The Douglas Walton Reader

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WINDSOR STUDIES IN ARGUMENTATION

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Catherine Hundleby

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WINDSOR, ON

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eBook ISBN: 978-1-998123-03-2
Print ISBN: 978-1-998123-02-5
Editorial and formatting assistance provided by Tamilyn Mulvaney.
Cover art by Amanda Panambi Morales Vidales.

This publication is dedicated to the memory of Dr. Catherine Hundleby, whose exemplary dedication and leadership as the coordinator of the Walton Reader project were instrumental in its inception and development. Her untimely passing before completing this work has left a profound void, but her indelible mark on this project and her unwavering commitment to academic excellence inspire us. We honour her memory by presenting this book, a testament to her enduring legacy and the collaborative spirit she fostered.

Contents

Acknowledgements

In 2023, the Walton Reader project held a Symposium that ignited a conversation about Douglas Walton's profound impact on the field of Argumentation Studies. In a testament to its significance, the project awarded three research scholarships to PhD students dedicated to bringing the book to life, including Asma Tajuddin, Amanda Panambí Morales Vidales and Kayla Lui. Among the collection of articles on informal logic, three pieces stand out, contributed by Walton's close collaborators Fabrizio Macagno, David Godden and Frank Zenker with Shiyang Yu. These articles, featured in the book, highlight the diverse ways in which Walton influenced scholars. The Walton Reader project serves as a powerful example of how academic work can inspire and shape future generations of researchers.

We extend our heartfelt thanks to Daniel Mejía Saldarriaga, whose dedicated efforts were immensely necessary throughout this project. Without his invaluable assistance, the completion of this project in all its stages would not have been possible.

We also express our sincere gratitude to Tamilyn Mulvaney for her tireless work throughout the entirety of this project. Her contributions have been invaluable to its success.

This book recognizes the enormous work of Dr. Walton, a luminary in the field of argumentation and a guiding force in the world of philosophy. His tireless pursuit of knowledge, unwavering dedication to his craft, and profound impact on the scholarly community continue to inspire and enlighten us.

May his legacy live on in the pages of this work and in the hearts of those who strive to follow in his footsteps. Rest in peace, Dr.

Walton, and may your spirit of inquiry and passion for truth endure forever.

Introduction

Who was Douglas Walton?

Dr. Douglas Neil Walton was a Canadian scholar who worked extensively on argumentation. He was a pioneer of the Informal Logic movement, known throughout the world. To briefly outline his academic journey, he began studying at the University of Waterloo in 1964 and later earned his Ph.D. from the University of Toronto in 1972. After teaching Philosophy at the University of Winnipeg, he moved to Windsor in 2008 and worked at the University of Windsor as a University Chair of Argumentation Studies at the affiliated Assumption University from 2008 to 2013. He also served as an adjunct Professor in the Philosophy Department. Moreover, he was the Distinguished Senior Research Fellow of the Centre for Research in Reasoning, Argumentation, and Rhetoric (CRRAR) from 2008 to 2020, (Tindale, 2020).

Walton's theory of argument has brought about a paradigm shift in various disciplines, creating a ripple effect of inquiry both theoretically and practically. The principles of Walton's theory have permeated various fields such as artificial intelligence, education, legal theory, methodology, and medical communication, where specific tools, including the dialogue types, the pragmatic approach to fallacies, and argumentation schemes, have been critical in encouraging the growth and development of these areas. He has self-authored and collaborated on approximately 60 books and over 400 research papers. He received numerous awards and was the very first recipient of the prestigious International Society for the Study of Argument (ISSA) award in recognition of a lifetime of scholarly achievement in the study of argumentation.

Reflecting on all these achievements, we believe that the presentation of Douglas Walton is a complex matter because there are not enough words to do justice to the significance of his work. According to Macagno and Toniolo, "presenting Douglas Walton would be an endless task" (2022, p.1). Therefore, this book presents just fragments that exemplify parts of his extensive and diverse theoretical corpus. Walton's theory of argumentation offers a wide range of variety. For example, he restructures the conceptualization of fallacies and introduces innovative methodologies for their analysis; this is the pivot from which Walton speaks of methods for analyzing dialogical interactions, making it an important aspect of his theory. At the peak of his career, Walton developed his theory of dialogues and schemes.

Walton understands arguments from both the semantic and the pragmatic dimensions. In this sense, he represents the semantic analysis in the theory of argumentation schemes, from which he proposes a new way of structuring and defining the limits of logic. The theory of schemes is a compilation of patterns of reasoning occurring repeatedly in everyday life, the reasonableness and acceptability of which can be evaluated by specific tools called critical questions (Macagno & Toniolo, 2022).

Walton's work is revolutionary because it opens new veins of analysis and application of argumentation theory that various disciplines take up for their own use and understanding, such as psychology, artificial intelligence, law, communication, etc. Achieving this level of influence is fundamental for philosophy because it broadens the panorama of argumentation as a field of study. In addition, it situates philosophy in the place from where theoretical models that help to explain reality are developed (Macagno & Toniolo, 2022).

The Walton Reader Project

The book in your hands is a product of the *Walton Reader* project, which introduces students to Walton's ideas. The Centre for

Research in Reasoning, Argumentation and Rhetoric (CRRAR) and the PhD in Argumentation Studies from University of Windsor thought of carrying out a project that would introduce students to the work of Walton published in the *Informal Logic* journal. This book provides an overview of Walton's scholarship in informal logic. It includes papers on fallacies, argument evaluation, dialogues, and argumentation schemes. This *Reader* adds to the special issue of *Informal Logic* Vol. 42, No. 1 (2022) in the University of Windsor's effort to remember and acknowledge the impact of Walton's work in argumentation studies.

The project entitled *The Walton Reader* was coordinated by Dr. Catherine Hundleby, who devoted a great deal of effort to its achievement. Unfortunately, Dr. Hundleby suddenly and sadly passed away. However, her spirit and will is reflected in this book, and out of respect for her effort, this project went ahead. In addition to this publication, The *Walton Reader* project hosted a Symposium in 2023 that sparked a conversation about Walton's profound impact on Argumentation studies. Along with the collection of *Informal Logic* articles, three other pieces stand out as they were contributed by close collaborators of Walton, Fabrizio Macagno, David Godden, and Shiyang Yu with Frank Zenker. These papers, included in the book, are a testament to the multiple ways Walton influenced scholars. The *Walton Reader* project is a powerful example of how academic work can inspire and shape future generations of researchers.

The *Reader's* goal is to introduce students to the thinking of Walton. That is why this project is made by students, for students. We aim to honour the memory and the significant work of Douglas Walton by promoting his theories and making them accessible to all people interested, across different fields of study.

Walton´s work is presented in the book in four sections. The first presents ways Walton has challenged the accounts of different fallacies, followed by his approach to argument evaluation and reasoning, and his theory on dialogues and argumentation schemes.

Finally, the book features three scholarly articles authored by Walton's close collaborators. These articles, deeply influenced by Walton's theoretical framework, offer insightful extensions of his work. Having outlined Walton's remarkable career and influences, we now offer a glance into his intellectual legacy – his groundbreaking theories in argumentation.

Informal Logic

According to Ralph Johnson and J. Anthony Blair, Informal Logic emerged for three main reasons: the criticism of the logic program in schools; the lack of adequate tools in logic to evaluate everyday reasoning, and the critique of the formal deductive logic as the only way that can provide good reasoning (Johnson & Blair, cited in Walton & Godden, 2007a). Informal logic, according to David Hitchcock, is a branch of logic that primarily deals with the analysis and assessment of arguments as they are used in everyday language. Unlike formal logic, which focuses on abstract, symbolic representations of arguments, informal logic concerns itself with arguments conveyed in natural language, emphasizing the practical aspects of reasoning. It encompasses the normative study of argumentation, looking at the standards, criteria, and processes involved in interpreting, evaluating, constructing, and critiquing arguments. This field acknowledges the complexity and nuances of real-world argumentation, where factors such as context, intent, and the use of rhetorical strategies play significant roles. Informal logic thus bridges the gap between the strict formalisms of traditional logic and the varied, often less structured ways in which people argue, reason, and persuade in everyday situations.

This movement, called *Informal Logic*, studies natural arguments in their normative forms, and intends to seek standards, criteria, and procedures for interpreting, evaluating and constructing arguments in everyday language (Blair & Johnson, 1987). According to Blair & Johson (1987), this logical field seeks to develop guidelines for understanding the reasoning behind arguments. The new

movement has brought with it philosophers such as Walton, who developed an account for everyday arguments. Walton was a prolific figure, and his work greatly influenced the informal logic movement as well as other fields of knowledge such as Artificial Intelligence, Education and Law.

In the early stages of his study, Walton questioned the notion of faulty reasoning. He believed that fallacies are incorrectly applied argumentation schemes (Macagno & Toniolo, 2022). He developed a pragmatic theory of argumentation that views arguments as instruments to resolve differences between parties. The nature of these arguments will depend on the type of dialogue in which the parties are engaged (Tindale, 1997). Walton's theory is essentially pragmatic, since it addresses how we use language and how its meaning is affected by context. Argumentation schemes gather empirical information from argumentative practice, distinguishing good from fallacious arguments (Lumer, 2016).

Fallacies

In the opening section of this book, dedicated to the exploration of fallacies, we delve further into the innovative contributions of Douglas Walton in the realms of argumentation and informal logic. This section showcases Walton's work, which challenged and reshaped traditional understandings of fallacies, as seen in a series of articles he co-authored with John Woods. These works, critiquing the conventional notion of fallacies from a formal deductive logic perspective (Tindale, 1997), set the stage for a more nuanced understanding. Walton and Woods (1982) argued that fallacies are not inherently flawed but are often misapplied schemes.

Walton's unique approach to fallacies, viewing them as conversational moves that can disrupt the flow of an argument (Walton, 1995), is further expounded in his papers. He suggests that fallacies should be seen as violations of procedural norms in a dialogue, a reasoned discussion or investigation (Walton, 2009). This per-

spective is grounded in the idea of dialogues being multi-sequential units of interactive argumentation, a position Tindale (1997) judges to be central to subsequent Walton's work.

This first section of the *Reader* presents four pivotal papers published in the *Informal Logic* journal that epitomize Walton's thoughts on fallacies. The first article, *"Puzzle for Analysis: Find the Fallacy"* (1978, Vol 1) is a puzzle that challenges the traditional idea of fallacies. According to Walton, there is an obstacle to the effective use of fallacies, and this is the lack of an adequate practical theory that tells us whether a given inference is valid or not. The paper starts with a puzzle and ends with one, the first puzzle is to intrigue the reader with the idea of circular reasoning, finding whether a fallacy has been committed and which one it is among the two: *Petitio* or *Post Hoc*. There is also a possibility that there is more than one fallacy. This is a paper that describes a situation where either one of the two fallacies is committed or there is circular reasoning by both the parties involved.

In 1979, Walton published in *Informal Logic*, a paper on a famous fallacy, "*Ignoratio Elenchi: The Red Herring Fallacy"*, (1979, Vol 2). It advances an open question, do all the popular fallacies like *ad baculum, ad populum,* and *ad misericordiam* involve the failure of topical appropriateness and relevance? This paper applies formal logic to *the red herring* fallacy to understand the concept of *relatedness,* but it is not efficient as not all arguments can follow the premise-to-conclusion method. In this paper, Walton shows that formal logic is not efficient and that's why he uses a dialogical model. The dialogical model developed by Walton is based on Charles Hamblin's idea of an argument as an interchange or discourse between arguers, a back-and-forth sequence of moves and countermoves (Hamblin,1970).

In *"Argument of the Beard" (*1996, Vol 18), Walton tries to discover whether the fallacy "a*rgument of the beard"* is a distinct category of fallacy. There is a detailed description of numerous cases in this paper that can help understand how the *argument*

of beard was defined as a f*allacy of continuum*, the opposite of the *black and white fallacy*, a short form of the *slippery slope argument slope, false dilemma, argument du gaspillage* (argument from waste) and more. It is a valuable investigation because the different cases help in understanding how distinct the argument of beard is from other similar fallacies. He also distinguished the problem of dismissing a criterion as arbitrary from the fallacy of the beard. This paper introduces the classification of subtypes of argumentation due to the vagueness of a verbal criterion that can help in a critical discussion, as the fallacious uses of the subtypes of argumentation help in understanding the pragmatic profiles of dialogues.

"Jumping to a Conclusion: Fallacies and Standards of Proof" (2009, Vol 29), with Thomas F. Gordon, shows that Jumping to a Conclusion is not a fallacy itself but a faulty argumentation pattern. There are four other informal fallacies which fit this category: *Post Hoc, Ad Ignorantiam, Ignoratio Elenchi* and suppressed evidence. Walton and Gordon analyze standard examples of both weak and fallacious arguments using formal logic tools, like argument diagramming methods that can identify normative conditions to identify things like the premises and conclusions of an argument, missing assumptions in an argument, and chains of argumentation in which one argument relates to another. But argument diagramming cannot help in analyzing informal fallacies as these need to be understood as violations of procedural norms of a reasoned discussion or investigation called a dialogue. The solution Walton and Gordon offered is a model of proof standards and burden of proof, taken from an artificial intelligence approach to the burden of proof (Gordon, Prakken & Walton, 2007). The significance of this paper is that it introduces Walton's work in analyzing informal fallacies, firstly by using formal tools like argument diagramming and then by introducing a model of proof standards and the burden of proof.

Argument Evaluation

The second section of the *Reader* presents selected papers on argument evaluation and Walton's theories of reasoning. To check if a particular argument is fallacious, one will have to learn how to evaluate arguments and understand how distinct types of reasoning work. The understanding of argumentation as dialectical was central to the founding of informal logic as a tool for evaluating arguments in natural language discourse by transcending the traditional ideal of a good argument as one that is deductively valid and has true premises (Blair & Johnson, 1987, p. 41). The normative, or theoretical, foundation of critical questions as tools for the evaluation of schematic arguments tests the three aspects of argument cogency: relevance, sufficiency, and acceptability (R.S.A.) (Johnson & Blair, 2006). According to the RSA criteria, an argument is a good one if its grounds (or premises) singly or in combination meet all three criteria. Firstly, the premises must be individually acceptable. Secondly, taken together the premises must be sufficient to support the claim that is the conclusion of the argument. Lastly, the premises need to provide relevant support for the conclusion. Argument evaluation can be done by using theoretical approaches, mapping tools and computational systems. In this respect, Walton's book *Argument Evaluation and Evidence,* helps in understanding how arguments are evaluated and how the concept of evidence is involved (Walton, 2016).

In "*Dialectical Relevance in Persuasion Dialogue"* (1999, Vol 19) Walton articulates his dissatisfaction with the Pragma-dialectical approach to fallacies, which defines them as rule violations while offering no independent justification for the rules. Although formal systems have captured topical relevance for dialectical relevance, Walton states that "*the basic problem is that relevance has never really been defined by the logic textbooks*." The term 'dialectical' (Hamblin, 1970; van Eemeren and Grootendorst, 1984; Freeman, 1991) refers to the use of an argument in a context of dialogue, or goal-directed conversational exchange of viewpoints. He has used dialectical approaches, roughly based on Hamblin's

dialectical approach (Hamblin, 1970). In this paper, Walton tested the dialectical relevance in persuasion dialogues and devised a method to test whether a persuasion dialogue meets the requirements of relevant appropriateness.

"Rules for Plausible Reasoning" (1992, Vol 14) presents a new type of reasoning discussed by Walton, plausible reasoning, a kind of reasoning based on tentative, *prima facie*, defeasible weights of presumption assigned to the propositions in an argument. He evaluated Nicholas Rescher's rules on plausible reasoning and a set of rules from AI (Artificial Intelligence) (Intelliware, 1986, Cited in Walton, 1992) to check if they can be adapted by informal logic for linked and convergent arguments. Walton then proposed new rules that can work for both linked and convergent arguments. This paper is significant as it is Walton's first move into AI. He used the rules for confidence factors in AI along with Rescher's rules to come up with a new set of rules that are adaptable to *Informal Logic*.

"What Is Logic About?" (1981, Vol 4) is vital for understanding Walton's ideas on Logic, his personal view that deciding what logic is about will require the study of informal fallacies as they provide benchmarks for the analysis of argument. In a demonstrative argument, the premises are better known than the conclusion. In a dialectical argument, the premises are presumed to be true. Walton analyses the *circumstantial ad hominem* and argues against counting it as an ethical violation rather than a logical one, citing the fluidity and unsettledness of the concept of argument that allows for crossover between logic and ethics. He thinks that the concept of argument is fluid and can accommodate something like *circumstantial ad hominem*, even if its nature is more inclined towards ethics than logic.

"A Dialectical Analysis of the Ad Baculum Fallacy" (2014, Vol 34) presents an application of the dialectical argumentation structures to the problem of analyzing the *ad baculum* fallacy. Walton states that not all instances of *ad baculum* arguments are fallacious.

The *ad baculum* fallacy is the *"appeal to force to cause the acceptance of some conclusion"* (Copi & Cohen, 1990, p. 105). It is found in the informal logic textbooks as cases of direct threat by an arguer. Copi and Cohen added that it can also be applied with "*considerable subtlety*" if the arguer uses a "*veiled threat*" but not a direct one. Such a veiled threat, as an *ad baculum* argument is difficult to evaluate by using traditional logic techniques. Walton designed an analysis, that can be carried out on three levels: (1) an *inferential level*, represented by an argument diagram, (2) a *speech act* level, where conditions for specific types of speech acts are defined and applied, and (3) a *dialectical level* where the first two levels are linked together and fitted into formal dialogue structures. Walton recognized that not all instances of *ad baculum* arguments are fallacious. Woods and Walton analyzed the form of the argument as being a disjunctive syllogism of a kind that can be classified as a prudential type of argument and added that it can be seen as reasonable (Woods & Walton, 1976).

"Defeasibility in Judicial Opinion: Logical or Procedural?" (2008, Vol 28) focuses on whether defeasibility in judicial opinions is procedural or logical. In this paper, David Godden and Walton adopted a different perspective of defeasibility in Law, in reasoned arguments offered by judges as part of their decisions. Judicial opinions are defeasible: they can either be overturned on appeal or sent back for retrial. Godden and Walton try to find the possible grounds, outcomes and legal procedures affecting the appeal of legal decisions to determine which model best fits. They argue that the defeasibility of *Ratio Decendi* (rationale for the decision) is best explained and modelled in a procedural and dialectical framework. This paper tries to look at the defeasibility of the judicial opinion of a sole reasoner, a judge giving judgment, not affected by the shifting of the burden of proof as there are no parties engaged in an argumentative dialogue, where the burden of proof can shift back and forth between disputants. Godden and Walton claim that *Ratio Decendi* are best explained in a procedural and dialectical framework, and appeals are best explained procedurally

as meta-dialogues, examining the correctness of the reasoning and argumentation.

Schemes and dialogues

According to Walton (2000), there are four tasks undertaken by informal logic: identification, analysis, evaluation, and invention of arguments. Identification is to find the premises and conclusion of an argument. Analysis is to find implicit premises or conclusions in an argument needed for evaluation. Evaluation means to figure out whether an argument is weak or strong. The task of invention is to construct new arguments that can be used to prove a specific conclusion (Walton, 2000).

Dialogues are normative models. The six basic types of dialogue were previously recognized by Walton and Krabbe (1995): persuasion, inquiry, negotiation, information-seeking, deliberation, and eristic Discovery dialogue has been added and there are now seven basic types of dialogues (McBurney & Parsons, 2001). Each model of dialogue is defined by its initial situation, the participants' individual goals, and the aim of the dialogue. A dialogue is formally defined as an ordered 3-tuple {O, A, C} where O is the opening stage, A is the argumentation stage, and C is the closing stage (Walton and Gordon, 2009, p. 5). Dialogue rules (protocols) define what types of moves are allowed by the parties during the argumentation stage (Walton & Krabbe, 1995).

Argumentation schemes can be described as abstract structures for different types of argument. Every scheme has a corresponding set of critical questions providing its defeasibility conditions and the possible weak points that the interlocutor can use to question the argument and evaluate its strength. A critic who has no counterarguments, can search through the list of critical questions matching the argument they are confronted with for clues on how the argument can be attacked that might suggest sources of evidence that could be used to build up a whole line of argumentation that offers a way of refuting the argument (Macagno, Walton, & Reed, 2017).

"Abductive, presumptive and plausible arguments" (2001, Vol 21) is Walton's effort to survey how the concepts of abductive, presumptive and plausible reasoning are used in a field, and to show their main differences and define them. Approaching abductive reasoning, without knowing inductive and deductive reasoning will not be fruitful, but this paper gives good examples to distinguish them from each other. For example, Preyer and Mans (1999, p. 12) give a three-way distinction between inductive, deductive and abductive reasoning. *Abduction* is often portrayed as a kind of *'backwards'* reasoning, because it starts from the known facts and probes backwards into the reasons. The etymological derivation of the term is from the Latin *ab* (from) and *duca* (lead) (Preyer & Mans, 1999). Following Blair (1999), Walton suggests that what counts as the best explanation is not a logical matter but a social matter. The social nature is helpful in understanding the fallacies that involve misuses of abductive reasoning (Blair, 1999).

"Advances in the Theory of Argumentation Schemes and Critical Questions" (2007b, Vol 27) shows the role of argumentation schemes in argument reconstruction and evaluates the role of critical questions. Argument schemes play a role as normative categories of argument. Walton and Godden proposed an account based on the R.S.A cogency standard (Johnson & Blair, 2006) for critical questions, further developing it for understanding the relationship between critical questions and the burden of proof. The purpose of the paper is to initiate a reconciliation between dialectical and informal logic approaches to the argumentation schemes. Good presumptive arguments can also fail for two reasons: a defective inference and being out of context. The function of a critical question is to test a typical or common way in which an argument of a certain schematic type can fail to meet one (or more) of the R.S.A. criteria (Walton & Godden, 2007b). Walton uses critical questions as a type of evaluative topoi, like a list of necessary conditions for the success of schematic arguments. Walton's approach to critical questions does not oppose the R.S.A cogency standard, but instead is derived from it, not to be used as an alternative, but for him their application is dependent on the argument

type, distinctive patterns of reasoning and unique dialectical situations.

"Why Fallacies Appear to be Better Arguments Than They Are" (2010, Vol 30) shows that fallacies also have a psychological dimension, they are illusions and deceptions. Fallacies seem like valid arguments but are not (Hamblin, 1970, p. 12). It is an open question whether "seems valid" is a psychological dimension as they involve heuristics, which interested Walton. According to Tindale (1997), the two most fully developed theories of fallacy are the pragmatic theory (Walton, 1995) and the pragma-dialectical theory (van Eemeren & Grootendorst, 1992). The term 'heuristic', as used here, refers to the study of methods for discovering problem-solving techniques (Russell and Norvig, 1995, p. 94). Heuristics are related to argumentation schemes, and this provides the connection between Walton's work and AI. A Para scheme is a device that can be used as the structure of a heuristic as a speedy form of inference that instinctively jumps to a conclusion and is commonly used to make decisions. Walton explains that para schemes can help in understanding why people reason carelessly.

"Dialectical Shifts Underlying Arguments from Consequences" (2009, Vol 29) shows how dialectical shifts occur when a deliberation dialogue shifts towards a persuasion dialogue. Such shifts are illicit, but not fallacious according to Walton. He analyses the argument from negative consequences and the argument from threats. He supports the idea that arguments from negative consequences and threats should not be dismissed as fallacious but need to be evaluated and their category needs to be discovered. There are three standard categories: (a) reasonable when considered in the context of a dialogue; (b) weak but not fallacious; and (c) fallacious (Walton, 2009). Walton's main concern in identifying shifts is because arguments can become dangerous since persuasive effect is more powerful than rational persuasion. The rhetorical persuasive effect of such arguments, which have concealed dialectical shifts, needs to be addressed.

In "*Formalizing Informal Logic"* (2015, Vol 35), Walton and Gordon investigate the applicability of formal argumentation models to ten characteristics of informal logic. This paper is interesting in that the characteristics of informal logic are evaluated by a formal logic tool. The ten characteristics are: (1) Informal logic's recognition of the linked-convergent distinction, (2) serial arguments and (3) divergent arguments, (4) relevance, (5) premise acceptability and (6) sufficiency, (7) pro-contra (conductive) arguments. (8) analyzing real arguments. (9) argument construction and (10) the notion of audience. They use the Carneades Argumentation System (CAS), a formal computational model of argument that uses argument graphs like diagrams. In CAS, argument evaluation is the process of critically assessing arguments by four means: (1) revealing implicit premises, (2) validating whether the arguments are formally correct by instantiating accepted argumentation schemes, (3) asking critical questions appropriate for a scheme, and (4) determining which claims are acceptable, taking into consideration the assumptions of the audience and its assessment of the relative weights of conflicting pro and con arguments.

Contributors

In the concluding section of this book are articles that serve as a fitting homage to Douglas Walton. They not only represent his intellectual legacy but also extend his theories, demonstrating their ongoing relevance and adaptability. Through these scholarly contributions, Walton's influence on argumentation theory is both commemorated and perpetuated, ensuring that his work continues to inspire and inform future research in the field.

The paper titled, "*Fallacy overlap and the pragmatics of fallacies*" is a guest paper by Fabrizio Macagno, a renowned scholar, who was Walton's student and has also collaborated with him on many projects. Macagno explores Walton's pragmatic approach to arguments and fallacies with a puzzle of fallacy overlap already tackled by Walton in his early days, a case that can be both considered

as an instance of *petitio principii* and *post hoc*. The "fallacy overlap" is a crucial challenge for argumentation theory because if a clear criterion is not defined then it will be difficult to distinguish between fallacies and their identification and develop tools for analyzing them.

The paper titled, *"Informal Logic: Contrasting the Waltonian and Windsor Approaches"* is a guest paper by David Godden, a renowned scholar, who was Walton's collaborator on different projects. Godden explores Walton's contribution to the emergence of Informal Logic in Canada. It is often seen as a unique Canadian approach to argumentation, with two main schools of thought: the Windsor-centric approach and the Winnipeg or Waltonian approach. Its history is well-documented, but the narrative is heavily Windsor-centric, often overlooking the influence of Walton in the development of Informal Logic. This paper gives an overview of Walton's approach to informal logic, outlining its main features and early development. The emergence story is presented against a background of the Windsor approach, highlighting the unique aspects of Walton's approach. Godden discusses efforts made to reconcile both approaches and incorporate the fundamental principles of a Waltonian approach.

The paper titled *"Walton's contribution to evaluating the ad baculum argument"* is a guest paper by Shiyang Yu and Frank Zenker. This paper is based on Walton's contribution to evaluating the *ad baculum argument* (the argument from threat) within a dialectical framework, connecting the argument scheme approach to speech act theory. Yu and Zenker have advanced Walton's approach, firstly by clarifying the relations between three analytical levels: the *inferential* or *logical* level, the *speech act* level, and the *dialectical* level, and secondly by focusing on the *speech act* level and the felicity conditions attached to the evaluation.

References

Blair, J. A. (1999). Walton's Argumentation Schemes for Presumptive Reasoning: A Critique and Development. In F. H. van Eemeren, R. Grootendorst, J. A. Blair and Ch. A. Willard (Eds.), *Proceedings of the Fourth International Conference of the International Society for the Study of Argumentation* (pp. 56-61). Amsterdam: SicSat.

Blair, J. A., & Johnson, R. H. (1987). The current state of informal logic. *Informal Logic*, 9(2&3), 147-151. DOI: https://doi.org/10.22329/il.v9i2.2671

Copi, I. M. & Cohen, C. (1990). *Introduction to Logic*. New York: Macmillan.

Freeman, J. B. 1991. *Dialectics and the Macrostructure of Arguments*. Berlin, Foris.

Godden, D. & Walton, D. (2008). Defeasibility in Judicial Opinion: Logical or Procedural? *Informal Logic*, 28(1), 6-19. DOI: https://doi.org/10.22329/il.v28i1.510

Gordon, T. F., Prakken, H., & Walton, D. (2007). The Carneades model of argument and burden of proof. *Artificial intelligence*, 171(10-15), 875-896. DOI: https://doi.org/10.1016/j.artint.2007.04.010

Hamblin, C. L. (1970). *Fallacies*. Virginia: Vale Press.

Johnson, R. H. & Blair, J. A. (2006). *Logical Self-Defense*. New York: Idea.

Lumer, C. (2016). Walton's Argumentation Schemes. In L. Benacquista & P. Bondy (Eds.), *Argumentation, Objectivity and Bias, Proceedings of the OSSA Conference*, Vol. 11.

Macagno, F., & Toniolo, A. (2022). Introduction to the Special Issue. Douglas Walton and His Contribution to argumentation Theory. *Informal Logic*, 42(1), 1-23. DOI: https://doi.org/10.22329/il.v42i1.7210

Macagno, F., Walton, D., & Reed, C. (2017). Argumentation schemes. History, classifications, and computational applications. *Journal of Logics and Their Applications*, 4(8), 2493-2556.

McBurney, P., & Parsons, S. (2001). Chance discovery using dialectical argumentation. In: T. Terano, Y. Ohsawa, T. Nishida, A. Namatame, S. Tsumoto, & T. Washio (Eds.), *New Frontiers in Artificial Intelligence*. JSAI 2001. *Lecture Notes in Computer Science*, vol. 2253. Berlin/Heidelberg: Springer. DOI: https://doi.org/10.1007/3-540-45548-5_57

Preyer, G., & Mans, D. (1999). Introduction: Contemporary Developments in the Theory of Argumentation. *Protosociology*, 13, 3-13. DOI: https://doi.org/10.5840/protosociology1999131

Russell, S. J., & Norvig, P. (Eds.). (1995). *Prentice Hall series in artificial intelligence*. Englewood Cliffs, N. J.: Prentice Hall.

Tindale, C. W. (1997). Fallacies, Blunders, and Dialogue Shifts: Walton's Contributions to the Fallacy Debate. *Argumentation*, 11(3), 341-354. DOI: https://doi.org/10.1023/a:1007706724732

Tindale, C. W. (2020). In Memoriam. Douglas Neal Walton 1942-2020. *Informal Logic*, 40(1), 1-2.

van Eemeren, F. H. & Grootendorst, R. (1984). *Speech acts in argumentative discussions*. Dordrecht: Foris.

van Eemeren, F.H. & Grootendorst, R. (1992). *Argumentation, Communication and Fallacies*. Hillsdale, N. J.: Erlbaum.

Walton, D. (1979). Ignoratio Elenchi: The Red Herring Fallacy. *Informal Logic*, 2(3), 3-7. DOI: https://doi.org/10.22329/il.v2i3.2823

Walton, D. (1981). What is Logic About? *Informal Logic*, 4(1), 2-4. DOI: https://doi.org/10.22329/il.v4i1.2760

Walton, D. (1992). Rules for Plausible Reasoning. *Informal Logic*, 14(1), 33-51. DOI: https://doi.org/10.22329/il.v14i1.2524

Walton, D. (1995). *A Pragmatic Theory of Fallacy*. London/Tuscaloosa: University of Alabama Press.

Walton, D. (1996). The Argument of the Beard. *Informal Logic*, 18(2), 235-259. DOI: https://doi.org/10.22329/il.v18i2.2382

Walton, D. (1999). Dialectical Relevance in Persuasion Dialogue. *Informal Logic*, 19(2), 119-143. DOI: https://doi.org/10.22329/il.v19i2.2323

Walton, D. (2000). The Place of Dialogue Theory in Logic, Computer Science and Communication Studies. *Synthese*, 123, 327-346. DOI: https://doi.org/10.1023/A:1005237527730

Walton, D. (2001). Abductive, Presumptive and Plausible Arguments. *Informal Logic*, 21(2) 141-169. DOI: https://doi.org/10.22329/il.v21i2.2241

Walton, D. (2009). Dialectical Shifts Underlying Arguments from Consequences. *Informal Logic*, 29(1) 54-83. DOI: https://doi.org/10.22329/il.v29i1.684

Walton, D. (2010). Why Fallacies Appear to be Better Arguments Than They Are. *Informal Logic*, 30(2), 159-184. DOI: https://doi.org/10.22329/il.v30i2.2868

Walton, D. (2014). A Dialectical Analysis of the Ad Baculum Fallacy. *Informal Logic*, 34(3), 276-310. DOI: https://doi.org/10.22329/il.v34i3.4109

Walton, D. N. (2016). Argument Evaluation and Evidence. *Springer, Law, Governance and Technology*, Vol. 23. DOI: https://doi.org/10.1007/978-3-319-19626-8

Walton, D., & Godden, D. (2007a). Informal Logic and the Dialectical Approach to Argument. In H. V. Hansen & R. Pinto (Eds.), *Reason Reclaimed, Essays in honor of J. Anthony Blair and Ralph H. Johnson* (pp. 3-17). Newport: Vale Press.

Walton, D., & Godden, D. (2007b). Advances in the Theory of Argumentation Schemes and Critical Questions. *Informal Logic*, 27(3), 267-292. DOI: https://doi.org/10.22329/il.v27i3.485

Walton, D., & Gordon, T. F. (2009). Jumping to a Conclusion: Fallacies and Standards of Proof. *Informal Logic*, 29(2), 215-243. DOI: https://doi.org/10.22329/il.v29i2.1227

Walton, D., & Gordon, T. F. (2015). Formalizing Informal Logic. *Informal Logic*, 35(4), 508-538. DOI: https://doi.org/10.22329/il.v35i4.4335

Walton, D. & Krabbe, E. C. (1995). *Commitment in dialogue: Basic concepts of interpersonal reasoning*. New York: State University of New York Press.

Walton, D., & Woods, J. (1978). Puzzle for Analysis: Find the Fallacy. *Informal Logic*, 1(2), 5-6. DOI: https://doi.org/10.22329/il.v1i2.2804

Walton, D., Reed, C., & Macagno, F. (2008). *Argumentation Schemes*. New York: Cambridge.

Woods, J. & Walton D. (1982). *Argument: The Logic of Fallacies*. Toronto: McGraw-Hill Ryerson.

Woods, J. & Walton, D. (1976). Ad Baculum. *Grazer Philosophische Studien*, 2(1), 133-140. DOI: https://doi.org/10.1163/18756735-90000026

I

Changing the Idea of Fallacies

1978 Vol 1: Puzzle for Analysis: Find the Fallacy

Douglas Walton and John Woods

A major stumbling block to the effective use of the informal fallacies in the teaching of practical logic is the lack of adequate and applicable theory to tell us, even in what are presumed to be paradigm cases, whether or not a given inference really is invalid (incorrect, fallacious). In the task of working toward a better theoretical and practical understanding of the fallacies one is often confronted with various interesting cases of "fallacy overlap", where an argument that we would probably want to classify as fallacious sits on a not very well defined fence between two of the traditional major informal fallacies. Hamblin (1, p. 34) notes that some standard examples I that are usually cited as instances of the *petitio* could be equally well classified as cases of the *ad verecundiam*. Some of these borderline cases are strikingly suggestive as to the more or less exact logic of the fallacies. It is one of these significant examples of quite general interest that we would like to propose as a puzzle for analysis.

Here is an argument apparently redolent of "circular reasoning". The residents of an outlying suburb take forward a plebiscite to City Hall in favour of improving the bus service in their neighbourhood. City Hall replies: "Why should we add more buses when the ones currently assigned to that route are operating at a deficit because not enough people are using them?" The residents then point out that if more buses were scheduled at a greater variety of times, and the residents became accustomed to being able to rely on regular, reliable bus service at times that would be convenient to them, then the service would be more fully used. They suggest that it is for the very reason that the present service is so

poor that nobody takes the bus. Nobody takes the bus because the present service is poor! City Hall's argument that the present service should remain at its present level because few people now use the existing service is one that in effect traps the residents in a vicious circle. The dialectical manoeuvre is a familiar enough one in the political forum. An existing poor service or underused but inefficient amenity can always, in just this quite characteristic way, be cited as "evidence" contra its own improvement. The form the argument takes can be formulated dialectically as follows.

> **Opponent:** Service S is underused, therefore it should remain at its present level.
>
> **Respondent:** Service S is underused because it remains at its present level.

Notice that the opponent argues from the premiss 'S is underused' to a conclusion that posits S remaining at the present level. The respondent argues the other way around. Hence the impression of circularity. Two other complicating elements are present however. The respondent's inference is explicitly causal. And one feels that what is at stake is a causal cycle. Second, the opponent's inference seems to be more explicitly normative, containing as it does the word 'should'.

Why a causal cycle seems to be involved is evident from the perspective of the citizens in our example. Given City Hall's proclivity for statistics, it is true to say that the present service is so poor because nobody takes the bus. But nobody takes the bus precisely because the present service is so poor. We are on a causal carousel of conservatism.

The essential fallaciousness of this sort of argument would thus seem to be a curious hybrid of *post hoc* and *petitio principii*. The aspect of *post hoc* that is involved concerns the factor (P2) of the set of conditions of (2, p. 580) used to analyse the fallacy of *post hoc* when considering inferences from correlations to causal con-

clusions. This particular factor is concerned with the non-symmetry of causal attributions. Its relevance is occasioned by the fact that we may know that there is some sort of causal connection between two conditions Φ and Ψ without knowing which way the relation is to be directed.

But enough hints. The problem is to sort out whether there has been a fallacy committed. If so, is it a *petitio* or a *post hoc*? Or is there more than one fallacy, or is the fallacy a combination of both? Another problem: who committed the fallacy, City Hall or the citizen's committee? Or did they somehow collaborate?

References:

C. L. Hamblin, *Fallacies*, London, Methuen, 1970, p.34

John Woods and Douglas Walton, 'Post Hoc Ergo Propter Hoc,' *Review of Metaphysics*, 30, 1977, 569-593

1979 Vol 2: Ignoratio Elenchi: The Red Herring Fallacy

Douglas Walton

It is a longstanding presumption of the tradition of logic that several major informal fallacies essentially involve failure of topical appropriateness or relevance. The *ad baculum*, the *ad populum*, and the *ad misericordiam* each involve an emotional appeal.[1] But there need be nothing wrong with appeals to emotion as such, nor need an appeal to emotion even involve argument, let alone fallacious argument. Indeed, many an emotional appeal is deceitful as a complete abandonment of argument covered up by the distraction of a naked appeal to emotion. What can be fallacious in emotional appeals however, where there is argument, is that the proposition that appeals to emotion turns out to be, in some important sense, irrelevant to the conclusion to be argued for. Thus if an advertiser tries to communicate the idea that his product is popular, there may be nothing fallacious in that. But if popularity is a premiss for the conclusion that his product is a good buy, or technically or nutritionally sound, an *ad populum* may be in the offing. Reason: popularity is not an appropriate or relevant basis for establishing technical performance or nutritional adequacy of a product. One has simply strayed off topic altogether.

The *ad hominem* is another case in point. Personal characteristics or circumstantial factors may often fail to be argumentatively connected in any serious way to the conclusion at issue. Perhaps it's true that our physician who cites evidence of the dangers of smoking cannot herself give up the habit. Yet to dwell on this interesting circumstantial inconsistency may commit an irrelevant appeal by

1. See Walton (1980).

masking the fact that the evidence cited by the physician is reasonable and good evidence, not to be overlooked.[2] Similarly, *ad verecundiam*[3] may dwell on an appeal to the sayso of some glamorous "expert" in lieu of evaluating serious evidence for or against some proposition.

The term *ignoratio elenchi* (misconception of refutation)[4] is often used, following in the Aristotelian tradition, to refer to failure of relevance in argument. But as Hamblin comments, until we have some firm idea of what is meant by "relevance" in this context, just calling failure of relevance a fallacy is not any help.[5] And indeed, historically the *ignoratio elenchi* has tended to become a rag-bag category to cover any argument where the author is uncertain why it is fallacious. What has happened is that the *ad populum*, *ad hominem*, and other major fallacies, have stayed in the textbooks, but with the lame explanation that they are somehow failures of an argument to be relevant. The problem is that until we know what relevant "means" we have no clear guidelines for showing clearly what really is fallacious about these arguments that so strongly seem to go wrong by being off topic.

Formal logic does not seem to be any help in resolving the problem. It is well known that classical logic has theorems like $p \supset (q \supset p)$ and $\sim p \supset (p \supset q)$, which suggests that classical logic is simply neutral on the issue of whether p and q are in any way topically related to each other. The classical material 'If . . . then' or $\supset$, only assures us that $p \supset q$ never takes us from a true p to a false q, never mind whether p and q are connected in any way.

2. See Woods and Walton (1977).

3. See Woods and Walton (1974).

4. But sometimes also translated as "ignorance of refutation".

5. Actually, as Hamblin indicates, and as will be pointed out below, the Aristotelian conception of *ignoratio elenchi* may be somewhat different from inferences that many modern writers might tend to classify as fallacies of relevance.

The branch of formal logic called relevance logic is specifically designed to deal with "fallacies of relevance" like the two classical tautologies above. But the problem with it is that although it offers a variety of formal logics based on the idea of relevance, somehow –at least so far– it has not provided us with a clear basic idea of what "relevance" means in one or more of these formal logics. We need a concept of relevance that can be applied to fallacies like the *ad baculum* and *ad verecundiam* so that we can see specifically how these arguments are, at least sometimes, dramatic failures of a proposition to be relevant to a given argument or conclusion. "Relevant", that is, in a sense which shows us why such arguments can correctly be said to be fallacious. The problem is that the philosophical task of showing the relevance of relevance logics to the major fallacies of relevance remains unsolved, or perhaps even unaddressed. It is by no means clear that "relevance" in the technical sense of relevance logic is the same concept of relevance that is meant when we say that the *ad misericordiam* is a fallacy of relevance. Part of the problem, as we will see, is that quite a variety of notions of the connections between the antecedent and consequent of a conditional proposition could be involved.

"Relevance" could mean all kinds of things, but let us go back to the basic idea so often expressed that a proposition p is connected to (relevant to, related to) another proposition q, if p and q share meaning content.

Suppose we begin with the idea that an argument or discourse is about a set of topics, T. Of course, with many arguments, the set of topics that the argument can comprise is not firmly agreed on by the participants at the outset. But to work towards what we want to analyse, let us adopt the model of an argument, after Hamblin, as an interchange between participants. An argument, by these lights is then a sort of interchange or discourse between arguers, a back and forth sequence of moves and countermoves. For a given discourse, let us make the assumption that the participants can establish a set of topics that comprises the legitimate subject of that discourse. Given an overall set of topics for a given series of inter-

changes, we can then look at any particular argument that is part of that series, and evaluate whether or not it is “off topic”.

Following a suggestion made by David Lewis, we take every proposition p, q, r, . . . , in the discourse we are concerned with, and assign it its subject-matter, called p, q, r, . . . , which is in each case a subset of T.[6] Then we can say that p is related to q if there is subject-matter overlap between p and q. For example if ‘Bananas are yellow’ contains the subject-matters ‘bananas’ and ‘yellow’, and ‘Bananas are nutritious’ contains the subject-matters ‘bananas’ and ‘nutritious’, then the two propositions are related. They both contain the topic ‘bananas’ in their subject-matters. This is a clear and simple idea of “relevance”, or relatedness as we prefer to call it, that provides a beginning point for exploring fallacies like those we have mentioned.

Clearly ‘p is related to q’ in the sense of overlapping subject-matters is a relation that is reflexive and symmetrical, but not transitive. The following example will show why transitivity fails. ‘Bananas are yellow’ is related to ‘There are two bananas on my desk’. And the second proposition is related to ‘2+2=4’. But ‘Bananas are yellow’ is not related to ‘2+2=4’.

Here at any rate is one clear conception of relatedness of propositions –that of subject- matter overlap[7] — that offers a place to begin in analyzing fallacies of relevance.

A typical example of irrelevance in argument is given by Johnson and Blair (1977, p. 54), where then Senator Paul Martin took exception to the slur contained in Arthur Hailey’s *Wheels* that Windsor is as grimy and ugly as Detroit. Martin responded:

6. See also Epstein (1979, p.156ff).

7. Another notion of related is that of spatio-temporal adjacency in an act-sequence. R(p,q) in this context has this meaning: what makes p true can affect what makes q true.

> When I read this I was incensed . . . Those of us who live there know that (Windsor) is not a grimy city. It is a city that has one of the best flower parks in Canada. It is a city of fine schools, hard-working and tolerant people.

In critically analyzing this argument, Johnson and Blair point out that Martin's initial point about the flower park does tell against Hailey's appraisal. But instead of continuing to build his case for the beauty of Windsor, the Senator changed the subject, by effecting a quick transition to other topics: the hard-working and tolerant characteristics of the people of Windsor. This shift is a red herring or *ignoratio elenchi* move in the argument, as Johnson and Blair point out.

The thrust of the argument runs something like this, if we break it down into distinct premisses.

> PREMISS 1: Windsor has one of the best flower parks in Canada.
> PREMISS 2: Windsor has fine schools.
> PREMISS 3: Windsor has hard-working, tolerant citizens.
> CONCLUSION: Windsor is not a grimy city.

Now the question is: how could what is fallacious about this argument be shown to be an incorrect argument in a relatedness modelling? The evidently insuperable initial problem is this: the fact is that there is subject-matter overlap between every premiss and the conclusion of the argument. Therefore, if *ignoratio elench*i is failure of subject-matter overlap, then the above argument is definitely not an *ignoratio elenchi* at all!

What I think this shows is that subject-matter overlap between premisses and conclusion does not constitute a sufficient condition of correct argument. Perhaps another illustration will make this point more clearly. The thirteenth century logician William of Sherwood cites the two arguments below as incorrect. They are cited as instances of Ignorance Regarding Refutation (*Ignoratio Elenchi*) –see the translation of Kretzmann (1966, p. 156). (1) Socrates is

naturally pious, but he is not absolutely pious; therefore he is both pious and not pious. (2) Socrates is running at time a (*currit in a*) and he is not·running at time b; therefore he is both running and not running. Now notice that in both these arguments there is subject-matter overlap between premisses and conclusion, yet both arguments are clearly incorrect. Indeed, both are sophismatical or fallacious arguments from premisses that are possibly true to a conclusion that can't be true.

So subject-matter overlap is not enough to rule out fallaciousness. To be a correct argument meeting reasonable standards that will avoid *ignoratio elenchi*, not only must there be subject-matter overlap but also the argument must not allow us to go from true premisses to a false conclusion. Hence the relatedness conditional, $p \rightarrow q$, must incorporate both requirements that (1) it is not the case that p is true and q is false, and (2) p is related to q.

In short, the reason why Senator Martin's argument fails is not failure of subject-matter overlap, but by virtue of the fact that the second two premisses simply fail to imply the conclusion, either deductively or inductively. It is neither impossible nor improbable that a grimy city might have hard-working and tolerant citizens.

Still, one might persist, isn't the red herring really explained by the evident presumption that 'has hard-working tolerant citizens´ as property of some city X, fails to have subject-matter overlap with 'is not a grimy city' for any X. The suggestion is that the following argument fails by reason of lack of subject-matter overlap, where X is any city.

> PREMISS 1: For all x, x has fine schools.
> PREMISS 2: For all x, has hard-working, tolerant citizens.
> CONCLUSION: For all x, x is not a grimy city.

And to be sure, this argument does fail to have significant subject-matter overlap, and is a bad argument.

So perhaps there is a second explanation of what is fallacious about Senator Martin's argument. It is, by these lights, really a true red herring after all and not merely a failure of implication not specifically due to subject-matter disjointedness. Still, even if this second analysis is acceptable, our general point remains that subject-matter connectedness by itself is not enough to assure correctness of an argument, as the examples from William of Sherwood show. For we cannot analogously reconstruct the Williams arguments as failures of subject matter overlap. For example the reconstruction of (l) as follows remains incorrect: for some individual x, x is naturally pious but x is not absolutely pious; therefore x is both pious and not pious. This argument is incorrect, but it still has subject-matter overlap between premisses and conclusion. Therefore generally we must conclude that ignorance of refutation involves more than just failure of subject-matter overlap. Topics are involved essentially, but they are not the whole story about *ignoratio elenchi*.

As can be seen by the examples cited above from William of Sherwood, the traditional Aristotelian fallacy of ignorance of refutation was not restricted merely to instances of failure of subject-matter overlap. Indeed, the Aristotelian tradition of the "topics", so influential in medieval logic, distinguished numerous different kinds of connections or "topics" that could relate the premisses and conclusion of a correct argument. Boethius followed Cicero's conception of a topic as *sedes argumenti* (a seat of argument), and described it as "that from which a fitting argument may be drawn for a proposed question" (*De Differentiis Topicis*). For these earlier authorities, a topic functions primarily as a way of finding new arguments, but for later writers like Abelard and Ockham the topic became the inferential basis of a conditional proposition.

Abelard claims that the topics show the inferential force (*vis inferentiae*) of all conditionals. According to Bird (1960) Abelard uses the topic as an "inference-warrant" that can accommodate formal as well as non-formal inferences. An example of Abelard's is that 'If it is man, it is animal' is a correct (good and necessary) infer-

ence whereas 'If it is stone, it is animal' is not, because the second lacks the relation of the Topical Difference of Species.

However, it is clear that genus-species was not the only topical relation recognized by the medievals, and in fact the diversity of the dialectical topics subdivided the kinds of correct conditionals they recognized into many classifications. For example we find in Peter of Spain an enumeration of some twenty-one topics including part-whole relations, attributions of place and time, causation, similarity, authority, adverbial modification, and so forth. What is common to them is that a topic is always a relation that warrants an inference.

This tradition of the topics suggests that the application of formal theories of the conditional to the wide varieties of failure of correct inference that are involved in many informal fallacies and practical arguments is no simple matter. It appears to involve many different kinds of relations that link the antecedent to the consequent in conditionals. Subject-matter overlap is one such relation that helps to clarify one sense of "failure of relevance" central to understanding the modern conceptions of the *ad populum*, *ad hominem* and related fallacies. Clearly however, other kinds of relatedness relations are involved as well, if the many different varieties of conditional used in practical arguments are to be studied.

Let us turn to seeing how a general theory of relatedness could be formulated to accommodate the above requirements and still allow for a good deal of flexibility in application to specific arguments. We will see that it can be done by modifying the usual propositional calculus and requiring the relatedness of antecedent and consequent in order for a conditional to obtain. Could such a formal approach be useful?

Many of those who are drawn to informal logic see it as a subject that shows pedagogical promise in teaching students how to handle the practicalities of evaluation of argumentation in pragmatic situations like the consumer marketplace. Because they see it as

a practical discipline they are skeptical that formal logic can be meaningfully applicable to realistic argumentation. After all, doesn't formal logic rest on a propositional calculus that certifies as valid argument forms schemata like $\sim p \supset (p \supset q)$? How could a logic that allows conditionals to obtain between ostensibly unrelated proposition be applicable to fallacies like the *ad populum* or *ad hominem*?

Yet on the other hand, if formal guidelines on what constitutes correct versus incorrect forms of argument are not available, how could practical logic of the informal sort ever offer clear and precise guidelines for evaluating arguments?

Perhaps the dilemma can be ameliorated by clarifying more precisely what is meant by "formal logic" in this context. True, classical PC is not a model of argument that suits the fallacies of subject-matter relatedness, but perhaps other formal approaches that deviate from classical logic in order to capture the relevant sense of propositional connectedness could be more useful.

One formal approach that shows great promise in studying fallacies associated with failure of subject-matter overlap is the relatedness logic of Epstein (1979). In relatedness logic, the conditional $p \rightarrow q$ is defined as incorporating the classical requirement that it not be the case that p is true and q false with the additional requirement that p be related to q. R(p,q) is read as 'p is related to q', a relation that is reflexive and non-transitive. It may be symmetrical or not, as you wish, but if relatedness is interpreted as meaning 'subject-matter overlap of p with q' then clearly it is also a symmetrical relation. Negation is defined in the classical way. Conjunction and disjunction may be defined either as classical or as requiring relatedness, as you wish. However, it is proposed in Walton (1979) that for purposes of subject-matter relatedness, it is natural to think of disjunction as requiring relatedness, but to think of conjunction as classical, i.e. not requiring relatedness. The final building block that yields a formal logic of relatedness is to show how the complex formulas are related to the simple formulas. The key ruling is

this: p is related to q → r if, and only if, p is related to q or p is related to r. This ruling seems reasonable for subject-matter relatedness because it is natural to say that 'Socrates is snub-nosed' is related to 'If Socrates sprints then some man is running' because the simple proposition is related to one of the propositions in the conditional, namely the antecedent.

Given the requirements set out above, what forms of inferences come out valid or invalid? The usual truth-table decision procedure enables us to determine tautologies. Consider *modus ponens*.

p	q	R(p,q)	p → q	(p → q) → q	p → [(p → q) → q]
T	T	T	T	T	T
T	T	F	F	T	T
T	F	T	F	T	T
T	F	F	F	T	T
F	T	T	T	T	T
F	T	F	F	T	T
F	F	T	T	F	T
F	F	F	F	T	T

As you can see, the truth-tables are similar to classical logic except that we must take relatedness into account, in addition to the truth-values of the propositions.

As an example of a classical tautology that fails in relatedness logic, consider [(p Λ q) → r] → [(p → r) ∨ (q → r)]. This schema can fail as follows. Let q be true and r false, then the q → r in the consequent is false. Let p be unrelated to r, then p → r in the consequent is false. Hence, on this interpretation the consequent is false. But assume p is false. Then p Λ q in the antecedent is false, hence (p Λ q) → r must be true, assuming that q is related to r, an assumption that is consistent with the assignments given to

the consequent. In short, there is a consistent assignment of truth-values and relatedness relations that makes the antecedent of the schema in question come out true and the consequent come out false. Hence the schema fails to be a tautology. In general, truth-tables always enable us to tell whether an argument is correct or not in relatedness logic.

To see how rejection of the schema above applies to practical arguments, consider a syllogism like this: All men are mortal (p), Socrates is a man (q), therefore Socrates is mortal(r). It is true that (p Λ q) → r applies, but it is false that (p →r) V (q → r) applies. Hence it is "paradoxical" indeed that [(p Λ q) ⊃ r] ⊃ [(p ⊃ r) V (q ⊃ r)] is a tautology in classical PC. More usual "paradoxes" cited are ∼p ⊃ (p ⊃ q) and q ⊃ (p ⊃ q), but these too fail to be relatedness tautologies. In short, relatedness logic turns out to be a subsystem of classical PC. All relatedness tautologies are classical tautologies, but there are some classical tautologies that fail in relatedness logic.

We can summarize our findings as follows. Many traditional major informal fallacies can be and often are categorized as involving a failure of propositions to be related to each other. Particularly, what seems to be uppermost in mind is failure of subject-matter overlap. But the traditional study of the logic of the topics suggests that there can be many different kinds of relatedness involved in studying sophismata that reflect fallacies important to practical reasoning by conditionals. However, we can focus on subject-matter overlap as one particularly central and clearly definable species of relatedness.

If we are to construct a general theory of conditionals based on relatedness that is useful in studying the underlying fallacy of *ignoratio elenchi* that is common to fallacies that go wrong by failure of relatedness, we must be clear that subject-matter connectedness is not by itself sufficient to assure correctness of an argument. In addition, we must require that a correct argument does not go from true premisses to a false conclusion.

Ignoratio elenchi, whether it be characterize as failure of subject-matter overlap in conditionals, or as failure of any kind of relatedness, is a general kind of fallacy that helps to explain, at least partly, what has often thought to be fallacious about arguments like the *ad populum* or *ad hominem*. But it is only part of the story of these other fallacies, and specific studies of these various individual fallacies help to bring out other important aspects of them.

References:

Otto Bird, "The Formalizing of the Topics in Medieval Logic," *Notre Dame Journal of Formal Logic*, 1, 1960, 138-149.

Richard L. Epstein, "Relatedness and Implication," *Philosophical Studies*, 36, 1979, 137-173.

R. H. Johnson and J. A. Blair, *Logical Self-Defense*, Toronto and New York, McGraw-Hill Ryerson, 1977.

Norman Kretzmann, trans. and ed., *William of Sherwood's Introduction to Logic*, Minneapolis, University of Minnesota Press, 1966.

Douglas N. Walton, "Philosophical Basis of Relatedness in Logic," *Philosophical Studies*, 36, 1979, 115-136.

Douglas N. Walton, "Why is the *Ad Populum* a Fallacy?" *Philosophy and Rhetoric*, to appear 1980.

John Woods and Douglas Walton, "*Argumentum ad Verecundiam*," *Philosophy and Rhetoric*, 7, 1974, 135-153.

John Woods and Douglas Walton, "*Ad Hominem*," *The Philosophical Forum*, 8, 1977, 1-20.

1996 Vol 18: The Argument of the Beard

Douglas Walton

Abstract: The essence of the argument of the beard (so-called by some logic text books) is the tactic used by a respondent to reply to a proponent, "The criterion you used to define a key term in your argument is vague, therefore your use of this term in your argument is illegitimate, and your argument is refuted." This familiar kind of argument tactic is similar to the much more famous heap (*sorites*) argument of Eubulides, closely associated with the slippery slope argument. This article provides a system of classification for sorting out these three arguments, and related types of argument of interest in informal logic.

The argument of the beard is a curiosity of the fallacy world. It occurs as a distinct fallacy (by that name) only in nine logic textbooks –Thouless (1930), Little, Wilson and Moore (1955), Moore (1967), Schneider (1967), Manicas and Kruger (1968), Byerly (1973), Darner (1980), Feamside (1980), and Moore, McCann and McCann (1985)– in all of the textbooks searched in the University of Winnipeg Library and the author's personal collection. Moreover, there seems to be some uncertainty whether the argument of the beard is different from the slippery slope argument, or from the heap (bald head, *sorites*) argument of Eubulides.

The problem of this paper is whether the beard argument (a) represents a distinct category of fallacy in its own right, worth keeping in the logic curriculum, or (b) whether it is insignificant, or (c) whether it is the same as, or (d) belongs under, one of these other more widely recognized categories of argument.

The argument of the beard is to be distinguished from the philosophical tradition, cited as "Meinong's beard" by Barth (1974, p. 4). According to this tradition, entities can be referred to in nat-

ural languages by terms beginning with definite articles, like 'the State,' '*die Sprache*,' or '*l'homme*.' This tradition is some thing philosophers have worried about, without coming to any clear answer on it, according to Barth (p. 4). But it appears to be quite a distinct idea from what is known in the logic textbooks as the argument of the beard.

To get an idea of what the argument of the beard is supposed to be, the best place to start is Thouless (1930), the earliest mention of this argument (by that name) we have been able to find in the logic textbooks except of course for the ancient origins of what appears to be the same, or a comparable type of argument called the"heap" or "bald head" argument.

1. Thouless on the Beard Argument

Of all of the accounts of the argument of the beard, the clearest and most compelling is the one given by Thouless (1930). According to Thouless (p. 182), it is a kind of "crooked thinking" we use when arguing about two things which show a continuous variation, and one party to the argument denies the reality of differences between the two things. Thouless (pp. 182-183) uses a "very old example" to illustrate the fallacy.

> **Case 1:** One may throw doubt on the reality of a beard by a process beginning by asking whether a man with one hair on his chin has a beard. The answer is clearly 'No.' Then one may ask whether with two hairs on his chin a man has a beard. Again the answer must be 'No.' So again with 'three,' 'four,' etc. At no point can our opponent say 'Yes,' for if he has answered 'No' for, let us say, twenty-nine hairs, and 'Yes' for thirty, it is easy to pour scorn on the suggestion that the difference between twenty-nine and thirty hairs is the difference between not having and having a beard. Yet by this process of adding one hair at a time we can reach a number of hairs which would undoubtedly make up a beard. The trouble lies in the fact that the difference between a beard and no beard is like the difference between white and grey in the fact that one can pass by continuous steps from one to the other.

The argument of the beard, so described, rests on the premise of a sequence of what Thouless calls "continuous variation" –a continuum along which there is no precise cutoff point so that you can say, exactly at this point, one thing changes to another distinctly different thing. For example, there is no numerically exact point –say, the difference between twenty-nine and thirty hairs– that is the difference between having a beard and not having a beard. Or in a continuum of shading from black to white, there is no single point where you can say, "Here is the exact point of difference between white and grey." Of course, you could arbitrarily define or stipulate such a point. But then, as Thouless astutely points out, a critic could "pour scorn" on the arbitrariness of that proposal.

The account of the argument of the beard is very reminiscent of a type of puzzling argumentation known in the ancient world as "the heap" or "the bald head," described in Walton (1992, pp. 37-38) as follows.

> **Case 2:** If you take one grain away from a heap, it makes no significant difference you still have a heap. Each time you repeat this step, it makes no difference, because one grain is too small to make a difference between something being a heap or not. But repeated long enough, the conclusion of this reasoning will become absurd, for it will become obvious that what is left can no longer be described as a heap.

The case of pulling hairs from a person's head was also often used to illustrate the puzzle. This is the "bald head" version. This paradox of the heap (or bald head), often called the *sorites* argument, was invented by a Megarian philosopher named Eubulides, said by Diogenes Laertius (II-108) to be the author of many dialectical arguments in interrogative form. Eubulides, we are told by Diogenes Laertius, was called "Eubulides the Eristic," a philosopher who"propounded quibbles" and "confounded the orators with falsely pretentious arguments."[1] The version of the puzzle of

1. According to W. and M. Kneale (1962, p. 15), 'eristic' is "the insidious term applied by Plato and Aristotle to arguments which they regard as frivolous." The Megarians,

Eubulides called the heap or the *sorites* is expressed by Diogenes Laertius (VII-82) as follows: "It cannot be that if two is few, three is not so likewise, nor that if two or three are few, four is not so; and so on up to ten. But two is few, therefore so also is ten."[2] Putting the argument in this way, it takes the form of a puzzle frequently called a paradox or "sophism" in logic (Walton, 1992, p. 38) –a case of a valid argument from true (or apparently true) premises to an absurd or false conclusion. But of course, in deductive logic, this represents a contradiction, for if the premises of a valid argument are all true, the conclusion must be true too. A paradox could even be defined as an inferential contradiction of this sort.

But a paradox or "sophism" is not a fallacy (or sophism, sophistical refutation) in the sense in which the logic textbooks more generally use this term. In the latter sense, a fallacy is an error of reasoning or deceptive tactic of argument that is commonly used to fool people by specious logic, and is therefore worth warning students about (Walton, 1995). What then is the argument of the beard as a fallacy in this sense?

Thouless (1930, p. 183) has an answer, when he shows how the argument of the beard is used as an effective tactic to get the best of an opponent in everyday argumentation.

> In this argument, the fact of continuous variation has been used to undermine the reality of the difference. Because there is no sharp dividing line, it has been suggested that there is no difference. This is clearly a piece of crooked argument which would take in no reasonable person, so long, at any rate, as it was used about beards and not about anything which engaged our emotions more strongly.

according to the Kneales (p. 15) were "universally credited with skill at verbal controversy."

2. Loeb Library Edition, p. 237.

As an example of everyday use of this argument, Thouless (p. 184) cites the following case.

> **Case 3:** We do, however, frequently hear an argument against the distinction between a proletarian and a capitalist which begins: "When does a man become a capitalist? If a working man has 25 pounds in the bank, is he a capitalist?" This is the argument of the beard.

This denial of difference is a fallacy, in the context of the kind of political dispute Thouless has in mind in Case 3, if the difference between those who own capital and those who do not is a difference that can be genuinely defended as important and legitimate in social thinking. Just because the term 'capitalist' cannot be defined precisely, in numerical terms, that does not mean there can be no justification for using it in the discussion sketched out in Case 3.

The fallacy or "piece of crooked argumentation" of the beard, according to Thouless (p. 187) may then be described as "the device of badgering one's opponent" to define or provide "clear-cut ideas with which the other person can play an intellectual game" to unfairly attack the other party. The essence of the tactic is to argue, "This criterion x in your argument is vague, i.e., there is no definite cut-off point for it; therefore your use of x at all in your argument is illegitimate, and your argument is refuted."

The kind of problem of everyday argumentation Thouless is rightly concerned about occurs in a dialogue exchange where one party attacks a term or criterion used by the other party as too vague, and the second party is therefore impelled to define this term more precisely. In general, such a request for precision is appropriate and useful, as a move in a critical discussion. But it can, in some instances, be pressed ahead too aggressively, and so used as a sophistical tactic of argument to unfairly put pressure on the other side. For after all, terms in natural language are vague, generally, and if one redefines a natural language term to make it more precise, one can be attacked for that too (on grounds of arbitrariness, for example).

So Thouless seems to have found a distinctive type of argumentation here –which could be called argument of the beard– that is of legitimate interest for informal logic.

2. Beard, Continuum and Slope

When we examine what other textbooks have written about the argument of the beard, some of them seem to have roughly the same basic idea of it as Thouless. However, some of them emphasize the continuum aspect of the argument more emphatically, suggesting that it could be a kind of slippery slope argument.

Fearnside (1980, p. 51) defines the argument of the beard as "contending that 'one more doesn't matter' in a situation where a line has to be drawn on a continuum." This description seems to allow that the argument of the beard need not be fallacious in all cases. However, Fearnside (p. 51) emphasizes the importance of recognizing that many guidelines that need to be drawn on a continuum in everyday affairs are arbitrary. Hence objecting to a line drawn, only because it is arbitrary, can be an unreasonable kind of argument.

> Through all the vast difference between one end of a spectrum and the other, the difference between its various shadings remains infinitesimal.We grow old day by day, temperatures rise in a continuous sequence, pound by pound the ship loads cargo from empty to overloaded, day shades into night. The practical affairs of life absolutely require breaking into such sequences. The child must begin school at a certain age, he can marry at another, join the army at another, vote at another, run for U.S. Senator at another, get Social Security at another, and so on. These are only some of the lines drawn across the continuum of our lives. They have one thing in common: all are arbitrary. Now "arbitrary" in this sense means that the rules are matters of human convenience, not that they are unfair. There is no principle involved in whether the line 16, 17, 171/2, or what ever is taken as the age required in order to become a licensed driver. The line is arbitrary; it has to be. If it turns out to be a poor choice then some other arbitrary point along the age continuum can be selected instead.

The kind of example of the fallacious use of the argument of the beard that Fearnside indicates he has in mind (p. 52) is the following.

> **Case 4**: A student objects because he cannot enroll in a class because a numerical limit has been set in place, arguing: "One more doesn't matter-setting the limit at 60 is arbitrary."

In this case, the student's premise that the line is arbitrary, setting the exact limit at 60 instead of, say, 61, may be true. Yet his contention that therefore the guide line set is unreasonable or indefensible does not follow from the arbitrariness of the limit alone. For as Fearnside has rightly argued above, many guidelines are (as a matter of practical necessity or convenience) arbitrary, but it does not follow, for that reason alone, that such a guideline is unfair. Institutional rules often have to be arbitrary.

Hence attacking a criterion as arbitrary is sometimes reasonable and sometimes not. But it is certainly a frequently used type of argumentation, and it does seem to carry weight in common practices of argumentation –sometimes quite correctly so, it would seem. But it seems that the beard argument is not exactly the same thing as the arbitrariness argument, as Darner's (1980) account of the beard argument indicates.

Darner (1980, p. 37) gives a very clear account of the kind of fallacy identified with the argument of the beard, but uses a different label for it.

> This fallacy consists in assuming that small differences are always unimportant or that supposed contraries, as long as they are connected by intermediate small differences, are really very much the same. Hence, there is the failure to recognize the importance or necessity of sometimes making what might appear to be arbitrary distinctions or cut-off points.

The assumption involved in this fallacy is a very common one, and it is not easy to persuade people of its dubious character. This

assumption is expressed in the common claim that "it's only a matter of degree." This "only a matter of degree" kind of thinking implicitly claims that small differences are unimportant or that making definite distinctions between things on a continuum is almost impossible, or at least arbitrary.

Darner (p. 7) calls the fallacy described above the *fallacy of the continuum*, but adds (p. 38), "the ancient name of this fallacy is the fallacy of the beard." To deal with the fallacy, Darner (p. 39) recommends that an arguer insist that making distinctions between vague concepts like "rich" and not "rich," "failing or passing a course" is possible and necessary, even though it may be difficult. Darner (p. 38) rightly sees the source of the difficulty in dealing with this fallacy as the problem of making clear distinctions when dealing with vague words so often used in everyday arguments.

Byerly (1973, p. 56) defines the fallacy of the beard as "arguing from the vagueness of a distinction to the absence of any meaningful distinction." Byerly sees the beard fallacy as the opposite of the fallacy of "black-white thinking" where "boundaries are drawn too sharply and simply"(p. 56). Byerly offers the following example as an argument that commits both these fallacies.

> **Case 5**: Let's be honest about it. Either you favor a socialized state running everything, or you don't. If you think the government should provide free medical care to everyone, why not have the government supply everyone's need for food, clothing, and shelter? Once you start down the slippery road to socialism, there can be only one result –the control of every facet of our life by a bureaucratic tyranny.

The problem with this example is that it is an instance of what would normally be called the slippery slope argument. It leaves out the middle steps –making it an instance of what is called the short form slippery slope argument in Walton (1992, pp. 170-173)– but it certainly has the "first step" and the "horrible outcome" characteristic of slippery slope arguments.

3. The Black-or-White Fallacy

Beardsley (1966, p. 176) classifies the slippery slope fallacy as a subspecies of the type of argument he calls the black-or-white fallacy –which appears to be similar or identical to what is normally called the argument of the beard in other textbooks– notably, except Thomas (1977). However, unlike other textbooks that give illustrative examples of the argument of the beard that are really (or more standardly classified as) slippery slope arguments, Beardsley sees the slippery slope as a distinctive type of argument in its own right. He gives the following case (p. 176) as his illustration of the slippery slope argument.

> **Case 6**: The assumption underlying our fatal drift toward a socialist economy is that one can have a little bit of socialism which is no more possible than having a slightly illegitimate baby or a slight case of murder. The society at the end of the road is regimented from top to bottom, according to a soulless master plan. We took the first step on that road the moment we allowed the government to go beyond its legitimate task of policing the streets and negotiating with other sovereign powers. Once you have a Post Office, it is easy to argue that a TVA project would hardly be any different, or a federally owned and operated communications satellite system, etc., etc. There's no logical stopping place; you are hooked.

This case is a classic example of the slippery slope argument, and clearly exemplifies the step or series characteristic of that type of argument as well as the "no logical stopping place" characteristic.

Thomas (1977) follows Beardsley generally on the black-or-white fallacy, but not in all respects. Curiously, what Thomas (1977, p. 204) describes as the "black-or-white fallacy" sounds a lot like what other textbooks would call the argument of the beard (except, of course, for Beardsley, notably).

> Anyone who argues or reasons that because something does not fall squarely within one category, it must therefore fall into a category at the opposite extreme simply because the difference between the two

> is "just a matter of degree" or "any line you draw is arbitrary," commits the "black-or-white fallacy." For example, someone who argued that a certain piece of bread was not 100 percent fresh and therefore was clearly "stale" because the difference between fresh bread and stale bread was 'just one of degree" and "any line of distinction is arbitrary" would commit the black-or-white fallacy. A variant is to argue that there really is no difference between two things (e.g. heavy versus light smoking, or freedom in one country versus freedom in another) because "the difference is only a matter of degree" or "any distinction is arbitrary."

This account is disorienting, because it combines some elements of what is normally called the "black-or-white fallacy" with the kind of argumentation that appears to be what is more normally seen as the opposite fallacy –the argument of the beard. Thomas does not use the expression (argument of the beard) at all, but the examples of arguments he gives above –about stale bread, smoking and freedom– would fit the description of the argument of the beard given in other textbooks like Thouless and Fearnside very well.

Thomas (1977) appears to have gotten his version of the black-or-white fallacy from Beardsley (1966), who also uses this phrase to describe something more like what is normally called the argument of the beard (although Beardsley does not use the term 'argument of the beard' at all). However, Beardsley's account of the black-or-white fallacy is somewhat different from the description of it given by Thomas, and also different from what most (or perhaps even all) of the other texts say. Beardsley (1966, p. 175) characterizes the black-or-white fallacy as "a subtle attempt to paralyze thinking about matters of degree by appealing to the arbitrariness of drawing lines." Beardsley (p. 175) offers the following form of argument as characteristic of this fallacy.

> A large difference of degree is made up of many small differences of degree.
> Therefore, a large difference of degree is not large at all.

This form of argument does seem somewhat similar to the kind of argument described by other texts as the argument of the beard. But by describing it as an argument that appeals to the arbitrariness of a term or criterion, Beardsley's account seems different from the others.

Thomas (1977, p. 205) offers the following illustration of what he calls the "black-or-white fallacy," writing that he has "concocted" it himself, because examples of this fallacy are "difficult to find in published writings."

> **Case 7**: I will go even further. I am still against the U.S. Post Office, and always will be. It's the thin edge of the wedge of socialism. If the government is in the business of carrying mail, then why not go into the business of electric power that is, the TVA and BPA? And it's only a step further to government ownership and control of telephone and telegraph lines –after all, how do these differ from carrying letters? And if the government owns these, why not mines and steel mills, farms and department stores –until everything is swallowed up in socialism? There is no logical stopping-place, once you let the government in. The only logical thing is to keep the government completely out of everything.

But this example quite clearly fits the category indicated as the slippery slope argument by the broad majority of logic textbooks. We could even categorize Case 7 in the classification system of Walton (1992) as a classic case of the (full) slippery slope argument. It has all the elements of the "thin edge of the wedge," the intervening steps, and the "no logical stopping-place" characteristic of the slippery slope argument.

4. Problematic Textbook Examples

Little, Wilson and Moore (1955, p. 11) define the argument of the beard as an opposite of the"black-or-white fallacy," or "false dilemma," which is committed "when we fail to admit the possibility of middle ground between extremes."

> We are guilty of the argument of the beard if we use the middle ground, or the fact of continuous and gradual shading, to raise doubt about the existence of real differences between such opposites as strong and weak, good and bad, and white and black. Blinded by this doubt, we may ignore significant differences because one extreme shades gradually into another. The fact that we cannot determine the exact point at which white ceases to be white does not prove that there is no difference between white and black.[3]

Citing the problem of how many whiskers make abeard (p. 11), Little, Wilson and Moore suggest that this problem of "determining an exact minimum" could lead to the type of error identified with the argument of the beard, illustrated by the following case.

> **Case 8**: Superficially, the error is used to support the argument that a little more or a little less will not matter. A student may argue that, since he has already been absent from class six times, an additional absence will not matter. It is true, of course, that there is not much difference between six and seven absences; nor is there much more difference between six and eight absences. But if one uses this argument to justify additional absences, he could conceivably reach the position of arguing that there is no difference between attending all classes and missing all of them.

If the student were to conclude that there is no difference between attending all classes and missing all classes, her argument would certainly be erroneous.

But this particular case is highly problematic to illustrate the error supposedly characteristic of the argument of the beard, because it raises the difficult question of what type of argument the student is using when she reasons that an additional absence will not matter, once she has missed six classes. Maybe it might not matter if, say she has already missed so many classes that she would fail the course anyway. But maybe it might matter if the attendance at the

3. Very Similar accounts of the argument of the beard are given in Moore (1967) and Moore, McCann and McCann (1985).

seventh lecture might be instrumental in overcoming the liability of the prior absence.

This curious argument seems to be related to what Perelman and Olbrechts Tyteca (1969, p. 299) call the *argument du gaspillage* (argument from waste), which "consists in saying that, as one has already begun a task and made sacrifices which would be wasted if the enterprise were to be given up, one should continue in the same direction." An example would be a person who has started taking a course, and is thinking of dropping it, but then reasons that she must continue, because she has already put so much work into it. The argument from waste is a type of practical reasoning in deliberation that could possibly be reasonable in some cases, but that seems questionable, and could be erroneous, unjustified, or even fallacious in other cases. However it should be evaluated, it is a distinctive and curious type of argument.

Case 8 is puzzling because it appears to partly involve an argument something like the argument from waste. In this respect, it is different from the argument of the beard, of the kind that Little, Wilson and Moore see as the opposite of the black-or-white fallacy.

A very similar account of the argument of the beard is given by Moore (1967, p. 166), except that the example used to illustrate this type of argument is quite different from Case 8 above.

> **Case 9**: Suppose the scores on l0l students are evenly distributed between zero and 100, and the instructor draws the line so that the lowest passing score is 60. A student with a score of 59 might contend that one point should not make this much difference. If the instructor agrees, however, that he is not justified in drawing the line between 59 and 60, then where is he to draw the line? How is he to draw any line at all? And if he shirks his responsibility for drawing the line, will he not ultimately be treating the students with zero and 100 as if there were no difference between them? We commit the argument of the beard whenever we dispute the right of authority to draw lines simply because the difference between the items on each side of the line is small.

The problem posed by this kind of case is that in any bureaucratic organization, like a university or a government agency, rules have to pick an exact, if arbitrary cut-off point to define what meets a requirement. Otherwise, people will object that the rule is unfair or is too vague. Of course, once the cut-off point is designated, other people will argue that the rule is arbitrary.

In the context of this kind of case, people will use what seems to be a type of argument of the beard, citing the arbitrariness of the criterion to try to get an other mark so they can get from a *D* to a *C* grade, for example. They might be likely to argue that the difference of one mark is really trivial, so that the instructor ought to be sympathetic in giving them the benefit of the doubt, and award them a C grade. This is not necessarily a fallacious argument in all instances, however.

The argument would be more easily portrayed as fallacious, however, if the pleader's conclusion is that there is really no difference between a *C* and a *D*, or even between any pair of numerical grades from zero to l00. The argument with this conclusion seems more like one that might properly be called the argument of the beard.

Another problem raised by Case 9 is the difference between vagueness and arbitrariness as an objection to a proposed criterion. Vagueness refers to the lack of an exact cut-off point. Arbitrariness can apply where there is an exact cut-off point, and refers to something else.

Manicas and Kruger (1968, p. 332) give quite a clear account of the fallacy of the beard:

> [The argument of the beard assumes] that since no distinction can be made anywhere along the line, no distinctions at all on a continuum are meaningful. There is no stopping-off point or line that can be drawn since all differences are connected by intermediary degrees on a continuum. In effect, then, it is absurdly concluded that even extremes, or contraries, are alike –hot is the same as cold, black is the same as white, smart is the same as stupid. Now, of course, this isn't

> so. Even though a sharp line cannot be drawn between contiguous, or overlap ping, categories like "hot" and "warm," they are still significantly different from one another, let alone 'hot' and 'cold.' The inability to draw sharp distinctions in certain contexts does not mean that no distinction at all can be made, as this fallacy assumes.

This is an admirably clear account of the fallacy of the argument of the beard, but the first example Manicas and Kruger use to illustrate it (p. 331) is problematic.

> **Case 10**: Marshall Tito of Yugoslavia used this fallacy facetiously when he supposedly remarked, 'There really isn't very much difference between the political systems of America and Yugoslavia; after all, America has two major political parties and Yugoslavia one, a difference of only one party.'

This ridiculously unconvincing argument is certainly a bad one. But it is not a good illustrative example of the distinctive fallacy characteristic of the argument of the beard. True, it is a citing of an important difference between two things as trivial, and therefore it is a weak and unconvincing argument. But it does not really exhibit the exploitation of the lack of cut-off point in continuum characteristic of the argument of the beard.

Schneider (1967, p. 18) offers the following argument to illustrate the fallacy of the beard.

> **Case 11**: Would you steal the last dollar a poor widow had? Would you steal to feed your starving baby brother if there were no other way to get him food? Either way you are a potential thief!

The problem with this case as an example of the argument of the beard is that it appears to be much closer to that often mentioned traditional fallacy, the *secundum quid* or "neglect of qualifications," also frequently called "hasty generalization" –see Walton (1990) for an account of these terms. Schneider defines the fallacy of the beard as "an argument that fails to recognize differences." But there are different kinds of differences that can be suppressed or not recognized in argumentation.

In Case 11, the basic problem is that many commonplace generalizations and rules are *defeasible* in the sense that they are subject to exceptions in particular cases, *viz*., the injunction against theft, a practice that is generally wrong, but that could be justified or defended in an exceptional case, like those cited by Schneider.

This type of fallacious *secundum quid* argument, as cited in Case 11 above by Schneider, is not the same thing as the argument of the beard. The argument in Case 11 could be extended so that it would also involve the argument of the beard if the arguer were to add, "Therefore there's really no difference in principle between stealing and not stealing," or something of that sort. Even so, what is important to recognize here is that the *secundum quid* fallacy of neglect of qualifications is, in principle, a distinctively different sort of error from the kind of fallacy that is characteristic of the argument of the beard. By confusing these two categories, Schneider's example is a highly unfortunate case to use as an illustration of the argument of the beard in a textbook.

5. Beard Versus Slope

The textbook accounts outlined above pose a problem. They are not consistent, and in many respects seem to be at odds with each other. Yet they do seem to be on to something that should properly be included in the treatment of fallacies. The examples they give to illustrate the so-called argument of the beard do indicate a problem that can be a serious obstacle to resolving a disagreement by reasonable argumentation. Criteria used in words and phrases in natural argument to make classifications are generally vague, and this vagueness in borderline cases is frequently used to attack the legitimacy of the criterion. But is the argument of the beard reasonable or fallacious, and if it is fallacious in some cases, what is the root of the error?

An even more pressing prior question is that of how to define the argument of the beard. It does seem to be somewhat different from the slippery slope argument. But some of the textbooks confuse

the two, and indeed, if there is a difference between them, it is not exactly clear what it is.

It seems that the argument of the beard bears a very close relationship to the type of slippery slope that turns on the vagueness of a term, as opposed to other types of slippery slope arguments that are more causal in nature. Govier (1982) distinguished between several types of slippery slope arguments, including a purely linguistic one, as opposed to a causal one. Govier (1982, p. 308) defines the structure of the linguistic or *sorites* type of slippery slope argument as follows –where *P* is a property and *x* is a degree of difference between two cases– calling it the "fallacy of assimilation."

Fallacy of Assimilation

1. Case (a) is *P*.
2. Cases (*b*) – (*n*) form a series differing initially from (*a*) and then from each other, only by *x*.
3. Considered in itself, each difference of amount *x* is insignificant. Therefore:
4. There is no difference between (*a*) and (*b*) – (*n*)with respect to *P*; all are equally *P*.

This form of argument does appear to correspond fairly well to the examples and descriptions of the argument of the beard given in the textbook accounts above. But does it represent the argument of the beard, or the (linguistic subtype of) slippery slope argument? Or are these two arguments really the same?

A comparable kind of problem of identifying a distinctive species of argument associated with a traditional fallacy arises in the case of the causal slippery slope argument. The causal type of slippery slope argument (Walton, 1992, Ch. 3) occurs where there is a causal sequence of events, and one party warns another that if he takes the first step in the sequence, he will not be able to stop the other steps from occurring, and therefore the final result will

be some horrible (dangerous) outcome. This species of slippery slope argument is also frequently called the "domino argument." A pedagogical problem with identifying this type of argument is that students, once they are introduced to it, tend to see any argument where one party warns the other of negative consequences of a contemplated action as being a (causal) slippery slope argument. Such a classification is inappropriate, however. There is a difference between argumentation from negative consequences generally and the slippery slope argument in particular.

What is the difference? Presumably, it is that argumentation from negative consequences can be a one-step or two-step argument that bad consequences will or may occur, as a result of a contemplated action, whereas slippery slope argumentation essentially involves the "no stopping point" idea that once you take the first step, you are then impelled along the sequence to the ultimate bad outcome. The idea of the repeating sequence or series is therefore very important to the slippery slope argument.

In the case of Govier's argument from assimilation then, the key premise is (2), which requires that the cases form a "series." A series could perhaps also be called a continuum. What is important to the slippery slope argument is that the series impels the respondent from one case (step) to the next, and so forth, so there is no turning back. What is important then is not just whether a series of steps exists, but the nature of that series. Is it just a sequence of causal outcomes or a few steps, where one leads to the other? Or is it a slope, a sequence of repeating or series-related steps such that, once you take the first one, you are impelled to take the next one, and so forth until, at some point in the sequence that is not precisely defined, you can no longer stop, and then the horrible outcome cannot be avoided?

One particular problem posed by the textbook treatment of the argument of the beard is whether it is a distinctive type of argument (or fallacy) in its own right, or whether it is just another name for the linguistic variant of the slippery slope argument. Intuitively,

judging from the examples and descriptions of the argument of the beard given in the textbook accounts above, beard does seem to be different from slope.

6. The Abortion Argument Cases

To try to clarify our basic intuitions that the beard argument is distinctively different from the slope argument, we consider a pair of cases of familiar kinds of arguments on the abortion dispute. The first seems to be a beard and the second a slope.

In the first case of the pair (Case 12, below) Bruce and Wilma are having a critical discussion on the subject of abortion (the abortion issue). Bruce takes the pro-life standpoint, and Wilma takes the pro-choice standpoint, but both are willing to make significant concessions to accommodate the view of the other side. At one point the discussion turns to the question of whether the fetus in the womb is a person (baby) or not. Wilma denies that it is a person, but Bruce makes the assertion that it is a person in the third trimester only. Wilma then uses the following argument in reply to Bruce's assertion.

> **Case 12**: Well, that's absurd, because if you take the fetus just the day after the third trimester, and compare it to the same fetus the day before, there's really no significant difference between the two entities, as developing organisms. Biologically, it's the same organism, and has all the same characteristics. Whether it's one day older or younger makes no difference, because the development of the spine, the brain, and the systems that support its cognitive and emotional functions, develop in a gradually continuing process. It's absurd to say it's a "person" on the day after the third trimester, and then to say it's not a person just the day before that.

In this argument, Wilma considers two cases: the fetus the day before the third trimester, and the fetus the day after. The premise she asserts is that biologically, as a developing organism, there is no significant differences between these two cases. Hence she draws the conclusion that to say the one case has the property of

being a person, while the other does not, is absurd, i.e., it is an untenable proposition that has been refuted by her argument.

Now let's consider a secondary case, in which the critical discussion between Wilma and Bruce on the subject of abortion continues after Wilma's argument in Case 12. In reply to Wilma's argument, Bruce says, "Well, you are just fiddling around with these picky borderline cases. But everyone has to draw the line somewhere. In present law, it is drawn at the moment of birth. I draw it at the third trimester, because there are plenty of well-established cases now where the baby needs to be treated as a physician's patient during that stage. Broadly speaking then, in the central areas of that third trimester stage, the fetus is clearly a person, an individual with rights." In reply to this move, Wilma then puts forward another argument, conveyed in the text of Case 13.

> **Case 13**: Well, Bruce, you agree that if it's a person on day 30 of the third trimester, then certainly it's also going to be a person on day 29, because one day here isn't going to make any significant difference in this respect [Bruce nods affirmatively]. But don't you see that you can repeat this same argument over and over? If it's a person on day 29, then it's also going to be a person on day 28, and so forth. Because no one day makes a significant difference to whether it's a person or not, you can't stop this argument, once it gets started. It's going to be a person right back at the beginning of the first trimester, when the egg was fertilized by a sperm.

How might Bruce reply to this argument? He might counter: "Well, I draw the line right at the beginning of the third trimester, and that's where your sequence of if-then assertions has got to stop, from my point of view." And then Wilma might reply: "That's the whole point of my argument. You can't stop there, once you accept the premise that one day makes no difference on whether the fetus is a person or not." Bruce might then reply that he had to draw the borderline somewhere, and that it is at this third trimester borderline that Wilma's argument stops.

From this point the argument between Wilma and Bruce might continue in various ways. Wilma might say, "But that borderline is arbitrary. That's my point!" And Bruce might reply: "So what! You have to draw an arbitrary line (or one that is more or less arbitrary, anyway) at some point. And where I am drawing it is at least clean and precise." And then they might continue to argue about arbitrariness, and perhaps about whether Wilma has a different criterion, and whether that too is "arbitrary" or not.

Intuitively, judging somewhat carefully from what is written in the textbook accounts, a plausible hypothesis presents itself here. Case 12 is an example of the argument of the beard, while Case 13 is characteristic of the slippery slope argument. So interpreted, it seems that Case 13 is a special sub-case of the type of argument used in Case 12, an extension that brings in the additional idea of the series of steps that can be repeated over and over, and that ultimately becomes unstoppable.

7. Slope Versus Heap

Eubulides' justly famous "heap" or "bald head" argument has been a subject of much attention in the fields of logic and philosophy. A particularly perspicuous version of it was given by Black (1970, p. 3), using the vague property 'short' as an illustration.[4] The first stage is the deductively valid argument represented in Case 14 below.

Case 14: (B_0) Every person who is four feet in height is short.
(I) If you add one-tenth of an inch, the person is still short.
(B_1) Every person who is four foot and one-tenth of an inch is short.

In this version, there is a base premise (B_0), an inductive premise (I), and a conclusion (B_1) At the second stage, the inductive

4. Black's version is actually a little more elaborate than the argument presented in Case 14.

premise is reapplied now to the conclusion (B_1), which functions as a premise generating a new conclusion (B_2).

> (B_2) Every person who is four foot and two-tenths of an inch is short.

Clearly this *sorites* (or chain) argument can be continued until eventually it will entail the conclusion,

> (B_n) Every person is short.

But this outcome is a *paradox* in the sense that (*a*) it is a valid form of argument at each step, (*b*) the initial premise is true, (*c*) the inductive premise is true, (*d*) the new premises generated by the inductive premise and the prior conclusions are true (at least, in the first few inferences), (*e*) there is no well-defined, clear point where this process of step-wise inferring should stop the sequence of inferences from generating a series of false conclusions, culminating in the final false conclusion (B_n), but (*f*) the conclusion is false. This outcome is impossible, because if (*a*)-(*e*) are all true the (*e*) cannot be true. So we can say that the heap argument is a genuine paradox.

One way of defeating the heap paradox is to use fuzzy logic (Zadeh, 1987), which admits of degrees to which a predicate can apply to something. According to this way of representing the argument in Case 14, the degree the predicate 'short' applies to the person in question begins to decrease until we reach a point where it becomes completely inapplicable. This solution to the puzzle is still somewhat arbitrary, because there will be a last person in the series who is short, at some point, and every person after that point will fail to have the property of being short. But even so, the ultimate conclusion (B_n) will not follow from the given premises, as it did before.

The heap paradox does provide a nice model of the internal workings of the slippery slope argument instantiated in Case 13, but are

these two arguments identical? It is argued in Walton (1992) that they are not.

In Walton (1992) four subtypes of slippery slope arguments are classified: the *sorites* slippery slope, the causal slippery slope, the precedent slippery slope, and the all-in (full) slippery slope argument. According to the analysis given in Walton (1992), none of these four types of argument is inherently fallacious. Each of them can be used fallaciously in some cases, but can be a reasonable kind of argument in many instances.

The *sortes* type of slippery slope is an argument that exploits the vagueness of term expressing a criterion that refers to a set of individuals (or sets of stages of an individual) that lie along a continuum. The set of individuals $a_0, a_1, \ldots, a_i, \ldots, a_j, \ldots, a_n$, are such that some of them posses a certain property *P* and others do not. The objects lie along a continuum beginning at a_0 and ending at a_n. The points a_i and a_j are the last clear cases on the continuum where *P* is definitely possessed by the individual or not.

The following figure is used in Walton (1992, p. 54) to express the idea that the part of the continuum where it is unclear whether the individual definitely has property P or not is called the grey area.

Continuum in a *Sorites* Slippery Slope Argument

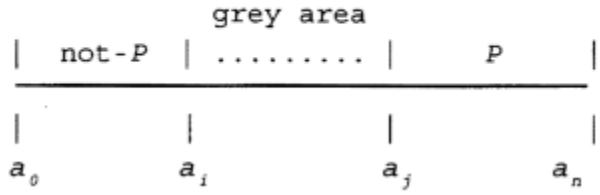

Figure 1

The structure of a *sorites* slippery slope argument must be schematized as a type of dialogue or talk exchange of argumentation

between a proponent and a respondent, according to the analysis given in Walton (1992, p. 55). The proponent tries to get the respondent to definitely agree, or become committed to the concession that some individual a_k ($n \geq k \geq j$) has *P*. Then she (the proponent) tries to get him (the respondent) to concede that a neighboring object *ak-1* also has *P*. Then she proceeds through a sequence which moves closer and closer towards the concession that a_i has *P*. The closer the proponent gets to a_i in this series, the more strong or presumptively successful is the slippery slope argument. If the proponent gets to the point a_i in this series, she has successfully put forward a convincing (correct) slippery slope argument.

The form of a correctly used *sorites* type of slippery slope argument is represented by the following argumentation scheme (Walton, 1992, p. 56).

Argumentation Scheme for the Sortes Slippery Slope

1. Initial base premise	1. It is clearly beyond contention that a_k has *P*.
2. General inductive premise	2. If a_k has *P*, then a_{k-1} has *P*.
3. Reapplication sequence premise-set	3. A sequence of modus ponens sub-arguments linking premises and conclustions from the clear area through the grey area.
4. Conclusion	4. a_i may have *P*, for all we know (or can prove).

This type of argument is said to be presumptively reasonable when it is used correctly, according to the account given of its structure

in Walton (1992, pp. 57-59), meaning that it can be challenged by asking appropriate critical questions of a designated type.

On this analysis, Case 12 lacks the structure of argument characteristic of the *sorites* slippery slope argument –the base premise, the inductive premise, and especially the reapplication sequence premise-set– whereas Case 13 can be shown to have all these characteristics. Here then, on the hypothesis we now advocate, is the essential difference between the argument of the beard and the slippery slope argument. The beard argument starts from a premise of (alleged) vagueness of a term, arguing that there is no real difference between two cases on either side of a criterion proposed to define the term. The slope argument uses not just two cases, but a whole series of cases, using a reapplication sequence of an inductive premise, going from an initial set of clear instances into a grey area, as shown in Figure 1. On this analysis the *sorites* slippery slope argument is a subtype of a more complex extension of the argument of the beard.

But where does Eubulides' argument of the heap come into this classification? Is it the same thing as the *sorites* slope, or is it something different? Our hypothesis is that the heap argument is a paradox that displays the internal workings of the *sorites* slippery slope argument in a clear model, by portraying it in a deductively valid form (resulting in a contradiction). By contrast, the *sorites* slippery slope is a characteristic type of real (actually used) argument, used in a critical discussion where two parties are trying to resolve a conflict of opinions. The slope is an argument that is used frequently in everyday argumentation, and its function is presumptive –it is used to shift a burden of proof in a discussion from one side to the other.

In short, the heap is an abstract philosopher's or logician's model, while the slope is a tactic of reasoned persuasion that has (fairly common) instances in real use.

It is possible to see exactly how the heap is involved in the central structure of the *sorites* slope argument, as used in an everyday case, by considering the following extension of the argument between Bruce and Wilma in Case 13. Let's continue this argument from the point left off in our follow-up to Case 13 where Bruce has replied that Wilma's argument stops at the borderline of the third trimester, where he has drawn the line. Wilma then replies as follows.

> **Case 15**: Even as we approach and pass over the borderline of the first day of the third trimester, one day isn't going to make any significant difference. You have to agree on this to preserve consistency, and yet one day after we pass from the third trimester to the second, you claim that the fetus is not a person. This amounts to a contradiction.

Here Wilma brings additional pressure to bear by arguing to Bruce that he can't have it both ways. If he wants to claim that there is no contradiction in his argument, he must somehow attack the inductive premise, or one of the other premises of the slope argument. Here the mechanism of the heap argument is revealed as being contained in the slope.

Argument from Vagueness of a Verbal Criterion

Both the argument of the beard and the *sorites* slippery slope argument are misused, in some cases, as serious tactics of deceptive argumentation used to unfairly get the best of a speech partner in a dialogue exchange of arguments. Hence what is important for informal logic is to classify and define both types of argument as they are actually used in everyday argumentation to persuade a speech partner to accept a conclusion.

On studying how these arguments function in such exchanges, we see that both of them are subspecies of a more general type of argumentation that is used to attack a criterion used by one party to define a term or make a verbal classification. Vagueness of a ver-

bal classification is often held to be a subject of criterion in argumentation for various reasons –if a term in an argument is vague, it could be criticized generally because it fails to meet some level of precision required for the argument.

Hastings (1963, p. 36) identified a species of argumentation he called "argument from criteria to a verbal classification," which he illustrated by the following example (rephrased below).

> **Case 16**: Government bonds earn a five percent annual interest rate this year. Five percent can be classified as a mediocre return. Therefore, government bonds earn a mediocre return this year.

In this case, clearly the term 'mediocre' is vague, and subject to further discussion on how it should be defined exactly. Hence the argument from criteria to a verbal classification is defeasible, in the sense that it is open to critical questioning, and possibly subject to default if the appropriate questions are not answered properly.

In Walton (1995, Ch. 5, Sec. 3: p. 53) the form of argument (argumentation scheme) of what is called the argument from verbal classification (taken to be roughly equivalent to Hastings' argument from criteria to a verbal classification) is given as follows. In this scheme, *a* is a constant for an individual and *x* is a variable that ranges over the individual constants *a,b,c,*….

(AfVC) *a* has property *F*.

For *x* generally, if *x* has property *F*, then *x* can be classified as having property *G*.

Therefore *a* has property *G*.

According to the account in Walton (1995) the argumentation scheme (*AfVC*) has two matching critical questions that can be used to respond to its use in a given case.

(CQ1) Does *a* definitely have *F*?
(CQ2) How strong is the verbal classification expressed in the second premise?

The idea is that using an argument of the form (*AfVC*) in a talk exchange of argumentation like a critical discussion, shifts a weight of presumption onto the respondent to either respond appropriately or to accept the presumption represented by the conclusion of the argument.

But in addition to posing either of the two critical questions (CQ1) or (CQ2), the respondent can attack the argument from verbal classification by using one of two refutational or negative argumentation schemes in reply. One way is to argue that the verbal criterion given for the classification is too vague. The other way is to argue that it is arbitrary.

The argumentation scheme for argument from vagueness of a verbal criterion (Walton, 1995, Ch. 5, Sec. 3) is the following.

(*AVVC*)

Some property *F* is used to classify an individual *a* in a way that is too vague to meet the level of precision required to support such a classification.

Therefore, the classification of *a* as an *F* should be rejected.

(*AVVC*) is a dissociative or refutational scheme –what Kienpointner (1992, p. 306) calls a *Gegensatz* scheme– in the sense that it is used to refute or counter opposed argument. In this case, it is used to oppose ones of the form (*AfVC*).

The other dissociative scheme opposed to (*AfVC*) is that of the argument from arbitrariness of a verbal criterion, defined below. This form of argumentation was broadly recognized in Walton (1992, pp. 60-62), although no specific form of it is presented there. The context of its correct and incorrect use is outlined, however.

(*AAVC*)

Some property *F* is used to classify *a* in a way that is arbitrary.

Therefore, the classification of *a* as an *F* should be rejected.

There are two critical questions matching (*AAVC*).

(CQ1): Is *F* really arbitrary?
(CQ2): Is arbitrariness a sufficient reason for rejecting the use of *F* as a criterion?

Question (CQ2) is significant, because sometimes arbitrariness is a good reason for rejecting a proposed criterion for a verbal classification, but sometimes it is not.

Both the argument from the vagueness of a verbal criterion and the argument from the arbitrariness of a verbal criterion are, in principle, reasonable arguments that can be used in a critical discussion or other verbal exchange of argumentation to shift a weight of presumption to the other side. But clearly also, both types of arguments can be used in a fallacious way in some cases to bring undue pressure to bear on an opponent.

Our aim here will not be to provide a framework for determining, in particular cases, when these arguments are reasonable and when they are fallacious. In an aside, we might add however that the argumentation schemes above would be the first step in such a project. Our aim here is the prior task of simply identifying the

argument of the beard as a distinctive type of argument, insofar as a clear and useful account of this type of argumentation can be abstracted from the practical concerns treated in the logic textbook accounts surveyed above.

8. Classifying these Related Types of Arguments

The classification we prefer is outlined in the typology of subtypes of argumentation from vagueness of a verbal criterion (Figure 2 below).

One aspect of this proposed classification that some might object to is that the phrase itself 'argument of the beard' strongly suggests the "bald head" argu ment (the same argument as that of the heap) ofEubulides. For whether you are pulling hairs off the top of the head or the bottom (in the jaw area) is irrelevant to the purpose of the illustration the type of argument is the same. Surely then, it might be objected, calling the type of argument we have "the argument of the beard" is misleading. For this phrase suggests the heap paradox of Eubulides, which on our theory, is something quite different.

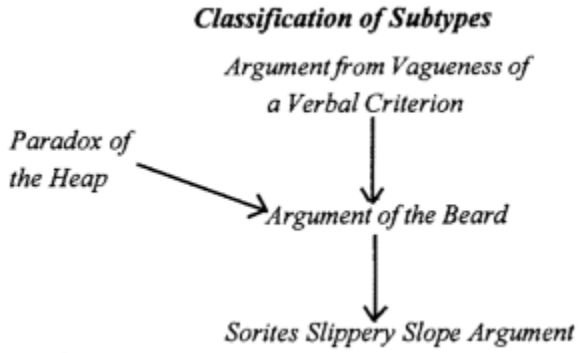

Figure 2

This point is well taken. By broadly following the textbook accounts especially those of Thouless and Feamside –we have opted for a terminology that is somewhat misleading. Why not call

the argument "the two-step vagueness rebuttal" or "the non-series continuum argument," or some such. We do not exclude such an approach altogether, and concede that Darner's label of the continuum argument for this type of argumentation, as an alternative, is quite acceptable. But the trend set by those textbooks we covered –the ones that do explicitly mention the argument of the beard– have set a precedent that is, broadly speaking, sensible and useful, once refined using the structures we have constructed above, to give an analysis of the appropriate argumentation schemes. Therefore, despite the slightly misleading aspect of the terminology (given the history of Eubulides' paradox, expressed so often in the form of the bald head version), we feel that, on balance, the term 'argument of the beard' is not a bad name to retain to identify this specific type of argument we have analyzed.

The main remaining question of classification is whether there is any significant type of argument corresponding to what the textbooks call the black-or-white fallacy. The first problem, as noted above, is that some of the textbooks have confused the issue by defining the black-and-white fallacy as though it is the same as the argument from the beard, or the same as the slippery slope argument. The textbook accounts are not consistent with each other at all, on this point, however. Others, more fruitfully, see the black-or-white argument as a kind of opposed or opposite argument to the argument of the beard.

The second problem is that terms like the "black-or-white fallacy," "false dichotomy," "black-and-white-thinking," and the like, have been used as generic labels for any kind of reasoning (e.g., in the formulating of questions) that force a sharply exclusive dichotomy or disjunction where none really exists, or is justifiable. And it would be misleading to narrow down the term "black-or-white" fallacy to refer to the special kinds of cases of the sort considered above, where vagueness versus arbitrariness of a term to make a verbal classification is the focus of the dispute.

Even so, there does seem to be legitimate room for the kind of argumentation designated under the heading of the black-or-white fallacy by some of the textbook accounts reviewed above. This category could usefully be taken to refer to the kind of inadmissible reply used when an arguer cleaves dogmatically to a vague criterion in the face of argument from vagueness of a verbal criterion by his opponent, while refusing to respond appropriately to the critical questions posed by the use of this argument. In the kind of argumentation illustrated in Cases 12, 13 and 15, this type of argumentation would be exemplified by the following response on the part of Bruce.

> **Case17**: The concept of a person, as you go along the continuum of the development of the fetus, is not vague. The fetus becomes a person on the first day of the third trimester. That's not an arbitrary definition –it is the absolute, only right one that any rational thinker could hold. None of your hair-splitting logic-chopping will convince me otherwise.

This dogmatic type of "digging in" without really being open to legitimate critical questioning of one's expressed viewpoint does represent a characteristic type of obstruction of the goal of a critical discussion that could be called a fallacy.

However, we are now transgressing the limits we have set for the scope of this investigation by getting into the area of evaluating which of these arguments are fallacious. Without dogmatically closing the issue then, we merely suggest that there may be room here somewhere for something like what has been called the black-or-white fallacy. Our inclination would be to find some other name for it, however.

9. The Place of the Argument of the Beard

Our investigation of the various cases, and the analysis of the structures of argumentation exemplified in these cases, indicates that Thouless was on to something highly significant, that is well

worth preserving in the textbooks on informal logic and argumentation theory. He was right to note that vagueness and precision are often pitted against each other in everyday argumentation in critical discussions in certain characteristic ways that are well worth charting systematically.

Vagueness is a common everyday phenomenon in argumentation using a criterion to make a verbal classification. But vagueness is not always bad, or eliminable, from a logical point of view. On the other hand, the making of distinctions to clarify one's terms, to define them more precisely, and so forth, is frequently very desirable in contributing to the goal of resolving a conflict of opinions by reasoned argumentation in a critical discussion.

However, argument from vagueness of a verbal criterion can be pushed ahead too hard, in some cases. In some cases, admitting one's criterion is vague while still maintaining it, can be a reasonable reply to this type of argument. In still other cases, eliminating the vagueness by moving to a criterion that is arbitrary, while admitting that the criterion is arbitrary, yet still defending it, can be a reasonable reply.

Requesting one's opponent clarify his terms in an argument is, in many cases, quite a reasonable and normally acceptable way of moving forward constructively in a critical discussion. But as Thouless (1930, p. 185) insightfully put it, this method of argument may be "no help but a grave hindrance if it marks off sharply in our thought things which are not sharply marked off in fact." According to Thouless (p. 185), in some cases, the very reasonable argument from vagueness of a verbal criterion becomes a "piece of crooked argumentation," used as "a device of badgering one's opponent to define his terms."

What is the difference between the legitimate and "crooked" or fallacious use of the argument from vagueness of a verbal criterion, and its subtypes, like the *sorites* slippery slope argument? A precise answer to this question (the evaluation problem) is not ven-

tured here, but we are now in a position to move forward with the research needed to find the answer. Understanding the fallacious uses of the different subtypes of argumentation from a verbal classification is to be sought in studying the pragmatic profiles of sequences of dialogue (in a critical discussion) in which a proponent puts forward these types of arguments and a respondent replies to them.

In particular, the fallacious cases are those where the proponent puts forward the argument too aggressively, putting pressure on the respondent so he cannot ask the appropriate critical questions, or where the respondent badgers the proponent in a comparable manner.

On our analysis, the key to understanding the argument of the beard is the appreciation that in natural language argumentation, arguers are continually torn, or pushed back and forth between the polar opposites of vagueness and precision. All natural language criteria for classifying individuals based on a verbal criterion tend to be inherently vague. But such a criterion can be made precise (or more precise, i.e. less vague). But either way, an opponent can attack the argument. She can say, "That criterion is vague, therefore it is no good to make the sufficiently precise criterion needed in this case." As a response the proponent can make the criterion more precise, say, by quantifying it in a numerical way. But then the opponent can attack the new version of the criterion as arbitrary, by citing a borderline case where no non-arbitrary basis for the inclusion (or exclusion) of a specific case is feasible.

All these types of argument are legitimate, in principle, and can serve, used in the right context of dialogue, to contribute to the goals of a critical discussion. But evidently, as we have seen, and as the textbook accounts of the fallacies have long rightly warned us, they can also be abused, or used as devices of "crooked thinking." Further research on this family of arguments will help us to set up normative criteria for evaluating, in particular cases, when they have been used fallaciously and when not.

References

Barth, Else M. 1974. *The Logic of the Articles in Traditional Philosophy*. Dordrecht: Reidel.

Beardsley, Monroe C. 1966. *Thinking Straight*. 3rd ed., Englewood Cliffs, NJ: Prentice- Hall.

Black, Max. 1970. *The Margins of Precision*. Ithaca: Cornell University Press.

Byerly, Henry C. 1973. *A Primer of Logic*. New York: Harper and Row.

Darner, T. Edward. 1980. *Attacking Faulty Reasoning*. Belmont, CA: Wadsworth.

Fearnside, W. Ward. 1980. *About Thinking*. Englewood Cliffs, NJ: Prentice-Hall.

Govier, Trudy. 1982. "What's Wrong with Slippery Slope Arguments?" *Canadian Journal of Philosophy*, 12: 303-316.

Kienpointner, Manfred. 1992. *Alltagslogik*. Stuttgart: Fromman-Holzboog.

Kneale,W. and M. 1962. *The Development of Logic*. Oxford: Clarendon Press.

Laertius, Diogenes. 1920. *Lives of Eminent Philosophers*. Trans. R. D. Hicks, Loeb Library Edition, Cambridge, MA: Harvard University Press, 2 vols.

Little, Winston W., Wilson, W. Harold and Moore, W. Edgar. 1955. *Applied Logic*. Boston: Houghton Mifflin.

Manicas, Peter T. and Kruger, Arthur N. 1968. *Essentials of Logic*. New York: American Book Company.

Moore, W. Edgar. 1967. *Creative and Critical Thinking*. New York: Houghton Mifflin.

Moore, W. Edgar, McCann, Hugh and McCann Janet. 1985. *Creative and Critical Thinking*. 2nd ed. Boston: Houghton Mifflin.

Schneider, John L. 1967. *Reasoning and Argument*. New York: Holt, Rinehart and Winston.

Thomas, Stephen N. 1977. *Practical Reasoning in Natural Language*. Englewood Cliffs, NJ: Prentice-Hall.

Thouless, Robert H. 1930. *Straight and Crooked Thinking*. London: English Universities Press.

Walton, Douglas N. 1990. "Ignoring Qualifications (Secundum Quid) as a Subfallacy of Hasty Generalization," *Logique et Analyse*, 129-130; 113-154.

Walton, Douglas N. 1992. *Slippery Slope Arguments*. Oxford: Clarendon Press.

Walton, Douglas N. 1995. *A Pragmatic Theory of Fallacy*. Tuscaloosa, AL: University of Alabama Press.

Walton, Douglas N.1996. *Argumentation Schemes for Presumptive Reasoning*. Mahwah, NJ: Law- rence Erlbaum.

Zadeh, Lofti Zadeh. 1987. *Fuzzy Sets and Applications: Selected Papers*. New York: Wiley.

2009 Vol 29: Jumping to a Conclusion: Fallacies and Standards of Proof

Douglas Walton and Thomas F. Gordon

Abstract: Five errors that fit under the category of jumping to a conclusion are identified: (1) arguing from premises that are insufficient as evidence to prove a conclusion (2) fallacious argument from ignorance, (3) arguing to a wrong conclusion, (4) using defeasible reasoning without being open to exceptions, and (5) overlooking/ suppressing evidence. It is shown that jumping to a conclusion is best seen not as a fallacy itself, but as a more general category of faulty argumentation pattern underlying these errors and some related fallacies.

1. Introduction

One common explanation in logic textbooks why several of the traditional informal fallacies are held to be fallacious is that the arguer jumps too quickly to a conclusion that is not justified by the premises of the argument. The fallacy called hasty conclusion, also called hasty generalization (Walton, 1999), ignoring qualifications, etc.,[1] seems to centrally fit this kind of error. As shown in this paper, four other informal fallacies fit this category as well: *post hoc*, *ad ignorantiam, ignoratio elenchi*,[2] and suppressed evidence. It is shown how each of these distinct kinds of error of reasoning can be classified under the more general heading of the error of leaping to a conclusion too quickly. In this paper, four dis-

1. The terminology is by no means standardized (Hamblin, 1970; Walton, 1999).

2. *Ignoratio elenchi* can be characterized as the fallacy of arguing to a wrong conclusion, but the problem is how broadly or narrowly this kind of error should be construed (Hamblin, 1970).

tinct types of error associated with these fallacies are identified and classified. Some general lessons of these findings for fallacy theory are also drawn, relating to problems of how to classify fallacies, how to define the concept of fallacy, and how to better treat some controversial examples. One problem is that these four informal fallacies seem to involve some form of jumping to a conclusion, but the errors occur in different ways. This raises a problem not only of classifying the various fallacies, but of seeing whether all or some of them are based on some larger underlying category of faulty reasoning associated with jumping ahead too quickly to a conclusion.

We analyze a number of standard examples of such arguments of familiar kinds taken in the logic textbooks to represent informal fallacies. Our first pass is to analyze these arguments by means of tools commonly used in logic, like argument diagramming methods, that identify the premises and conclusions of an argument, missing assumptions in an argument, and chains of argumentation in which one argument is connected with another. Our finding is that these methods do help us to identify the types of arguments represented by the examples, and to grasp some normative conditions of their use and misuse. However, despite the usefulness of these methods in posing the problem in a more specific way, we show that the project of analyzing these fallacies outruns them. We show that these fallacies need to be understood as violations of procedural norms of a reasoned discussion or investigation called a dialog.

The solution we offer is based on a formal model of proof standards and burden of proof (Gordon and Walton, 2008) built on earlier research in artificial intelligence (Gordon, Prakken and Walton, 2007) on burden of proof. In this model, a dialog is defined as a triple $<O, A, C>$, where O is the opening stage, A is the argumentation stage, and C is the closing stage. A burden of proof is set at the opening stage for each of the two parties in the dialog, comprising a thesis (designated proposition) that each party must prove, in order to "win" at the closing stage, and a standard of

proof that must be met. The notion of having different proof standards for arguments depending on a type of dialog was inspired by legal proof standards that can vary. For example the preponderance of evidence standard is used in civil law, whereas the higher 'beyond reasonable doubt' standard is required in criminal law. As shown in (Gordon and Walton, 2009), such standards can be ordered by the relative amount of proof needed to satisfy the standard, going from weaker standards to more strict ones.

2. Informal fallacies involving jumping to a conclusion

If we look over examples of the informal fallacies presented in logic textbooks, we see that many of them, no matter how they are classified, show the distinctive sign that they appear to be fallacious because they jump hastily to a conclusion not adequately supported by the premises. Johnson and Blair (1977, 17) cite numerous examples of such cases where the fallacy of "hasty conclusion" is committed because premises fail to provide sufficient support for a conclusion, but where an arguer jumps to that conclusion uncritically anyway. Such arguments are often based on generalizations that are stereotypes like "Fundamentalists are intolerant of other religions" (Carey 2000, 221). When such a generalization is applied to a specific case, we can get an inference like this one: "Fundamentalists are intolerant of other religions; Bob is a fundamentalist; therefore Bob is intolerant." The problem is that even if we recognize that the first premise is not an absolute universal generalization, the two premises still fail to provide sufficient support for accepting the conclusion uncritically. Bob may be a tolerant fundamentalist.

We are often warned about the dangers of this kind of thinking. The skeptical philosopher Arcesilaus held that nothing is more shameful than for assent and approval to run ahead of knowledge

and perception.[3] Here the arguer seems to jump too quickly to the conclusion, even if the precise nature of the error is unclear. The jump is so hasty and poorly thought out that the fallacy could equally well be called "leaping to a conclusion", because a leap sounds even more precarious that a jump. The argument is too hasty in this case, and can correctly be described as a fallacy, because it depends on an implicit stereotyping that oversimplifies and ignores contrary evidence. A pre-existing prejudice can easily make an arguer jump to an unwarranted conclusion.

Another fallacy that fits very well under this category is that of *post hoc* reasoning, often called "false cause". Arguing from a perceived correlation between two events to the conclusion that one causes the other is, in principle, a legitimate form of reasoning. Indeed, many inductive arguments to causal conclusions are based on correlations. The fallacy of *post hoc* is said to arise when the arguer jumps too quickly to the causal conclusion, while overlooking other evidence that ought to be taken into account, and that would indicate that reservations need to be considered. The following example is categorized under the heading of the fallacy of false cause (Hurley, 2003, p. 135).

> There are more laws on the books today than ever before, and more crimes are being committed than ever before. Therefore, to reduce crime we must eliminate the laws.

This argument fits one of the three species of the *post hoc* fallacy classified by Pinto (1995, 306). An analysis of the structure of the reasoning in this species of the fallacy can be built by considering the argumentation scheme for arguing from correlation to causation, along with its matching set of critical questions.

The argument scheme and a set of three of the critical questions matching it (Walton, 2006 p. 101-103) are presented below.

3. Cicero, *Academica* I-45. The rashness of assent Cicero describes as held to be something shameful by Arcesilaus equates nicely with the fallacy of jumping to a conclusion.

Arguments scheme for argument from correlation to cause

Premise	There is a positive correlation between A and B.
Conclusion	Therefore A causes B.

Three critical questions matching the scheme

CQ1: Is there really a correlation?
CQ2: Is there any reason to think that the correlation is any more than a coincidence?
CQ3: Could there be some third factor *C*, that is causing both *A* and *B*?

These three critical questions are merely presented as a simplified example of how the scheme works. A fuller list of seven critical questions is presented in (Walton, 1995, p. 142). This argumentation scheme represents the structure of a kind of argument that can be reasonable. Suppose the correlation is shown to exist, and therefore the premise of the causal argument is shown to be true. At very least, such a finding legitimately suggests that the possibility that a causal connection may exist, and could be further investigated. As noted by Pinto (1995, 306), "many authors have pointed out that the inference from correlation to cause may lend significant support to a causal hypothesis". However one of the three species of *post hoc* fallacy identified by Pinto is the error of jumping to a causal conclusion only on the basis of a correlation without considering other questions.

On our analysis, the first premise makes the claim that there is a positive correlation between increasing numbers of crimes being committed and increasing numbers of laws on the books. The interim (implicit) conclusion suggested to follow from this alleged fact is the claim that the latter increase is causing the for-

mer one. From this interim conclusion, the stated conclusion, 'To reduce crime we must eliminate the laws' is held to follow. Along with the interim conclusion there is an additional implicit premise, where *X* and *Y* are variables for types of events: 'If *X* causes *Y*, then to eliminate *Y* we must eliminate *X*'. This generalization does not hold up, since a type of event can have multiple causes, and to eliminate something that causes the event will not necessarily eliminate the occurrence of the event (although it might). This argument can be criticized on a number of grounds, but the interesting core of it is a *post hoc* argument.

The following example of the *argumentum ad ignorantiam* is the classic foreign spy case (Walton, 1989, p. 45), where X stands for the name of a person.

> Mr. X has never been found guilty of breaches of security, or of any connection with agents of the foreign country he is supposedly spying for, even though the Security Service has checked his record. Therefore, Mr. X is not a foreign spy.

It is impossible to be absolutely certain that Mr. X is not a foreign spy. He could be a "mole", like Kim Philby, the British intelligence agent who concealed his activities as a spy for the Soviet secret service for most of his working career (Walton, 1996, p. 165). Perhaps for this reason, the argument from ignorance has traditionally been classified as a fallacy in logic. After all, arguing merely from a lack of evidence doesn't really prove anything at all.

But is argument from ignorance, or argument from lack of evidence[4], as it might better be called, really a fallacy in all instances? Suppose that a thorough search by a competent government security agency turned up no evidence of Mr. X's being a foreign spy. The negative evidence provided by such a search could be part of a reasonable defeasible argument for the conclusion that Mr. X is

4. During discussion at the ICAIL 2009 conference in Barcelona on June 14, Trevor Bench-Capon suggested a highly suitable term for this type of argument: absence of reasons to the contrary.

not a foreign spy. Once an implicit premise has been revealed, the argument can be properly evaluated, depending on whether it is justified. A key part of the argumentation is the following depth-of-search premise: if Mr. X really was a foreign spy, the search by the competent security agency would probably have discovered some evidence of his being a foreign spy. Inserting the implicit depth-of-search premise in the foreign spy case (represented as a conditional statement in the analysis of arguments from ignorance in (Walton, 1996, p. 259)), yields the following reconstruction of the argument.

> If Mr. X is a foreign spy, the search by the security agency would have discovered some evidence of his being a foreign spy.
>
> The search by the Security Service found no evidence of Mr. X's being a foreign spy.
>
> Therefore, Mr. X is (probably or plausibly) not a foreign spy.

This argument is defeasible, as shown by the Philby case. Even if the premises are true, it does not follow necessarily that the conclusion is true. But still, it seems to be a reasonable argument from ignorance. Fallaciousness, in such a case, depends on defeasibility, which in turn depends on an implicit premise.

A problem posed for fallacy theory stems from the increased recognition in recent times of the legitimacy of defeasible reasoning (Prakken and Sartor, 1997). This kind of reasoning does make a tentative jump to a conclusion, typically on the balance of considerations under conditions of uncertainty and lack of knowledge, of a kind that is subject to defeat (Pollock, 1995; Walton and Reed, 2002). Should new evidence come in, the conclusion may have to be retracted (Prakken and Sartor, 2003). Much recent work in AI in particular has been done on defeasible reasoning, resulting

in many formal models of nonmonotonic[5] reasoning, in which the adding of new premises to an argument may fail to preserve the conclusion (Horty, 2001, p. 336). Such an argument can rightly carry weight, or be a plausible basis for acceptance, on a balance of considerations in an investigation or discussion that is moving forward, as new evidence is being collected, even if it might fail as new premises are added (Rescher, 1976). Yet jumping ahead too quickly to a conclusion, before all the evidence is in, can be an error.

Defeasible reasoning of the kind that guides so much of our intelligent behavior needs to be defined, at least in part, as based on reasonable argument from ignorance. Horty (2001, p. 337) defined default reasoning as "reasoning that relies on absence of information as well as its presence, often mediated by rules of the general form: given *P*, conclude *Q* unless there is information to the contrary". A leading theory of defeasible reasoning (Reiter, 1980) is based on the possibility of invoking what is called the "closed world" assumption, a closure rule that allows us to assume that all relevant positive information has now been collected in a case. Using this rule, it is legitimate to conclude that a positive proposition is false whenever it is not explicitly present in a database (Horty, 2001, p. 241). Such an argument is quite clearly a reasonable form of argument from ignorance used in defeasible reasoning.

To illustrate the point, the following example (Reiter, 1980, 85) can be used to show how the closed world assumption is used as the basis for drawing an inference based on absence of reasons to the contrary (argument from ignorance).

> A passenger in an air terminal is scanning the televised flight monitor, to see whether there is a flight from Vancouver to New York. She scans over all the flight connections listed on the monitor, and

5. Monotonicity of an argument is defined (Horty, 2001, p. 336) as the property that if a conclusion follows from a set of premises, it will still follow if other premises are added to the original set.

finds no Vancouver/New York flight among the flights listed. She concludes there is no flight between Vancouver and New York.

According to the closed world assumption, any positive fact not specified in a given database (the knowledge possessed by the agent) may be assumed to be false. However, it is assumed that all the relevant information in a situation has been specified, and anything else may be disregarded, or taken not to apply to the situation as known. The closed world assumption, in this example, is that all the flights one can take from this terminal at this time are listed on the monitor. The inference may then be drawn that if a flight from Vancouver to New York is not listed, there is no such flight available. Such an inference fits the form of the argument from ignorance, for if a proposition is not stated, that lack of knowledge justifies the inference that the proposition is (or may be assumed to be) false.

What is the difference between a reasonable argument from ignorance and a fallacious one? One answer (Walton, 1996) is that in the fallacious instance of the lack of evidence argument, the arguer leaps ahead too quickly to the conclusion, failing to satisfy the requirements of a depth-of-search of premise, or perhaps even ignoring it entirely. One might cite the classic case of argument from ignorance used to illustrate the fallacy in the logic textbooks. The case in point is the McCarthy witch hunt investigation in which an innocent person was accused of being a communist on the grounds that there was no evidence in the file that he was not a communist.[6] The problem with this kind of case may not be just its logical form as an argument from ignorance. On least one analysis, the form of the argument could be reconstructed as follows.

6. In the early 1950s, Joseph R. McCarthy, a U.S. senator, accused many innocent people of being Communist sympathizers, with the result that they were perceived as "loyalty risks" and lost their jobs. McCarthy used the form of reasoning called argument from ignorance when he used the following pattern of argument: "There is nothing in the files to disprove this person's Communist connections, therefore we can infer that he has Communist connections."

Major premise:	If there is no evidence that not *A* is the case then conclude *A*.
Minor premise:	There is no evidence that not *A* is the case.
Conclusion:	*A*

This form of argument is deductively valid (*modus ponens*). The real problem with the witch hunt example is that the major premise of the argument reverses the burden of proof. The truth or acceptability of the major premise seems questionable, since it would require a database that keeps track of evidence for what is not the case. Hence the deeper problem is not just in the logical form of the argument, but in how burden of proof is assigned during an investigation in which data is being collected.

So far, then, we have examined three informal fallacies, hasty generalization, *post hoc* and argument from ignorance, that can all be analyzed as fallacies by showing that the argument jumped too quickly to the wrong conclusion. Next, it needs to be asked whether this error of having jumped to the wrong conclusion is a special case of a broader error, that of arriving at a conclusion other than the one which is supposed to be proved.

On Aristotle's theory, a fallacy is a sophistical or apparent refutation in a chain of valid syllogisms that appears to refute the conclusion it is supposed to refute, but does not. According to Hamblin's summary of Aristotle's theory (Hamblin, 1970, p. 105), such a failure can occur for any one of the following nine reasons: (i) the reality is not contradicted, but only the name, or (ii) the proof contains only a 'synonymous' word, or (iii) the premises of the refutation are not granted, or (iv) are not necessary (but only accidental), or (v) the original point to be proved is among the premises, or (vi)

the refutation does not refute in the same respect or (vii) relation or (viii) manner or (ix) time.

Each one of these failures could be classified as a separate fallacy in its own right, but violating any of requirements (vi) through (ix) amounts to committing the *secundum quid* fallacy of overlooking exceptions to a generalization (Walton, 2004, p. 33). It is easy to see why the fallacy of *ignoratio elenchi* (ignorance of refutation) came to be a catch-all category in the logic textbooks through the ages.

However, in another place Aristotle gave a much more specific definition of the fallacy of misconception of refutation, shown below in a literal translation of the following passage in Topica (162a13 – 162a16).

> When the argument stated is a demonstration [*apodeixis*] of something, if it's something other than that leading to the conclusion, it will not be a syllogism about that thing.[7]

The fallacy described here could fit the error of leaping to the wrong conclusion quite well. The problem is that the given argument may prove a conclusion. Thus it might appear to be a good proof, and it might even be valid. But it is a fallacious argument if it did not prove the conclusion that was supposed to be proved. This kind of fallacy is classified in (Walton, 2004) as a failure of relevance. An argument may be valid, but if it goes to a conclusion other than the one that is supposed to be proved, it is irrelevant. The problem is how widely or narrowly relevance should be defined.

The following example is classified under the heading of the fallacy of *ignoratio elenchi* translated as "missing the point" (Hurley, 2003, p. 123).

7. Translation provided by Craig Cooper, December 1995, as quoted in (Walton, 2004, p. 35).

> Crimes of theft and robbery have been increasing at an alarming rate lately. The conclusion is obvious: we must reinstate the death penalty immediately.

The clue to the reader in this case that enables him or her to see that the argument in the given case is a fallacy is the hasty jump to a conclusion that seems almost ridiculously inappropriate. It is the wrong conclusion. But should the diagnosis be that the argument is irrelevant, or simply that it is too weak to adequately support its conclusion? Maybe neither is the heart of the problem. A better analysis might be that the argument ignores or suppresses evidence that is relevant, and that should be taken into account. Reinstating the death penalty is a solution that arguably won't work to stop crimes of theft and robbery, at least so many would say. At best it is an extreme solution, and other possible solutions should also be considered before leaping to this conclusion. As in the example of *post hoc* cited above, the argument seems fallacious because it overlooks or suppresses evidence on crime prevention that ought to be taken into account.

Another error in this case is that theft and robbery would not be punishable by death, even if the death penalty were reinstated. Thus reinstatement cannot be expected to deter theft or robbery. On this analysis, one might question whether the argument is an example of jumping to the wrong conclusion, so much as it is an example of including some implicit assumptions that are questionable and even implausible. Still, when you look at the example as stated, what stands out is the wild leap from a premise that might be true to a conclusion that doesn't follow.

The majority of logic textbooks don't recognize a special type of fallacy in which evidence is overlooked or ignored, making an argument too weak to support its conclusion. However, a widely used textbook (Hurley 2003) does recognize a fallacy of this kind, called the fallacy of suppressed evidence (pp. 153- 155), possibly picking it up from the fallacy called "suppressed evidence" in (Kahane, 1971, 4-7). Hurley classifies this fallacy as a failure to

meet a criterion of what he calls a cogent argument. He defines a cogent argument as an inductive argument with good reasoning and true premises (p. 153). On his analysis, quoted below, the fallacy of suppressed evidence is committed by an argument that fails to meet this requirement.

> The requirement of true premises includes the proviso that the premises not ignore some important piece of evidence that outweighs the presented evidence and entails a very different conclusion. If an inductive argument does indeed ignore such evidence, then the argument commits the fallacy of suppressed evidence.

Hurley offers the following example (p. 153) to illustrate this fallacy. Let's call it the Little Dog argument.

> *The Little Dog argument*
>
> Most dogs are friendly and pose no threat to people who pet them. Therefore, it would be safe to pet the little dog that is approaching us now.

This example is an interesting one, but there are some problems with how Hurley uses it to define the fallacy of suppressed evidence. On his account, the fallacy of suppressed evidence is committed by an argument that ignores some important piece of evidence that outweighs the presented evidence, where the addition of the ignored evidence leads the argumentation to a different conclusion. One problem with this example is that the argument is quoted from Hurley above seems reasonable, unless there is some evidence that this particular little dog might be in some way unusual or even dangerous. Perhaps the fallacy is to overlook this possibility, given that touching an unknown dog can sometimes be dangerous. The problems are whether this failure should be seen as a fallacy or not, and if it is supposed to be a fallacy, how the fallacy should be analyzed as a distinctive type of failure or deceptive tactic. It certainly is reasonable to set a general requirement in place to the effect that all relevant evidence must be considered when evaluating the acceptability of a claim. However, this requirement

does not seem to be captured in the logical form of an inference in the case of an example like the little dog argument. Instead, it seems to be a general procedural requirement on how to collect and apply evidence when evaluating an argument.

These examples are good ones for a textbook on informal fallacies that is to be used in trying to teach beginning students of logic how to recognize fallacies and evaluate arguments as reasonable or fallacious. But what is of interest is what is common to them. This particular characteristic of jumping to a wrong conclusion is evident not only in the many examples of informal fallacies given in Hurley (2003), but in the examples presented in many other informal logic textbooks as well. These observations suggest that this particular characteristic of jumping too quickly to a conclusion may be centrally important somehow not only for identifying fallacies, but in regard to defining and explaining the basic notion of fallacy itself.

The first premise of the little dog argument is a generalization that appears to be open to exceptions, and the argument in this example is a paradigm case of defeasible reasoning. As noted above in this section, overlooking exceptions was recognized by Aristotle as a subcategory of fallacies coming under the general heading of *ignoratio elenchi*. As noted in connection with Aristotle's general definition of this fallacy, violating any of requirements (vi) through (ix) amounts to committing the *secundum quid* fallacy of overlooking exceptions to a generalization.

3. The Little Dog argument

A recurrent problem in fallacy theory is that of drawing the line between examples in which the argument is merely weak, and presents insufficient evidence, and examples where it should properly be classified as fallacious. The difference is between an argument that is merely weak, or lacking adequate support, and one that commits a serious enough kind of recognizable error that it can properly be evaluated as fallacious (Walton, 1995, p. 260). The

specific problem addressed in this paper is whether it is a fallacy to leap ahead too quickly to a conclusion in an argument, or even worse, to ignore or suppress evidence needed to prove its conclusion. Are such errors better classified as fallacies or as weak arguments? The Little Dog argument is surely an outstanding example that poses this question in an acute form.

One problem with the Little Dog argument as it stands is that the allegedly suppressed evidence is not stated as part of the argument. For purpose of discussion and further analysis, let's modify the argument and make the error more explicit, and easier to pinpoint and diagnose. Suppose that as we approach the little dog, we see that it looks like a pit bull, and that based on common knowledge, we know that pit bulls are dangerous. We could call this revised version of the example the Little Dog argument, version 2 or the Pit Bull argument. It does strongly seem to be fallacious. One premise of version 2 states that most dogs are friendly and pose no threat to people who pet them. But the top premise identifies the dog as looking like a pit bull. The fallacy of sticking with the previous conclusion to go ahead and pet the little dog resides in the failure of the new version of argument to take into account the new data. We see that the little dog looks like a pit bull. Based on argument from appearance, it would be fair to conclude that it might be a pit bull, for all we know. Ignoring this perceptual evidence would lead to the wrong conclusion that would be safe to pet the little dog approaching us now. Version 2 makes the example much more convincing as an argument that can properly be said to be fallacious and that ignores or suppresses evidence.

However the question remains whether it is appropriate to call this kind of failure a fallacy. Is it more justifiable to classify it as merely a weak argument that leads to a wrong conclusion? There is no consensus in the logic text books to guide us, except that the majority of logic textbooks do not include the fallacy of sup-

pressed evidence under the common lists of informal fallacies.[8] As noted above, the issue depends on the prior unresolved issue of how to define the notion of fallacy.

Version 2 of the Little Dog argument represents a departure from version 1 by adding new evidence to the case, namely the observation that the little dog looks like a pit bull. But as indicated in the analysis represented in Figure 2 below, part of the original example was an assumption that we don't know whether the little dog is friendly or not. It was this lack-of-knowledge premise that made the argument defeasible and that also made it fall into the category of an argument from ignorance. To bring out these factors, and at the same time illustrate a different approach to argument analysis and diagramming, we diagram another version (version 3) of the Little Dog argument using the Beardsley-Freeman system method of argument diagramming supported by the *Araucaria* software (Reed and Rowe, 2004). This system has a number of useful features. It can used to display the difference between linked and convergent arguments, it can be used to represent implicit premises in an argument, and it can be used to represent argumentations schemes of various kinds on the diagram.

We will carry out the analysis in two parts. First we present an analysis of the original argument, which concludes that it is safe to pet the little dog. Then we present the secondary argument that attacks the original argument. We begin the analysis by setting out a list of the propositions (key list) in the original argument of version 3 of the little dog argument.

Key list for the original argument in the Little Dog example

- Most dogs are friendly and pose no threat to people who pet them.
- Here is a dog approaching us now.

8. It was not recognized in the account of the standard treatment of fallacies presented by Hamblin (1970).

- This dog is friendly and poses no threat to people who pet it.
- If a dog is friendly and poses no threat to people who pet it, it is safe to pet it.
- It is safe to pet this dog approaching us now.
- Let's go ahead and pet this dog approaching us now.

The diagram in Figure 1 shows the original argument used to justify the conclusion to go ahead and pet the little dog.

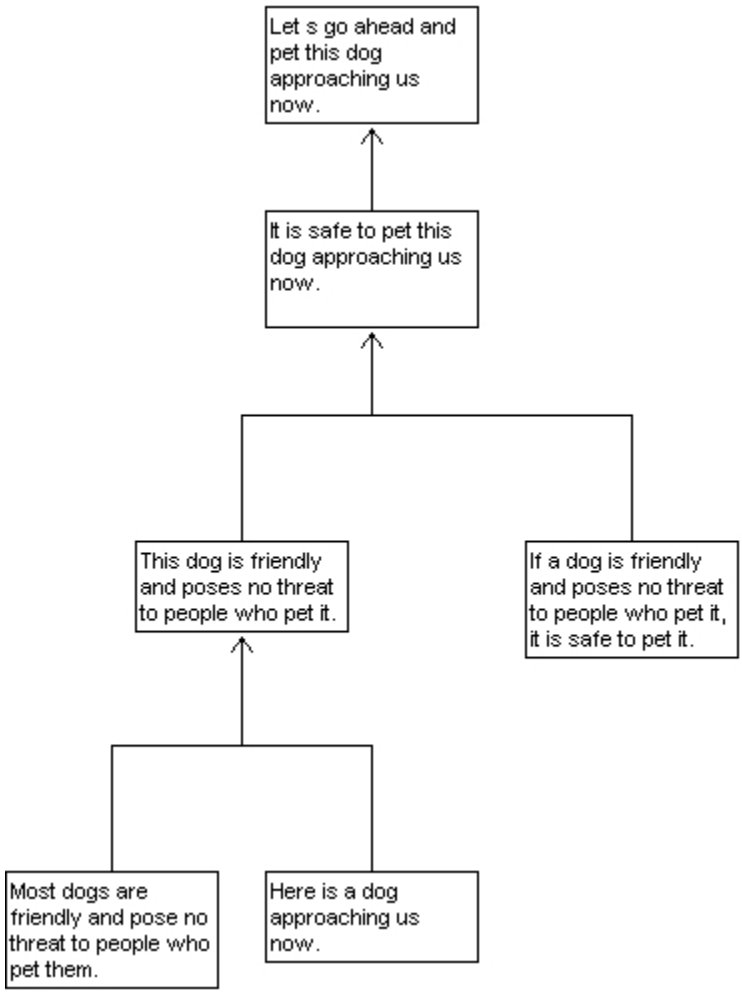

Figure 1:Araucaria diagram of the original argument in version 3

The leftmost box at the bottom of Figure 1 contains a generalization. It could be stated as an implicit premise that there is no evidence known so far that indicates that the dog approaching us now is not friendly and poses a threat to people who pet it. Inserting such a premise would make the argument an argument from ignorance. The argumentation scheme for that type of argument could be displayed on the diagram, linking the implicit premise to other

premises in the diagram at the appropriate places. But rather than analyzing the argument this way, we choose an alternative method.

In the key list below, a general principle is enunciated that is taken to be an essential assumption in version 3 of the secondary argument. The principle of tutiorism comes from the doctrine of probabilism in Catholic moral theology, a part of casuistry, a method for deciding what to do when applying general ethical principles to particular cases (Jonsen and Toulmin, 1988). The rule of probabilism holds that when there is a preponderance of evidence on one side of a controversy, one should act in accord with the contention of that side.[9] The doctrine of tutiorism is an exception to the rule of probabilism to be applied in the case where danger and the risk of error are involved. The rule of tutiorism holds that in a case of doubt one should act in accord with the contention of the safer side.

Casuistry has been discredited as a method for ethical decision-making, but Jonsen and Toulmin (1988) maintain that it had a lot of very useful techniques that were unfairly attacked. The casuistic language of probabilism is, however, misleading in some respects. When casuists say that something is probable, they do not refer to probability in the modern sense, and it might be better to use the term 'plausible' to express this key notion. Reformulated in these terms, the two rules could be less misleadingly formulated as follows. The first is a general rule that one should act in accord with the view that is more plausible. There is a secondary rule that applies in a case in which safety is at issue. The secondary rule allows that in such cases it may be reasonable to act in accord with a less plausible view. It is this secondary rule that best formulates the principle of tutiorism.

9. Other accounts of probabilism in casuistry offer differing versions of the rule –see for example the account given in the Wikipedia entry for 'probabilism', and also the discussions in (Jonsen and Toulmin, 1988). However, this is the version we find most useful here.

Key list for the secondary argument in the Little Dog example

- Exception: some dogs are not friendly and pose a threat to people who pet them.
- If a dog is not friendly and poses a threat to people who pet it, it is not safe to pet it.
- It is not known whether this dog approaching us now is friendly, and poses no threat, or is not friendly, and poses a threat.
- It may not be safe to pet this dog.
- Principle of Tutiorism: Under conditions of uncertainty and lack of knowledge, if there is a choice between one of two hypotheses, it may be reasonable to accept the less plausible one if (a) accepting the more plausible one may have significant negative consequences that are known, while (b) accepting the less plausible one does not have significant negative consequences that are known.
- Let's refrain from petting this dog.

Using this key list, the secondary argument in version 3 is analyzed and represented in *Araucaria* as shown in the argument diagram in Figure 2.

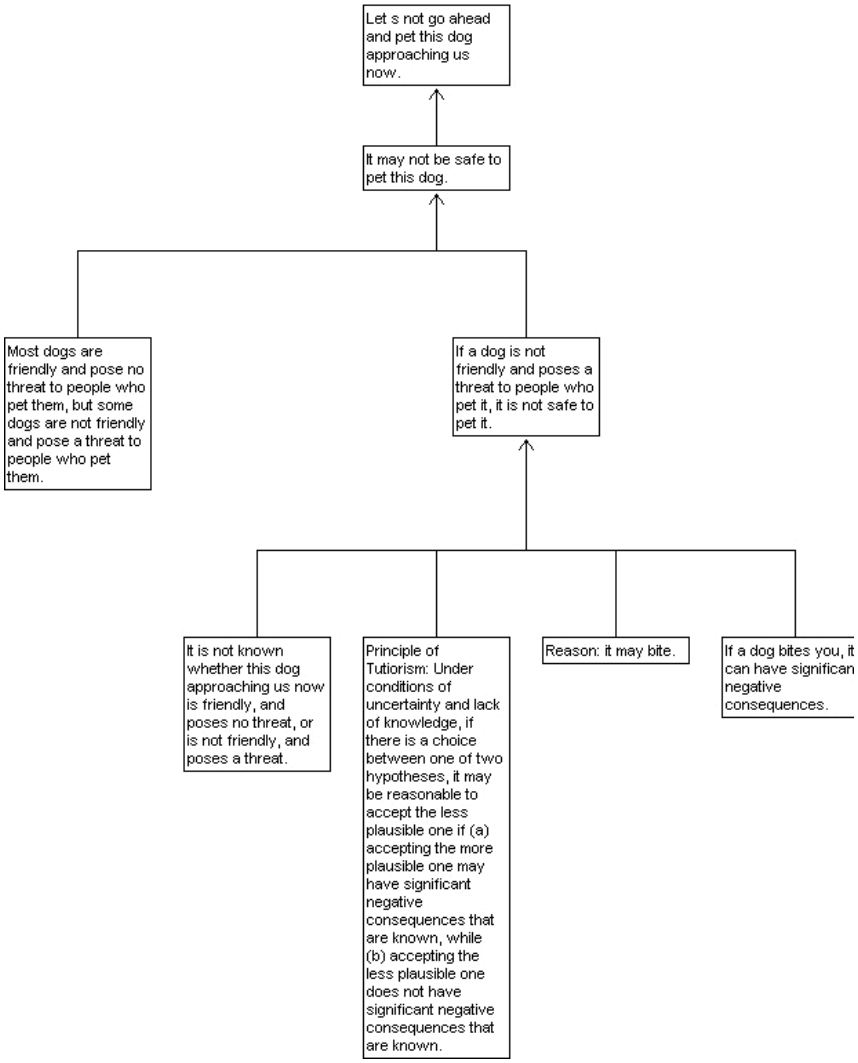

Figure 2: Secondary argument in version 3 defeating original argument

Araucaria represents refutation using a double arrow from one node to another. In *Araucaria*, refutation is seen as similar to classical negation in logic. In other words, it is comparable to the notion of the defeating rebutter, as opposed to an undercutting rebutter. The concept of one argument undercutting another one cannot, at least technically, be represented on an *Araucaria* diagram.

To represent the entire sequence of argumentation in version 3 of the Little Dog example, we need to join the two argument diagrams together in Figure 1 and Figure 2. We can do this by joining the ultimate conclusion at the top of the diagram in Figure 2 by means of our refutation double arrow to the ultimate conclusion at the top of the diagram in Figure 1. One is the negation of the other. The large diagram composed of the joining together of these two diagrams represents the whole sequence of argumentation in version 3, showing how the secondary argument refutes the original argument.

The main problem with this analysis is that the principle of tutiorism has been represented as a premise in the argument. This way of proceeding is okay as far as it goes, but it does not recognize that the principle of tutiorism is better seen as a meta-level procedural principle of practical reasoning that can be applied to cases of deliberation or danger, including when the danger of making an error that has significant negative consequences is involved. In such cases, a decision has to be made between accepting two equally plausible propositions, or cases where one is more plausible than the other, but where selecting the less plausible has significant consequences. Such a case brings argumentation from negative consequences into play, when a principle of risk rules against selecting the proposition representing the course of action that has the significant negative consequences. The problem with the analysis represented in Figure 4 is that although it depicts the inferential structure of the argument in a useful way by expressing the principle of tutiorism as a premise, really how this principle works in the argument needs to be seen in a different way.

It is our contention that the principle of tutiorism needs to be seen as a design principle of a class of argumentation schemes. The schemes in this class are variations and specializations of: "if *X* is dangerous/risky then avoid *X*." An example: avoid things that look like snakes (because the cost of being bitten is higher than the cost of walking around the object). Such schemes are different from schemes based on defeasible generalizations about what is usually

or normally the case, like the classic example 'Birds fly'. This does not fit the principle, since there are no apparent risks in wrongly inferring that something is or is not a bird.

In the cases we have considered, the principle of tutiorism applies under conditions of decision-making under uncertainty and lack of knowledge, where significant negative consequences of an action are involved and safety is a value. When evaluating a chain of argumentation, the principle tells us that in addition to the plausibility of the claim on each side of the controversy, practical matters of avoidance of harm need to be taken into account in decision-making. Practical reasoning concerning the goals and values of the decision-maker and a wider audience needs to be factored into the argument evaluation. A formal model that applies to cases of practical reasoning where the argumentation is based on values such as safety is that of Atkinson and Bench-Capon (2007). Their model applies to cases in law where decisions require an element of choice that depends on the goals and interests of the people making the decision. Their Value-Based Argumentation Framework (VAF) labels argument trees with the values that would be promoted if the argument were to be accepted. Thus their analysis applies to cases where safety is a value, like the Little Dog example.

4. Four kinds of error distinguished

There are four kinds of error that we have analyzed that need to be clearly defined, and distinguished from each other, and from other kinds of error. The first one is to argue from premises that are by themselves insufficient as evidence to prove the conclusion that is supposed to be proved in the given case. It is assumed that in the given case there is some standard of proof that indicates the party responsible and sets a standard regulating how much evidence there needs to be in order to successfully prove the conclusion. This assumption is in turn based on a prior assumption that argumentation in the given case takes place in three stages (Gordon and Walton, 2008). There needs to be an opening stage, an

argumentation stage and closing stage. The global burden of proof (called the burden of persuasion in law) needs to be set at the opening stage. It is fixed throughout all three stages. This assignment of burden of proof sets the following requirements into place. (1) A thesis (a proposition) that each party has to prove is determined. (2) A standard is set determining how strong the argument of each side needs to be in order to qualify as a proof of its thesis. There is also a local burden of proof (called a burden of production in law) that can shift back and forth from one side to the other during the argumentation stage. (3) At the closing stage it needs to be decided which of the two sides met its assigned burden of proof in its argument put forward during the argumentation stage. Assuming that the thesis of one side is the opposite of the thesis of the other side, only one side can fulfill its global burden of proof.

In analyzing the four kinds of error, we have used argument diagrams to represent the inferential structure of the reasoning during the argumentation stage. However, in each of these cases we've seen that the errors are procedural. For example, in the case of the McCarthy argument, the error was a reversal of the burden of proof. In other cases as well, the error resulted from a deficiency in a search made for both positive and negative evidence, and this too was a procedural error concerning misapplication of burden of proof. It is possible to represent failure to meet a burden of proof as shown in Figure 3.

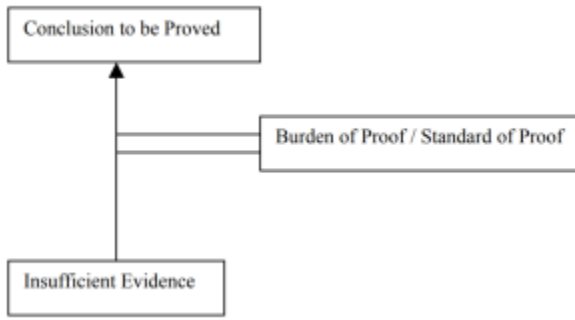

Figure 3: Failure to meed burden of proof and standard of proof requirements

In this kind of case, the arguer jumps ahead too quickly on the basis of a set of premises that is not sufficient as evidence to prove the conclusion. The problem in this kind of case is to judge whether the failure is a fallacy or simply an argument that is too weak. As this kind of problem can only be solved, we argue, by looking into procedural matters concerning the three stages of the argumentation in the context of an investigation that is supposed to arrive at the conclusion.

The second kind of error is that of argument from ignorance. As shown by the foreign spy case in Section 1, this type of argument can sometimes be reasonable, but can commit a fallacy by leaping ahead too quickly and ignoring the depth-of-search premise. The problem is that such a failure to take all the required evidence into account is a failure to meet requirements of burden of proof, making the argument too weak to prove the conclusion it is supposed to prove. Once again we could represent the error by looking at the structure of an inference from premises to a conclusion. So depicted, the general failure could be classified as a special instance of the error shown in Figure 4.

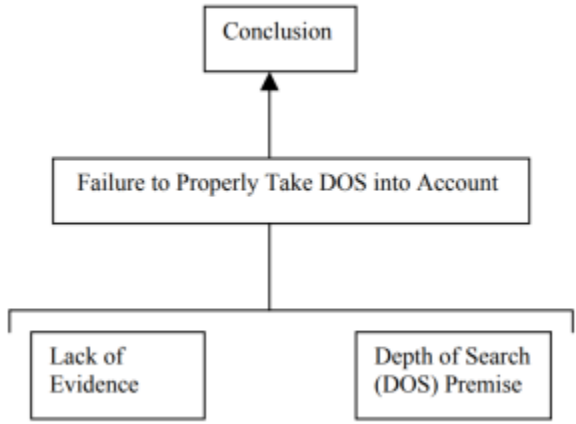

Figure 4: Fallacious argument from ignorance

The fallacy exhibited in Figure 4 fits the pattern of the error of leaping ahead too quickly to the conclusion that is supposed to be

proved, because proving that conclusion needs to be based on two premises. If the DOS premise is ignored or insufficiently justified, the arguer may leap ahead too quickly and draw the conclusion merely from ignorance. But, on the other hand, it is a special kind of error in its own right, based on a lack-of-evidence premise and another premise that concerns the depth of search of the investigation used to find evidence in the case. The special kind of error is procedural, because matters of depth of search for burden of proof need to be decided at the opening stage.

The third kind of error is one where the arguer leaps to the wrong conclusion on the basis of given premises instead of constructing a line of argument that ends in the conclusion that was properly supposed to be proved in the given case. This kind of error can be shown in Figure 5.

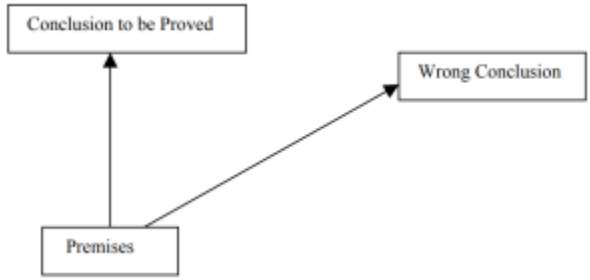

Figure 5: Leaping to the wrong conclusion

This third kind of error, shown in Figure 5, corresponds to Aristotle's fallacy of irrelevant conclusion. This too seems to be a procedural kind of error, assuming that what determines relevance of an argument is the issue set at the opening stage of a dialog.

The fourth kind of error occurs in a case where a defeasible generalization is used along with other premises to argue for a conclusion that is supposed to be proved. In such a case, as shown in Figure 6, the inference from the premises to the conclusion is a qualified one. It is supposed to be open to defeat if new evidence comes in showing that the present case is an exception to the

generalization. The proper line of inference is shown by the arrow on the left, while the erroneous line is shown by the arrow on the right.

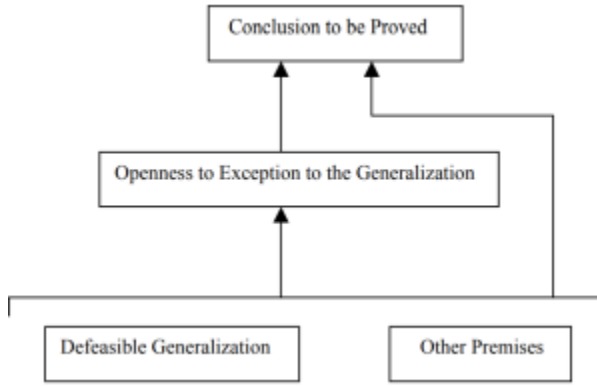

Figure 6: Jumping ahead too quickly by ignoring exceptions

In this fourth kind of fallacy the arguer exhibits a kind of closed-mindedness. He or she is not open to exceptions that either do or might occur with respect to the defeasible generalization that is one of the premises. In this kind of case, the arguer leaps ahead from the premises to the conclusion, ignoring potential or actual exceptions to the generalization that need to be taken into account. From there, a decision can be arrived at on whether the error is serious enough to merit the argument being called fallacious. This kind of fallacy is often labeled under the heading of hasty generalization.

These four types of error are fundamentally important to recognize, in order to build up a fallacy theory that can classify basic errors of reasoning underlying informal fallacies that often combine the, or combine other aspects of, argumentation with an underlying pattern of erroneous reasoning.

5. Classifying the four types of error

Studying these fallacies as instances of the broader error of jumping too hastily to a conclusion has raised the problem of fallacy inflation observed by Hamblin in his commentary on Aristotle's analysis of the fallacy of misconception of refutation. It is very easy to analyze not only these three fallacies, but many others as well, perhaps even including nearly all the traditional informal fallacies, as committing the fallacy of misconception of refutation. It depends on how broadly this fallacy is defined. If we define the error of arguing to our wrong conclusion broadly enough, nearly every informal fallacy could be absorbed into this model. The same remark could be said about the general category of jumping too hastily to a conclusion. The danger is that not only hasty generalization, *post hoc*, and argument from ignorance are fitted under this classification, but many other informal fallacies as well. Thus it would seem that the error of jumping too quickly to a conclusion represents quite a broad and general type of error of reasoning, and precise classifications of which fallacies fall under this type of error is a job that remains to be done. As Hamblin (1970) noted, attempts so far to produce a system of classification of informal fallacies have not been successful. Still, seeing how four distinct types of error are involved can help us begin this task. The analysis of the Little Dog case brought out how the study of the supposed fallacy of suppressed evidence is closely related to, and in some cases inseparable from, the fallacy of argument from ignorance. To begin the task of classifying the different ways the fallacy of jumping to a conclusion can be committed, we review and further analyze the four basic kinds of errors that could be classified under the general heading of jumping too hastily to a conclusion were distinguished in Section 4.

These four errors, it is proposed here, should be seen as specific categories of errors, corresponding to types of fallacies that have already been traditionally identified, all falling under a more fundamental pattern of faulty reasoning that can be called jumping to a conclusion. This pattern of reasoning underlies many of the

informal fallacies, and is especially closely related to the four fallacies cited in Section 1. The first error was failure to meet a burden of proof. The problem is not only to define the notion of burden of proof, but to set standards against which a given argument can be evaluated to see whether it has met that standard of proof or not. This problem is complicated by the fact that there can be different standards for burden of proof in different dialogs, and an argument judged to be acceptable by one standard may not be acceptable judged by another. Another complication, as shown by the Little Dog example and the snake example, is that a standard of proof may be set high if the factor of safety is involved, for instance, if there is known threat to human life or the possibility of injury. The variability of standards of proof in different dialog settings has already been taken into account in law, where the burden of proof is different in a criminal trial from a civil trial. The problem for defining failure to meet a burden of proof as a species of jumping to a conclusion is one of recognizing the variability of burden of proof in different types of dialog by setting standards appropriate for what constitutes a successful proof in a given case. Some research in artificial intelligence and law (Freeman and Farley, 1996) has drawn important distinctions between different kinds of proof standards used to set burden of proof in law.

Gordon, Prakken and Walton (2007) defined three proof standards for a statement at issue in a dialog. The idea is that after arguments pro and con have been collected together during the prior sequence of argumentation in the dialog, a decision can be taken on whether the statement should either be accepted or rejected. During the point where this decision is made in a dialog, one of the three following proof standards can be used to set in place an appropriate burden of proof against which the acceptability of the statement can be decided. A statement meets the standard of *scintilla of evidence* if and only if it is supported by at least one defensible pro argument. A statement meets the *best evidence* standard if and only if its strongest defensible pro argument outweighs its

strongest defensible con argument.[10] A statement meets the standard of *dialectical validity* if and only if it is supported by at least one defensible pro argument and none of its con arguments are defensible. The standard of *beyond a reasonable doubt*, one familiar from law, is another standard that might be considered as well.[11]

In light of the variability of such proof standards, what needs to be clarified in relation to the error of jumping too quickly to a conclusion by failing to meet a burden of proof, as represented in Figure 3, is that the failure to meet the burden of proof by presenting an argument that is insufficient to prove the conclusion that is supposed to be proved is not necessarily fallacious. The failure could be just that of an argument that is too weak to meet the appropriate standard of burden of proof, and that needs further substantiation by the bringing in of additional evidence. There is nothing inherently fallacious about such a shortcoming. Indeed, throughout this paper, we have stressed that defeasible arguments, although they often tend to be weak, should not be seen as inherently fallacious. On the other hand, certain informal fallacies are closely associated with failure to meet a burden of proof. One is the fallacy of arguing in a circle, or begging the question (*petitio principii*). When this fallacy is committed, an arguer fails to meet the burden of proof, when arguing for a conclusion that is doubtful, by assuming one of the premises of his argument required to be proved in order to prove that premise (Walton, 1995). But the very purpose of putting forward an argument designed to rationally persuade the questioner to accept the conclusion is to use premises that can remove the questioner's doubts about that conclusion. Committing this kind of fallacy means that the argument so used is doomed to failure, because the premise used is just as doubtful as the conclu-

10. The preponderance of evidence standard was renamed the best evidence standard in response to a criticism (made by Trevor Bench-Capon) mentioned in (Gordon, Prakken and Walton, 2007) to the effect that the formalization of this standard proposed in that paper was not legally adequate.

11. The standard of beyond a reasonable doubt was not included in (Gordon, Prakken and Walton, 2007).

sion to be proved. Such an argument cannot effectively be used to remove the questioner's doubts about that conclusion. Although this fallacy involves a failure to meet an appropriate standard of proof, and thus is basically a fallacy of burden of proof, it is also much more than that. It is use of a circular argument of a kind that is not useful to remove doubt about a conclusion that is an issue in a dialog.

The second kind of error was closely related to the failure to meet a burden of proof by jumping ahead too quickly is the fallacy of argument from ignorance. This too is basically a failure to meet requirements of burden of proof appropriate for a dialog. But once again, the fallacy is not just the use of a weak argument that fails to meet the appropriate requirement set for burden of proof. The fallacy is one of jumping ahead too quickly, purely on a basis of ignorance, or lack of evidence, without backing one's argument up with enough additional positive evidence of the kind required to prove the conclusion. In the classic foreign spy case, the failure is that of not collecting enough evidence of the kind required to prove the depth-of-search premise. This fallacy is the error represented by the structure in Figure 4. The second kind of error of jumping ahead too quickly to a conclusion with the consequent failure to meet a burden of proof is that of the fallacious argument from ignorance, pictured in Figure 4. This fallacy, like the fallacy of begging the question, can be classified under the more general error of failure to meet a burden of proof, represented in Figure 3. However, what needs to be emphasized is that the error of failing to meet a burden of proof, as pictured by Figure 3, is not only explainable as a fallacy. It needs also to be viewed as a failure to comply with procedural norms of the type of dialogue or investigation that is underway. The fallacy is not purely in the inferential form of reasoning. The problem is that the search for arguments was not deep enough. It is like the case of a criminal trial in which the judge declares the trial to be over after the prosecution has presented its evidence but before the defense has had an opportunity to present its evidence. Or it is like the case of a deliberation about where to build a new factory in which the parties have agreed that

the phase of collecting evidence will last for one week, and the moderator prematurely cuts off this information collecting phase. This kind of mistake is a procedural error, because not enough time for collecting arguments was made available.

The third kind of error coming under the heading of jumping to a wrong conclusion, represented in Figure 3, is different from errors of types 1 and 2, because it involves moving to a specific statement that is a wrong conclusion, as contrasted with the conclusion that is properly supposed to be proved in a dialog. The fallacy in this kind of case arises because the conclusion actually proved may appear to a respondent or an audience to be very similar to, or even equivalent to the conclusion that is supposed to be proved. This type of error, corresponding to Aristotle's fallacy of arguing to the wrong conclusion, depends on the assumption that, in a given case, a specific conclusion has been identified at the confrontation stage of a dialog as the proposition that is supposed to be proved by the arguer. Many good examples of this kind of fallacy have been cited in the logic textbooks, but we make no further comment about them here, as this type of error has already been classified as a fallacy of relevance (Walton, 1999).

It may be questioned at this point whether this third type of error properly fits under the category of jumping to some conclusion. But it does fit in, we contend, because the error is that of moving to a conclusion other than the one that is supposed to be proved. Such a movement may be gradual or sudden, and hence it may not always be classifiable as a jump or (even less likely) a leap, and this might seem to leave open the question of whether the fallacy represented by this kind of case, a failure of relevance, should properly fall under the heading of jumping to a conclusion. Our inclination is to say that it should fit under this heading, based on the analysis of relevance in Walton (1999).

The fourth kind of error, and the one studied most extensively in this paper, is the error of leaping ahead too quickly by ignoring exceptions. The structure of this error was represented in the argu-

ment diagram in Figure 6. As shown there, the error is that the arguer jumps ahead too quickly from the given premises to the conclusion, ignoring the possibility of exceptions to the generalization that is one of the premises of his argument. There are two variants of this kind of error, represented by versions 1 and 2 of the Little Dog example. One is the error of ignoring or suppressing actual evidence which has already been furnished by a premise in the argument, or made available in a way that the arguer should perceive. If the little dog looks like a pit bull, and the arguer knows that a pit bull is a dangerous type of dog, overlooking the obvious appearance of the dog as being classified into the pit bull category is a serious error. This kind of error certainly could be called a fallacy, because the basis of the error is a failure of reasoning by jumping too quickly to a conclusion.

Another variant on fallacies of defeasibility that might be classified under the heading of jumping to a conclusion is the error of being closed-minded by not being open to exceptions to a generalization that is part of one's argument. In Section 4 it was suggested that the arguer exhibits a kind of closed-mindedness by not being open to the possibility of exceptions, even in advance of where the particular exception has been cited by the respondent in a dialog, or is clearly visible to the arguer. One example that could fit this type of error are arguments of the sort cited in Section 1, based on stereotypical generalizations like "Fundamentalists are intolerant of other religions" (Carey (2000, 221). As noted in Section 1, they can be part of an inference of this type: "Fundamentalists are intolerant of other religions; Bob is a fundamentalist; therefore Bob is intolerant." The problem is that if the arguer's generalization is put forward in a dogmatic way, indicating that it is meant not be open even to the possibility of exceptions, it is one sort of jumping to a conclusion. The fallacy in this kind of case could be diagnosed as one in which the defeasible generalization is improperly treated as an absolute universal generalization of the kind that might be modeled by the universal quantifier in classical deductive logic. It is not subject to exceptions, and an argument based on it as a premise is defeated by one counter-example to the generalization. The error

in this kind of case is not easy to evaluate, because we're told very little about the background dialog of how the arguer arrived at the singular conclusion, starting from the generalization expressed in the premise. The leap from such a broad generalization to a singular case too is so lacking in supporting evidence of a kind that would be required to meet the burden of proof that the argument is well classified under the category of fallacy of hasty generalization. However, this fallacy is an error at least partly because it fits the more general category of jumping to a conclusion prematurely on the basis of insufficient evidence. Even worse, it may involve suppression of evidence, a topic we return to in Section 7.

6. The principle of tutiorism and implicit assumptions

In both versions 1 and 2 of the Little Dog argument, a key part of the argument is the presumption revealed in the analysis above as the principle of tutiorism. In version 1, the exception is explicitly stated. It already exists as a premise in the argument, and failure to take it into account is an obvious sort of error. Version 2 is more subtle, and it is not a straightforward matter to judge whether it should properly be said to commit a fallacy of jumping too hastily to a conclusion. In this case, there is an unstated exception to the rule that is not properly taken account of, especially once the implicit presumption of the principle of tutiorism comes into play. This case is more complicated, because implicit premises need to be revealed, and it needs to be shown how they can be used to build a counter-argument that undercuts the original one by postulating an exception to the generalization that is one premise in the original argument. We conclude by offering the comment that it appears dubious whether it would represent a kind of counter-argument that should be classified as meeting the requirements for the fallacy of leaping too hastily to a conclusion. Version 1 of the Little Dog argument shows evidence of all four kinds of error that can occur when an argument leaps too quickly to a conclusion, as represented by Figures 3 through 6.

Here we proposed that the principle of tutiorism could be better modeled as a design principle for argumentation schemes. It works to modify burden of proof in cases of practical deliberation where making an error can be dangerous and where negative consequences of accepting the conclusion of an argument are significant and need to be considered. In such a case we may have a choice between accepting two conclusions where one is more plausible than the other. If the more plausible conclusion has significant negative consequences that pose a threat to safety, this consideration may introduce a reason for accepting the less plausible conclusion. However, deciding whether matters of safety should be taken into account at the closing stage of the deliberation where all the arguments on both sides are being weighed up and compared, is a problem that needs to be resolved at the opening stage. Hence, in such a case, the question whether a given argument should be judged to be fallacious depends on procedural considerations.

A different kind of error is involved in the example categorized under the heading of *post hoc* in Section 1. In this case, a special argumentation scheme is involved (in the version of *post hoc* we considered), namely that for argument from correlation to cause, and the error is that of overlooking a critical question that should be considered, before leaping to the conclusion that we must eliminate all the laws in order to reduce crime. As in the previous example, the conclusion is such a broad and implausible generalization that the burden of proof required to establish it surely must be set at a high level. The reason that the evidence given in the existing premise is insufficient to establish that conclusion, however, is that it is not easy to argue from correlation to causation, and the additional implicit premises required in order to support such a defeasible argument need also to be supported in order to give the argument any plausibility. Similarly, in the classic foreign spy case, the problem is the overlooking of an implicit premise that requires support in the given case if the argument is to be judged as very plausible.

7. Suppressing and ignoring evidence

These considerations bring us to the question of whether there really should be a fallacy of suppressed evidence, of the kind suggested by the example of the Little Dog case, or whether the argument in this case should merely be dismissed as a defeasible argument that is too weak to support its conclusion. What has been shown is that a careful distinction needs to be drawn between two kinds of error. One is committed by a defeasible argument that jumps to a conclusion too quickly by not taking implicit presumptions into account, and the other by a defeasible argument that hides evidence that already exists in a given case. The first kind of error is merely the overlooking of evidence, or not taking it into account in arriving at a conclusion. Version 1 of the Little Dog argument is the key example illustrating this error. In the other kind of case, the fault in the argument is that it moves ahead to a conclusion without taking into account implicit principles that should be seen as presumptions. For example, there are commonly implicit presumptions concerning safety, that indicate that a burden of proof should be set in place that the given argument would need to meet. If the little dog is identified as a pit bull, and it is known or accepted that pit bulls are dangerous, suppressing or ignoring this evidence and moving to the conclusion to pet the dog is an even more serious error. If it doesn't meet the burden imposed by tutiorism, the argument should be judged as not acceptable. If there is no evidence whether the little dog is friendly or poses a threat, one kind of error of leaping to the conclusion to pet it is the failure to take into account the possibility of an exception to the rule that dogs are generally friendly. This kind of case clearly involves defeasibility, because even though the general rule holds, there are exceptions to it, and a presumption concerning safety could open the original argument to critical questioning, and then by means of burden of proof, defeat the original argument by undercutting it. Version 2 of the Little Dog argument is an example illustrating an even more serious error of overlooking or suppressing actual evidence.

In either event, we see the failure of suppressing evidence as an error that involves a dialog in which one party has access to evidence, but hides that evidence from the other party. Procedural rules of reasoned dialog should provide the respondent with an opportunity to ask critical questions, and in some types of dialog, each party must present relevant evidence to the other (as in a trial in law). The error here is to deny the respondent this right to have access to evidence. Thus to really get to the bottom of this kind of fallacy, we need to see it not just as an inferential error of drawing the wrong conclusion from a set of premises, but at least partly as a procedural error by one party in a dialog cutting off the possibility of acquiring relevant evidence by the other party.

8. Modeling defeasible reasoning and fallacies in a dialog model

The analyses of jumping too quickly to a conclusion presented in this paper modeled openness to various kinds of defeat in sequences of defeasible reasoning as an argument proceeds. The model of rational argument developed in this paper assessed incremental growth of evidence in argumentation as new evidence comes in, new evidence that can undercut or defeat the original argument in some cases. Applying this dynamic method of argument evaluation took us beyond the old inferential model of argument merely being a set of fixed propositions and an inference joining them (a set of premises and a conclusion). Instead, as was shown, in order to judge in various kinds of arguments whether the argument leaps too quickly to a conclusion, we need to look at how the argument evolved dynamically, and how the arguer who put it forward reacts to counter-arguments that may defeat it or support it. A dialog model, of the kind much in use in argumentation and AI[12], can be proposed as a framework that could help address the

12. See Gordon (1995), Walton (1995), Prakken and Sartor (1996), and Bench- Capon and Prakken (2006).

problem. It a dialog model, an argument is seen as being used by an arguer to remove doubt expressed by a questioner.

In this kind of case, the fallacy is the failure to make some moves in the dialog which would not further the goals of the dialog. In order to prevent this kind of fallacy from occurring, critical questions need to be asked. In other cases, the problem is to understand how it can be fallacious not to reveal an implicit premise. In the spy example, perhaps the premise in question is one of the essential premises of the argumentation scheme, not a critical question that may be left implicit. However, it could be considered fallacious to omit essential premises from an argumentation scheme.

Studying fallacies in a more realistic way demands examining the strengths and weaknesses of defeasible arguments, and we have shown the job of studying them is a worthy undertaking. Defeasible reasoning is typically used in legal argumentation, or in scientific reasoning at the discovery stage, where an arguer is justified in going ahead tentatively to draw an inference to a conclusion provided he or she is open to defeat in an investigation or dialog should new evidence come in. Such arguments are often necessary, and they are commonly used heuristic devices of both everyday and legal reasoning. But they are inherently dangerous, for not only are they subject to defeat as new evidence comes in, they can even be fallacious, sometimes encouraging jumping to a wrong conclusion. As we have shown, jumping to a wrong conclusion is an error, and indeed can be any one of the four kinds of error. The underlying basic failure in all four cases needs to be at least partly seen as a violation of the procedural norms for a dialog that is underway. Much depends on implicit premises that are revealed as an argument proceeds in such a dialog, on how the original argument is critically questioned, and on how the asking of critical questions is anticipated (or not) by that argument as presented. As we have shown, much also depends on matters of burden of proof that should be set at the opening stage of a dialog.

9. Conclusions

Attempts to classify fallacies, by fitting groups of fallacies under more general categories, is still at an early stage. The textbooks exhibit little consistency in this regard. The general project seems to depend on a prior classification of argumentation schemes, and that project as well is still at an early stage. The work in this paper is meant to be a first step in any attempt to classify fallacies.

We conclude that jumping to a conclusion should not be treated as a specific fallacy in its own right, but is better seen as an underlying pattern of erroneous reasoning into which various important fallacies and errors fit. The list of these specific fallacies includes the main four we began by identifying: (1) arguing from premises that are insufficient as evidence to prove the conclusion that is supposed to be proved (failure to meet the standard of proof appropriate for burden of proof in a dialog), (2) fallacious argument from ignorance, or argument from the absence of reasons to the contrary, as the non-fallacious version of it might better be called, (3) constructing a line of argument that ends in a conclusion other than the one that was supposed to be proved in a dialog (irrelevant conclusion), and (4) using defeasible reasoning that is supposed to be open to defeat if new evidence comes in, but failing to be open to an exception to the defeasible generalization that is the basis of the inference. This fourth form of error has been traditionally classified under the heading of the fallacy of hasty generalization, or sometimes even more appropriately we think, the fallacy called *secundum quid*, referring to a failure to be open to exceptions to a general rule. Another variant on this fourth fallacy is the fallacy of being closed-minded by not only ignoring an exception to a rule but also by actively refusing to countenance the exception, or even its possibility. All these fallacies, and perhaps others as well fit under the more general category of jumping to a conclusion.

We added to this list the faults of overlooking and suppressing evidence. Throughout the paper we saw that there are more simple errors of overlooking an exception and more serious fallacies of

failing to admit, or even suppressing an exception. This duality can also be observed in the terminological ambivalence between ignoring evidence and suppressing evidence discussed in Section 7. We think that it is an error to treat ignoring and suppressing evidence as on a par, even though they are closely related failures of reasoned argumentation. Suppression of evidence is a more active effort in a dialog that would seem to almost always pernicious and culpable, whereas ignoring evidence may be neither, even though it can often be a problem in rational thinking. Whether suppression of evidence and ignoring evidence are fallacious in specific cases where they occur, on our view, depends on how they are used in context of dialog.

References

Aristotle (MCMLX). *Topics*. Loeb Classical Library. Trans. by E.S. Forster, Cambridge, MA: Harvard University Press.

Atkinson, K. and Bench-Capon, T.J.M. (2007). Argumentation and Standards of Proof. In R. Winkels (Ed.), *Proceedings of the Eleventh International Conference on Artificial Intelligence and Law*, pp. 107-116. New York: ACM Press. Available at: http://www.csc.liv.ac.uk/~katie/icail07.pdf

Bench-Capon, T.J.M. and Prakken, H. (2006). Argumentation. In A.R. Lodder & A. Oskamp (Eds.), *Information Technology & Lawyers: Advanced Technology in the Legal Domain, from Challenges to Daily Routine*, pp. 61-80. Berlin: Springer Verlag.

Carey, S.S. (2000). *The Uses and Abuses of Argument*. Mountain View, CA: Mayfield Publishing Company.

Cicero, M.T. (1933). *Academica*. Loeb Classical Library. Cambridge, Mass: Harvard University Press.

Freeman, K. and Farley, A. (1996). A Model of Argumentation and Its Application to Legal Reasoning. *Artificial Intelligence and Law*, 4, 163-197.

Gordon, T.F. (1995). *The Pleadings Game: An Artificial Intelligence Model of Procedural Justice*. Dordrecht: Kluwer.

Gordon, T.F. Prakken, H. and Walton, D. (2007). The Carneades Model of Argument and Burden of Proof. *Artificial Intelligence*, 171, 875- 896.

Gordon, T.F. and Walton, D. (2009). Proof Standards and Burden of Proof. In I. Rahwan & G. Simari (Eds.). *Argumentation in Artificial Intelligence*. Berlin: Springer.

Hamblin, C.L. (1970). *Fallacies*. London: Methuen.

Horty, J. (2001). Nonmonotonic Logic. In L. Goble (Ed.), *The Blackwell Guide to Philosophical Logic*, pp. 336-361. Oxford: Blackwell.

Hurley, P. (2003). *A Concise Introduction to Logic*, 8th ed. Belmont, CA: Wadsworth.

Johnson, R.H. and Blair, J.A. (1977). *Logical Self-Defense*. 1st ed. Toronto: McGraw-Hill Ryerson.

Jonsen, A.R. Toulmin, S. (1988). *The Abuse of Casuistry: A History of Moral Reasoning*. Berkeley: University of California Press.

Kahane, H. (1971). *Logic and Contemporary Rhetoric*. Belmont, CA: Wadsworth.

Pinto, R.C. (1995). Post Hoc Ergo Propter Hoc. In H.V. Hansen & R.C. Pinto (Eds.), *Fallacies: Classical and Contemporary Readings*, pp. 302-311. University Park, PA: The Pennsylvania State University Press.

Pollock, J. (1995). *Cognitive Carpentry*. Cambridge, MA: MIT Press.

Prakken, H. and Sartor, G. (1996). A Dialectical Model of Assessing Conflicting Arguments in Legal Reasoning. *Artificial Intelligence and Law*, 4, 331-368.

Prakken, H. and Sartor, G. (1997). Argument-based Extended Logic Programming with Defeasible Priorities. *Journal of Applied Non- classical Logics*, 7, 25-75.

Reed, C. and Rowe, G. (2004). Araucaria: Software for Argument Analysis, Diagramming and Representation. *International Journal of AI Tools*, 13, 961-980.

Reed, C. and Rowe, G. (2005). *Araucaria, Version 3*. Available free at http://www.computing.dundee.ac.uk/staff/creed/araucaria/.

Reiter, R. (1980). A Logic for Default Reasoning. *Artificial Intelligence*, 13, 81-132.

Walton, D. (1989). *Informal Logic*. Cambridge: Cambridge University Press.

Walton, D. (1995). *A Pragmatic Theory of Fallacy*. Tuscaloosa, AB: University of Alabama Press.

Walton, D. (1996). *Arguments from Ignorance*. University Park, PA: The Pennsylvania State University Press.

Walton, D. (1999). Rethinking the Fallacy of Hasty Generalization. *Argumentation*, 13, 161-182.

Walton, D. (2004). *Relevance in Argumentation*. Mahwah, NJ: Lawrence Erlbaum.

Walton, D. (2006). *Fundamentals of Critical Argumentation*. Cambridge: Cambridge University Press.

Walton, D. and Reed, C. (2002). Argumentation Schemes and Defeasible Inferences. In G. Carenini, F. Grasso & C. Reed (Eds.), *Working Notes of the ECAI 2002 Workshop on Computational Models of Natural Argument*, pp. 45-55. Available at: http://www.csc.liv.ac.uk/~floriana/CMNA/WaltonReed.pdf

II

Argument Evaluation and Reasoning

1999 Vol 19: Dialectical Relevance in Persuasion Dialogue

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Abstract: How to model relevance in argumentation is an important problem for informal logic. Dialectical relevance is determined by the use of an argument for some purpose in different types of dialogue, according to the new dialectic. A central type of dialogue is persuasion dialogue in which one participant uses rational argumentation to try to get the other participant to accept a designated proposition. In this paper, a method for judging relevance in persuasion dialogue is presented. The method is based on using the technique of argument diagramming.

A method is presented here for testing an argument for dialectical relevance or irrelevance.[1] The term 'dialectical' (Hamblin, 1970; van Eemeren and Grootendorst, 1984; Freeman, 1991) refers to the use of an argument in a context of dialogue, or goal-directed conversational exchange of viewpoints.[2] The particu-

1. Support for this work was provided by a Research Grant from the Social Sciences and Humanities Research Council of Canada. Thanks are also due to the Philosophy Department of the University of Western Australia for providing support and facilities. I would also like to thank the participants in a discussion during an invited talk I gave on relevance at Murdoch University in Perth, Australia on November 25, 1996. I would like to acknowledge the support given by the University of Oregon during my term as Distinguished Visiting Professor at the Oregon Humanities Center in the spring of 1997, and the support given by the Department of Communication Studies at Northwestern University during my term as Senior Fulbright Fellow in the first quarter of 1999.

2. The term' dialectical' as used in argumentation theory is different from the Hegelian-Marxist use of it. According to Hamblin (1970, pp. 254-255) formal dialectic is the construction of systems of dialogue to evaluate arguments put forward in a context of

lar type of dialogue in which dialectical relevance is modeled here is the persuasion dialogue (Walton, 1989), where the goal of each participant is to persuade the other party that a particular proposition (the arguer's thesis to be proven) is acceptable as a commitment.[3] The main idea of the investigation is to use the conditions for a proper persuasion dialogue as a means of clarifying the idea of dialectical relevance. A method of argument extrapolation is devised to test an argument given in a particular case, to determine if it meets the requirements of relevance appropriate for a persuasion dialogue.

Two cases are used to illustrate the application of the test. One is a classical case used in a logic textbook (Copi, 1982) to illustrate the fallacy of irrelevant conclusion. The other is an argument used in an actual case –a political debate in the Canadian House of Commons. The practical problem addressed is how criticisms of irrelevance should be evaluated by a set of precisely formulated rules in particular cases like these. But it is also shown how this set of rules can be formalized, providing a core structure of persuasion dialogue. And it is shown how this core structure can be implemented as a dialogue system for artificial intelligence uses.

1. Persuasion Dialogue

The elements of a persuasion dialogue are two participants, called the proponent and the respondent, and two propositions (statements). One proposition is the thesis of the proponent and the other proposition is the thesis of the respondent. The two theses stand in a relation of opposition to each other. The strongest form of opposition of a pair of propositions is that of contradictoriness (negation), meaning that the one proposition is true if

use. One of the main uses of dialectic, according to Hamblin, is the analysis of fallacies.

3. Persuasion dialogue is modelled as a dialectical system in Walton and Krabbe (1995).

and only if the other is not true. Both participants have the same goal –to prove their own thesis from the commitments of the other party.

The type of persuasion dialogue described above could be called a dispute, meaning that it is a symmetrical type of dialogue where the arguments of the one party are opposed to that of the other, and each side has a burden of proof to prove a designated proposition. There can also be another type of persuasion dialogue where the goals of the two parties are different. The proponent, to be successful, must prove her thesis, where the respondent, to be successful only has to raise questions about the proponent's attempted proof that throw doubt on it, showing that it has not been successful.[4]

The essential characteristic of persuasion dialogue, according to Walton (1989, pp. 4-10) is that the arguments used by both parties must be based on premises that are commitments of the other party. In a Hamblin structure of formal dialectic (Hamblin, 1970, p. 257), each participant in a dialogue has a commitment set, a set of propositions that keep a running tally of an arguer's commitments. As each speaker makes a move in the dialogue, propositions are added to or deleted from this set, depending on the type of move made. For example, if a particular proposition is asserted at some move by a participant, then that proposition is added to her commitment set.

Basically, in a persuasion dialogue, two arguers ask questions and put arguments to each other, where the aim is to get the other party to become committed to propositions that can be used to prove one's own thesis by a connected chain of argumentation. Each individual inference in the chain is supposed to be valid, or structurally correct, according to the forms of argument appropriate for use in this type of dialogue.

4. This account is a simple sketch of the basic elements of a persuasion dialogue. More details are given in Walton and Krabbe (1995, chapter 4).

One particular type of persuasion dialogue is the critical discussion, where the goal is to resolve a conflict of opinions by rational argumentation (van Eemeren and Grootendorst, 1984; 1992). A successful critical discussion, according to van Eemeren and Grootendorst (1984, p. 86) ends with a resolution of the conflict, and otherwise it is "not clear whether the discussion has had any point." But in types of persuasion dialogue other than a critical discussion, the dialogue may be regarded as successful if the conflict is not resolved, but the discussion has thrown light on the issue by revealing new commitments through strong and persuasive arguments that make the viewpoints on both sides more sophisticated and less susceptible to refutation –see the discussion of the maieutic function of persuasion dialogue in (Walton and Krabbe, 1995).

In a persuasion dialogue, various kinds of moves are allowed, including the asking of questions, the answering of these questions, and the putting forward of arguments. When it comes to the putting forward of arguments, there are four basic requirements that determine what is an argument that has been used successfully and appropriately by a proponent in the dialogue, to prove a conclusion.

> (R1) The respondent accepts the premises as commitments.
> (R2) Each inference in the chain of argument is structurally correct.
> (R3) The chain of argumentation must have the proponent's thesis as its (ultimate) conclusion.
> (R4) Arguments meeting (Rl), (R2), (R3) and (R4) are the only means that count as fulfilling the proponent's goal in the dialogue.

Some possible exceptions to these rules of a rational argument –discussed in Hamblin (1970, Chapter 7) and Walton (1996, Chapter l)– concern hypothetical uses of arguments. We sometimes use arguments that are hypothetical in the sense that the

premises are not commitments of the respondent, at least right now, but are propositions that the respondent might concede provisionally, or "for the sake of argument," as assumptions (or presumptions). This practice seems to violate (R1), but really it does not, because in the end, for an argument to count as rationally persuasive to a respondent, it must be based on premises that he has come to accept (as commitments) in the dialogue.[5]

What is meant by (R2) is that an argument is structurally correct if the conclusion follows from the premise as an instance of a type of argument recognized by the participants in the dialogue. The appropriate rules of inference could be a set of rules for deductive logic, like propositional calculus. But the kinds of inference structures representing forms of argument most often used in presumptive reasoning are called argumentation schemes (Walton, 1996a).

Requirements (R3) and (R4) are closely related to the concept of dialectical relevance in argumentation, and need to be discussed in this light.

Two objections to the plan above are now stated and replied to.

Objection 1: Premises that a respondent accepts as commitments may fail to prove the conclusion that the respondent intends to establish on their basis even if each inference in the chain of argumentation is structurally correct, because these premises may be false or defective. Therefore requirements (R1) to (R4) are not jointly sufficient for proof.

Reply: Three points need to be made in reply. First, the persuasion dialogue is an acceptance-based model of argumentation. One party can rationally persuade the other party to accept, or become committed to a proposition even though the proposition may not be true, or known to be true, established beyond

5. Ways of dealing with this complication are implemented by the more complex structures of persuasion dialogue in Walton and Krabbe (1995).

doubt as true, etc. Retraction of commitment in a persuasion dialogue is generally possible, although not under all conditions (see Walton and Krabbe, 1995). Second, persuasion dialogue is not the only type of dialogue that represents the notion of proof, it is possible to have other frameworks of dialogue in which argumentation takes place, and is used to prove a conclusion (see Walton, 1998). Third, there are different types of persuasion dialogue. For the example, the critical discussion is just one type of persuasion dialogue with very special requirements that define it, namely the ten rules of van Eemeren and Grootendorst (1987). (R1) through (R4) are not all the rules of any particular type of persuasion dialogue. They are postulated as minimal core requirements that are taken to be necessary (but not sufficient) for correct argumentation in any of these types of persuasion dialogue. Thus (R1) through (R4) are not meant to be jointly sufficient for proof. They are meant to be necessary requirements for an argument to be rationally persuasive.

Objection 2: How can we know that for an argument to count as rationally persuasive to a respondent is the same thing as for an argument to be used successfully by a proponent in a persuasion dialogue? Before we can proceed any further, it needs to be shown that these are the same thing.

Reply: The problem with this objection is that it demands that what is required to be proved, instantly proved at the outset. The critical discussion with its ten rules, as constructed by van Eemeren and Grootendorst, purports to meet the kind of criterion required by this objection. But it is not a formalized model. The problem then is to see if we can take some minimal requirements of a kind that can be formalized, namely rules (R1) through (R4), and see what needs to be added to them, in manageable increments, to work towards something like the type of dialogue that van Eemeren and Grootendorst have in mind, or other types of persuasion dialogue like the ones in (Walton and Krabbe, 1995). The proposed project is to break the problem down into a sequence of smaller, manageable steps. The objec-

tion misunderstands the nature of the problem, demanding an immediate solution in one single giant step. It says, “You are not allowed to go any further in the investigation until you immediately present the outcome, right away at the beginning”. Instead of simply giving up at the outset in the face of this stultifying objection, the investigation needs to press on, to explore whether in fact (R1) through (R4) do represent some minimal notion of persuasion, and to consider what other requirements need to be added to them. The problem is that there are other requirements that can plausibly be added, but these additional rules are even more problematic to formalize, or express in any precise way, than (Rl) through (R4). Hence the procedure of investigation·adopted here is to begin with these four core requirements, and see how they can be stated in a precise way that can be formalized. The next phase of the program is to consider how various additional requirements can be added on.

2. Chaining of Arguments

(R2) and (R3) depend on the possibility of chaining together a sequence of infer ences in argumentation. This idea is familiar in work on artificial intelligence, where so-called “forward chaining” and “backward chaining” are common features of how reasoning is done using premises in a data base. To take **a** simple example, take a *modus ponens-type* of inference based on a rule (or conditional proposition, as it is called **in** logic) and a fact (or simple proposition).

(11) If A then B
A
B

This inference can be “chained together” with another one-say, for example (12).

(12) If B then C
B
C

The two inferences, (11) and (12), can be chained together in a longer sequence of argumentation, because the conclusion of (11), namely the simple proposition B can be utilized as a premise in (12).

The simple example, above, would be a case of forward chaining of an argument, because the line of argument "moves forward" to prove the ultimate conclusion, C. But in so-called abductive inference sequences in artificial intelligence, the user (or the system) is given the conclusion, C, and has to "reason backwards" to determine the premises that C was based on (Josephson and Tanner, 1984).

Such chaining together of sub-arguments into a longer chain of argumentation is also a familiar phenomenon in critical thinking (informal logic) techniques of argument diagramming. Here the so-called "serial argument" is a chaining together of two arguments, where the conclusion of one functions as a premise in the next one –just as in the kind of example sketched out above (Walton, 1996, pp. 89-91). Such a chaining of argumentation can be modeled as a pathway of reasoning in an argument diagram (of the kind familiar in informal logic), using the new method of argument diagramming in (Walton, 1996, chapter 6). In this method, a line of reasoning is an alternating sequence of propositions and inference-steps where each step goes from one proposition to the next (see the formal definition in Walton, 1996, p. 189). A pathway of reasoning is a line of reasoning in which all the propositions are distinct (p. 189). A pathway of reasoning, in other words, is a line of reasoning in which there is no circular line of reasoning. The pathway of reasoning gives a picture of where an argument is going, looking at the argumentation in a global perspective, and not just as a single step of inference.

In a persuasion dialogue, in any given case, you can view the argumentation on one side as a connected chain of argumentation that (ideally) uses only premises accepted by the other side, and that has a particular proposition as the ultimate conclusion at the end of the chain. This proposition is the thesis that the participant on this side of the dispute is supposed to prove. In a persuasion dialogue, this proposition is designated prior to the argumentation stage of the dialogue (at the so-called confrontation stage, where the theses of the both sides are identified). Once this proposition is identified for a participant, it provides a target, towards which all of her arguments are to be directed, as her ultimate conclusion to be proved. This chaining together of the argumentation on one side of a persuasion dialogue, and the directedness of the chain towards a single proposition, is an ideal of the successful (functional, appropriate) use of argumentation in this type of dialogue that provides a normative requirement to help us judge, in a given case, what is or is not a good (correct, appropriate) argument in this context of use. A good (useful) argument is one that fits into such a chain as a sub-argument of the longer chain that culminates in the arguer's thesis.

Not only is the idea of the chaining of arguments a clear and well-defined structure that can easily be modelled by the current technology in use in artificial intelligence, but all the other requirements of the persuasion dialogue, (R1), (R2) and (R4) are also easily modelled using this technology. The commitment set is just a set of propositions that can easily be modelled as a set of propositions in a computer data-base. How the commitment set is managed, by inserting propositions into it, and deleting propositions from it, at each move in a dialogue exchange, is clearly described by Hamblin (1970; 1971). There are problems here. The most difficult one is to define the conditions under which retractions of commitments should be allowed. But these problems have been dealt with in Walton and Krabbe (1995) by constructing several different formal models of persuasion dialogue that have rules of retraction appropriate for the rigor or permissiveness of the dialogue exchange. Within this framework, persuasion dialogues

meeting the requirements (R1) to (R4) can be formalized as clearly defined logical structures.

In the formal system of persuasion dialogue **PPD$_0$** constructed by Walton and Krabbe (1995, pp. 149-154), there are four kinds of rules. *Locution rules* indicate the types of permissible moves. *Commitment rules* govern the insertion and deletion of propositions from commitment sets. *Structural rules* define turn taking, and which types of moves can or must follow other moves. *Win and loss* rules define the participants' goals in the dialogue, and what counts as a sequence of moves that successfully fulfills one of these goals. One of the kinds of moves allowed in **PPD$_0$** is an *elementary argument* (p. 128), which is essentially a local argument, *e.g.*, of the form *modus ponens,* of the kind so familiar as the standard kind of argument treated in logic textbooks. These elementary arguments can be chained together in a **PPD$_0$** dialogue, and in fact, a participant's total argumentation in support of her thesis can, at the concluding stage of a persuasion dialogue of this type, be seen as a lengthy chain of (hopefully) connected elementary arguments. So argumentation chaining is modelled in a **PPD$_0$** type of formal dialogue structure. And a **PPD$_0$** dialogue is the kind of structure in which all four of the requirements (R1) to (R4) are appropriate.

In any given case, if we view an argument as supposedly a contribution to a persuasion dialogue, then the presumption is that the proponent of the argument has a thesis that is supposed to be proved (or to be questioned or refuted). This thesis to be proved provides an end point, towards which the proponent's argument should be aimed. If it shows evidence of not really being aimed at this end point, but instead goes off in a different direction that only appears, superficially or to some extent to do so, it should be open to criticism on the grounds that it may be committing a fallacy of irrelevant conclusion. In evaluating any given case, the critic conducting the evaluation needs to look back, and ask what the original thesis was that the proponent was supposed to prove. Then the critic needs to look at the actual sequence of argumentation in

the case, and judge to what extent it goes towards the proving or supporting of that original thesis. The normative requirement of a persuasion dialogue is that such a thesis exists, and that both parties have agreed that it *will represent the issue to be decided by the argumentation in the dialogue.*

3. Rules of Dialogue and Fallacies

Our goal in this exercise is to see how the persuasion dialogue as a structure, having only the requirements (R1) to (R4) imposed on it, can provide a useful normative structure for modelling dialectical relevance. Dialectical relevance is the kind of relevance that is appropriate when one speaks of arguments, or other moves made in argumentation (like the asking of questions), that are perceived as being logically or critically deficient, in some sense: as arguments or moves that should be subject to criticism. But once we bring in this negative idea of irrelevance as a failure of rational argumentation, we are in the realm of the traditional informal fallacies, many of which have standardly been portrayed in the logic textbooks as failures of relevance.[6]

The proposal that dialectical irrelevance is a logical defect of argumentation raises questions about how to define the range of the defect, leading to the following objection.

Objection 3: If dialectical relevance is defined broadly enough, any defect in argument could be a failure of dialectical relevance. If an argument has premises that are known to be false, this represents a kind of defect in the argument. But false premises may be relevant to the conclusion for which they are offered as support. Reason: if these premises were true, their truth would count in favor of the truth of the conclusion. So what are we to say about an argument in which the premises are known to be false? Are such premises relevant, or do they involve a failure of dialectical relevance? If so, the notion of dialectical relevance is obscure, and too

6. Hamblin (1970, chapter 1).

broad. If not, an argument may have a failure other than that of dialectical relevance.

Reply: The issue of false premises has already been discussed in the reply to Objection 1. But objection 3 adds another dimension, by questioning how relevance (and irrelevance) should be defined in relation to (R1) through (R4). It seems that (R2) and (R3) define relevance, whereas (R1) is a question of the status of the premises of an argument. (R1) has to do with whether the premises are accepted by the respondent. (R2) and (R3) have to do with the chain of argumentation leading from these premises, and whether that chain has the ultimate conclusion to be proved in the dialogue as its end point. In other words, there are two separate questions. One question is what are the starting points or premises of an argument, including their status as commitments. The other is the question of where these premises are leading. Are they leading in a line of argument towards the conclusion to be proved? The latter question rests on the presumption that in a persuasion dialogue, there is an ultimate conclusion-a proposition to be proved by one side, and to be questioned, thrown into doubt or disproved by the other side. This second question is the question of dialectical relevance. In reply to Objection 3 then, an important distinction should be made between dialectical irrelevance and another kind of logical defect that can occur in arguments. This other defect has to do with the status of the premises themselves, as propositions that can be supported or defended as commitments.

To get a more useful account of precisely what kind of logical failure irrelevance is, a connection needs to be made with the literature on the traditional informal fallacies. Van Eemeren and Grootendorst (1984; 1987; 1992) have already made this connection, by advocating the theory that fallacies are violations of the rules of a critical discussion. There is in fact a striking connection between (R1) and the theory of van Eemeren and Grootendorst. According to the third rule for a critical discussion stated by van Eemeren and Grootendorst (1987; p. 286), an attack on a point of view (standpoint) must “relate to the standpoint that has

really been advanced by the protagonist." Violations of Rule Three cited by van Eemeren and Grootendorst (1987, p. 286) are "imputing a fictitious standpoint to someone" and "distorting someone's standpoint." According to van Eemeren and Grootendorst, these violations of Rule Three correspond to the straw man fallacy, the fallacy of refuting an opponent's argument by setting up an exaggerated or distorted version of that opponent's standpoint (thesis being advocated), and then demolishing this phony version, thereby claiming to have refuted the opponent's argumentation. A familiar kind of example would be the case of a critic who claims to refute an environmentalist position by painting it as "having the ideal of making the world a parkland," and then criticizing this ideal as hopelessly impractical. Hence we can see from the theory of van Eemeren and Grootendorst, how the rules of a critical discussion can have normative bite in evaluating argumentation, and how violations of such rules can be associated with certain traditional informal fallacies.

What about modeling relevance then? Are certain rules for the critical discussion of a type that would be associated with dialectical relevance of argumentation? The fourth rule of the critical discussion (van Eemeren and Grootendorst, 1987, p. 286) stipulates that a party's point of view may be defended only by advancing arguments that are related to that point of view. The actual wording of the rule is: "A standpoint may be defended only by advancing argumentation relating to that standpoint." The question is how to interpret this rule exactly in a way that could be modelled in a formal structure of persuasion dialogue. In particular the question is one of how to interpret the expression 'relating to.' It seems fair to interpret this rule as essentially requiring relevance of argumentation in a critical discussion.

Objection 4: The above analysis interprets 'relating to' in terms of relevance, when it is said that the rule of van Eemeren and Grootendorst requires relevance. But then the analysis interprets relevance in terms of 'relating to'. This account is circular.

Reply: Yes, there is a circularity here, due to the yet-undefined nature of the terms used. But there is independent evidence that what van Eemeren and Grootendorst mean by 'relating to' does refer to the kind of relevance that is significant in connection with informal fallacies (see van Eemeren and Grootendorst, 1992a). In the end, this verbal question of whether the term 'relevance' or 'relating to' should be used is less important than the problem of trying to give some precise account of what either or both terms mean in relation to fallacies of irrelevance. But also, there is evidence for the hypothesis that the term 'relating' in van Eemeren and Grootendorst's rule refers to relevance. This hypothesis is supported by the two kinds of violations of the rule cited by van Eemeren and Grootendorst (1987, p. 247). One kind of violation occurs where "the argumentation does not refer to the standpoint under discussion," as in the case of "irrelevant argumentation" or *ignoratio elenchi.* The other kind of violation occurs where "the standpoint is defended by rhetorical ruses instead of argumentation," as in pathos, or "playing on the emotions or prejudices of the audience." Both fallacies are portrayed by van Eemeren and Grootendorst as being failures of relevance.

These descriptions of violations cited by van Eemeren and Grootendorst will turn out to correspond quite well to the examples we now turn to study –cases of the traditional fallacy of irrelevant conclusion, of the kind cited in the traditional accounts of fallacies in the logic textbooks. It seems fair to say then that the fourth rule of the critical discussion is a requirement that is meant to ensure that the argumentation in a critical discussion is in some sense relevant –relevant in the sense that the argumentation used must "relate" to the standpoint that is supposed to be argued for by a protagonist in such a discussion.

The problem is that irrelevance could take many forms in argumentation, and in fact, many fallacies are classified by logic textbooks like Copi (1982) as fallacies of relevance. Indeed, the catch-phrase "failure of relevance" has become such a widely used, but unexplained, device for declaring arguments of many dif-

ferent kinds fallacious that Hamblin (1970, p. 31) calls it a "rag-bag" category.

The basic problem is that relevance has never really been defined by the logic textbooks in any more than various *ad hoc* and unhelpful ways that have never been based on any real theory of relevance. Sperber and Wilson (1986) have defined a kind of relevance, of a sort that refers to the information content of a proposition, but there is no indication whether or how this type of relevance applies to argumentation in a persuasion dialogue. Dascal (1977) and Berg (1991) have cited various kinds of relevance that might prove useful for purposes of evaluation of argumentation, but none of these kinds of relevance has been expressed in a formal structure or general theory. The formal systems of relevance logic that have been developed capture the idea of topical relevance, but not the idea of dialectical relevance (Walton, 1982).

4. The Fallacy of Irrelevant Conclusion

Many logic textbooks have traditionally described the "fallacy of irrelevant conclusion" as the device in argumentation of presenting an argument that may be valid (or otherwise correct), but that arrives at a conclusion other than the one that was supposed to be proved. For example, Jevons (1878, p. 178) defined the fallacy of irrelevant conclusion as "arguing to the wrong point, or proving one thing in such a manner that it is something else that is proved." Fowler (1895, p. 149) described "the fallacy of irrelevancy" as being committed by the person "who in a disputation does not confine himself to proving the contradictory or contrary of his adversary's assertion," but who proves some other proposition instead. Although many other kinds of fallacy of relevance are described by the logic textbooks, this particular one (based on Aristotle's fallacy of *ignoratio elenchi*, or "ignorance of refutation") has a place of central importance. Aristotle, in *On Sophistical Refutations* (167a22-67a36), following the translation of Hamblin (1970, p. 87), gave a very broad account of the fallacy of misconception

of refutation *(ignoratio elenchi).* As Hamblin showed (1970, p. 105), Aristotle's account of this single fallacy encapsulates a virtually complete doctrine of fallacy. This broad and many-pronged account confused subsequent commentators, leading to the "rag-bag" problem. But there is also a more specific account of the fallacy of misconception of refutation in the *Topics* (162a13-162a16), where Aristotle describes an irrelevant argument as an argument that leads to something other than the conclusion it is supposed to prove. It is this more specific type of fault that is so often taken as the main fallacy of relevance in (often called the fallacy of wrong conclusion, or the fallacy of irrelevant conclusion) by the logic textbooks, over the ages. A leading case in point is the widely used introductory logic textbook of Copi (1982).

Copi (1982, p. 110) gives the following account of the fallacy of irrelevant conclusion, including a standard example that is very useful as a focus for discussing dialectical relevance.

> *Ignoratio Elenchi* (irrelevant conclusion). The fallacy of *ignoratio elenchi* is committed when an argument purporting to establish a particular conclusion is directed to proving a different conclusion. For example, when a particular proposal for housing legislation is under consideration, legislators may rise to speak in favor of the bill and argue only that decent housing for all the people is desirable. Their remarks are then logically irrelevant to the point at issue, for the question concerns the particular measure at hand. Presumably everyone agrees that decent housing for all the people is desirable (even those will pretend to agree who do not really think so). The question is, Will this particular measure provide it and if so, will it provide it better than any practical alternative? The speakers' arguments are fallacious, for they commit the fallacy of *ignoratio elenchi*, or irrelevant conclusion.

According to Copi's explanation of how this fallacy works as a tactic of deceptive argument, one must contrast logical relevance and psychological relevance. The legislator's remarks about the desirability of decent housing for all the people are "logically irrelevant," according to Copi (1982, p. 110), but they "may succeed in

evoking an attitude of approval for oneself and what one says." This positive attitude may then be transferred to the conclusion of the speaker's argument by the audience who hears the speech. So the legislator's remarks could be psychologically relevant, in the sense that such a transference takes place by "psychological association," as opposed to "logical implication" (p. 111).

The main problem with the kind of example cited by Copi is to understand the meaning of the concept of logical irrelevance, in virtue of which the legislator in the example can be criticized for having committed the fallacy of irrelevant conclusion. The basic failure, as described by Copi, is that the argument purports to establish a particular conclusion but "is directed to proving a different conclusion." This account of the failure suggests that the nature of the logical irrelevance committed by the legislator can be explained as a failure to meet requirement (R3) of a persuasion dialogue. The fault was (a) that the legislator's argument failed to have the proposition he was supposed to prove (his thesis in the persuasion dialogue) as the conclusion of his argument, and (b) he directed his argument toward proving a different conclusion. Feature (a) could be described as a failure to meet (R3), and feature (b) is an instance of a proponent's using some means to (apparently) fulfill her goal in a persuasion dialogue, other than the proper kind of means required by (R3). Hence the kind of logical (or dialectical) irrelevance that is the root of the problem of evaluating the fallacy of irrelevant conclusion in Copi's kind of case can be explained as a failure of good (correct, appropriate) use of argumentation by requirement (R3) of the persuasion dialogue. But while (R3) pinpoints the crux of the fault, a deeper explanation of the fallacy is helpful as well, which involves (R1), (R2) and (R4). The legislators' argument was that decent housing for all the people is desirable. This argument may very well have met requirements (R1) and (R2). It may have been based on premises that even the opponents of the bill would accept. It may have been composed of chain of inferences on which each sub-inference is structurally correct. And since it was on the topic of housing, it may have looked like it met (R3). And since it looked like it met

all the three other requirements, therefore it may have looked like it met (R4) as well. Why would the argument look relevant, generally? One reason is that is, in at least one important sense, relevant.

The legislator's argument is, in at least one significant sense, logically relevant to the conclusion he is supposed to prove. When the legislator argues "Decent housing for all the people is desirable," this proposition is topically relevant to the conclusion he is supposed to prove, namely that the proposal for housing legislation is a good measure that ought to be voted for. The two propositions are topically relevant in the sense (Walton, 1982) that both share some common subject-matters. For example, both contain the subject-matter of "housing." Topical relevance is one kind of logical relevance. The problem is not that the legislator's argument is totally irrelevant, in every respect that is logically significant, from the conclusion he is supposed to prove. The problem relating to the fallacy is that his argument fails to be materially relevant to this conclusion, meaning that it is part of a chain of argumentation that really is useful for proving this conclusion (as far as one can tell, from the details of the case given). It fails to be materially relevant, as well as dialectically relevant, because it fails to meet requirement (R3). But because it may either meet or appear to meet all of the other three requirements, it has an appearance or semblance of being relevant.

A practical problem is how to prove material relevance or irrelevance of an argument, as used in a given case like this example. The legislator's argument is used *in medias res,* in the middle of an ongoing legislative debate. How do we know that somehow he might not, in his subsequent chain of argumentation, use the premise, "Decent housing for all the people is desirable," as part of a materially relevant argument to support the conclusion that the housing bill he advocates is a good piece of legislation? The problem is that we really do not know this not to be the case, from the information given. It is only an assumption we make, from what we are told about the nature and direction of his argument. Once the debate is over, and we have a transcript of all that was said, it

could be possible to document the claim that the legislators' argument fell short of its ultimate conclusion to be proved. But during the debate, if criticized for committing the fallacy of irrelevant conclusion, the legislator might reply, "If you just give me a little more latitude, I think I can show where my argument is leading, and why it is relevant." The speaker of the house would then have to judge whether more time should be given. In short, there is a practical problem of judging relevance in particular cases, especially when all the evidence may not yet be in. This same kind of practical problem is routinely dealt with in legal argumentation by judges in trials. One counsel may object that the opposing counsel's line of argument is irrelevant. The opposing counsel may ask for latitude, so she can show how her argument will tum out to be relevant. The judge will have to decide how to rule. According to the analysis proposed below, what the judge does, or should do, can be viewed as a chaining forward of the line of argumentation from the point where it is now at in the case. The question is whether such a chaining can go forward far enough to have the counsel's thesis to be proved as its ultimate conclusion. If so, the counsel's argument is relevant. Otherwise it is not. What the counsel's thesis is supposed to be is set by the burden of proof in the trial.

The other problem is that the argument in Copi's example is part of a political debate –a context of dialogue that is difficult to classify exactly. Argumentation in a political debate is not as highly structured as argumentation in a legal trial. The problem is that such a debate is not necessarily a persuasion dialogue at all. Or if it is partly a persuasion dialogue, it may equally well be partly a negotiation dialogue, or a deliberation type of dialogue, involving the making of prudent decisions for or against a particular course of action (in this case represented by the bill or measure being debated). Much here may depend on the stage the bill has reached –whether it is in a first or second reading, for example– in the legislative process.

Despite these problems, however, the example from Copi is not a bad one, in that it does give a fairly clear and common (if sketchy) case where the failure of logical relevance is of a kind that fits in with what could be described as a failure to meet requirement (R3) of a persuasion dialogue. If we view the legislator's speech in this case from a viewpoint that the normative model of the persuasion dialogue represents the type of dialogue, then the logical irrelevance exhibited by his argument can be explained and evaluated as a failure to meet one of the requirements for successful argumentation in a persuasion dialogue. While appearing to meet the normative model of persuasion dialogue, the dialectical and material irrelevance displayed by his argument can be explained as a fallacy, on the grounds that it fails to meet one key requirement while appearing to meet the other three appropriate requirements of persuasion dialogue.

5. The Method of Argument Extrapolation

The example used by Copi to illustrate the fallacy of irrelevant conclusion was problematic in several important respects, but it is an evocatively familiar type of case that does suggest very plausibly a common tactic of deceptive argumentation that is well worth being aware of. The central problem is how material relevance of the kind that fails in this example can be modelled precisely in the persuasion type of dialogue. The solution is to provide a way of implementing the requirements (R1) to (R4), as applied to particular cases where material relevance and irrelevance is at issue. It is especially important to focus on (R3), to determine when, in a given case, this requirement has not been met adequately.

The general problem of evaluation posed by particular cases is that there is a thesis to be argued for, and there is a given line or direction of argument, representing the way the argument has gone so far in that case. The fallacy of irrelevant conclusion is committed when the textual details of the case can be used to document the claim that the direction of the argument is not moving towards the thesis to be argued for. Instead, it may appear that it is moving

in a different direction perhaps one of evoking a positive attitude to gain the psychological relevance needed to persuade an audience. But the logical failure is that the conclusion to be proved (that is supposed to be proved, according to the conventions appropriate for the type of dialogue the participants are supposed to be engaged in) is not the same proposition the real argument in the case is being directed towards.

But how can we identify, analyze and evaluate arguments used in given cases to see whether they exhibit this particular sort of failure? The failure is not one of deductive validity of the kind traditionally addressed by logic. It is a dialectical failure of an argument to be used in a conventional type of dialogue to fulfill the goals appropriate for this type of dialogue by the means that should be used for this purpose. It is a pragmatic failure of the use of an argument in a context of dialogue.

The method used to determine dialectical relevance of the use of an argument in a given case, argument extrapolation, matches the given argumentation up to the conclusion to be proved by a process of forward and backward chaining, as indicated in Figure l (see next page).

The given argument, which is a localized sequence of argumentation, as attributed to the proponent in the particular case, is extrapolated forward to get an idea of where it seems to be leading. At the same time, if the conclusion to be proved globally has been made evident in the case (as it was in the legislator case), a backwards chaining extrapolation can be made, yielding an idea of what sorts of lines of argumentation would be required to establish this conclusion (from what we know of the type of dialogue involved, and the methods of argumentation needed to prove something in this type of dialogue). Then the question is: Do these two chains of argumentation meet up at some point in the middle or not? Is the forward chaining of the given argument a direction that shows promise of being useful for completing a line of argument moving towards the conclusion to be proved? Or is it moving in a different direction? It is the asking of these two questions, in relation to the information given in a particular case, that should determine

whether the argument used in that case is dialectically (logically) relevant or not.

In any given case, once the argument diagram has been constructed for the case, using the method of argument diagramming, one can look over the pathways of argumentation exhibited in the diagram, and see whether the particular argument in question is part of a pathway that goes towards the ultimate conclusion that is supposed to be proved by the argumentation in the case. But if the argument is still at a mid-point, and the case is not closed, it may be hard to tell where the pathway of argumentation is leading. Also, in many cases, of the kind used in logic textbooks, not enough context is given to have a really good basis for judging where the line of argument might be leading. In such cases, the argument extrapolation can only be based on assumptions and conjectures. All a critic can do is base an evaluation of an argument used in a particular case on the available evidence of the discourse given in the case.

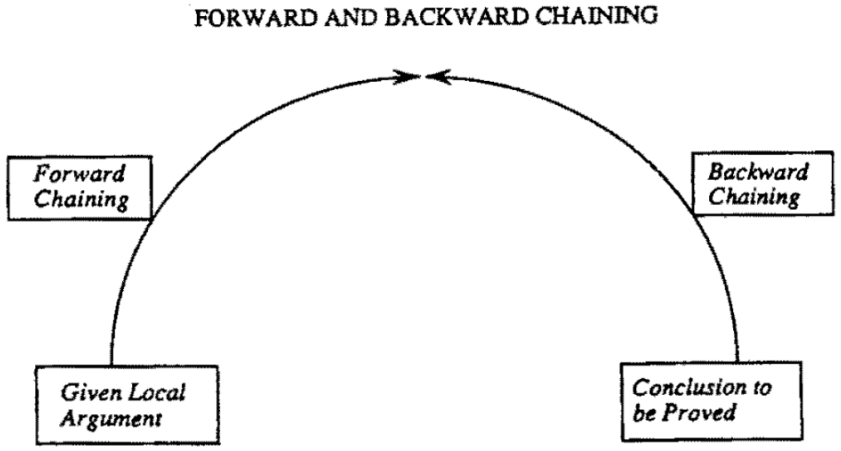

Figure 1

Copi's legislator case seems more like a case of deliberation than persuasion dialogue, but the method of argument extrapolation seems to be applicable here, even though the details are very sketchy. Copi puts the test of relevance or irrelevance of the argu-

ment as follows: the question is whether the measure (the housing bill proposed) will provide "decent housing for all the people" and "if so, will it provide it better than any practical alternative?" The legislator's argument is judged to be irrelevant by Copi because his speech about "decent housing for all the people" does not show promise of presenting a line of argument that gives good reasons for thinking this particular bill will do the job, as opposed to any practical alternative. In this case, it may be presumed that the debate is on a particular bill, and that the legislator in the case is in favor of passing the bill. This context sets the thesis that the legislator is supposed to argue for. He is supposed to present arguments supporting this particular housing bill that will offer reasons to those opposed to the bill to change their opinion, and vote for it. His thesis is that this particular housing bill is a good one, meaning that it is a good piece of legislation that everyone in the legislative assembly ought to vote for.

A problem with Copi's example is its sketchiness, however. Not enough details of the legislator's speech, and the particular housing bill that has been proposed, have been given, of a kind that would enable a critic to judge just exactly how and why the legislator's argument fails to be useful in moving forward to the conclusion that the particular bill under consideration is a good solution to the housing problem (or not).

What really enables one to support the evaluation that the legislator's argument does not perform this function is Copi's evocation of what we know from personal experience is a favorite tactic of political speakers in legislative debates and other political speeches. According to Copi (1982, p. 111), "The speaker may have succeeded in evoking such a positive sentiment for housing improvement that the hearers will vote more enthusiastically for the bill proposed than if its passage had really been proved to be in the public interest." The tactic being used by the speaker in such a case is a familiar one we all recognize. More precisely, the account given of the speaker's use of emotions to rouse the enthusiasm of the audience indicates the fault can be located as a failure of (R4). The speaker is doing something else to win the approval of the audience for the bill he advocates –something other than using a

chain of proper arguments of the kind required in a persuasion dialogue by (R1), (R2) and (R3). In providing a normative framework for evaluating the argument in this particular case as irrelevant, both (R3) and (R4) play a role.

But the sketchiness of the example presented by Copi leaves a lot to be desired if we really want to pin down the criticism that the legislator's argument is irrelevant. There doesn't seem to be enough data given for the method of argument extrapolation to get a good bite on the case. Testing an actual example would be more lengthy, but to get a bit further, this is the step that needs to be taken.

6. Testing an Actual Example

Actual cases comparable to the kind of case cited by Copi can be found in political debates in legislative assemblies. An illustrative case is provided by a debate on the Northumberland Strait Crossing Act in the Commons Debates of the Canadian House of Commons *(Hansard*, June 14, 1993, pp. 20729-20744). The purpose of this debate was to discuss, and to vote on, proposed amendments to the Northumberland Straits Crossing Act (Bill C-110) at the so-called "report stage" where the debaters are supposed to avoid irrelevance, and to address their comments to the question before the House (according to the rules of procedure for the Canadian House of Commons). The particular focus of this debate were amendments to the bill concerning the environmental impact of the proposed construction of a bridge, or "fixed link" between Prince Edward Island and the mainland of Canada.

The discussion of the proposed amendments was long and detailed, but about ten pages into the record of it, Jim Fulton, the member for Skeena, started to attack both parties in a derogatory way. He accused the Liberals of wanting to "squeeze and sleaze their way and get a few extra votes" in the region. And he accused the Conservatives of wanting "to use the fixed link as a banner to wave around the Maritimes saying they are going to do something big for all the voters out there" (p. 20738). Then Fulton launched

into a personal attack on the leader of the Conservative Party at the time, Prime Minister Kim Campbell (pp. 20738- 20739).

> It is like the person who has just become Canada's Prime Minister the hon. member for Vancouver Centre. She said before her campaign began that she had smoked marijuana. When asked during the leadership campaign she said she had smoked marijuana but she did not break any law by doing it. Every dean of law in the country said that was not true. If one smoked marijuana, one broke the law.
>
> Five hundred and thirty thousand Canadians have a criminal record for smoking marijuana. They are all supposed to keep their criminal records. They cannot get bonded jobs. They cannot do anything but it is okay. A person can be the Prime Minister of Canada and break the law. Also, you can say that because you are who you are you did not break the law.
>
> Canadians are getting really sick of this stuff. I am getting really sick of it. There is one law for the grand elevated elite who sit on the government side as prime minister or whatever. The law applies only to the great unwashed. It applies to those Canadians who have to pay the truces and the piper.

This particular argument doesn't really seem to be relevant to the debate as a whole, which is about a particular bill. Fulton's rousing attack on the "grand elevated elite" stands out from the rest of the debate on the Northumberland Strait Crossing Act, which continues for another six pages or so in *Hansard.* It seems to be an interjection. But his remarks are not completely irrelevant. He is suggesting that there is a pattern of unethical conduct and disdain for the law in the leading parties, and that the failure to conduct an environmental assessment for the impact of the bridge project is consistent with or comparable to this pattern of disdain shown by these two parties.

But is Fulton's attack on Campbell, for having admitted smoking marijuana in the past,[7] materially relevant in the debate on the Northumberland Strait Act? This bill is the specific question to be addressed, and in particular, the question is whether the proposed amendments to it should be approved or not. For Fulton's

7. There is no evidence that she denied inhaling the marijuana.

attack on Campbell's marijuana smoking to be materially relevant, it must advance the line of argument on this question by connecting to it in some material way. But as one scans over the text of the debate, there appears to be no clear and convincing evidence of such an argument extrapolation. Fulton's comments are quite general and wide-ranging in nature, and do not give particular reasons for rejecting or reformulating any of the proposed amendments.

In this case, as opposed to the case from Copi, the issue of the debate is quite specific, and is stated with a fair amount of precision. So one can get a fairly clear idea of what kinds of arguments should be dialectically and materially relevant to the dialogue. Also, looking at the details of Fulton's interjection above, in the context of the actual debate that took place, it is quite possible to give documentable evidence of a failure of material relevance in the case.

Ultimately the test of material relevance in such a case is whether the actual argument given can be extrapolated forward so that it meets up with another line of argument that would give a good reason for accepting or rejecting the proposal being discussed. To apply the text is a contextual job. One has not only to look at the actual text of discourse –given, in this case in the fifteen pages of the transcript of the debate– but to judge from this text whether the argument cited (as quoted above) can move forward as a contribution to a persuasion dialogue (or deliberation) on the issue and connect up with the thesis the proponent is supposed to be establishing. To make the test, a critic has to look over the whole transcript of the case, and make an evaluation based on the evidence given in the sum total of the argumentation presented.

From a dialectical point of view of the requirements of a persuasion dialogue, the evidence in this case indicates that Fulton's argument was not materially relevant, in the sense required by requirement (R3). It may have appeared to be relevant, because it was part of a kind of *ad hominem* attack on the ethics of the Liberals and Conservatives. But the debate in this case was on specific proposed amendments to the Northumberland Strait Crossing Act –the bill being discussed. Thus the proponent, Fulton, was supposed to be bringing forward arguments for or against the specific

amendments. The conclusion to be proved is that one or more of these proposed amendments is a good thing to vote for, or not. It is something else again to prove, or at least argue, that Kim Campbell smoked marijuana. What use could such an argument be to prove what Fulton was supposed to prove in the debate? None at all, it would seem. Hence given the evidence of the text of discourse and the dialectical context of the case, it would seem fair enough to criticize his argument on grounds of its questionable material relevance to the debate.

However, one can also look at relevance from the point of view of the rules of order for commons debates in Canada,[8] and ask why the Speaker of the House failed to intervene and ask Fulton to get back on track. Probably the reason is that Fulton's interjection was not so lengthy that it seriously threatened to interfere with the discussion of the Northumberland Strait Crossing Act, given the time allotted to the reading stage of this bill. At any rate, Fulton's argument was not questioned by the Speaker on grounds of relevance. He was not asked to "get back on track," as sometimes happens in these debates.

But from a logical and dialectical viewpoint that would be appropriate for a persuasion dialogue, Fulton's arguments could be judged to be materially irrelevant in exactly the sense cited by the logic textbooks as constituting the fallacy of irrelevant conclusion. In this way, it is comparable to Copi's example. In that case, as well, the debate was supposedly on a specific housing bill, and the legislators' speech simply failed to give any real reason to vote one way or the other. The difference with the Fulton case is that, being an actual case, it takes a much more detailed analysis of the text of the debate to apply the test of argument extrapolation. But on the other hand, the test can be applied in a more decisive way that utilizes a larger body of evidence.

8. These rules are printed in the Précis of Procedure (House of Commons: Canada), 2nd ed., Ottawa, Table Research Branch, Clerk of the House of Commons, 1987.

7. How the Method Should be Applied

In evaluating a case like the marijuana argument above, one needs to be careful. The argument is a personal attack on the ethics of the leader of the Conservative Party, and as such can be classified as an *ad hominem* argument, in the usual terminology for traditional fallacies. The second part of Fulton's argument, where he talks about the "grand elevated elite," and how "the law applies only to the great unwashed," could be classified as an *argumentum ad populum*, or "appeal to the people" type of argument. From the traditional point of view then, the standard treatment would be to see Fulton's argument as fallacious, because it uses these two types of argumentation, traditionally classified as fallacies. But recent work (Walton, 1989) has shown that neither of these two types of argumentation is inherently fallacious. Indeed, in political debate, character is (in some cases) a relevant, and even a very important, issue. And in a democratic system of government, appeal to the people, or to popularly accepted views, can be quite a reasonable type of argumentation generally even though it (like the *ad hominem)* is subject to abuse. On grounds of these traditional classifications alone then, it would be too much of a logical leap to evaluate the marijuana argument as irrelevant, simply because the *ad hominem* and *ad populum* types of argument are used in it. Instead, the evaluation should be made the other way around. One of the most important criteria for evaluating arguments of these types as fallacious (in some cases) is that the argument, as used in the given case, is not materially relevant.

Also, as noted in the account of the Northumberland Strait debate given above, it was part of the larger chain of argumentation in Fulton's speech to attack both the Conservative and Liberal parties by attacking their ethics, using words like 'sleaze,' and accusing them of showing disdain for the law. In context then, the marijuana argument is relevant in the sense that it does fit in with the overall direction and strategy of what appears to be Fulton's general line of argument. And questioning the ethics of those who hold opposed views, or appealing to popular opinions, as noted above,

can be relevant in a political debate.

So what evidence can and should be given then, to support the charge that the marijuana argument is irrelevant? Several steps are needed to provide such evidence. The first step is to ask what type of dialogue the participants are supposed to be engaged in. It is a House of Commons Debate in Canada, which means that the dialogue is in an institutional framework, and is a particular debate with a purpose in a democratic system of legislation –a debate that is ruled by a Speaker, using codified rules of procedure. There are rules requiring relevance, but they are quite general, and are not very often used by the Speaker.[9]

Can we look at such a debate from a logical point of view, and judge an argument in it to be materially irrelevant on logical grounds? Some would say that logic has nothing to do with political debate, and that to expect politicians to be logical in debating is hopelessly naive. But surely if a democratic system of legislation is to be defended as part of a system of government that can at least sometimes lead to informed and wise choices, some standards of relevance of a logical sort can and should be applied in evaluating or criticizing argumentation in political speeches. So it could be legitimate to look at an argument in a political debate from the viewpoint of a normative model of dialogue, like that of a persuasion dialogue, and then evaluate the argument according to the standards and requirements of that normative model. Such an evaluation could be informative and useful, provided it is clear that it is being conducted from a particular standpoint, according to standards of rational argument appropriate for that standpoint. The next step is to turn to the details of an argument used in a particular case, and to determine, using the textual evidence, whether the requirements were met or not by the argumentation given in that case.

Applying the method of argument extrapolation is done by taking the particular argument at issue, and determining its premises and conclusions (at the local level). In this case, Fulton's argument

9. For example, at the third reading of a bill, debate is "irrelevant that is not strictly confined to the elements of the bill" (Précis of Procedure, 1987, p. 78).

starts out as an argument from analogy –"lt is like the person … " –citing a case where the Prime Minister admitted doing something that was illegal. He then uses this argument –a type of personal attack– to lead into a second argument to the effect that the "grand elevated elite" are above the law that applies to the ordinary person. The question is whether this argument can be extrapolated forwards in a chain of argumentation that has as its conclusion the proposition that the Northumberland Strait Crossing Act is defective –and in particular that one of the proposed amendments to the act is not good legislation. This test, it needs to be emphasized, is one of dialectical and material relevance.

The kinds of skills needed to apply this test incorporate many of the techniques of argument diagramming already in use in argument reconstruction (Freeman, 1991; Snoeck Henkemans, 1992; Walton, 1996). As indicated in Section 2. above, the new method of argument diagramming set out in (Walton, 1996, Chapter 6) contains the concept of a pathway of reasoning, and this concept is the fundamental tool that should be used to evaluate cases of arguments to assess the relevance of a line of argument in a given case. Using these methods, premises and conclusions of an argument are identified as particular propositions. In particular, lengthy sequences of argumentation are reconstructed as chained together sub-arguments, where the conclusion of one sub-argument becomes a premise in the next one. For purposes of evaluating argumentation for relevance, this technique needs to be extended, so that a given argument can be extrapolated forward, to test whether it can meet up with a line of argument that would prove or disprove a thesis at issue in a dialogue.

One problem with applying the test to a case of a materially irrelevant argument like the marijuana argument is that much of the evidence is negative evidence. It is the failure to find enough of a basis for such an argument extrapolation, after having gone over all the text of discourse of the dialogue, that is the evidence for evaluating the argument as irrelevant. Much of the focus in informal logic has in fact been on evaluating argumentation on the negative basis of criticizing arguments as fallacious. However, this negative aspect is not essential to the method of argument extrap-

olation. It can as well be used to show how an argument is materially relevant, as used in a given case, in a context of dialogue. So it could be equally well used to defend an argument from the criticism that it is irrelevant.

8. Questions Raised

The analysis above has picked out this one particular type of example of the fallacy of irrelevant conclusion as the sort of case to be studied because (R3) does appear to pick out or indicate this type of failure as what the requirement is excluding. Thus the question is raised whether particular fallacies are associated with violations of particular rules. Perhaps, one might hypothesize, (R3) is the "rule of relevance," so that all failures of dialectical relevance are excluded by this rule. These observations raise a number of questions.

What seems to be an (at least somewhat) separate fallacy of irrelevance is the so-called red herring fallacy, where an arguer not only argues for the wrong conclusion, but tries to throw the audience off track (off the proper line of argumentation leading to the right conclusion) by going in a different and distracting direction. Some elements of this use of a tactic of distraction are evident in both cases studied above. Is this tactic a separate fallacy of relevance, or is it a kind of extension of the fallacy of irrelevant conclusion? It seems that the red herring fallacy involves a failure to meet (R3), but it also involves using a different line of argument, a distraction of the kind that would come under the heading of (R4), *i.e.*, using other means than a proper chain of argumentation meeting requirements (Rl), (R2) and (R3).

So do we have one fallacy of irrelevance here, or two? Another problem is that many logic textbooks, like Copi (1982), include many other kinds of arguments thought to be fallacious, like the *ad hominem* and *ad populum* as being failures of relevance. Hence it becomes problematic whether a single fallacy is associated with a single rule, so that there is a one-to-one correspondence between the fallacies and rules for persuasion dialogue, or critical discus-

sion, or some other type of dialogue.

What remains however is that there is a fairly good match, or at least a kind of mirroring or correspondence, between (R3) and the fallacy of irrelevant conclusion, as characterized above. The rule does state a general requirement for argumentation in a persuasion dialogue that does both explain and exclude what has centrally gone wrong in a case where the fallacy of irrelevant conclusion has been committed. It tends to support the theory of van Eemeren and Grootendorst (1984; 1987) that fallacies are essentially violations of the rules of a critical discussion, and that the fallacies can be paired with violations of particular rules. For the critical discussion would appear to be a type of persuasion dialogue, and both appear to have more or less the same requirement of relevance.

But now some questions need to be raised on how close the match is between (R3) and the fallacy of irrelevant conclusion. In Copi's example, the assumption made was that the premise, "Housing for all is desirable," does not appear to be leading along any pathway that has the legislator's thesis in the debate as its ultimate conclusion. As a practical inference that would be structurally correct, we could reconstruct the legislator's argument as follows.

(PI) Housing for all is desirable.
The proposed legislation is the best available means for procuring housing for all.
Therefore, the proposed legislation should be adopted.

Reconstructing the line of argument in this way appears to make it able to meet the requirement set in place by (R3), even though the argument is incomplete. And in fact, if his argument was criticized as irrelevant, this defence might be the very line of reply to the criticism that the legislator might take up. But would such a line of defence be convincing, as a justification of the claim that the legislator's argument is really relevant after all? It probably would not be, but why not? The answer to this question may indicate that it is not the violation just (R3) that leads one to think that the legislator's argument should be criticized as a fallacy of irrelevance, but some other rule violation is involved as well.

Such a criticism can be sketched out as follows. The problem with the legislator's argument is that the first premise of (PI) the statement that housing for all is desirable, was presumably already in the commitment of everyone involved in the debate, and so bringing in the argument of the form (PI) didn't make any advance. If we were to suppose instead that everyone agreed with the second premise, that legislation is the best means, but if many doubted the first premise, that housing was an appropriate goal, then the legislator's argument would not have been irrelevant at all. But since nothing was said by the legislator (as far as we are told) to support the additional premise about legislation being the best means, there was no advance of the argument on that side. Since the legislator failed to back up an argument of the form (PI) in the appropriate way, by supporting the premises, his argument made no advance towards the conclusion to be proved, namely that this legislation should be adopted.

The failure indicated by the above criticism relates to the failure of advance of the line of argument based on a premise that everyone accepts anyway, and that would therefore appear to be useless to persuade the opponents of the housing bill to accept the conclusion that they should vote for it. It's not just that this premise fails to be on a pathway that leads to the conclusion to be proved, but that the pathway of the kind that this is on is not really being used to prove something to the audience that they doubt. The failure with the argument (PI) is that it is no advance, in the sense that it is not being used to overcome the doubt of the other legislators by taking some premise that they already accept, or can be gotten to accept, and then using that premise to get them to accept something else (the conclusion that this legislation should be adopted). This criticism is based on a failure of the probative function of an argument, whereby the premises are used by the proponent to shift a weight of acceptance forward so that the conclusion, which was previously not acceptable to the respondent, now becomes acceptable. The probative function represents the use of an argument to overcome a respondent's initial doubt, so that the respondent will become committed, in virtue of how the argument was used, to its conclusion.

So it may be that (R3) alone, or in conjunction with the other three requirements of the successfulness of an argument in a persuasion dialogue given in Section 1., cannot handle all aspects of why the argument in Copi's example is thought to be a fallacy of relevance. In addition, the probative function also needs to be taken into account. An argument is dialectically irrelevant not just because it does not extrapolate forward to reach the conclusion it is supposed to prove, by some pathway of reasoning that could be used. The failure is more than this. It is that a pathway does not lead to this conclusion that represents a line of argumentation that could be used to fulfill the probative function by removing the respondent's doubt about this conclusion. In short, there are some questions raised by this way of viewing the criticism of the legislator's speech in Copi's example that suggest that failure to meet (R3) may not be the whole story of how to explain and evaluate cases of the fallacy of irrelevant conclusion. The probative function may have a role to play in this story as well.

Some other interesting questions are also raised about the modelling of relevance in formal systems of dialogue. A simple system of persuasion dialogue, using only the four requirements (R1) to (R4), could easily be implemented as a framework for argumentation between a user and a computer program –of a familiar kind, like an expert system containing a set of facts and rules– where the user tries to get the system to accept her thesis by putting forward arguments to prove that thesis, based on propositions in the commitment set (the set of facts and rules) of the system. Such an artificial intelligence modelling of argumentation in persuasion dialogue would be an interesting way to study fallacies of relevance.

Other questions relate to the application of a formal system of persuasion dialogue to realistic cases, like the Northumberland Strait Act case above, to test out the argumentation used in the case to see whether it can be judged to be materially relevant or not. These questions involve many of the same kinds of problems widely discussed in the use of argument diagramming for argument reconstruction.

References

Aristotle. *On Sophistical Refutations*. Trans. E. S. Forster, Loeb Classical Library, Cambridge, Mass., Harvard University Press, 1928.

Aristotle. *Topica*. Trans. E. S. Forster, Loeb Classical Library, Cambridge, Mass., Harvard University Press, 1939.

Berg, Jonathan. "The Relevant Relevance," *Journal of Pragmatics*, 16, 1991, 411-425.

Copi, Irving M. *Introduction to logic*, 6th ed. New York, Macmillan, 1982.

Dascal, Marcelo. "Conversational Relevance," *Journal of Pragmatics*, 1, 1977, 309-328.

Eemeren, Frans H. van and Grootendorst, Rob. *Speech Acts in Communicative Discussions*. Dordrecht, Foris, 1984.

Eemeren, Frans H. van and Grootendorst, Rob. "Fallacies in Pragma-Dialectical Perspective," *Argumentation*, l, 1987, 283-301.

Eemeren, Frans H. van and Grootendorst, Rob. *Argumentation, Communication and Fallacies*. Hillsdale, N. J., Erlbaum, 1992.

Eemeren, Frans H. van and Grootendorst, Rob. "Relevance Reviewed : The Case of Argumentum Ad Hominem," *Argumentation*, 6, 1992a, 141-159.

Fowler, Thomas. *The Elements of Deductive*. Oxford, Clarendon Press, 1895.

Freeman, James B. *Dialectics and the Macrostructure of Arguments*. Berlin, Foris, 1991.

Hamblin, Charles L. *Fallacies*. London, Methuen, 1970.

(Hansard) Canada: House of Commons Debates. Ottawa, Queen's Printer.

Jevons, W. Stanley. *Elementary Lessons in Logic*. London, MacMillan and Co., 1878.

Snoeck Henkemans, A. F. *Analyzing Complex Argumentation*. Amsterdam SICSAT, 1992.

Sperber, Dan and Wilson, Deidre. *Relevance: Communication and Cognition*. Cambridge, Mass., Harvard University Press, 1986.

Walton, Douglas. *Topical Relevance in Argumentation*. Amsterdam, Benjamins, 1982.

Walton, Douglas. *Informal Logic*. Cambridge, Cambridge University Press, 1989.

Walton, Douglas. *Argument Structure: A Pragmatic Theory*. Toronto, University of Toronto Press, 1996.

Walton, Douglas. *Argumentation Schemes for Presumptive Reasoning*. Mahwah, NJ., Erlbaum, 1996a.

Walton, Douglas. *The New Dialectic: Conversational Contexts of Argument*. Toronto, University of Toronto Press, 1998.

Walton, Douglas N. and Krabbe, Erik C. W. *Commitment in Dialogue: Basic Concepts of Interpersonal Reasoning*. Albany State University of New York Press, 1995.

1992 Vol 14: Rules for Plausible Reasoning

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Abstract: This article evaluates whether Rescher's rules for plausible reasoning or other rules used in artificial intelligence for "confidence factors" can be extended to deal with arguments where the linked-convergent distinction is important.

Many of those working in the field of argumentation now accept the idea that there is a third type of reasoning distinctive from deductive and inductive reasoning called *plausible reasoning*, a kind of reasoning based on tentative, *prima facie*, defeasible weights of presumption which can be as signed to the propositions in an argument.[1] Some theorists have now even offered sets of rules (calculi) for plausible reasoning.

The set of rules presented by Rescher (1976) is perhaps the best known to those of us working in informal logic and argumentation. But within the field of artificial intelligence, where presumptive reasoning based on "confidence factors" is very important, e.g. in applying expert systems of technology, various proposals for rules of this type have been advanced.

This paper evaluates Rescher's rules, and one set of rules from AI (Intelliware, 1986) with a view to seeing whether or to what extent such accounts of plausible reasoning could be useful for, or adapted to, the needs of informal logic. Taking into account the vital distinction between linked and convergent arguments, new, more general rules for plausible reasoning are proposed which

1. Research for this paper was supported by three awards: (1) a Killam Research Fellowship from the Canada Council, (2) a Fellowship from the Netherlands Institute for Advanced Study in the Humanities and Social Sciences, and (3) a Research Grant from the Social Sciences and Humanities Research Council of Canada.

would be useful for evaluating argumentation in a critical discussion, in the sense of van Eemeren and Grootendorst (1984) and Walton (1992).

1. Systems of Plausible Reasoning

Rescher's system of plausible reasoning follows a conservative way of evaluating an argument. The least plausible proposition in a set is the weakest link in the chain of argumentation, because it represents the greatest possibility of going wrong or getting into trouble. Hence Rescher's accounts of plausible inference are generally based on the weakest link idea. It is easy to appreciate how this idea fits the context of a critical discussion.

The respondent has the obligation or function of asking critical questions in response to an argument advanced by a proponent in a critical discussion. Naturally, a critical respondent is trying to resist being persuaded by his partner's argument. He has the job of seeking out the weakest premises, and attempting to challenge or question these premises especially. This has two consequences. One is that the proponent always tries to boost up these weak premises, or potential avenues of escape (loopholes) for the respondent. The proponent always tries to have all premises as potentially being able to be backed up so that they are more plausible than the conclusion the respondent doubts or resists. But second, the respondent is always drawn towards these weakest links (loopholes) in his adversary's line of argument. So the conclusion he is supposedly being pushed towards conceding can never be rationally rated as more plausible, for him, than that weakest premise.

Another important context of application of plausible reasoning is that of deciding on a course of action based on the advice gathered from the solicited opinion of an expert authority on a question (Rescher, 1976, p. 6). The user interface of an expert system is designed for a very similar use. For it is the user of the system who must draw conclusions from a set of facts and rules in a knowledge

base which represents the systematization of an expert's knowledge in a given domain of expertise. In using an expert system, it must be recognized that exceptions to accepted rules may exist, and therefore an approach to reasoning which assigns confidence factors (CF's) as rough guides to reliability of advice has proved most successful.

The way an expert reasons, however, in arriving at a conclusion in her field of expertise, is quite different from the way a (non-expert) user reasons in drawing conclusions from what the expert says. The user is typically engaged in deliberating on what to do, and quite often the context is that of a critical discussion concerning the *pro* and *contra* points of view on a possible course of action being considered.[2]

For example, in judging the alleged fallaciousness of an *argumentum ad verecundiam,* the problem is typically to evaluate how an appeal to expert opinion was used in a critical discussion between two parties.[3] The expert is a third party whose opinion was appealed to as a move made by one of the participants in the critical discussion. In such a case, the rules of plausible reasoning need to be formulated in the context of the critical discussion.

Although plausible reasoning involves a qualitative judgment of relative comparison of propositions, as opposed to a quantitative-numerical calculus, formalized systematization of general rules for plausible reasoning have been proposed by Rescher (1976) and other systems of rules are in use in AI programs. Among the six formal rules for plausible reasoning given by Rescher (1976, p. 15), perhaps the most fundamental and characteristic rule is the consequence condition. This condition requires that when a group of mutually consistent propositions entails a particular proposition, then the latter proposition cannot be less plausible than the least plausible proposition in the original group. This rule is also called

2. Walton (1990, chapter eight).

3. Walton (1989, chapter seven).

the *least plausible premise rule,* and it defines the essential characteristic of plausible reasoning as a kind of logical inference, in Rescher's calculus.

In artificial intelligence, a variety of sets of different types of rules have been given, for example, in expert systems research, to provide the "inference engine" for deriving conclusions in a data base where the facts and rules lead, at best, to tentative conclusions based on degrees of confidence. In the language of AI, a *rule* is a condition that may have several antecedents (premises) where the collection of antecedents is treated as a conjunction of simple propositions (facts). In one leading approach, outlined by Intelliware (1986), the rule for calculating confidence factors (CF's) for *and* takes the minimum plausibility value (confidence factor). Formally,

$$plaus(A \wedge B) = \min (plaus\ A, plaus\ B)$$

Then to calculate the plausibility of a conclusion based on a set of premises, we multiply the plausibility value of the rule with the plausibility value obtained from the premises (by the conjunction rule above, where there *is* more than one premise). Formally,

$$plaus(\text{conclusion}) = plaus(\text{premises}) \times plaus(\text{rule})$$

This approach (hereafter called the *product rule)* is quite different from Rescher's in several important respects, most notably perhaps in allowing a plausibility value for the inference itself. And then, of course, the product rule is itself basically different from Rescher's in the specific formula of calculation used.

The basic formal rules of plausible reasoning are given by Rescher (1976, p. 15), and comparable rules for inexact inference for expert systems are given by Intelliware (1986), Main Menu, *Inexact Inference,* pp. 3-9). However, recent developments in the area of argumentation indicate two important kinds of exceptions to these rules. Accordingly, these rules need to be modified, extended and developed in new directions. The first exception concerns the dis-

tinction between two kinds of conditionals.[4] In a must-conditional, 'If A then B' means that B is true in every instance in which A is true, with no exceptions. In a might-conditional, 'If A then B' means that B may be expected (presumed) to be true in a preponderance of typical instances in which A is true. But the linkage between A and B is a matter of typical or customary expectation, which can admit of exceptions. The plausibility value of a must-conditional is always equal to 1 (certainty), whereas the plausibility value of a might-conditional, v, can range between 0 (of no value as a plausible presumption) and 1 (maximally plausible): $0 \leq v \leq 1$.

The set of rules in Rescher (1976, p. 15) is defined only for must-conditionals, but recent developments in artificial intelligence –see Forsyth (1984), Bratko (1986) and Intelliware (1986)– show a clear practical need for consideration of rules of inference where "confidence factors" (certainty factors) need to be taken into account, by using inference rules with values of less than one for might-conditionals.

It has already been noted above that in Intelliware (1986) a rule (conditional proposition) can be assigned a confidence factor of less than one as a value. When inferring a conclusion from a set of premises, the way to calculate the value of the conclusion is to multiply the value of the rule (conditional) by the value of the least plausible (lowest confidence factor) premise. In lntelliware (1986, Main Menu, *Inexact Inference,* p. 6), the following example of calculating CF's for a single rule with a value of .60 is given. The asterisk (*) stands for multiplication (product).

4. See Walton (1990, pp. 74-77).

Rule 1:

Stock 12 is volatile IF	CF = 0.60
Stock 12 is hightech AND	CF = 0.90
Stock 12 is in demand	CF = 0.60

Evaluate Rule 1:
CF(Rule 1) = Min (0.90, 0.60) * 0.60 = 0.36

This type of rule allows us to derive conclusions using a might-conditional, or as it is called in AI, a rule that is assigned a confidence factor of less than one (CF < 1).

Rescher (1977, p. 6) introduces a *provisoed assertion relation*, A/B, meaning that A ordinarily obtains provided that B obtains, other things being equal, which he insists (p. 7) is not to be identified with implication. However, "for simplicity" (p. 8), he supposes that moves in dialogue of the form A/B are "always correct," meaning that disputants can never make erroneous or incorrect claims about them. Rescher's comment (p. 8) is that this assumption "eliminates various complications" that do not matter for his present purposes. But this assumption also removes the possibility of dealing with might-conditionals by showing how to derive conclusions from them in combination with premises in plausible reasoning. What is needed is a more realistic or practical concept of frame-based conditionals (provisoed assertion relations) that are suitable to the needs of persuasion dialogue.

Might-conditionals are frame-based conditionals to the effect that if one proposition A is plausible, and another set of presumptions S are plausible in the commitment set of a respondent, then another proposition may be presumed to have a certain weight of plausibility. For example, consider the two propositions below.

A: Jones is less than five feet tall.
B: Jones is an All-Star forward on the NBA Los Angeles Lakers.

lf A is taken as a proposition in a commitment set of a participant in argument, then given what we all know about basketball *(viz.* it is practically necessary for a basket-ball player to be fairly tall, we would normally expect, in order to be successful as an All-Star forward on the NBA Los Angeles Lakers), then **B** would not be plausible as a proposition in that participant's commitment set. Similarly, if B were taken as a plausible presumption, by a might-conditional, it would follow that A would not be a plausible presumption in that same set. In fact, from the point of view of plausible argumentation, A and B are "opposites" of each other (assuming they are in the same commitment set, which also contains the set S of plausible presumptions about successful players in the **NBA).**

In short, there is a clash or opposition between A and B. Not a logical inconsistency, but a pragmatic inconsistency which reflects a tug of opposing plausibility weightings.

2. Linkage of Premises in a Critical Discussion

The second type of exception to conventional systems of plausible reasoning concerns a requirement on the linkages between pairs of premises in an argument advanced by a proponent in a critical discussion. The additional requirement needed here is that the premise-set as a whole must be taken to be plausible by the respondent to whom an argument in per suasion dialogue is directed. Otherwise, the least plausible premise rule (reflecting the conservative point of view) might fail.

This requirement of linkage of a set of premises in a useful argument in a critical discussion reflects the importance that should be placed on consistency (coherence) in a commitment set to be used as a set of premises to convince someone of a conclusion. Indeed,

the primary way that interactive reasoning functions to produce maieutic insight is through the criticism of inconsistencies in an arguer's position. By dealing with the presumptive inconsistencies found by a critic, a participant in interactive reasoning can come to a deeper understanding of his own position (commitment set).

When discussing the rules of plausible inference, we start with a set of propositions, A, B,…, each of which can be assigned a plausibility value. For example, the plausibility value of the proposition A is written as *plaus(A).* For any proposition A, the value of A is subject to the condition: $0 \leq plaus(A) \leq 1$. In other words, a maximal plausibility (totally reliable) proposition can be assigned a value of 1, and a proposition that would not count as plausible, one of no useful value to persuade a respondent of a conclusion, can be given a value of *0.*[5]

The basic axiom of plausible inference is the *consequence condition* (Rescher, 1976, p. 15): when a set of mutually consistent propositions $A_1,\ldots, A_n$ implies some other proposition B by valid deductive argument, then the plausibility of B cannot be less than the plausibility value of the least plausible proposition among the set $A_1,\ldots, A_n$. In short,

$$\text{If } A_1\ldots, A_n \text{ imply B, then } plaus(B) \geq \text{MIN } plaus(A_1,\ldots, A_n)$$

This consequence condition settles how conjunction is to be defined in plausible inference. The following *plausibility rule for conjunction* gives this definition. See Intelliware (Main Menu, *Inexact Inference,* p. 3).

$$plaus(A \wedge B) = \textbf{MIN}\ (plaus(A), plaus(B))$$

That is, the plausibility of the conjunction $A \wedge B$ always reduces to the plausibility value of the lesser of the two propositions, A, B.

5. For further background on how plausible reasoning fits into Rescher's general conception of reasoned argument, see Rescher (1977) and (1988).

How the consequence rule determines the conjunction rule above has been shown by Rescher (1976, p. 16, theorem 3). First, recall that the following three forms of inference are deductively valid.

(I1) $\frac{A \wedge B}{A}$ (I2) $\frac{A \wedge B}{B}$ (I3) $\frac{A \quad B}{A \wedge B}$

According to the consequence condition, the plausibility of the conclusion of a deductively valid argument must be as great as the plausibility of the least plausible premise. Since $A \wedge B$ is the only premise of (I1), it follows that the plausibility of A must be at least as great as that of $A \wedge B$. Similarly for (I2), the plausibility of B must be at least as great as that of $A \wedge B$. In other words,

(T1) *plaus*(A) ≥ *plaus*($A \wedge B$); *plaus*(B) ≥ *plaus*($A \wedge B$)

Hence whichever of A or B has the lesser plausibility, it still must have a value at least as great as that of $A \wedge B$. In other words,

(T2) MIN(*plaus*(A), *plaus*(B)) ≥ *plaus*($A \wedge B$)

But now, looking at (I3), we can see that according to the consequence condition, the plausibility of $A \wedge B$ must be at least as great as the plausibility of whichever of A or B has the lesser value. In other words,

(T3) *plaus*($A \wedge B$) ≥ MIN (*plaus*(A), *plaus*(B))

Putting (T1) and (T2) together yields the plausibility rule (T3) for conjunction given above. It has been shown then that the conjunction rule follows from the consequence condition.

So conceived, the rules for plausible inference are parallel to the rules for deductive inference. Just as conjunction was defined as a logical constant in the theory of deductive reasoning, so too conjunction will have a rule (T3) that defines it as a constant in the

theory of plausible reasoning. So conceived, also, the theory of plausible reasoning presupposes the concept of deductive logical consequence that is defined in the theory of deductive reasoning. By these lights, plausible reasoning has a formal aspect which appears to make a calculus with formal rules of inference.

This parallel begins to break down, however, when certain kinds of cases of plausible reasoning enter the picture. These examples undermine the plausibility rule for conjunction, and with it, the fundamental least plausible premise rule. The latter rule states that, in a deductively valid argument (where the premises are logically consistent) the conclusion must be at least as plausible as the least plausible premise. But consider the following argument.

Case 0:

(P1) Jones is less than five feet tall.
(P2) Jones is an All-Star forward on the NBA Los Angeles Lakers.
(C) Jones is a less than five-foot tall All-American forward on the NBA Los Angeles Lakers.

In this case, there may be evidence that makes (P1) highly plausible, and also other evidence that suggests that (P2) is highly plausible. But although the form of argument in case 0 is deductively valid, and the premises are logically consistent with each other, the conclusion is not highly plausible. In fact, it is implausible. And since case 0 is of the form (I3), the plausibility rule for conjunction also fails in case 0.

Case 0 is a linked argument, in the sense that both premises (P1) and (P2) are required to derive (C) by a deductively valid argument form. If either of (P1) or (P2) is omitted, the argument ceases to be valid. But in some other sense perhaps, case 0 may not appear to be a linked argument, in that it would seem to be somehow characteristic of this type of argument that the line of evidence for (P1) should be separate from, or distinct from, the line of evidence for

(P2) and *vice versa*. But it does not seem obvious what "separate from" means in this context. This is a problem we return to below.

One might wonder how plausible reasoning compares to probable reasoning in this type of case. In case 0 above, part of the problem appears to be that the premises are probabilistically dependent on each other so that the conditional probability of either on the other is less than its unconditional probability alone. But the problem does not disappear by attempting to restrict the rules to sets of premises that are probabilistically independent of each other.

Case 1:

(P1) The first flip of this coin will be heads.
(P2) The second flip of this coin will be heads.
(C) Both the first and second flip of this coin will be heads.

In this case, like the one above, the probability (or plausibility) is less than the probability (or plausibility) of the least probable (plausible) premise. Plausibility seems parallel to probability in this type of case. But, at any rate, plausibility does not follow the least plausible premise rule. And this failure is instantiated in its basic failure to follow the plausibility rule for conjunction in these cases.

Possibly to deal with this kind of exception, Rescher (1976, p. 15) adds the requirement of the *compatibility condition*: all propositions in a plausibility evaluation set must be "logically compatible and materially consonant with one another." To be *materially consonant* (Rescher 1976, footnote, p. 15) is meant "logical compatibility with certain suitable 'fundamental' stipulations of extra-logical fact." But what are these "fundamental stipulations of extra-logical fact"? Rescher does not tell us, and the resulting gap makes it hard to apply the least plausible premise rule, and to know where it is applicable to argumentation and where not. For clearly the exceptional cases above indicate that the rule is not applicable in some instances.

The third exception to the conventional rules of plausible reasoning arises through the distinction between linked and convergent arguments, now commonly used in informal logic. The exception noted in the present section arises because, in linked arguments, the premises must be connected together in such a way as to provide a plausible commitment set or position from which the respondent can be persuaded to accept a particular conclusion. In the next section, another exception arises through the fact that not all arguments advanced in persuasion dialogue are linked arguments.

In a linked argument, a bundle of premises is taken together as a fixed set representing the commitment set of a respondent at one move in dialogue. However, in dynamic interactive reasoning, "new knowledge" may be added to the commitment store of a participant in dialogue.

3. Linked and Convergent Arguments Revisited

The third exception concerns the distinction between two kinds of argument techniques represented in argument diagramming, namely linked and convergent arguments. Since the reader conversant with informal logic is already familiar with these techniques of argument diagramming, no further, more elaborate examples need to be presented here. It is enough to note that convergent and linked arguments can be combined into larger networks of argument structures, by means of serial connections joining subarguments together.

The basic rule of plausible reasoning in the Rescher framework, as noted, is the *least plausible premise rule*, which states that in a deductively valid argument, the conclusion must be as plausible as the least plausible premise. This rule works well in critical discussion for linked arguments, but not for convergent arguments. Typically, in a convergent argument, a conclusion is based on some existing evidence, but then some new and independent evidence comes along. If this new evidence is stronger than the old evi-

dence, there should be an upgrade of the plausibility value of the conclusion, based on the value of the new premises. In such a case, if there is one "old" premise and one "new" premise, for example, the value of the conclusion should be set at the value of the most plausible premise –in this instance, the value of the "new" premise.

It follows that the least plausible premise rule is not universal for plausible reasoning. It fails in convergent arguments. It also fails where the linkage between premises and conclusion is that of a might-conditional.

The distinction between convergent and linked argumentation is not modelled in classical logic where, for example, we have valid forms of inference like 'A $\wedge$ B, therefore A'; and the deduction theorem allows us to treat separate premises as a grouped conjunction of propositions in a single premise. But in a critical discussion the distinction between uses of these two types of argument is fundamental because each of them has to be defended against criticisms in a fundamentally different way.

In a linked argument, the respondent, who is inclined to be resistant to being convinced of the proponent's conclusion, will try to reject the premises if the argument is otherwise convincing. And he will seek out the weakest of the premises, for if one premise alone fails, the whole argument fails to persuade successfully. But in a convergent argument, each premise is a separate line of argument. So if one fails, the proponent can rely on the other. This fundamental difference is basic to the structure of using inference in critical discussion.

In figure 0, there are two premises A and B, used as a basis to support a conclusion C.

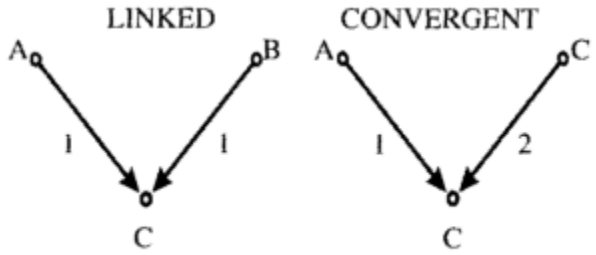

Figure 0

In the linked argument, both premises A and B are needed to prove C. In the convergent argument each of A and B is independent of the other.[6] What this means, in dialectical terms, is that the use of each type of argument has a distinctive pragmatic rationale.

This duality of pragmatic rationale was recognized and clearly stated by Windes and Hastings (1965), in their discussion of how to organize a proof when your goal is to construct a convincing case in order to persuade an audience to accept a particular proposition. Within such a context of persuasion dialogue, Windes and Hastings postulate (1965, p. 215) that there will be an "over-all argument" that states the issues (the global level of argumentation), and subarguments that are local contentions supporting these global issues. Serial argumentation connects some subarguments to other subarguments, resulting in extended chains of argumentation in a proof.

What is especially interesting here is that Windes and Hastings clearly distinguish between linked and convergent arguments, and articulate a basic principle of plausible inference governing each type of argument. First, they describe linked argumentation, and express what is, in effect, a statement of the weakest link principle as applicable to linked argumentation. In convincing an audience of a particular proposition, they wrote, there may be several issues, and the principle of argumentation is: "Each one of the issues must be established for the proposition to be established." (1965, p. 216)

6. On this notation for argument diagramming, see Walton and Batten (1984).

In other words, as they put it: “If any issue is not proved, then the proposition is not proved.” (p. 216) They recognize, as well, that this principle of reasoning is typically embedded in a larger process of a chain of arguments that may be quite long.

This statement of Windes and Hastings expresses the basic pragmatic rationale behind linked argumentation in the context of persuasion dialogue. It expresses the idea that a linked argument is only as strong as its weakest premise. For if any premise (issue) is not proved, in a linked argument, then the conclusion is not proved. In a linked argument, the premises are interdependent, and if the audience doubts one premise, or finds it weak and unconvincing, then the audience will not be persuaded by the argument to accept its conclusion.

Windes and Hastings went on (p. 216) to recognize a second type of argumentation where there are “independent lines of reasoning” that “lead to the same conclusion,” i.e. what we have called convergent argumentation.

They cite the following case, where “three reasoning processes” are used to support the conclusion, ‘The corn crop of Dullnia is failing.’

> Case 2:
>
> 1. Dullnia is buying corn on the world market. (Reasoning from effect to cause.)
> 2. The testimony of an agricultural expert who visited Dullnia. (Testimonial evidence.)
> 3. The presence of drought and poor growing conditions this year. (Cause to effect.)

In describing the pragmatic rationale of this type of (convergent) argument in persuasion dialogue, Windes and Hastings claim that both the number and the plausibility of the component arguments can be important (p. 217). Two other pieces of advice they offer

the advocate generally –whether the argument is linked or convergent– are to use as many different lines of argument as possible, "giving precedence to the strongest proofs." (p. 218) This significant remark suggests another pragmatic ration ale that (in the present author's opinion) is especially and distinctively applicable to convergent argumentation. This is the rationale, from the point of view of the advocate of a convergent argument in a persuasion dialogue, of giving precedence to the strongest line of argument, where more than one (independent) line of sup port for your conclusion is available.

These pragmatic rationales for linked and convergent arguments both have a dual nature, reflecting the character of persuasion dialogue. From the point of view of the proponent, or advocate of an argument, his function is to persuade the respondent by finding premises that will meet the bur den of proof for that respondent. From the point of view of the respondent, his function is to critically question the premises of the proponent's arguments, finding a way to resist being persuaded, if he can.

This framework leads to the following characteristic general formulations of a pragmatic rationale and a plausibility rule for both of these types of argumentation in persuasion dialogue.

> PRAGMATIC RATIONALE FOR LINKED ARGUMENTATION:
> *If the respondent succesfully questions one premise, the whole argument fails to meets its burden of proof. So the respondent can choose to attack one or the other.*

> PRAGMATIC RATIONALE FOR CONVERGENT ARGUMENTATION:
> *If the respondent questions one premise, the other can be brought to bear to back up the conclusion. So the respondent needs to attack both, to refute the argument. Matching each of these pragmatic rationales is a corresponding rule/or plausible reasoning.*

PLAUSIBILITY RULE FOR LINKED ARGUMENTS:
C has the value of the least plausibility value of the pair (A, B).

PLAUSIBILITY RULE FOR CONVERGENT ARGUMENTS:
C has the value of the greater plausibility value of (A, B).

From the point of view of the critical questioning of linked and convergent arguments, each type of argument has its own characteristic type of strategy as well.

STRATEGY FOR QUESTIONING A LINKED ARGUMENT:
Generally attack the weaker (weakest) premise (other things being equal).

STRATEGY FOR QUESTIONING A CONVERGENT ARGUMENT:
There is no point in starting by attacking the weaker premise. You might as well attack the stronger premise right away.

These differences have fundamental implications for the project of formulating rules of plausible reasoning for use in a critical discussion.

4. New Rules for Convergent and Linked Arguments

The basic idea of plausible reasoning has, to this point, been typified by the least plausible premise rule. This rule, it will be recalled, states that the conclusion of a deductively valid argument is at least as plausible as the least plausible premise of the argument. Now we have distinguished between linked arguments and other kinds of arguments like convergent, divergent and serial arguments. However, some important exceptions to the least plausible premise rule need to be explained. For while the least plausi-

ble premise rule holds generally for valid linked arguments at the local level, it is superseded by other rules of plausible inference in convergent arguments, and in some serial arguments.

The least plausible premise rule derives its justification from the characteristics of the critical discussion as a context of use. Generally, an argument in a critical discussion is a kind of interchange where the proponent of an argument is trying to persuade the recipient (respondent) of the argument to accept the conclusion. However, generally speaking, it is a feature of this kind of dialogue that the recipient does not accept the conclusion of the argument, at least to begin with, and he is inclined to doubt or even reject the conclusion. This being the case, the recipient of a valid argument will generally try to resist accepting the conclusion of an argument he has just been presented with, by seeking out the "weakest link" in the premises.

In a linked argument, the respondent should try to attack the weakest premise, because that will bring the whole argument down, if he can attack this one premise successfully. From the proponent's point of view, he can expect the respondent to be convinced by his argument only to the strength (weight) provided by his weakest premise. Hence the appropriate strategic presumption to gain assent in persuasion is the least plausible premise rule.

For example, suppose that Lester doubts that Nasir is a Christian, but Arlene advances the following argument.

Case 3:

Nasir went to church.
If Nasir went to church then Nasir is a Christian.
Therefore, Nasir is a Christian.

If Lester does not dispute the first premise, and finds it relatively plausible, but he does dispute the acceptability of the second premise, and finds it much less plausible, how should he respond to

Arlene's argument? If he is a smart and reasonable critic, he would attack the second premise, as the "weakest link," and he would not find the conclusion any more plausible than he finds the (weak) second premise, even though he may agree that the first premise is highly plausible. And it is the second premise that Arlene needs to defend.

So it can be appreciated why the least plausible premise rule is an appropriate rule of plausible reasoning in persuasion dialogue for valid linked arguments, like the one above. This argument is a linked argument because each premise fits together with the other to support the conclusion. Both premises are required to support the conclusion, and neither premise appears to render the other premise implausible for the respondent (or at least so we may presume, from what we know of the position of the respondent, on the information available to us as critics).

However, now let us contrast a case of a linked argument with a case of convergent argument. In the linked argument below, the two premises go together to support the conclusion. Whereas in the convergent argument, the second premise does not depend on the first, or vice versa. Each premise is an independent item of evidence to support the conclusion.

Case 4:

There is smoke coming from the University.
If there is smoke coming from the University, then there is a fire in the University.
Therefore, there is a fire in the University.

This example is a linked argument, because each premise goes along with the other to help support the conclusion. In the linked argument, if one premise is weaker, then the conclusion is only made as plausible, through the argument, as this weaker premise. For example, in the linked argument above, if the first premise is highly plausible, but the second premise is only weakly plausible,

then the conclusion is only made weakly plausible by the argument.

However, in a convergent argument, each premise is a separate line of evidence, independent of the other premises. Therefore the conclusion is made as plausible as the most plausible premise, if the argument is valid. This principle is illustrated in the following example.

Case 5:

Virgil said sincerely that there is a fire in the University.
Vanessa said sincerely that there is a fire in the University.
Therefore, there is a fire in the University.

This example is a convergent argument, for each premise individually constitutes a plausible argument for the conclusion without requiring the support of the other premise. Now let us suppose that Virgil is a highly reliable source on the subject of the fire in the University, and that Vanessa is a less reliable source. Suppose, in other words, that the first premise is highly plausible, but the second premise is only slightly plausible. What plausibility value should we assign to the conclusion? Clearly, we can infer that the conclusion is highly plausible, that it is at least as plausible as the first premise. In short, the new rule is the following.

PLAUSIBILITY RULE FOR CONVERGENT ARGUMENTS:
In a convergent argument, the conclusion is at least as plausible as the most plausible premise.

This rule then contrasts with the case of the linked argument, where the conclusion is assigned a plausibility value at least as great as the least plausible premise.

A complication is introduced through the fact that linked and convergent arguments can be combined, as below.

Case 6:

1. A passerby reported smoke coming from the University.
2. If a passerby reported smoke coming from the University, then there is a fire in the University.
3. The Fire Chief reported a fire in the University.
4. If the Fire Chief reported a fire in the University, there is a fire in the University.
5. Therefore, there is a fire in the University.

This example is a case of two linked arguments joined together in a convergent argument, as shown below.

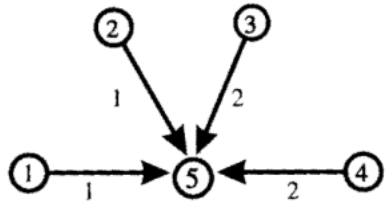

Figure 1

In this case, the second linked argument is stronger than the first. Therefore, the plausibility of the conclusion, (5), should be at least as high as that of the least plausible premise of the argument that has (3) and (4) as premises.

To illustrate the point more clearly, let us presume that plausibility values can be assigned to each premise as follows. Values range between 0 and 1, where 0 is the lowest plausibility a proposition can have and l is the highest plausibility.

Case 7:

plaus(1) = .9 (very highly plausible)
plaus(2) = .2 (slightly plausible)
plaus(3) = .6 (fairly plausible)
plaus(4) = .8 (highly plausible)

The problem with this case is that if we straightforwardly apply the plausibility rule for convergent arguments given above, we would assign a value of .9 to the conclusion that there is a fire in the University. But this would be erroneous, since the very highly plausible premise (1) is linked to the premise (2), which is only slightly plausible. Hence the plausibility rule for convergent arguments must be modified to deal with this type of case. What must be done is to combine the least plausible premise rule with the plausibility rule for convergent arguments, in order to have a more generally applicable rule of plausible inference.

In the example above, clearly we need to consider each convergent argument separately, and pick the strongest one. But since each is a linked argument, the strongest will be the one with the highest least plausible premise. We have two convergent arguments to select from, with plausibility value given below.

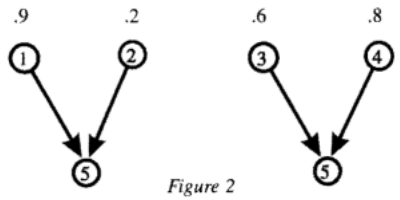

Figure 2

Using the least plausible premise rule, it is concluded that the linked argument on the right is the strongest, because its least plausible premise has a value of .6, which is greater than the value of the least plausible premise of the other linked argument (.2). We conclude that the plausibility value of (5) is at least as great as that of (3), namely .6 (fairly plausible).

The general rule below covers cases where linked arguments are combined into convergent arguments.

MAXMIN RULE:

Collect together the values of the least plausible premises of all the linked arguments, and then pick the maximum of all these minimum values, for every convergent argument.

Even the maxmin rule above turns out to be oversimplified in certain respects, because it is possible to have various kinds of combinations of linked and convergent arguments in serial sequences.

A serial argument requires a successive readjustment of plausibility values. Suppose the initial values given a serial argument of the form 'A → B → C' are the following: A = .6, B = .5, C = .3. First, B is adjusted upwards to a value of .6. This evaluation follows the rule for single premised arguments where no other lines of argument lead in to the conclusion. The value of the conclusion is adjusted upwards to match that of the premise. Similarly, the value of C is then adjusted upwards to .6.

Another type of case that can occur is illustrated by the following example, modelled by figure 3. First, C needs to be adjusted upwards to a plausibility value of .6, in virtue of the least plausible premise rule for the linked argument. Then E has to be adjusted upwards to .6, in virtue of the rule for convergent arguments (maximum value).

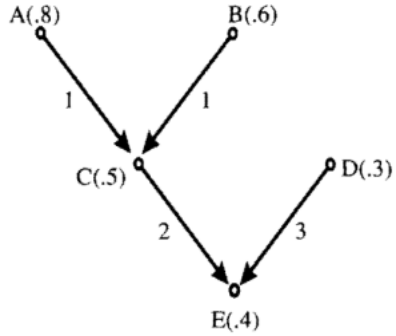

Figure 3

Serially Combined Linked and Convergent Argument

To account for these complications, the MAXMIN RULE needs to be stated in a more general way, as follows.

MAXMIN RULE:
Scan over the whole graph of the argument, starting at the

> *initial premises (premises that have no lines of argument leading in to them) and adjust the values at the nodes upwards at each step. where required, according to the appropriate rule, depending on whether that step is a linked argument or a convergent argument. For linked arguments, take minimum values of premises. For convergent arguments, take maximum values of premises.*

The use of this new MAXMIN RULE is straightforward as applied to the method of using graphs to diagram complex sequences of argumentation in Walton and Batten (1984). Once a plausibility value has been assigned to each premise or conclusion, the appropriate adjustments are then made, using the MAXMIN RULE.

The basic thing to remember is the distinction between linked and convergent arguments. A convergent argument represents the idea of "new evidence" or a new line of argument that is independent of the previous premises of an argument. Convergent arguments do not follow the least plausible premise rule, because we are dealing with two "separate" arguments for the same conclusion, and this calls for a different kind of defending and questioning strategy.

Despite this exception, the least plausible premise rule still states a basic truth about plausible reasoning. Because plausible inference is inherently fallible, where premises are linked, the least value is taken.

5. Might-Conditionals

In the example from Intelliware (1986) presented in section 1 above, we saw how might-conditionals are dealt with in inference rules for inexact inferences in AI: the product rule tells us to multiply the plausibility value (certainty factor) of the premise by that of the conditional (rule). This product rule is consistent with the basic philosophy behind plausible reasoning. Since the expert or source of information could be as wrong about a conditional as about a premise or simple proposition (fact), the plausibility of the conclu-

sion drawn using that conditional as a rule of inference should be no greater than the least plausible of the premise and the conditional.

This general approach suggests the following rule: if a rule (conditional) and a fact (premise in a knowledge base) are combined to generate a conclusion, the plausibility value of the conclusion should be no greater than the lesser value of the pair of values given for the rule and the fact. The product rule also preserves the intent of this type of rule as well, however. For where the values combined are fractions between zero and one, their product will always be less than either value, taken singly. Indeed, the product rule is even more conservative, because it tends to lower the lower value. Let us call the first rule above the reduction rule, as opposed to the product rule.

The reduction rule, in effect, treats the rule of inference (conditional) as another value that needs to be factored in like a premise in the argument. This approach can be summed up in a new type of rule that allows values for might-conditionals to be counted in, even where the value is less than one.

> MAXMIN MIGHT RULE:
> Rules of inference are to be assigned numerical plausibility values in arguments and counted in at the last stage of plausibility adjustment by being treated as a premise linked to the argument.

For example, suppose we have a linked argument with values as given below for the two premises, and the rule of inference is given a value of .4.

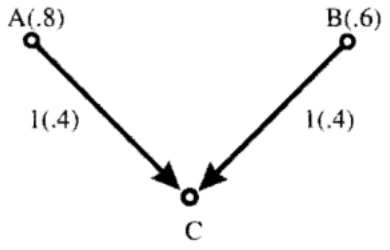

Figure 4

Now the number of the inference marked on the arc is given a number, representing its plausibility value. By the MAXMIN RULE, the least plausible premise, which has a value of .6, should indicate an upward adjustment of the value of C to .6 as well, if it was less than that before. However, applying the more general MAXMIN MIGHT RULE, the value of C would be adjusted upwards only to .4, because that is the plausibility value of the rule of inference, 1.

By contrast, the product rule would entail multiplying all three values (.8 * .6 *.4) which would yield a final plausibility value of .2 for the conclusion. The product rule method generally tends to give a lower value for a conclusion than the reduction rule method.

What happens in the case of a convergent argument? This eventuality appears to be covered by a *Rule for Combining Evidence* given in Intelliware (1986, Main Menu, *Inexact Inference*, p. 8):

> Suppose there are two rules which support a hypothesis. If A and B are the CF's ob tained from these two rules, the combined certainty, Combine (A, B) is defined as:
> Combine (A, B) =A + B – (A * B).

The following example (lntelliware, 1986, p. 9) illustrates the use of the *Rule for Combining Evidence* with a case where there are two rules with values of .6 and .8.

Case 8:

Rule 1: Stock 12 is volatile IF	CF = 0.60
Stock 12 is hightech AND	CF = 0.90
Stock 12 is in demand	CF = 0.60
Evaluate Rule 1: CF(Rule 1) = Min (0.90, 0.60) * 0.60 = 0.36	
Rule 2: Stock 12 is volatile IF	CF = 0.70
Stock 12 is a new issue OR	CF = 0.80
Stock 12 is heavily traded	CF = 0.40
Evaluate Rule 2: CF(Rule 2) = Max(0.80, 0.40) * 0.70 = 0.56	
Combine Evidence: CF(Stock 12 is volatile) = 0.36 + 0.56 – (0.36 * 0.56) = 0.72	

In effect, the *Rule for Combining Evidence* appears to be a way of dealing with convergent arguments, at least in those cases where there are no premises in the one inference that are dependent on any premises in the other inference. Such is the case, it appears, in the example above, where each line of inference seems to be meant as an independent line of argument for the same conclusion (Stock 12 is volatile). However, it need not be so in every instance. In some cases where the *Rule for Combining Evidence* could be

applied, some premises in the one inference could be dependent on, or even identical to, some premises in the other inference. By failing to make this distinction, the *Rule for Combining Evidence* is inadequate to deal with the need to distinguish between linked and convergent sub-arguments in a structure of argumentation.

The problem in cases of combined argumentation like the type of case confronted by the *Rule for Combining Evidence* is whether each line of argument is dependent on the other or not. These two kinds of cases need to be treated differently. One possibility is the case of two linked arguments combined to create a convergent argument at the macro level. This type of case is illustrated by the figure on the left below. Another quite different type of case is the one where two linked arguments are linked together by a third sub-argument. This type of case is illustrated by the structure on the right in figure 5. The case on the left represents two linked arguments combined as a convergent argument. The case on the right represents two linked arguments, combined as a linked argument for a conclusion. Whether a product-style rule is applied, or a reduction-style rule is applied, in principle, each of these types of cases should be treated differently. *The Rule for Combining Evidence* appears to refer to the type of case pictured on the left, where each linked argument is a new line of evidence for the common conclusion. But the situation on the right could also possibly be covered by the same rule, and that is a problem.

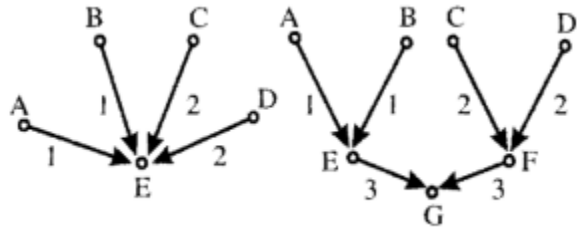

Figure 5

From a reduction rule perspective, the solution is given straightforwardly by the MAXMIN RULE. In the case on the right, the least value is chosen from the least values in each sub-argument. In the

case on the left, the greater of the pair of least values is chosen. We will not propose a modified product-style rule to reflect the distinction between linked and convergent arguments. It suffices to comment that Al should look to taking account of this distinction in combined evidence rules.

6. Applying the More Plausible Premises Rule

There are many purposes of argument, but one stands out, especially in a critical discussion. A primary goal of any reasoned persuasion type of dialogue is for a proponent arguer to persuade or convince a recipient (respondent) arguer, by proving the proponent arguer's conclusion from the recipient arguer's premises. This means that to find a successful or useful argument, the proponent arguer must find premises that are relatively plausible to the respondent of the argument. And indeed, to be useful, an argument must have at least some, or even all premises that are more plausible for the recipient than the conclusion of the argument which the recipient doubts, or is reluctant to accept.

This requirement must be tempered by qualifications, however. If the argument is a linked argument, then each premise must be more plausible than the conclusion, in order for the argument to be useful in persuasion. But if the argument is convergent, it may be that only one of the premises, or perhaps some subset of the premises, needs to be more plausible. How the more plausible premises requirement is implemented will depend on the structure of the argument revealed by its argument reconstruction and diagram.

Another important qualification is that, at the local level, an argument may not need to have premises that are immediately more plausible. This is because adjustments of plausibility, according to MAXMIN RULE, may take place over a longer sequence of argumentation which may not yet be complete. What is required, then, is for an argument to show some promise or capability of leading to other premises that are more plausible. Any argument where this

evidential route, through the premises, to further premises that may be more plausible, is "choked off" will fail the evidential priority requirement. And of course, an argument that commits the fallacy of begging the question is just such a case in point. Where an evidential route is left open so that subsequent argumentation could potentially lead to confirmation that the premises are more plausible to a degree useful to meet burden of proof, no allegation of the criticism that the argument begs the question arises.

For example, suppose that Ted is a biology student who states to Eva, his biology professor, that he finds it hard to believe that a whale is a mammal. After all, Ted says, "It looks like a fish." Ted asks Eva, "Can you prove to me that the whale is a mammal?" Eva replies with the following argument.

Case 9:

> If an animal suckles its young, then that animal is a mammal. The whale is an animal that suckles its young. Therefore, the whale is a mammal.

This linked argument is deductively valid, but what makes it useful as an argument to help to persuade Ted of the acceptability of its conclusion is that its premises are open to being proved to Ted. If the premises are immediately plausible to Ted, then that is the end of the argument. If they are not, then Eva can go on to supply further arguments for any premise questioned by Ted, in response to his critical questions.

Suppose Ted still maintains that he cannot bring himself to accept the first premise, because he does not find it plausible. Then Eva might respond with a further argument for this first premise. She might reply: "That is the accepted criterion for classification as a mammal in biology." Since Eva is herself a professor of biology, her argument here is a form of appeal to expertise (here in a pedagogical context of dialogue). An appeal to expertise can be a reasonable form of argument in some cases, and let us presume that,

in this case, Ted finds the argument plausible, and has no objections to it. If Ted now finds the first premise of the argument above plausible, and already finds the other premise plausible (that the whale is an animal that suckles its young), then Ted will, or should, find the conclusion plausible as well.

The danger of the appeal to authority as a type of argument is that it can be pressed ahead too dogmatically or assertively as a tactic to block off critical questioning, turning into a fallacious *argumentum ad verecundiam*.[7] But in this case, no such fallacy needs to have been committed by Eva. For it is open to Ted, as a good biology student, to check up on Eva's claims. He can go to the library and check to see whether in fact there is evidence to confirm the premise that whales suckle their young. Or he can check studies on taxonomy to confirm the criteria for classifying an animal as a mammal. Provided Eva's argument has left these avenues open, it should not be criticized for convening or interfering with the implementation of the kind of plausibility requirement studied in section five.

The general pattern of Eva's use of the argument to alter Ted's commitments is clear. Because Ted could be convinced that the premises are plausible, and because the argument itself had a structure that enabled plausibility to be transferred to the conclusion (indeed, it was deductively valid, in this case), Ted could be persuaded by the argument to accept the conclusion as a plausible proposition. This pattern of argument leads to the following working implementation of the more plausible premises rule as applicable to cases where a critic has the job of evaluating whether an argument begs the question or not.

> MORE PLAUSIBLE PREMISES RULE:
> *If an argument is to be capable of meeting the requirement of evidential priority which is to make it a useful or potentially successful argument relative to a critical discussion,*

7. See Walton (1989, chapter seven).

> *then (a) the premises must be more plausible than the conclusion, or (b) routes of further argument to the premises must be open so that, through further argument, the premises could be shown to be more plausible than the conclusion, as the dialogue continues.*

It is important to note that applying this rule depends on the argument reconstruction. If the argument is linked, then each premise must be more plausible (actually or potentially). But if it is convergent, only one more plausible line of argument needs to be open.

It should be pointed out that two versions of the more plausible rule are open to consideration. The version above is the weaker version. The stronger version deletes clause (b) above, retaining only clause (a). No doubt, many would prefer to adopt the stronger version, instead of the weaker version proposed above. The issue of which version is chosen has highly significant implications for any analysis of the fallacy of begging the question.[8]

The problem with the stronger version is that it leaves the proponent of a thesis no room to develop an argument. If he asks his respondent to tentatively accept a premise, in order to open up a line of argumentation, even though this premise is not (immediately) more plausible than the conclusion to be proved, the respondent can at once criticize his argument for committing the fallacy of begging the question. It is for this reason that the weaker version of the more plausible premises rule is preferable in some cases. However, once a critical discussion has been properly closed, and all the relevant arguments on both sides have been considered, the strong version of the more plausible premises could be the more appropriate version. But in fact, criticisms are often made in the middle (argumentation stages) of a dialogue. Hence the more dynamic (weaker) version of the more plausible premises rule is more generally applicable at the argumentation stage of a critical discussion.

8. See Walton (1991).

The reason that the more plausible premises rule is appropriate in this case is that Ted has expressed frank doubts that the conclusion is plausible. Therefore, in order to overcome these doubts, Eva will have to find premises that are more plausible than the degree of plausibility that Ted initially attaches to the conclusion. This case is not a compound dispute, in the sense of van Eemeren and Grootendorst (l984),[9] as far as we know from the *corpus* of the dialogue, at any rate. Ted, in other words, does not enter into the argument with the thesis that whales are not mammals. He has only expressed doubts about the plausibility of this proposition.

The more plausible premises rule is not a requirement of every context of argument. In some cases, it is clearly obligatory. In other cases, we may not know whether it is an appropriate requirement or not, because we simply do not know enough about the context of dialogue from the given *corpus* of the argument. And in other cases, it can be evident that it is not a requirement.

7. Arguments that are Useless for Persuading

What makes an argument useful for the purpose of reasonable persuasion is that the plausibility value of the premises should be (at least potentially) greater than that of the conclusion, from the point of view of the respondent to whom the argument was addressed. The rationale behind this requirement is simple. The respondent in a critical discussion is disinclined to accept the conclusion of an argument presented to him by the proponent. The respondent needs to be convinced. How to convince him? The usual way is for the proponent of the argument to present premises that the respondent is already committed to, or, at any rate, premises that he can be brought to accept, because he can find them plausible. Then the proponent can *use* these premises, in arguments that have conclusions that the respondent can be driven (persuaded) to accept, by means of these arguments.

9. Van Eemeren and Grootendorst (1984, p. 80).

What we are talking about here is not just the logical form or semantic structure of these arguments, *per se*. We are talking about how such arguments can be *used* in order to fulfill goals of dialogue, e.g. to persuade a respondent to accept a conclusion he is initially inclined to be doubtful about. Arguments that fail the more plausible premises requirement are not faulty or open to criticism because they are deductively invalid, or because they fail to have a semantically valid form of argument. They are faulted because, even if they are deductively valid, they are useless to persuade a doubter.

The basis of criticism in a critical discussion is not always that the argument is formally invalid. Rather, a common and legitimate type of criticism is that the argument is not useful for the purpose it was supposed to have in the critical discussion designed to resolve a conflict of opinions. To resolve such a difference of opinions, plausible reasoning must be brought to bear through arguments that can be useful to change a respondent's opinions on an issue. The two basic configurations of argumentation that are useful for the purpose of reasoned persuasion are the linked argument and the convergent argument. These are pragmatic structures of argumentation, and the distinction between them is therefore best seen as relative to a context of reasoned dialogue. Here, we have been primarily concerned with critical discussion, although, to be sure, other contexts of argumentation could be important as well.

In a critical discussion, the distinction between the linked and convergent structures of argumentation is to be drawn in tactical terms of successful attack and defence. In the linked argument, a successful attack or questioning of the argument implies that the whole argument "falls down" (is refuted). By contrast, in the convergent argument, a successful attack still leaves open the possibility of a successful rebuttal. This way of putting the distinction in terms of attack and defence is fruitful and appropriate in persuasion dialogue, because of the designated rules of the two participants in this type of dialogue. The proponent has the burden of proof –he must persuade the respondent, using plausible premises,

in order to win the game. His argument has to "move forward" from the premises to the conclusion. The respondent –the person to whom the argument is directed in dialogue– has the burden or rule of questioning (resisting) the argument. If he fails to do this successfully, the argument will go forward and carry the weight of presumption, by default. Whether the argument is good or bad, defensible or fallacious, and so forth (positively or negatively evaluated) depends on the shifting back and forth of these burdens. Therefore, ultimately the criterion of how the argument is to be evaluated can be put in terms of available attacks and defences in a context of dialogue.

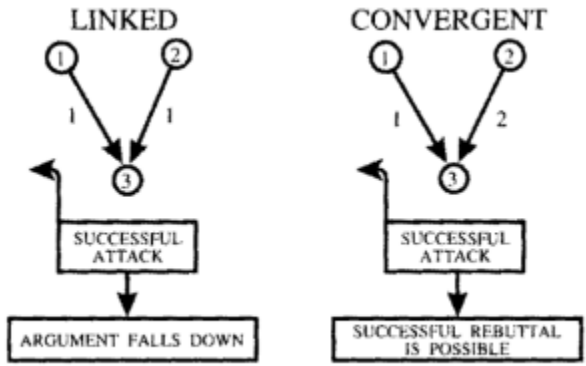

Figure 6

The critic's strategy in a linked argument should be to attack the weakest premise. The analogy is to the attackers of a medieval castle. The attacking force seeks out the weakest point in the wall. The defenders, consequently, must concentrate their forces on that point as well, trying to patch up the weak spot as strongly as necessary to repel the attack.

In a convergent argument, however, the critic's strategy should be to attack the strongest premises first. Once again, the defender must match the point of attack. If one side is not plausible or strong, he must go to the other side, and try to build up that defence. The analogy here is not that of defending a fort. It is like a two-pronged (or multiple-pronged, in the general case) attack,

where there are two separate columns of attacking forces. When one column is met with a counter-attack that overwhelms it, the appropriate tactic must be to press ahead with the other stronger column, in the hope of breaking up the counter-attack. If one line of effort is not working for the defender, his best tactic is to go to the other one. In general, his best strategy is to back up his strongest line of argument as fully as possible. If another line appears weak, it can be abandoned without losing the over all struggle.

Plausibility rules for divergent and serial argumentation can also be formulated. In a divergent argument, you can conclude to either conclusion (2) or conclusion (3) below.

DIVERGENT ARGUMENT

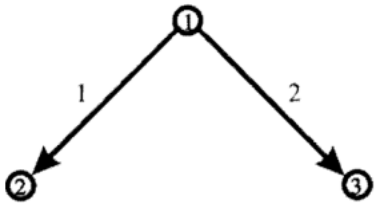

Figure 7

Hence, in this kind of argumentation, the plausibility value of both 2 and 3 should be adjusted upwards to the value of (1), if (2) and (3) are not already at that value or higher.

With serial argumentation, the MAXMIN RULE is operative, because everything depends on whether the links in the chain of argumentation are linked or convergent. But generally, the longer the chain of argument for a conclusion, the more escape routes and openings for questioning there will be for a critic to find. Therefore, the basic principle governing serial argumentation in persuasion dialogue was enunciated by Windes and Hastings (1965, p. 218) as follows: “[The proponent] should begin the chain of proof at the most advanced evidence which the audience will accept and move to the proposition [the conclusion] from there.” In a serial argument the values are adjusted upwards sequentially.

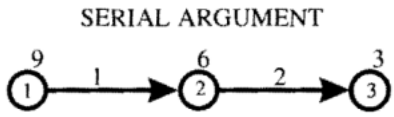

Figure 8

In the argument in figure 8, for example, if both steps 1 and 2 are plausible and complete arguments for the conclusions (2) and (3) respectively, then the required plausibility adjustments are as follows. First, the value of (2) is raised to 9, to meet the value of (1). Then, in a second phase of adjustment, the value of (3) is raised to 6, to meet the value of (2). But then a third phase of adjustment is also required –the value of (3) must be raised again to meet the new value of (2), namely to 9. Thus serial argumentation requires a whole series of adjustments, as far along a chain of argumentation as is required to meet all adjustments. The problem is that arguments in persuasion dialogues are not one-step affairs. A respondent must often give a proponent of an argument "room to argue," meaning that it may not always be reasonable to immediately require premises that are more plausible. In some cases, a premise could be acceptable, at least provisionally, if it shows promise of leading to other premises (from which it follows) that are more plausible. In other words, it is not the immediate premises of an inference, but the ultimate premises that are required to be more plausible, if the chain of argumentation based on those premises is to be successful in persuasion regarding a doubtful matter.

Hamblin's reorientation of the problem shows that we need to evaluate the worth of premises in a persuasion dialogue in relation to how these premises can ultimately stand up to critical scrutiny by the respondent they were advanced to convince. And this, in turn, indicates the importance of the distinction between linked and convergent arguments. It will be recalled that, according to van Eemeren and Grootendorst (1984, p. 91), the crucial difference between linked and convergent argumentation turned on the sequences of the respondent's calling the argument into question. In the linked argument, the proponent has to defend all his

premises, whereas in the convergent argument, the proponent need only defend one premise as plausible in order to meet the goal of convincing the respondent. The new rules proposed above fit these requirements of the use of reasoning to rationally persuade a respondent in a critical discussion in order (ultimately) to resolve a conflict of opinions.

Generally, it seems appropriate to have different kinds of rules of plausible reasoning for different types of dialogue in which argumentation occurs. However, it is the contention of this paper that Rescher's "least plausible premise" approach is suitable to provide the basis for a set of rules appropriate for the critical discussion as a type of dialogue. However, these rules require the additions and modifications proposed above, in order to fit this context of the use of argumentation.

References

Bratko, Ivan. *Prolog Programming for Artificial Intelligence*, Reading, Mass., Addison Wesley, 1986.

Eemeren, Frans H. van and Rob Grootendorst, *Speech Acts in Argumentative Discussions*, Dordrecht and Cinnaminson. Foris Publications, 1984.

Forsyth, Richard. *Expert Systems*, London, Chapman and Hall, 1984.

Hamblin, Charles L. *Fallacies*, London, Methuen, 1970.

Intelliware, *Experteach* (Software and Manual), Intelligence Ware, Inc., Los Angeles, 1986.

Rescher, Nicholas. *Plausible Reasoning*, Assen Amsterdam, Van Gorcum, 1976.

Rescher, Nicholas. *Dialectics*, Albany, State University of New York Press, 1977.

Rescher, Nicholas. *Rationality*, Oxford, Oxford University Press, 1988.

Walton, Douglas N. *Informal Logic*, Cambridge, Cambridge University Press, 1989.

Walton, Douglas N. *Practical Reasoning*, Savage, Maryland, Rowman and Littlefield, 1990.

Walton, Douglas N. *Begging the Question*, New York, Greenwood Press, I991.

Walton, Douglas N. *Plausible Argument in Everyday Conversation*, Albany, SUNY Press, 1992.

Walton, Douglas N. and Lynn M. Batten, "Games, Graphs and Circular Arguments," *Logique et Analyse*, 106, 1984, 133-64.

Windes, Russel R. and Arthur Hastings, *Argumentation & Advocacy*. New York. Random House, 1965.

1981 Vol 4: What Is Logic About?

Douglas Walton

Mrs. Jones has her ear cupped to the wall adjoining the next apartment. She hears some tense, guttural pronouncements – a man's voice? Then she hears some higher pitched responses that a speech act theorist might describe as "aggrieved whining". The lower voice now breaks into loud staccato accusatory stabs of statements. Mrs. Jones can even make out some unprintable words. The higher voice now responds with unmistakable screams, audible even to Mr. Jones, who is trying to read *Maclean's* magazine. The crescendo of voices is punctuated by a crash of crockery. "What's going on over there?" Jones queries his wife. Mrs. Jones replies, "They're having an *argument!*"

The paradigm probably most of us have of an argument – at least those of us relatively uncontaminated by the study of logic – is that of a verbal interchange between or among a number of participants with (a) an adversarial or disputational flavour, and (b) heightened emotions, very often anger, being involved. Of course none of these items is absolutely essential. One can argue with oneself. One can have a friendly, or constructive argument. And one can argue unemotionally, in the style of Mr. Spock, the imperturbable Vulcan. Nonetheless, hot interpersonal dispute is among the commonest conceptions of argument. Let us call this model of argument the *quarrel* (more fully exposited in the work cited in note 8, Ch. 1).

According to the much more modest and sober, not to say austere, conception of argument favoured by twentieth-century logic, an argument is merely a set of propositions. This conception strips away the emotion, the interpersonal element, and even the adversarial notion of disputation. By this conception, an argument can

even be some chalk marks on a blackboard or ink-marks on a page, according to some of the most determined exponents of austerity, at any rate.

If we define logic to be the science of argument, which model of argument is better to start with? The first one is obviously rich in psycho-social information. Ann Landers would find lots there to be interested in. The second is very rich in mathematical results. Boole and subsequent generations of mathematicians have found lots there to be interested in.

It is not too hard to see the fascination of each model for the critic of arguments. The second one admits of formal models that are decidable and complete. You can tell by objective tests which arguments are correct and which fall short of correctness. That is worth studying. The first one gives real-life case studies of actual arguments, refutations and fallacies. Critics have, however, pointed out limitations of each model.The first model is unstable, subjective, even unruly. Too often it seems impossible to tell who is mostly right or wrong, or even what the argument is. The second model is provably correct as far as it goes, but it is questionable to what extent it applies to lively specimens of realistic argumentaion. Are we forced to choose between them?

Sometimes exponents of one model will partially acknowledge the other. Gricean conversation theory argues that classical deductive logic is the right logic, but it needs to be trimmed with conversational niceties in order to approximate the do's and don't's of natural discourse.[1] On the other hand, some who stress the study of real life actual argumentation may concede that formal logic has its place. It's just that arbitrary designation of a set of propositions as *argument* does not go far enough. It is a legitimate – but informal – task to determine what the argument is, even before it gets processed further.

1. H. P. Grice, "Logic and Conversation," in *The Logic of Grammar*, ed. Donald Davidson and Gilbert Harman, Encino, California, Dickenson, 1975, 64-74.

But the question remains whether we have to choose between these two models of argument. Are there other alternatives?

Aristotle, the founder of the subject of logic, distinquished two models of argument, neither of which is precisely identical with either of the pair above. Aristotle defined a *demonstrative argument* as one in which the premisses are better known than the conclusion, so that the conclusion may be established on the basis of the premisses. This is an asymmetrical model of argument. If *p* is a correct argument for *q,* then *q* cannot be a correct argument for *p.* It is also irreflexive.The classical inference pattern "*p,* therefore *p*" cannot be correct according to the demonstrative model of argument. Aristotle defined a *dialectical argument* as one in which the premisses are presumed to be true, or thought to be true by the wise or some other source that falls short of guaranteeing that the premisses are known to be true.

These facts about Aristotle are well known, but they are worth reviewing because they posit two models of argument distinct from the quarrel or the purely deductive model. In modern treatments, the first model is akin to the model of epistemic logic developed notably by Hintikka.[2] The second has been formalized in recent times by the dialectical games of Hamblin.[3] According to the dialectical model, an argument is a two or many person game with a set of rules that defines permissible moves in orderly sequence, and a win-strategy. Each move is a proposition, indexed to a participant.

These dialectical and demonstrative models of argument are a nice compromise because they capture the personal element, the give-and-take of disputation, and the directionality of reasoning. But at the same time the rules are clear, and the model is amenable to decision procedures to determine correctness or failure of correctness. Kripke has even given an interpretation of the intuitionistic

2. Jaakko Hintikka, *Knowledge and Belief*, Ithaca, N.Y., Cornell University Press, 1962.

3. C. L. Hamblin, *Fallacies*, London, Methuen, 1970.

calculus that would seem to make it a very good model of one kind of demonstrative argument.[4]

A major problem is that there are many formal models of dialectical and demonstrative reasoning. So the application problem is very much with us. Which of these is most applicable to realistic argumentation where fallacies and other good or bad steps of reasoning take place? The realistic models of the quarrel, or even the discussion, or Socratic disputation, or debate cannot be left behind. Even the model of argument as a set of propositions is incorporated into the dialectical and demonstrative models.

If all four models of argument so far identified have a legitimate role to play in the theory of argument, do we not seem to be enmeshed in a hopeless pluralism? Not to mention the inductive-deductive pluralism discussed. in recent issues of this newsletter![5] Is there some common root to these various models? In essence, we are asking: What is logic about? I will not try to settle this question. Suffice it to say that it is my own opinion that we will only be able to work towards an answer to it by means of a more attentive study of the so alled informal fallacies – traditional, significant sophisms of argument that provide benchmarks for the analysis of argument.

Logic, argument, and fallacy – the three concepts are closely connected. But how closely? Charles Kielkopf has warned us that there may be fallacy (at least of the traditional sort, like *ad baculum)* without argument.[6] But perhaps more narrowly and properly construed, a fallacy should be a fallacious argument. Certainly

4. Saul Kripke, "Semantical Analysis of lntuitionistic Logic I," in *Formal Systems and Recursive Functions* ed. J. N. Crossley and M. A. E. Dummett, Amsterdam: North-Holland, 1965, 92-130.

5. David Hitchcock, "Deduction, Induction and Conduction," *ILN*, iii.2, 1981, 7-15.

6. Charles Kielkopf, "Relevant Appeals to Force, Pity, and Popular Pieties," *ILN*, ii.2, 1980, 1-5.

logic is about arguments, and thereby about fallacies. Without pursuing these interconnections further, let me pose one problem about them.

Mrs. Jones, ear cupped to the wall again, hears what appears to be the higher voice saying, "George, you're so inconsistent. You tell me not to back-seat drive, and then the other day you criticized my failure to signal a turn. You're always lecturing me on the foolishness of smoking, and you can't give up the habit yourself, … " Mr. Jones looks up, "What's going on?" Mrs. Jones replies, "She just accused him by means of the circumstantial *ad hominem.*"[7]

Here we have an argument, and a very interesting one at that. George stands accused, not of logical inconsistensy, but of an action-theoretic circumstantial conflict that may, or may not, be reducible to some logical inconsistency. In a nutshell, he is accused of failing to practise what he preaches. This lapse, if not defensible, may indeed be a serious ethical failure or at least evidence of one. But despite the traditional *ad hominem* label, is it really a lapse of logic? Are George's arguments incorrect because of his actions? A hard question, but if the answer is to be "yes", it is equally hard to see how the argument can be elucidated by any of the four preceding models of argument.

George may even admit that he can't give up smoking and that he is thereby circumstantially inconsistent. He may still maintain his condemnation of smoking is, in itself, sound. Is his argument good, bad, or partially both? We might say that the argument is O.K., but that George's own personal advocacy of it is questionable. In other words, according to one model of argument – an impersonal one – the argument is good. According to another model – a person-relative one – the argument can be criticized negatively. In short, we

7. John Woods and Douglas Walton, "Ad Hominem," *The Philosophical Forum*, 8, 1977, 1-20.

are back to a relativity of pluralistic models.[8] Just as worrisome, we are on the border line between the logic of argument and the ethics of argument. It is not entirely clear that the lapse, if there is one, is a failure of logic as opposed to a moral incorrectness of Goerge's actions.

Should the circumstantial *ad hominem* be taken out of the logic textbooks and put into the ethics textbooks? I do not think so. Not yet anyway. If only by dint of the inertia of a tradition in which, there is some wisdom, it should not be turfed out too hastily. The concept of argument is fluid and unsettled in such a way as to accommodate questionable characters like the circumstantial *ad hominem.* Still, one cannot but suspect that George is being criticized more for his morals than for his logic.

Editor's Note: After his review of the four models of argument – the quarrel, the set of propositions, the demonstration and the dialectical interchange – Professor Walton wonders if there is a common root, and announces that "We will only be able to work towards an answer" by studying the informal fallacies more attentively. The only support he gives for this appears to be the comment that logic, argument and fallacy are closely connected, and that, *pace* Charles Kielkopf (*ILN*, ii.2), "properly construed, a fallacy should be a fallacious argument". For one who would deny any necessary connection between fallacy and argument, this won't do; so assuredly Walton owes us further support here. But beyond that, his intriguing suggestion that the notion of fallacy will unlock the mystery of the concept of argument, and thence explain what logic is, merits amplification. And it is perhaps doubly deserving of development in light of a couple of recent challenges to the adequacy of our analyses of informal fallacy. One I'm thinking of is Maurice Finocchiaro's grim indictment of the handling of fallacies in textbooks:

8. John Woods and Douglas Walton, *Argument: The Logic of the Fallacies*, Toronto and New York McGraw-Hill-Ryerson, 1980.

> In summary, textbook accounts of fallacies are basically misconceived, partly because their concept of fallacy is internally incoherent, partly because the various alleged fallacious practices have not been shown to be fallacies, partly because their classification of fallacies is unsatisfactory, and partly because their examples are artificial. *(American Philosophical Quarterly.* Vol. 18, No. 1, January 1981, p. 18.)

The other is the chapter on informal fallacies in Karel Lambert and William Ulrich's recent text. *The Nature of Argument* (Macmillan, 1980), Lambert and Ulrich conclude,

> … we are suggesting that until a general characterization of informal fallacies can be given which enables one to tell with respect to any argument whether or not it exhibits one of the informal fallacies, knowing how to label certain paradigm cases of this or that mistake in reasoning is not really useful for determining whether a given argument is acceptable. (p. 28.)

In the face of these dissatisfactions with the development of the theory of informal fallacies, it looks as though the burden of proof shifts to Walton's side.

Finally, Walton's puzzle about how to handle the circumstantial *ad hominem* is indeed perplexing, but how does it bear on the issue of whether the study of the informal fallacies is the correct route to the heart of the concept of argument, and thence the explanation of what logic is?

Walton's answer to this question might be that the informal fallacies exist; they are committed here, there and everywhere, and so they are the raw material from which we must start. We must be empirical, and start our analysis from what we know to be errors in arguments. Let's look and see. The trouble with this answer is, as I've indicated, some hold that when we claim there are fallacies, we're making things up. So who is right?

J.A. Blair

2014 Vol 34: A Dialectical Analysis of the Ad Baculum Fallacy

Douglas Walton

Abstract: This paper applies dialectical argumentation structures to the problem of analyzing the *ad baculum* fallacy. It is shown how it is necessary in order to evaluate a suspected instance of this fallacy to proceed through three levels of analysis: (1) an inferential level, represented by an argument diagram, (2) a speech act level, where conditions for specific types of speech acts are defined and applied, and (3) a dialectical level where the first two levels are linked together and fitted into formal dialogue structures. The paper adds a new type of dialogue called advising dialogue that needs to be applied at the third level.

1. Introduction

The objective of this paper is not to give an overall survey of *ad baculum* arguments. That has already been done in the literature, for example in (Walton, 2000). This literature already abundantly recognizes that not all instances of *ad baculum* arguments are fallacious. The focus of this paper is on the *ad baculum* fallacy, and the aim of the paper is to show that it needs to be modeled as a dialectical failure, and thus cannot be explained as a purely inferential failure of some sort. The paper presents a ten-step evaluation procedure for evaluating whether a given instance of an *ad baculum* argument is fallacious or not, and a dialectical theory explaining why such an argument is fallacious, if it is, or why not, if it is not.

The *ad baculum* fallacy is said by the logic textbooks, such as Copi and Cohen (1990, 105) to consist in the "appeal to force to cause the acceptance of some conclusion". The normal way of doing this

is to make a threat. Some relatively simple examples of this tactic found in the informal logic textbooks are cases of the use of a direct threat by an arguer. More complex cases involve the use of an indirect threat. For example, Copi and Cohen add that an *ad baculum* argument can be applied with "considerable subtlety" if the arguer uses a "veiled threat" that makes no explicit or direct threat to intimidate a respondent. The *ad baculum* argument built on such an indirect threat has tended to be a more difficult kind of case to pin down and evaluate by the traditional methods of logic, which define an argument only as a set of propositions comprising premises and a designated member of the set called the conclusion. But in *ad baculum* examples, context, suggestion and innuendo or implicature are involved, as shown in this paper. Is there some objective way to use such contextual evidence to furnish an objective method to evaluate *ad baculum* arguments of this kind? This paper provides such a method by showing how the inferential and speech act level of analysis of this fallacy needs to be extended to a dialectical level, the so-called dialectical tier of Johnson (1996).

Section 2 gives a brief review of the relevant literature on the *ad baculum* fallacy. Section 3 presents a simple example of a direct threat argument from the artificial intelligence literature and a more complex textbook example of an indirect threat, and uses simple argument diagrams to make a first pass at grasping the structure of the arguments. Argumentation schemes are applied in sections 4 and 5 to insert additional implicit premises and conclusions into the arguments to get better analyses of the logical structure of the examples. Section 6 formulates sets of requirements that define three types of speech acts, the speech act of warning, the speech act of advising, and the speech act of making a threat. Section 7 briefly explains the notion of an indirect speech act. Section 8 steps up to the dialectical tier by introducing a new type of dialogue called advising dialogue to the existing classification of types of dialogue that function as frameworks for argumentation. Two examples from *Consumer Reports* are given to illustrate this type of dialogue and reveal its main characteristics. Section 9 presents a dialectical analysis of the argumentation in both examples.

The analysis explains why the argument in each example should be taken to be an instance of the *ad baculum* fallacy or not. Section 10 explains how the fallacy works in the example by showing the juxtaposition of appearance and reality that is revealed once the dialectical structure of the argumentation in the case has been analyzed. Section 11 summarizes the method of evaluating *ad baculum* arguments as a ten-step procedure and offers some general conclusions and suggestions for further research.

2. The literature on *ad baculum*

According to the account given in this paper, not all *ad baculum* arguments are fallacious. The goal of the paper is to diagnose what has gone wrong when such an argument is used fallaciously, and so the brief survey of the literature in this section covers previous attempts to solve this problem. A wider survey on the *ad baculum* arguments can be found in (Walton 2000).

Woods and Walton (1976) surveyed the accounts of the *ad baculum* fallacy in the logic textbooks, concluding that these accounts have so far failed to solve the problem of explaining why the *ad baculum* argument is fallacious. They analyzed the form of the argument as being a disjunctive syllogism of a kind that can be classified as a prudential type of argument. However they added that in many instances such a prudential argument could be seen as reasonable. They concluded that the question is open on how instances of arguments normally classified as *ad baculum* in the logic textbooks can be diagnosed as fallacious. Woods (1987) reaffirmed the earlier Woods-Walton conclusion that argumentum *ad baculum* can be a reasonable form of argument because it meets the standards required for prudentially sound argument. An argument from negative consequences can often be a good argument by incorporating a threat to negative consequences, that can often be a reasonable basis for one party to commend a certain line of action to another party.

Opinions in the literature on *ad baculum* are sharply divided on the issue of whether trying to build a dialectical analysis of the fallacy is a good direction for research. Van de Vate (1975) characterized this type of argument as being inherently dialectical. Van de Vate made this point as follows (1975, 45): "Regarding the appeal clearly as an appeal to force must involve at least two parties. One can't appeal to force to oneself." In order to understand the fallacy, he theorized that one must situate the *ad baculum* argument in the context of an argumentative exchange between two parties. Wreen (1988) argued that the *ad baculum* fallacy is not dialectical and is not based on threats. Brinton (1992) argued that the *ad baculum* fallacy is dialectical and is based on threats. Walton (2000) argued that the *ad baculum* fallacy is dialectical.

The exchange between Wreen (1988) and Brinton (1992) was particularly significant in suggesting directions that future research on the *ad baculum* fallacy would take. Wreen offered a number of examples of the *ad baculum* fallacy, and showed that they centrally involved a particular form of argument in which one party threatens another party by advising the other party that he should carry out a particular action or suffer some negative consequences which the first party will bring about. He offered the following typical example: if you don't give me your money, I will shoot you; getting shot would be a very bad outcome for you; therefore you should give me your money. Wreen saw this inferential structure as an instance of the form of argument known in the literature as practical reasoning. Brinton went on to argue that Wreen's theory was a good starting point, but it failed to take into account other elements that are necessary for an adequate model of the *ad baculum* argument that can be used to explain how the fallacy works.

Brinton (1992, 90) argued that the structure of the *ad baculum* fallacy involves what he called an agent-patient relationship, a context of use into which the inferential structure of the *ad baculum* argument is embedded. He argued that successful use of the argumentum *ad baculum* presupposes a relationship of power between two parties. On this account of this relationship, one party plays

the role of an agent while the other plays the role of the patient (Brinton, 1992, 91). In this framework the agent arguer imposes a "presence" on the other party that creates a reason for action within the argument itself. This separation of the inferential and transactional aspects of the *argumentum ad baculum* turned out to be a prescient indicator of the direction future research on the *ad baculum* fallacy would take. Brinton's notion of the power relationship between the two parties in an *ad baculum* argument foreshadowed the status function (see below) used by Budzynska and Witek (2014, section 3.3) to analyze the *ad baculum* fallacy.

Kielkopf (1980) complained that the textbook treatments of the *ad baculum* fallacy are superficial and misleading. He cited the treatment of the fallacy in Copi's widely used textbook, saying it is "committed when one appeals to force or the threat of force to cause acceptance of a conclusion." On Kielkopf 's account, (1980, 2), this explanation is superficial because it fails to "distinguish between what is relevant as a reason for acting, from what is irrelevant for thinking that a claim is true". This conclusion reinforced the point made by Woods and Walton (1976) and Woods (1987) that appeal to force or the threat of force to cause acceptance of a conclusion, for example in diplomatic negotiations,may not necessarily be fallacious.

In (Walton 2000) a distinction was drawn between three kinds of arguments traditionally classified by the logic textbooks as falling under the heading of *ad baculum*: (1) the scare tactics type of argument that does not contain a threat, but merely describes some scary outcome to influence a respondent; (2) the threat appeal type of argument, where the making of a threat by one party is used to present an argument designed to try to get another party to take some course of action; and (3) the use of force by one party to try to get the other party to take some course of action. This paper will be exclusively concerned with category (2) and, centrally, with a difficult type of instance of the threat appeal argument where the threat is put forward as an indirect speech act.

The latest development in the analysis of the *ad baculum* fallacy is a recent paper (Budzynska and Witek, 2014) arguing that it is a deficiency of the standard model (Walton, 2000) that it is merely an inferential model involving premises and conclusions that fails to capture the basic rhetorical technique of this fallacy, which needs to be based on speech acts. Budzynska and Witek (2014, section 3.3) show that the communicative and cognitive tactic deployed in the *ad baculum* argument is an application of a speech act that has two parts. The directive part of the *ad baculum* speech act has the use of placing an obligation on the respondent to carry out the action that is the conclusion of the argument. The use of the commissive part of the argument is to indicate the proponent's so-called "status function". The notion of the status function derives from the analysis of speech acts in (Searle, 1969). This function contains the proponent's power to give the respondent binding orders with respect to an action to be carried out. The proponent tells the respondent that he or she should bring about a particular action that is being recommended by the proponent. Using this function, the proponent has the power to make binding directive acts that apply to the respondent in an exchange between the two parties.

3. Two examples

We begin with what appears to be a very simple case from artificial intelligence. Kraus, Sycara and Evenchik (1998) have built a computational argumentation model in which agents in a multi-agent system can use argumentation as a mechanism for achieving cooperation and agreement. In their system, agents plan and act together using practical reasoning to resolve conflicts, and one of the ways they resolve conflicts is to negotiate with each other. Quoted below (Kraus, Sycara and Evenchik, 1998) is their leading example used to illustrate in a simple case how two agents might interact in a standard sequence of argumentation.

> "For example, imagine two mobile robots on Mars, each built to maximize its own utility. R_1 requests R_2 to dig for a certain mineral.

> R_2 refuses. R_1 responds with a threat: "if you do not dig for me, I will break your antenna". R_2 is faced with the task of evaluating this threat. Several considerations must be taken into account, such as whether or not the threat is bounded, what R_1's credibility is, how important it is for R_2 to have its antenna intact, so on and so forth. R_1 may take a different approach if R_2 refuses to dig, and respond with a promise for a reward: "if you dig for me today, I will help you move your equipment tomorrow". Here, R_2 needs to evaluate the promise of future reward."

In light of the traditional treatments of the *ad baculum* fallacy in logic, this example is interesting for several reasons, based on the way the example is presented. The first reason is that even though R_1 has put forward an argument that takes the form of a threat, it seems to be assumed by the way the example is presented that the argument is not inherently fallacious. When faced with the task of evaluating the threat, R_2 is said to have several considerations that must be taken into account. These remarks suggest that the threat argument may not be entirely unreasonable, and that it can be responded to appropriately by the asking of critical questions that provide the basis for judging how to respond to the threat.

Also, it is said in the example that each of the robotic agents is built to maximize its own utility. This implies that both robots are programmed with goals, and are autonomous agents that can use practical reasoning to seek actions that are means to carry out these goals. To see how R_2 might use this kind of reasoning to figure out what to do, examine the argument diagram in figure 1. In its simplest form, an argument diagram, or argument map as it is often called, is composed of two elements, a set of propositions representing premises or conclusions of arguments, and a set of arrows representing inferences from some propositions to others. For this reason an argument map is often called a box and arrow diagram, a visual representation of an argument formed by drawing arrows leading from text boxes to other text boxes. An argument diagram takes the form of a tree structure in which there is a single proposition representing the ultimate claim or thesis to be proved at the

root of the tree. All the other propositions are premises or conclusions that lead along branches of the tree to this root proposition.

An argument diagram can easily be made using pencil and paper, but nowadays there are many argument visualization tools that can be used to assist in drawing an argument diagram that can be saved and later modified. Such argument mapping tools have now become centrally important argumentation methods in their own right, as they can perform different functions that are helpful for clarifying, analyzing, summarizing and evaluating arguments. There are now over sixty computational argument mapping systems (Scheuer et al., 2010) that can be used to summarize or analyze argumentation in a visual format on a computer screen for various purposes. The style of diagrams adopted in this paper is that of the Carneades Argumentation System (CAS). The Carneades editor (version 1.0.2), a visualization tool for CAS, can be accessed at http://carneades.github.com. CAS is an Open Source software (permits users to change it) project, which has the goal of developing tools for supporting a variety of argumentation tasks, including argument mapping and argument evaluation, by applying proof standards and the notion of an audience (Gordon, 2010). Carneades formalizes argument graphs as bipartite directed graphs, consisting of argument nodes linked to statement nodes. In CAS argument maps, statement nodes are represented as text boxes that contain propositions. Argument nodes are represented as circles using a + or – sign inside the circle to denote pro and con arguments.

Carneades treats a convergent argument as two separate arguments by showing the convergent argument as displaying two or more arguments, each indicated by a circle node, each leading separately to the same conclusion. A linked argument is drawn by showing two or more premises leading to the same argument node that then goes by a line with an arrowhead leading to the conclusion. Two linked arguments are shown in figure 1. The statement nodes are the rectangular boxes. The argument nodes are the two circles containing the plus signs. The two premises, in each instance, are the

statements in the text boxes to the right of the circle node representing the argument.

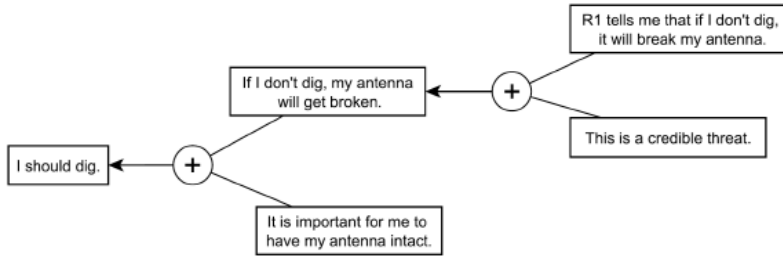

Figure 1: R_2's Reasoning in Response to R_1's Threat.

In figure 1, let's say that an agent's goal is represented by the statement 'It is important for me ….'. Then the argument at the left can be seen as instance of practical reasoning. The argument at the top, let's say, can be represented as an argument from threat. So what's wrong with the threat argument shown in figure 1? Perhaps there is nothing wrong with it, from R_2's point of view. If R_2 has nothing better to do at that time anyway, but it is important for him to preserve his antenna for future use in the mission, maybe it would make practical sense for it to dig. The upshot of our observations in this example is that it might be very unwise to assume that *ad baculum* arguments are fallacious, by adopting the theory that making any kind of threat in argumentation should automatically be classified as an unreasonable or fallacious form of argument.

Also, it is said that depending on how R_2 responds to R_1's argument, R_1 may take a different approach and put forward a follow-up argument that offers a reward to R_2. Offering a reward is a typical instance of practical reasoning that proceeds by offering an incentive to the party to whom the argument was directed to try to get the party to carry out a particular action. So if offering a reward is not fallacious, why is it that we seem to jump much more easily to the conclusion that making a threat is generally a fallacious form of argument.

Next let's move on to consider an example that introduces some additional complications. The following case is typical of the kind of example used by the logic textbooks to illustrate cases of an *ad baculum* fallacy based on a threat (Walton, 2000, 123).

> A known gangster says to the owner of a small business: "You should pay us protection money, because this is a very dangerous neighborhood. The last guy who didn't pay had his store looted and destroyed, right after he failed to pay".

Threats can be nasty, dangerous, impolite, scary, unpleasant, irrelevant, and even illegal in some instances. Hence it is easy to jump to the conclusion that the *ad baculum* argument used in this case as fallacious. But it is harder to try to pin down a precise general way why an argument of this kind should be evaluated as fallacious. Making a threat is generally recognized as a legitimate tactic in negotiation, thus it is a relevant and important type of argument to be used in strategic maneuvering. For example in contract negotiations between union and management representatives, making a threat is commonly accepted as normal tactic in the strategic maneuvering carried out during the bargaining process by both sides. Of course, the making of a threat can be illegitimate or irrelevant in some instances, but the problem of pinning down exactly what these instances are is not as easy as it looks.

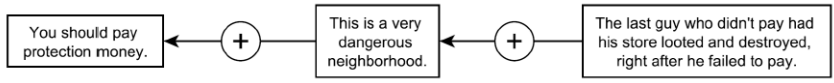

Figure 2: First argument diagram of the gangster example

The argument diagram shown in figure 2 represents the simplest analysis of the argumentation in the gangster example. There are two explicit premises and an explicit conclusion. No indication is given whether either of the arguments fits any known argumentation scheme. This argument diagram seems reasonable enough in representing the basic argumentation structure of the gangster example. The problem is that it is too superficial to reveal anything

about the nature of the argument move. It doesn't tell us much of anything, one way or the other, on whether the argument is a fallacious *ad baculum* or not.

The upshot of our observations on these examples is that it might be very unwise to assume that *ad baculum* arguments are fallacious, by adopting the theory that making any kind of threat in argumentation should automatically be classified as an unreasonable or fallacious form of argument. To probe into the structure of the argument further we have to use some other tools.

4. Practical reasoning and argument from consequences

In the simplest and most basic kind of practical reasoning, a rational agent reasons from a goal, and an action that represents a means to reach the goal, to a conclusion that it should carry out that action. A *rational agent* is an entity that has goals, some (though normally incomplete) knowledge of its circumstances, the capability of acting to alter these circumstances, and the capability to perceive (some of) the consequences of so acting. It also has the capability for feedback, meaning that it can change its conclusion on how to act and its goals as it gathers incoming knowledge about the consequences of its actions. The following scheme represents the basic form of practical reasoning. In this scheme the first-person pronoun 'I' stands for a rational agent of this kind (Walton, 1996).

Goal Premise: I have a goal, *G*.
Means Premise: Carrying out this action *A* is a means to realize *G*.
Conclusion: I ought (practically speaking) to carry out this action *A*.

Here the term 'ought' (or equivalently we could use the term 'should') is interpreted as offering prudential reasoning for the wisdom of carrying out a designated action. Practical reasoning is a defeasible form of argumentation, meaning that its conclusion is subject to retraction when new information comes in, even though the original premises of the argument still hold. It can be

defeated by the asking of critical questions or by the posing of relevant counterarguments. One of these critical questions concerns negative consequences, often called side effects, of carrying out the action in the conclusion. Practical reasoning can also be attacked by a counterargument that cites negative consequences of the action being contemplated by the practical reasoner, and argues that the negative value of these consequences outweighs the positive value of the goal the agent is trying to fulfill. There are two basic kinds of practical reasoning: instrumental practical reasoning and value-based practical reasoning. The former kind of practical reasoning is not concerned with values, but only with instrumental matters of maximizing utility.

Practical reasoning was involved in the robots example. R_2 had to decide whether its best course of action was to follow R_1's request to dig, or whether it should risk having this antenna broken by R_1. To make this decision R_2 has to weigh whatever goals it might have that might be interfered with by spending time digging against the negative consequences of having its antenna broken, an outcome that might interfere with the goal of the mission. This kind of problem is typical of practical reasoning, where an action being contemplated by an agent might fulfill one goal but have negative consequences with respect to fulfilling another goal.

The argument in the gangster example is an instance of the argumentation scheme for argument from negative consequences. The connection between the *ad baculum* fallacy and argument from negative consequences has been noted by Tindale (2007, 109). The argumentation scheme for argument from negative consequences (NC) is presented below.

> **Major Premise:** If *A* is not brought about, then consequences *C* will occur.
> **Minor Premise:** Consequences *C* are bad.
> **Conclusion:** Therefore *A* should be brought about.

In the gangster example, the gangster is telling the small business owner that if he doesn't pay the protection money, his store will

be looted and destroyed. This proposition fits the major premise of the argument from negative consequences. Both parties in the example accept the proposition that the consequences of having his store looted and destroyed are negative from the point of view of the small business owner. The conclusion follows, according to this scheme, that the small business owner should pay protection money.

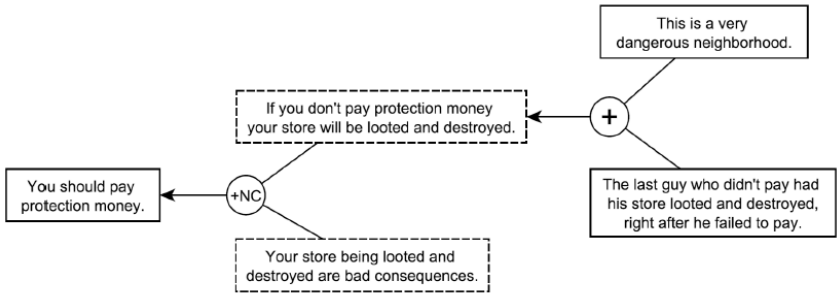

Figure 3: Argument from consequences in the gangster example

Arguments fitting this scheme are known to be fallacious in some instances, but in the broad majority of cases they are very commonly used as reasonable arguments. One needs only to think of a typical example such as, "You ought not to take this drug, because it is known to have the following side effects, one of which in particular is very dangerous for you." This type of example, which cites the negative consequences of the contemplated course of action as a reason for not undertaking an action, is an extremely common form of argument in everyday conversational argumentation, and is often quite reasonable.

This way of reconstructing the argument is somewhat more helpful than the simple way represented in figure 3. However, it still doesn't tell us much that is very useful in arriving at a solution to the problem of whether the argumentation in the case constitutes a fallacious *ad baculum* or not. Since arguments from consequences

are basically reasonable, or at least do not commit the *ad baculum* fallacy in their predominant uses, we still don't have much to go on by way of using this structure to devise criteria that will enable us to determine in a particular case whether an argument using a threat is fallacious or not. To get a bit further with this task, it is necessary to probe more deeply into the argument structure of the example.

5. Argument from threat

The next tool we need, in addition to the definition of the speech act of making a threat, is the argumentation scheme for argument from threat (Walton Reed and Macagno, 2008, 333). The scheme is presented here in slightly modified form with three premises. The speaker is an agent represented by the first-person pronoun 'I'. The hearer is another agent, represented by the pronoun 'you'.

> **Premise 1:** If you do not bring about *A*, some cited bad consequences, *B*, will follow.
> **Premise 2:** I am in position to bring about *B*.
> **Premise 3:** I hereby assert that I will see to it that *B* occurs if you do not bring about *A*.
> **Conclusion:** You had better bring about *A*.

This argument is precisely the one used in the robots example. Both premises 1 and 3 are explicit in the example, and it may be presumed from the circumstances described in the case that premise 2 also applies. But more work is required to see how it fits to the gangster example.

Figure 4 represents a fuller analysis of how the argumentation in the gangster example contains the making of a threat by inserting five implicit premises.

An explicit premise is shown in a text box that has the form of a normal rectangle. An implicit premise is shown in a text box that is rectangular but where the perimeter of the rectangle is a dashed

(dotted) line. The notation +AT in an argument node represents a pro argument from threat. The reader should check to see that the three premises in this argument fit the format required by the scheme for argument from threat above. The notation +AN in an argument node represents the scheme for argument from analogy. The other two argument nodes are not associated with any specific argumentation scheme, and are merely represented as pro arguments, as indicated by the plus sign.

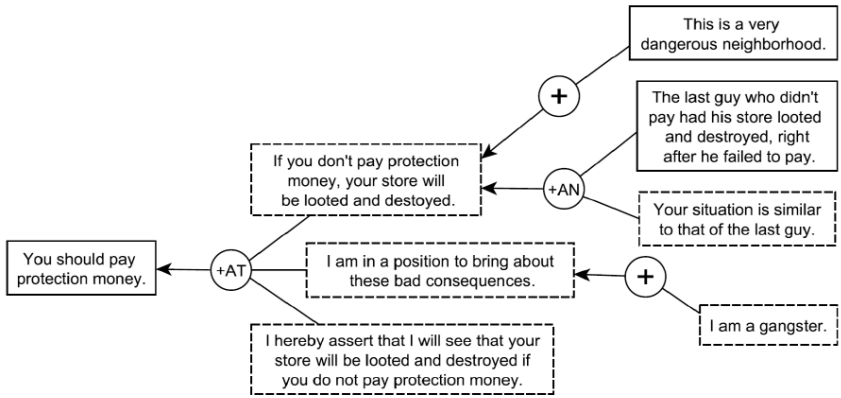

Figure 4: Complex argument diagram of the gangster example with implicit premises

Notice that all three premises in the argument from threat shown in figure 4 are marked as implicit premises. None of them is explicitly stated in the text of the gangster example. This observation by itself should suggest that there is something unusual about the example. Clearly the gangster is making a threat to the store owner, but he has not explicitly stated any of the premises in the argument from threat. When we try to represent the argument diagrammatically to reveal a little more structure, we need to figure out where the two explicitly stated premises should be fitted in. In figure 4 they are shown at the top right. One is the statement that the last guy who didn't pay had his store looted and destroyed, right after he failed to pay. This premise is joined together with an implicit premise stating a similarity to the present case. These two

premises are taken to be parts of an argument from analogy, indicated by the +AN in the argument circle. It is taken to be a pro argument supporting the implicit conclusion saying that if the store owner doesn't pay protection money, his store will be looted and destroyed.

The next question about this figure is whether there is any evidence either explicitly or implicitly present in the case that supports the implicit premise that the gangster is in a position to bring about the bad consequences of the store being looted and destroyed. There is implicit evidence, because the store owner is aware that the person he is talking to is a gangster. It can be assumed that he knows about gangsters, and that gangsters are quite capable of bringing about death and destruction in order to achieve their ends. To indicate this implicit evidence on the argument diagram in figure 4, an implicit premise containing the statement 'I am a gangster' has been shown as part of a pro argument supporting the conclusion that the speaker is in a position to bring about the bad consequences. Once again here we see that this part of the argument is purely implicit. None of it has been explicitly stated by the gangster.

Now we come to the final point to be discussed. There is one explicit premise of the argument remaining to be dealt with, the statement that this is a very dangerous neighborhood. The problem is how to fit this premise into the argument diagram somewhere. The initial attempt to do that is shown in figure 4, where this statement is represented as a premise in an argument supporting the implicit conclusion that if you don't pay protection money, your store will be looted and destroyed. Viewed in this way the statement is taken to go along with the explicit premise just below it as an additional argument supporting this conclusion. The statement 'This is a very dangerous neighborhood' gives the store owner some reason to accept the proposition that if he doesn't pay protection money, his store will be looted and destroyed.

Notice, however, that this way of representing this part of the argument does not seem quite right. If the store owner already knows that the person confronting him is a gangster, and knows that this man has just stated that the last guy who didn't pay had his store looted and destroyed, right after he failed to pay, he already knows that the gangster is convincingly telling him that if he doesn't pay protection money, his store will be looted and destroyed. The additional statement that this is a very dangerous neighborhood adds nothing in the way of significant evidential support. Something else is going on. The question is: can we get at what else is going on by building a deeper analysis of the argumentation in the case that goes beyond the inadequate argument structures displayed in figures 2, 3 and 4?

To answer this question it is necessary to examine the function of the statement 'This is a very dangerous neighborhood' in the gangster's argumentation strategy. It appears that the gangster is trying to create a superficial appearance of giving the store owner advice, by warning him of some bad thing that might happen or advising him on how to avoid it, while in reality he is making a nasty threat. To explore the basis of this distinction we have to go to the next level, which goes beyond logic (narrowly construed) to speech act theory.

6. Speech acts

Budzynska and Witek (2014) have shown that speech acts are vitally important for analyzing the *ad baculum* fallacy, and that it is necessary to bring speech acts to bear on this fallacy to explain its dynamics. The next part of this paper will provide additional evidence to support their approach by demonstrating the importance of speech acts for the analysis of both reasonable and fallacious arguments based on threats.

A speech act is conventionally made up of four components (Searle, 1969):

1. the two parties involved, called the speaker and hearer,
2. the propositional content of what was said by the speaker,
3. the illocutionary act, the intended meaning of the speaker's utterance, and
4. the perlocutionary act, the action resulting from the locution. There is the possibility of ambiguity in this framework, in that the speech act intended by the speaker can be construed in more than one way. For example, in the gangster case, what he says could be taken as a warning or a threat, even though the evidence that was meant as a threat is quite convincing.

The speech act of warning has the following four conditions (Searle, 1969, 67). The version presented below has been modified from Searle's original account to fit in with subsequent developments in argumentation theory.

> ***Propositional Content Condition*:** The propositional content of the speech act poses some future event that may affect the hearer.
> ***Preparatory Condition*:** The speaker has reason to believe that this event will be against the interests of the hearer.
> ***Sincerity Condition*:** The speaker believes that the hearer will benefit from knowing in advance that this event may occur.
> ***Essential Condition*:** the action of telling the hearer about the event is taken to offer to the hearer a way of avoiding its coming about or affecting him.

The propositional content condition postulates some event that might come about and affect the interests of the hearer. The preparatory condition requires that the coming about of this event will be against the interests of the hearer. The sincerity condition requires that it is in the hearer's interest from learning about the event before it happens. The essential condition is that there is something the hearer can do about it.

Another type of speech act is the speech act of advising (Searle, 1969, 67) .

> ***Propositional Content Condition*:** The propositional content of the speech act describes some future problem or choice the hearer is confronting.
> ***Preparatory Condition*:** The speaker has reason to believe that choosing one way or another can affect the interests of the hearer.
> Sincerity Condition: The speaker believes that the hearer will benefit from knowing in advance about means to solve the problem or make the best choice.
> ***Essential Condition*:** The action of telling the hearer how to proceed is taken to offer to the hearer a way to solve the problem or make the best choice.

By comparing the two sets of requirements it can be seen how the speech act of warning is different from the speech act of advising. Kauffeld (2000) has offered an analysis of the speech act of advising by contrasting it with the speech act of putting forward a proposal. On his analysis, performing the speech act of proposing carries with it a burden of proof to defend the proposal if challenged to do so, whereas performing the speech act of advising carries no such burden.

According to the analysis of the speech act of making a threat given in (Walton, 2000, 127), the speech acts of giving a warning and making a threat are closely connected. What is important in this analysis is not only the verbal formulae used to make the threat, but attention has to be paid to pragmatic features of the context of dialogue in which the speech act has been put forward as a locution. As noted above, the hearer needs to draw the conclusion that the arguer is making a threat by implicature from the conversational maxims appropriate for the context of dialogue. According to the definition of the speech act of making a threat given in (Walton 2000, 113) there are four speech act conditions that have to be met.

***Propositional Content Condition*:** The hearer has to have reasons to believe that the speaker can bring about the negative consequences in question.
***Preparatory Condition*:** It is presumed by both the speaker and hearer that the negative consequences will not occur without the intervention of the speaker.
***Sincerity Condition*:** The negative consequences will not be in the hearer's interests and the hearer would want to avoid them if possible.
***Essential Condition*:** The speaker is making a commitment to see to it that the bad consequences occur unless the hearer carries out the action recommended by the speaker.

The essential difference between the speech act of giving a warning and the speech act of making a threat is the existence of the essential condition. This requirement is characteristic of the speech act of making a threat, and is characteristically absent when the speech act of giving a warning is made. Unless the essential condition is present in a given case, the speech act needs to be classified as a warning, and not a threat.

Is what the gangster said a warning or a threat? And how can it be proved that it fits into one category or the other? It seems that the significant feature of the case, from the point of view of the *ad baculum* fallacy, is that on the surface, what the gangster said appears to have the form of a warning. But what makes it inviting to classify the example as an instance of the *ad baculum* fallacy is that the text can also obviously be taken as expressing a threat—a threat that would be very scary to the store owner—and also might be highly effective in encouraging him to pay the protection money. To find an argumentation method that can be used to capture this ambiguity of expression, and utilize it in an objective way to gather evidence to evaluate whether the argument is fallacious or not, we need to go beyond the inferential structures represented in the three argument diagrams above. We need to consider the context of discourse. To do this it is necessary to make the ascent to a third level, the dialectical level.

7. Indirect speech acts

The standard example given to illustrate an indirect speech act is the question, 'Can you pass the salt?' In normal conversational practice this question is not given the literal interpretation, asking the respondent whether she is in a position to pass the salt. It is a polite request to pass the salt by avoiding the somewhat impolite locution 'Pass the salt!' which might appear to be giving a direct order. Indirect speech acts are often used to reject proposals. Consider the following dialogue exchange.

> Bob: Would you like to go for a walk?
> Alice: I have a doctor's appointment.

Alice's statement that she has a doctor's appointment does not logically imply rejection of Bob's proposal that they should go for a walk. Hence it is classified as an indirect speech act. But how do we get by inference from Alice's statement that she has a doctor's appointment to the conclusion that she is rejecting Bob's proposal that they should go for a walk? We could insert the missing premise that since Alice has a doctor's appointment this leaves no time for her to go for a walk. But this explanation by itself does not seem very satisfactory.

According to Searle's theory of indirect speech acts, the speaker communicates more than what is explicitly said by relying on common knowledge shared by the speaker and hearer, along with powers of rationality and inference that the speaker presumes that the hearer shares (Searle, 1969). According to Searle's program to build a theory that might help to explain indirect speech acts, the suggestion is made to think of a conversation as an exchange between participants that assumes cooperation and relevance on the part of the participants (Levinson, 1983). This theory needs to assume some more generalized framework of a systematic conversation between parties that follows rules of some sort. The Gricean theory of conversational implicature explains indirect speech acts by framing them in conversational postulates that Grice called

maxims (Grice, 1975). Grice offers conversational rules, but does not specify how these rules differ in different kinds of conversational interactions. Nor does he provide a structure that postulates the purpose of a particular type of dialogue, and the kinds of speech acts that function as moves in the dialogue. Nor does he give any indication of systematic criteria enabling a party outside the dialogue to determine whether the dialogue has been successful or not.

Since the advent of argumentation theory, these conversational maxims are associated with rules of dialogue, making up a system of rules called protocols in the artificial intelligence literature. Each speech act in the dialogue has protocols that impose conditions on the putting forward of the speech act by one party at any particular point in the dialogue, and protocols that impose conditions on the range of responses that the other party is allowed to make. Many formal and computational dialogue systems have now also been built in the artificial intelligence literature to represent standard types of communication frameworks (McBurney and Parsons, 2002). Formal systems of persuasion dialogue, information seeking dialogue, inquiry dialogue, deliberation dialogue and negotiation dialogue are now available. Reed (2011) has presented a formal and computational model of argumentation in which speech acts function as the glue between utterances that form a dialogue structure. In these formal systems the speech acts are the locutions (such as making an assertion) that can be made at each move of a dialogue.

To deal with the *ad baculum* fallacy apparently committed in the gangster example, it is necessary to identify some features illustrated by the argumentation in this example. We know that the gangster is making a threat to the store owner, but at the same time what he purports to be doing is merely advising the store owner on how to avoid danger. We hypothesize that the gangster is arguing in this way in order to avoid the responsibility for having made a threat. His *modus operandi* for implementing a strategic maneuver to this end is to mask his conversation as an instance of inno-

cent advice-giving. What is invoked is pretense of a framework of advising to mask the inappropriateness of making a threat. To model this strategic maneuver, merely thinking of advising as a type of speech act is too narrow. It is much more advantageous to think of advising as a type of dialogue in its own right. But to my knowledge, advising has not been previously defined as normative type of dialogue in its own right in the argumentation literature. Some work needs to be done to specify the characteristics of this type of dialogue.

8. Advising dialogue

In the simplest case, advising dialogue has two parties. In formal dialogue models, one party is usually called the proponent and the other the respondent. We will call the proponent the advisor and the respondent the advice receiver. The proponent's goal is to offer advice to the respondent, and the respondent's goal is to benefit from this advice. The respondent needs to consider the advice, and ultimately to accept or reject it. In a normative model of dialogue, the respondent should only accept the advice if it is good advice. The purpose of the dialogue as a whole is to help the proponent with his attempt to make a decision on what to do in a situation that requires choice, on the problem he confronts. Hence advising dialogue is typically embedded in a larger structure of deliberation dialogue where a single agent or group of agents is trying to solve a problem or decide what to do in circumstances requiring a choice of actions.

Advising dialogue is similar to persuasion dialogue in some respects, but it is not the same thing. In persuasion dialogue, there is a difference of opinions that needs to be resolved. The one party accepts that a certain proposition is true, while the other party is of the opinion that this proposition is false, or at least has doubts that it can be proved to be true. In advising dialogue, one party confronts a problem or choice of actions and relies on the other party to furnish relevant information as an aid in making a good decision

based on adequate evidence. Advising dialogue definitely fits the form of argumentation, because the advice given takes the form of pro and contra arguments, arguments that support or attack the recommendation given by the advisor, displaying the evidence on both sides of the decision for the receiver to consider.

An example displaying this feature of advice-giving is the evaluation of the Chrysler 200 family sedan given in (*Consumer Reports* (Canada), April 2013, 47).

> "The 200 is an outdated design that is uncompetitive among family sedans. On the plus side, the ride is compliant and the optional V6 is strong and smooth. The noisy and unrefined four-cylinder gets only 21 miles per gallon overall, the same as the 283-hp V6. The six-speed automatic doesn't shift particularly smoothly or quickly. Though the soft suspension provides decent isolation, it also allows frequent body motions, and handling lacks agility. Most controls are straightforward. Reliability has dropped to below average."

The practice of *Consumer Reports* is to indicate along with the evaluation whether the car being described fits into their recommended category or not. In the case of this evaluation, there was no checkmark given indicating that this car is recommended. This notation essentially means that the car is not being recommended. *Consumer Reports* specifies criteria for being recommended, including such matters as whether the vehicle passed safety tests, whether it has proved to be reliable, how high the costs of repair have been, and so forth.

In this case we can clearly see that argumentation is involved. The pro arguments are listed along with the con arguments so that the reader can make an informed decision. In table 1 the set of arguments is classified into pro and con. There are four pro arguments and eight con arguments.

Table 1: Argument pro and con for the Chrysler 200

PRO	CON
The ride is compliant.	The 200 is an outdated design.
The optional V6 is strong and smooth.	The 200 is uncompetitive among family sedans.
The soft suspension provides decent isolation.	The four-cylinder is noisy.
Most controls are straightforward.	The four-cylinder is unrefined.
	The four-cylinder gets only 21 miles per gallon.
	The suspension allows frequesnt body motions.
	Handling lacks agility.
	Reliability has dropped to below average.

It is not just the number of the arguments, however, that is significant. What is significant is that the information about the car's property and performance, based on testing it, is made available to the consumer who is considering buying a vehicle. We can look over the pro and con arguments and decide which ones are more important or less important for arriving at a decision. We can weigh them in with other considerations that are important for her. For example, she might have test-driven this car or others, and she might have special requirements, depending on the uses she has for the car, or she may want special features that are really important to her such as all-wheel drive. Price will also be a factor for most buyers. Also significant in the advice given is the decision of *Consumer Reports* not to put the Chrysler 200 in the recommended category. For example, some buyers might only consider vehicles in the 'recommended' category.

To deal with this kind of case more effectively, merely thinking of advising as a type of speech act is too narrow. An alternative would be to think of advising as representing a continuous type of discourse containing argumentation. In the argumentation literature, seven basic types of dialogue are recognized: persuasion dialogue, deliberation dialogue, inquiry dialogue, information-seeking dialogue, discovery dialogue, negotiation dialogue, and eristic dialogue. It may be useful to see advising dialogue as a distinctive type of dialogue in its own right that is often embedded within these other types of dialogue. It is especially characteristic that there is an embedding of advising dialogue into deliberation dialogue. When an agent is deliberating on how to solve a problem or what course of action to choose, it may be useful for her to consult with another party who is not a participant in the deliberation dialogue for advice on how to make the best choice. This kind of situation is very common when experts are consulted for example.

An example of this type of advising dialogue can be found in an article meant to help someone shopping for a new car to select an in-car electronics system (Connect with Your Car: How to Plug-in Your Music, Apps, and Lifestyle, *Consumer Reports*, April 2013, 18-20, no author given). In the quoted segment below the author offers some advice to help the reader check for some features worth considering.

> "When comparing cars, check that the location of the inputs works for you. They're typically found in the dash, center console, or glove box. The latter two let you keep your device out of sight but may not work as well if you mount your phone in a windshield or dash mount for navigation or hands- free phone calls."

When you buy a new car you will see that the inputs for your electronic devices may be found in one of three places, the dash, the center console, or the glove box. But the author of the article offers practical advice. If the inputs are located in the center console or the glove box, the good consequence of this location is that they will be out of sight. However the bad consequence is also noted that they may not work as well for navigation or hands-free phone

calls in this enclosed location. This bit of practical reasoning can be passed on to the reader because the testers of these cars encountered this practical problem when they used the electronic in-car technology themselves. Not just this particular example, but much of the writing in *Consumer Reports*, can nicely be classified as representing advising dialogue.

Advising dialogue has, in the simplest case, two participants, the advisor and the advice seeker. In the opening stage, the advice seeker poses a problem and asks for help in solving it. The question is more than merely a request for information. It may involve the giving of information, but it is more of a practical request for help on how to proceed in a situation where the advice seeker needs help and the advisor is in a position to provide that help. In advising dialogue, the advice seeker opens the dialogue by posing a problem and explaining to the advisor how he is trying to solve this problem. The advice seeker formulates the problem using the argumentation scheme for practical reasoning. For example, he might tell the advisor that he has a goal that he wishes to carry out, and the problem is that he cannot find the best means to carry out the goal. Therefore he wishes to consult the advisor to see if she can suggest a way to resolve this problem. These transactions between the two parties occur during the opening stage.

During the argumentation stage—which will generally contain arguments, presenting information, explanations, warnings, and other speech acts—the advisor continuously provides the kind of help requested. During this stage the advice seeker ask questions about things he does not understand, or other questions relating to the practical reasoning given in the advice. During the argumentation stage the advisor offers advice and the advice seeker asks for explanations and further information about the advice offered so that he can fully understand the means he needs to take in order to solve the problem. As part of the argumentation stage the advice seeker may criticize the plan of action proposed by the advisor, by indicating parts in the plan that he thinks might not work or that appear to be questionable. A *plan of action* is a sequence of actions

and events (Russell and Norvig, 1995, 56) linking goals to actions that are means to achieve the goal or contribute to achieving it.

Once the advice given is sufficient to solve the problem expressed at the opening stage, or otherwise if the discussion has reached the point where no further help can be given, the dialogue reaches its closing stage. The closing stage is reached either if the advisor is satisfied that the advice given to him has been shown to him to be the best way to solve this problem, or if the advisor has tried her best to answer all the questions of the advice seeker, but he is still not convinced that the plan she has recommended is the best means to carry out the goal that he wishes to achieve. In that sense the advice seeking dialogue has not been successful in presenting the advice seeker with a solution to this problem. But it could still be successful in another way if it presented enough information about alternative means of working toward solving the problem so that it helped the advice seeker to move forward by seeking further advice from other sources. Indeed it may well be that the advice seeker has to discuss this problem with a number of advisors so that he can compare their recommendations on the best course of action, evaluate their advice, and either pick out the best action plan or combine the action plans to build a better one that might fulfill the goal the advice seeker wants to achieve.

9. Dialectical analysis of the *ad baculum* arguments in the examples

An interesting aspect of the robots case as presented is that negotiation is involved in the model of argumentation, suggesting the scenario that in multi-agent reasoning if two agents are deliberating on what to do in a given case, it might be quite reasonable for one of them to try to negotiate with the other in order to move their joint deliberations forward. Parsons and Jennings (1997, 267) offered the classic case of two agents engaged in a deliberation dialogue on how to hang a picture. Using practical reasoning they come to the conclusion they need a hammer, and a nail. Their joint

goal is to hang the picture and they agree that a means of hanging the picture is to use a nail. They also know that they need a hammer to put the nail in the wall in order to hang the picture. Let's say also that one knows where a hammer can be located while the other knows where to get a nail. Following the example further, let's suppose that they start to negotiate on who will provide the hammer and who will provide the nail. Notice what has happened. They started out engaging in a deliberation dialogue on how to hang the picture, but then at some point the discussion shifted to a negotiation dialogue.

Also it might appear to be a reasonable hypothesis that whether the making of a threat in an argument should be evaluated as a fallacious *ad baculum* or not depends on the framework of multi-agent dialogue that the argument is supposed to be part of. In the robots example, each of the two robots is built to maximize its own utility, but they need to communicate in order to pass along information about the circumstances to each other in order to carry out the tasks required by each to fulfill the mission. When the one threatens the other, presumably they are engaged in a deliberation dialogue using practical reasoning to carry out their individual goals, and the goal of the mission generally. If there is some problem about which one should carry out a particular task needed to move towards these goals, they may need to negotiate. If a shift of this sort occurs, and during the negotiation interval one makes a threat to the other by using *ad baculum* argument, this argument is not necessarily fallacious. The reason is that making threats is normal in negotiation dialogue (Walton, 2000). For example, in union management negotiation dialogues, it is common for the union to threaten to go on strike or to go on some sort of job action that might harm the company's interests.

On the other hand, we can imagine circumstances in which the shift from the one type of dialogue to the other could be evidence of committing an *ad baculum* fallacy by the party who made a threat. For example, suppose the two robots are engaged in a delicate problem of fixing a short circuit in some of their equipment,

and failure to solve the problem could easily result in failure of the mission. Moreover, suppose that there is limited time to solve the problem because several other important jobs also need to be done before liftoff. If the one robot starts making threats and quarreling or negotiating with the other robot at this time, and this interferes with the goals of the deliberation dialogue, and indeed with the goals of the mission as a whole, then the *ad baculum* argument could certainly be seen as inappropriate in the setting of deliberation dialogue that is underway. For this reason, the argument could be evaluated as an improper or even fallacious use of a threat. However, the robot example is quite simple. That is the nice part of it from the point of view of studying the *ad baculum* argument. Even though it is an *ad baculum* argument, for all we know, from the details of the example given, it is a non-fallacious use of this type of argument. However, as indicated, we could think of some hypothetical circumstances in which it would be a fallacious argument.

The problem with the gangster example that prevented us from giving an adequate analysis using the argument diagram in figure 4 that would explain the *ad baculum* fallacy presumably committed in this case, concerns the gangster's statement that this is a very dangerous neighborhood. The problem was how to fit it into the argument diagram shown in figure 4. In figures 2, 3 and 4 it was shown as a pro-argument supporting the implicit premise stating that if you don't pay protection money, your store will be looted and destroyed. It could also have been repositioned as a premise directly supporting the ultimate conclusion stating that you should pay protection money. However, both of these ways of fitting this statement into the network of argumentation in the case seemed to be inadequate. As indicated in section 5, it seemed that something else was going on. The problem posed is one of how we can build a deeper analysis of the argumentation in the case that goes beyond the structures displayed in figures 2, 3, and 4.

We can see how the speech acts of warning, advising and threatening each have their individual components by reviewing the

argument diagrams of figures 2, 3 and 4. Figure 2 represents the components of the speech act of warning. The main part of the act of warning is composed of the two statements explicitly made by the gangster, (1) this is a very dangerous neighborhood, and (2) the last guy who didn't pay had his store looted and destroyed, right after he failed to pay. Basically, the gangster is warning the storeowner that something bad is about to happen to him, without specifying exactly what the bad event is. However, some indication of what it is like is given in statement (2). Optionally, the conclusion that the store owner should pay the protection money can be included as part of the warning. But the essential part of the warning is the gangster's telling the store owner that something is about to happen that is highly negative from the store owner's point of view.

The components of the speech act of advising can be seen displayed in figure 3. Here the gangster is not only saying that this is a very dangerous neighborhood, and that the last guy who didn't pay his protection money had his store looted and destroyed. He is also offering a solution to the problem posed by the warning. He is advising the storeowner that if he doesn't pay protection money his store will be looted and destroyed, and in order for the storeowner to avoid these negative consequences, he is advising him to pay protection money. Therefore the argumentation structure represented in figure 3, taken as a whole, displays the speech act of advising. Figure 3 includes both warning and advising, and shows how the warning speech act is included within the advising speech act as part of it.

Figure 4 displays the speech act of making a threat in the central part of the diagram where the three propositions displayed in the rectangles with dashed borders are lined up vertically with each other. Notice that all the components of the threat are based on implicit assertions attributed to the gangster by implicature. Notice that in figure 4, the warning component is still present in the two propositions shown as explicit premises at the top right. So we can see how warning is connected with threatening by looking at

these diagrams. But the problem remains to determine the precise relationship in the example between advising and threatening. The solution to this problem can be provided by mapping the relationships between the speech acts and the arguments, as shown in figure 5.

Figure 5 shows the speech act of warning at the top right of the diagram. Comprising this speech act are the gangster's two explicit statements. The gangster's asserting of these two statements, considered in isolation from the other parts of the argumentation represented in figure 5, can be taken as representing a warning that is part of an advising dialogue.

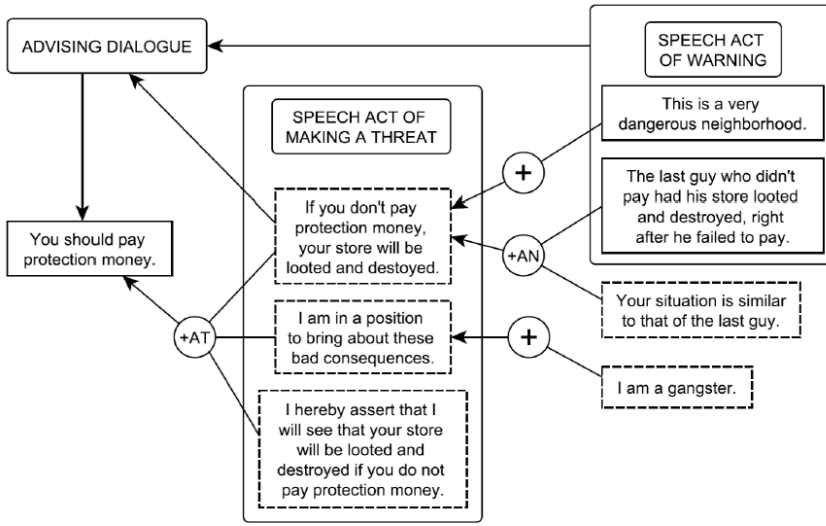

Figure 5: Map of the relationships between the speech acts and the arguments

The two statements that are components of the speech act of warning can be taken as representing an argument in an advising dialogue where the gangster is simply advising the storeowner that he should pay the protection money. The other part of the structure is the speech act of making a threat, represented by the three implicit statements in the big rectangle in the middle of figure 5. This part

of the structure has already been shown in figure 5 to make up the implicit premises for an argument from threat that also leads to the conclusion that the store owner should pay the protection money. But now we can see that one of the implicit premises, the statement that if you don't pay protection money, your store will be looted and destroyed, is also part of the advising dialogue that goes along with the other two statements shown in the rectangle representing the speech act of warning.

What this shows is that we can take the argumentation in the case two different ways, and we can see how to do this once we separate the argumentation into its speech act components, the speech act of making a threat and speech act of warning. Then we can see how each of these speech acts contributes both to the advising dialogue and to the ultimate conclusion that the store owner should pay protection money. This way of framing the relationships between the speech act of making a threat and the speech act of warning shows the relationship of both components to the dialogue of advising and also to the argument from threat. It also shows how these components feed into the ultimate conclusion. This structure solves the problem of explaining how the *ad baculum* fallacy works.

10. Pretending to advise

Now that we have a speech act of advising, and even more usefully a type of dialogue representing advising discourse, we are in a position to get a deeper analysis of the argumentation in the case. The reason that the gangster says that this is a very dangerous neighborhood is that he is pretending to advise the store owner. He is pretending to advise the store owner on what to do, by warning him about the potential negative consequences of not taking the course of action he advises.

This move can be seen as part of a strategic maneuvering tactic for the gangster to distance himself from having made an explicit threat to the store owner. What the gangster is pretending to do is shown in the argument diagram in figure 1. All the gangster

explicitly says is that the store owner should pay protection money because this is a very dangerous neighborhood. This is an argument, the inference link being indicated by the word 'because'. The surface appearance is that the gangster's statement that the last guy who didn't pay had his store looted and destroyed, right after he failed to pay, is merely a statement. But is that really its function in the discourse? No, we all know it was meant as a threat, and will be so taken by the store owner (unless he is very naïve, or is lacking knowledge about his and the gangster's circumstances).

Figure 6 shows the dialectical component. We begin at the left with an advising dialogue in which one party conveys an explicit warning to another party, optionally adding a recommendation on what the other party should do in order to avoid some negative consequences. So far there is no fallacy. There is merely an advising dialogue of the kind illustrated by the two examples from *Consumer Reports*. The middle box shows what happens when we interpret the text of discourse more deeply and identify the speech act of making a threat. This move constitutes an *ad baculum* fallacy, as the evidence box at the bottom in the middle indicates.

However, in the gangster example, as shown in figures 4 and 5, the threat is purely implicit, and so there is an additional dimension in this case. To extract the threat we have to insert missing premises and/or conclusions into the argument by viewing the argument as an enthymeme, an argument that can best be made sense of by inserting implicit premises and conclusions into it.

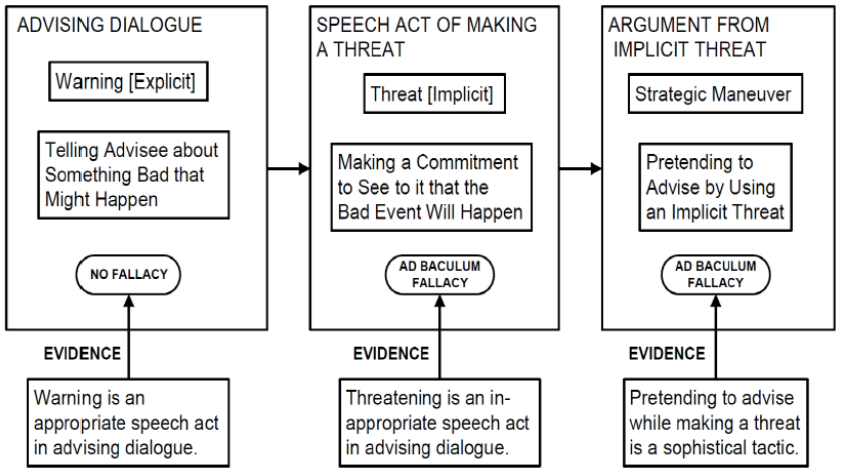

Figure 6: Structure of the *ad baculum* fallacy

Once the implicit threat has been brought out, we need to take into account the strategic maneuver that the arguer is simply pretending to advise the other party, ostensibly by warning him about some event that will go against his interests, and offering some recommendation on how to avoid these negative consequences. To move to this third stage of the fallacy analysis, we need to identify the argument from threat, even though it is implicit, and recognize that the strategy of using a fallacious *ad baculum* is one of avoiding responsibility for the threat by leaving a route for plausible deniability. According to this analysis, the *ad baculum* fallacy, as illustrated by the gangster case, is not simply an error of reasoning. More than that, it is the strategic maneuver, a sophistical tactic, designed not only to strongly motivate the agent to whom it is directed, but also to artfully pretend that the arguer is acting in the helpful capacity of someone who is only giving friendly advice to the respondent. Essentially the gangster trying to immunize himself against future accusations of failure to follow the rules appropriate for this type of dialogue by making a threat instead of arguing.

The juxtaposition of appearance and reality brought out by this analysis of the argumentation in the gangster example is reminiscent of the common definition of a fallacy as an argument that appears to be valid but is not (Hansen, 2002). Appearances can not only be misleading; they can be exploited. Some fallacies are merely errors caused by jumping to a conclusion too quickly, but others are subtle sophistical tactics used to unfairly get the best of a speech partner.

Now an objection needs to be taken up. The discussion of figure 1 might be criticized by saying that it is irrelevant, because what is at issue is whether R_1's argument is fallacious, but the figure displays R_2's argument. The criticism claims that even though R_2's argument is clearly not fallacious, that says nothing about whether R_1's argument is fallacious. This criticism misunderstands what figure 1 is designed to show, and leaps to the wrong conclusion. As shown in the discussion under figure 1, the discussion is meant to show that perhaps there is nothing wrong with the argument from R_2's point of view. The point is that we need to examine whether the argument is fallacious or not from the dialectical point of view by looking at the dialogue protocols of how the argument is put forward by one party, and how it can be responded to by the other party as they take turns making moves in the dialogue. In this instance, as shown by the discussion, the issue depends on how R_2 is allowed to respond to the argument put forward by R_1, if it is important for him to preserve his antenna for future use in the mission, it might make practical sense for him to dig. Looked at from this dialectical perspective, R_1's argument would not appear to be an instance of the sophistical tactics type of *ad baculum* argument that is an attempt to block off the respondent's capabilities for replying. Hence the dialectical analysis of the fallacy proposed in the paper can not only be used to marshal evidence in a given case to show an *ad baculum* argument is fallacious; it can also be used to show that it has not been used in a fallacious way in the robots example.

11. Conclusions

The most general conclusion of this paper is that whether a given *ad baculum* argument should be properly judged to be fallacious or not is dialectical, meaning that it depends on the type of discourse the argument is supposed to be part of. In a persuasion dialogue or an inquiry dialogue the speech act of making a threat is simply inappropriate. It is easy to rule out threats once one applies a formal model of either of these types of dialogue, because the speech act of making a threat is simply not included in the protocols for the speech acts considered as permitted moves in the dialogue. This phenomenon may explain why *ad baculum* arguments were considered more or less obviously fallacious for so long in the logic textbooks. It was probably assumed that the context was that of a persuasion dialogue or an inquiry. Also, as shown in the gangster case, an advising dialogue can commonly be joined to deliberation dialogue, and in that main deliberation dialogue, as well as in the embedded advising dialogue, making a threat to the other party should not be included among the allowable speech acts.

The robots example of *ad baculum* is a case where a direct threat was made. The gangster is an instance of an indirect threat. But in either type of case the basic ten-step procedure set out below can be applied to analyze and evaluate an *ad baculum* argument.

- The first step is to identify the premises and conclusions in the given argument.
- The second step is to find the inferential links that join these propositions as inferences using an argument diagram.
- The third step is to identify argumentation schemes, such as the one for argument from negative consequences, that might fit any of the argument nodes.
- The fourth step is to fill in any implicit premises or conclusions that are helpful for making sense of the argu-

ment.

- The fifth step is to identify speech acts that link the argument to the type of dialogue that represents the communicative context.
- The sixth step is to determine what the initial type of dialogue is supposed to be.
- The seventh step is to inquire further into the details of the case to see if there has been a shift to another type of dialogue.
- The eighth step is to determine whether the speech act, whether it be one of warning, advising or threatening, is an appropriate move in the original type of dialogue.
- The ninth step is to determine how that speech act is being used in the secondary type of dialogue.
- The tenth step is to look for evidence of the commission of a fallacy, for example the use of a sophistical tactic to try to make a threat seem like a warning.

As shown by the two examples treated in the paper, the ten-step procedure is a method for marshaling the textual evidence in a given case, and for using the tools illustrated in the paper to arrive at an evidence-based judgment whether the argument in question should be considered fallacious or not. It is a misconception to think that any particular subset of the requirements formulated in the bullet points have to be satisfied or violated to make an argument fallacious. It would be nice if the procedure was that simple, but it is not. The evaluation tools have to be applied to the textual evidence in the given case where it is suspected that an *ad baculum* fallacy has been committed, and the evidence on both sides has to be considered methodically by going through all ten steps in the evaluation procedure.

This paper has presented a dialectical analysis of the *ad baculum* fallacy that can help us not only to evaluate *ad baculum* arguments

but also to explain precisely what goes wrong when such an argument is fallacious by pinpointing a group of dialectical failures that can occur. So what has been accomplished in the paper is to provide not only an evaluation procedure for this type of argumentation but also a theory offering an explanation of why it can be justifiable to evaluate certain types of paradigm cases as being instances of the *ad baculum* fallacy.

As well as being applicable to teaching informal logic skills, this method is applicable to the current technology of building software agents that communicate with each other for various purposes in multiagent systems. For example, autonomous software agents can be used to communicate information about the stock market, to buy and sell stocks, and to negotiate deals. Because they are autonomous, they can go ahead and engage in argumentation in a creative and original way, meaning that they can even commit fallacies, because they are programmed to get the best deal within the allowable moves in their communication protocols. These rules may allow moves like the speech act of making a threat or not. So the potential for an autonomous software agent committing an *ad baculum* fallacy on the Internet is there.

Another conclusion is the recommendation that a new type of dialogue called advising dialogue should be added to the standard list of seven dialogues recognized so far in the argumentation literature. This new type of dialogue seems in a certain respect subsidiary to the main seven types of dialogue, because it often takes place during an interval in one of the other types of dialogue. It can occur in an inquiry dialogue or an information-seeking dialogue, but as its three stages have been framed in this paper, the opening stage posits the need to solve a problem or make a decision, characteristic features of a deliberation dialogue.

An interesting subject for further study would be the relationship of argument from expert opinion, which is a well- known argumentation scheme and set of critical questions, to advising dialogue. So far in the literature, the argumentation scheme for

argument from expert opinion has been mainly deployed and studied in a context of persuasion dialogue. But now it appears that argument from expert opinion and its relationship to critical questioning may be a more complex matter than we previously thought. We now need to recognize that evaluation of instances of expert opinion advice needs to be carried out not merely by considering one simple argument move or speech act, but by examining a connected sequence of moves that represents a special type of discourse in its own right. Study of advising discourse is a significant topic for further investigation of the *ad baculum* fallacy, as well as other problems in argumentation studies.

A problem posed by this paper, a highly significant and central one for argumentation studies, is that of enthymemes, the problem of filling in implicit premises and conclusions in an argument diagram. The findings of this paper suggest that one of the most important means of working toward a systematic method for dealing with this problem is to use speech acts within dialectical structures where the speech acts are used to define the permissible moves in a dialogue.

Acknowledgements: Work in this paper was supported by Social Sciences and Humanities Research Council of Canada Insight Grant 435-2012-0104: the Carneades Argumentation System.

References

Brinton, A. (1992). The *Ad Baculum* Re-Clothed, *Informal Logic*, 14 (2 & 3), 85-92.

Budzynska, K. and Witek, M. (2014). Non-Inferential Aspects of *Ad Hominem* and *Ad Baculum*, *Argumentation*, to appear.

Copi, I.M. and Cohen, C. (1990). *Introduction to Logic*. New York: Macmillan.

Grice, H. P. (1975). Logic and Conversation, *Syntax and Semantics*, vol. 3, ed. P. Cole and J. L. Morgan. New York: Academic Press, 1975, 43-58.

Gordon, T. F. (2010). The Carneades Argumentation Support System, *Dialectics, Dialogue and Argumentation*, ed. C. Reed and C. W. Tindale. London: College Publications.

Hansen, H. V. (2002). The Straw Thing of Fallacy Theory: The Standard Definition of Fallacy, *Argumentation*, 16, 133-155.

Johnson, R. H. (1996). The Need for a Dialectical Tier in Arguments, *FAPR*, volume 1085 of *Lecture Notes in Computer Science*, 349-360. Berlin: Springer.

Kauffeld, F. J. (2000). Arguments on the Dialectical Tier as Structured by Proposing and Advising, *Argumentation at the Century's Turn: OSSA 1999 Proceedings*, CD, 1-34.

Kielkopf, C. (1984). Relevant Appeals to Force, Pity & Popular Pieties, *Informal Logic*, 2(2), 2-5.

Kraus, S., Sycara, K. and Evenchik, A. (1998). Reaching Agreements through Argumentation: A Logical Model and Implementation, *Artificial Intelligence*, 103, 1-60

Levinson, S. (1983). *Pragmatics*, Cambridge: Cambridge University Press.

F. Macagno and D. Walton (2013). Implicatures as Forms of Argument, *Perspectives on Pragmatics and Philosophy*, ed. A. Capone et al. Berlin: Springer, 203-224.

McBurney, P. and Parsons, S. (2002). Dialogue Games in Multi-Agent Systems, *Informal Logic*, 22(3), 257-274.

Reed, C. (2011). Implicit Speech Acts Are Ubiquitous. Why? They Join the Dots, Zenker, F. (ed.). *Argument Cultures: Proceedings*

of the 8th International Conference of the Ontario 2011. Windsor, ON (CD ROM), 1-15.

Parsons, S. and Jennings N. (1997). Negotiation through Argumentation: A Preliminary Report. *Proceedings of the Second International Conference on Multi-Agent Systems*, ed. M. Tokoro. Menlo Park, California: AAAI Press, 267-274.

Russell, S. J. and Norvig, P. (1995). *Artificial Intelligence: A Modern Approach*. Upper Saddle River: Prentice Hall.

Scheuer, O., Loll, F., Pinkwart, N. and McLaren, B. M. (2010). Computer-supported Argumentation: A Review of the State of the Art, *Computer-Supported Collaborative Learning*, 5 (1), 43–102.

Searle, J. (1969). *Speech Acts*. Cambridge: Cambridge University Press.

Tindale, C. W. (2007). *Fallacies and Argument Appraisal*. Cambridge: Cambridge University Press.

Van de Vate, D. (1975). The Appeal to Force, *Philosophy & Rhetoric*, 81 (1975), 43-60.

Van Eemeren, F. H. (2010). *Strategic Maneuvering in Argumentative Discourse*. Amsterdam: Benjamins.

Walton, D. (1996). *Argumentation Schemes*. Mahwah: Erlbaum.

Walton, D. (1995). *A Pragmatic Theory of Fallacy*, The University of Alabama Press, Tuscaloosa and London.

Walton, D. (2000). *Scare Tactics*, Kluwer Academic Publishers, Dordrecht.

Walton, D. and Krabbe, E. C. W. (1995). *Commitment in Dialogue*. Albany: State University of New York Press.

Walton, D., Reed, C. and Macagno, F. (2008). *Argumentation Schemes*, Cambridge: Cambridge University Press.

Woods, J. (1987). *Ad Baculum,* Self-interest and Pascal's Wager, *Argumentation: Across the Lines of Discipline*, ed. F.H. van Eemeren et al. Dordrecht: Foris, 343-349.

Woods, J., and Walton, D. (1976). *Ad Baculum, Grazer Philosophische Studien,* 2, 133-140.

Wreen, M. (1988). Admit No Force But Argument, *Informal Logic*, 10 (2), 89-95.

2008 Vol 28: Defeasibility in Judicial Opinion: Logical or Procedural?

Douglas Walton and David M. Godden

Abstract: While defeasibility in legal reasoning has been the subject of recent scholarship, it has yet to be studied in the context of judicial opinion. Yet, being subject to appeal, judicial decisions can default for a variety of reasons. Prakken (2001) argued that the defeasibility affecting reasoning involved in adversarial legal argumentation is best analysed as procedural rather than logical. In this paper we argue that the defeasibility of *ratio decendi* is similarly best explained and modeled in a procedural and dialectical framework. We propose that appeals are best understood as meta-dialogues about the reasoned dialogue occurring in the initial trial.

1. Introduction

The idea that there is a distinctive type of legal reasoning (Ellsworth 2005) has inspired theorists of both law and argumentation to provide viable explanatory models of it. There is a strong concurrence among theorists that a characteristic feature of legal reasoning is that it is in some sense defeasible. Yet, there is less agreement concerning the proper explanation of the nature, source and operation of this defeasibility. Recent efforts on this topic have viewed it in the context of adversarial argumentation—the making and presenting of cases at trial. In this context, Prakken (2001, p. 269) has argued that, because defeasibility in adversarial legal argument involves dialectical roles and (potentially shifting) allocations of burdens of proof, defeasibility in (adversarial) legal reasoning is properly analysed as procedural rather than logical.

In this paper, we consider a different dimension of defeasibility in law, as it occurs in judicial opinion—that is, in the reasoned argu-

ments offered by judges as part of their decisions. In this situation, the obviously dialectical features of argumentation are absent. Instead of two parties engaged in an argumentative dialogue where the burden of proof can shift back and forth between disputants, we have a situation where a single reasoner has provided a justification or rationale for a decision. Yet, it remains the case that judicial opinions are defeasible: they can be overturned on appeal or sent back to a trial court for retrial. What is the best perspective by which to analyse this dimension of the defeasibility of legal reasoning?[1]

We begin by providing a brief overview of existing treatments of defeasibility in legal reasoning. Following this, we consider the possible grounds, outcomes and legal procedures affecting the appeal of legal decisions to determine which explanatory model best fits the type of defeasibility affecting judicial opinion.

2. Defeasibility in law: An overview

It is typically held (MacCormick 1978, p. 37 and Ch. 2 *passim*; Golding 1984, 35-42; Hage 2003, p. 230) that at least some instances of reasoning used in law are correctly analysed as deductive. Indeed, both statutory law and the legal authority[2] arising from precedent in common law can be articulated as rules and expressed in the form of conditionals of the form *If p then q* (Twining and Miers 1999, pp. 131-134; MacCormick 1978, p. 45). It

1. For the remainder of the paper we restrict our use of the term 'legal reasoning' to apply only to cases of judicial opinion. Golding (1984, p. 1) specifies this narrow sense of the term, whereby: "'legal reasoning' refers to the arguments that judges give … in support of the decisions they render. These arguments consist of the reasons for the decisions, and these reasons are intended as justifications for the decisions."

2. In the practice of law, the justification of a decision by precedent is often indicated by saying, with reference to a line of cases treated as precedents, "there is authority for saying that q [based on those precedents whose operative facts were p]." In this paper, we use the phrase "legal rules" to indicate both statute law and the authority of precedent.

might seem, then, that legal rules can be treated straightforwardly as material conditionals of the form *p e q*, and that legal reasoning roughly has the form of *modus ponens*: "whenever certain operative facts occur, a given legal consequence follows" (MacCormick 1978, p. 67).

2.1 Sources of defeasibility in legal reasoning

There are several features of the law which prevent this type of deductive analysis of legal reasoning in many cases. First, the operative facts entered into evidence at trial may over-determine the legal outcome by, for instance, triggering conflicting rules whose consequences are mutually inconsistent. Here, it will have to be determined which legal rule(s) ought to trump the other(s), and fundamental legal principles like justice and fairness may apply. In this way, legal arguments may be *rebutted* (Pollock, 1970) or *overridden* (Pinto, 2001) by stronger arguments for opposite conclusions.

Second, many of the conditionals expressing legal rules are not universal, but are subject to defeat in certain types of circumstances, e.g., when exclusionary conditions apply. In this way, legal arguments may be *undercut* (Pollock, 1970) or *undermined* (Pinto, 2001) by operative facts which defeat the inference at work in the argument. Thus, MacCormick (1995, p. 103) describes all legal rules as only "ordinarily necessary and presumptively sufficient."

2.2 Inferential models of defeasibility in legal reasoning

To accommodate this second feature, Sartor (1995, p. 121) has proposed that the conditions pertaining to legal rules include both *probanda* (or *elements to be proved*) and *non-refutanda* (or *elements not to be refuted*). On this analysis, legal rules are not like material conditionals but rather have the form *If* p_1 *and … and* p_i *and* $<r_j>$ *and …* $<r_n>$ *then q*, whereby "a norm condition must be considered satisfied if every *probandum* [*p*] contained in that

norm antecedent has been derived in the accepted justification context, and no *non-refutandum* [<*r*>] included in that antecedent has been refuted" (Sartor 1995, p. 121). This allows inferences to be presumptively drawn in the absence of countervailing considerations which, if determined to obtain at some later point could, nevertheless, defeat the original inference. Sartor (1995, p. 122-130) argues that such a formulation is able to represent a variety of legal ideas including: constitutive vs. impediment facts; presumed vs. non-presumed facts; facts to be proved vs. facts for which there must not be proof to the contrary, and facts about which the plaintiff bears the burden vs. facts about which the defendant bears the burden. The idea that defeating conditions can be explicitly stated as *non-refutanda* captures MacCormick's (1995, p. 100) notion of *express defeasibility*.

Yet, it is generally agreed that it is not possible to explicitly give *all* the defeating conditions for some rule. Rather, as MacCormick (1995, p. 103) writes, "Law has to be stated in general terms, yet conditions formulated generally are always capable of omitting reference to some element which can turn out to be the key operative fact in a given case." Thus, legal rules must also be understood as *implicitly defeasible* (MacCormick 1995, p. 104), "limited not only by specific exceptions but by indeterminate and estimated provisions" (Sartor 1995, p. 141). This third source of defeasibility seems to indicate that we cannot expect a fully formalized system of defeasible legal reasoning, but instead that some relevant conditions governing the application of a legal rule can only be identified after the fact.

This third sense of defeasibility in law is standardly traced back to H.L.A. Hart's (1948-49) essay "The Ascription of Responsibility and Rights." There (p. 173) Hart argued that the definition of a legal concept cannot be given "by the provision of a verbal rule for the translation of a legal expression into other terms or one specifying a set of necessary and sufficient conditions." This notion matured in Hart's later works (1958, 1961) into the idea that the concepts of ordinary language are 'open- textured' such that, while

there is a core meaning (exemplified by paradigmatic and constitutive examples), there will be a 'penumbra' of cases where it is not certain whether the concept properly applies. "Fact situations do not await us neatly labeled, creased, and folded, nor is their legal classification written on them to be simply read off by the judge" (Hart 1958, p. 607). Because of this, legal reasoning cannot properly be analysed as deductive because "Logic is silent on how to classify particulars—and this is the heart of a judicial decision" (*ibid.*, p. 610). Under this analysis, defeasibility is the result of a certain kind of indeterminacy: there is a conceptual indeterminacy in the classification of cases which produces a rule-indeterminacy when rules involving some open-textured concept are applied to cases in the conceptual penumbra.

MacCormick (1978, pp. 65-67) has shown how this type of indeterminacy can be analysed as a problem of ambiguity among legal rules, and the problem of classification becomes a problem of interpreting the law. MacCormick considers an example[3] where the law (roughly) states: [L] "If a person discriminates against another on the ground of national origins, then he discriminates unlawfully," and a judge is required to rule on a case where a housing board has denied applications on the basis of legal nationality. Such a case seems to hang on whether the law is rightly interpreted to say [L'] "if a person discriminates against another on the ground of national origins (including a person's legal nationality) then he discriminates unlawfully", or [L"] "if a person discriminates against another on the ground of national origins (as distinct from that person's legal nationality), then he discriminates unlawfully." In effect then, even when stated complete with all its explicit *probanda* and *non-refutanda*, a legal rule can remain ambiguous between two conditionals of the forms [L'] *If* $\boldsymbol{p_1}$**'** *and … and* p_i *and* $<r_j>$ *and …* $<r_n>$ *then q* and [L"] *If* $\boldsymbol{p_1}$**"** *and … and* p_i *and* $<r_j>$ *and …* $<r_n>$ *then q*. Importantly, the reasoning involved in determining this issue of interpretation will be part of

3. *Ealing Borough Council London v. Race Relations Board* ([1972] A.C. 342)

the *ratio decendi* of the case, and will not be deductive in nature (MacCormick 1978, p. 67-68).[4]

The primary way, then, that defeasibility in law has been modeled is logically, or inferentially, as a type of reasoning involving some form of defeasible conditional. This defeasibility does not always arise in the way standardly envisioned by non-monotonic logic (where additional information defeats a previously licensed inference), but the prevailing view seems to be that other forms of defeasibility can be modeled inferentially as well.

Normally in the literature on defeasibility, this term is taken to refer to the kind of situation in which a new premise is added to an argument, and the addition of that new premise makes the argument default, so that the conclusion can no longer be drawn (Prakken and Sartor 2004). However, our way of defining defeasibility makes it wider than the traditional notion. On our way of defining it, defeasibility also includes cases where the deletion or modification of an old premise in an argument makes the argument default, so that the conclusion can no longer be drawn. For example, we would include under the heading of defeasibility a case where one premise is a generalization that has to be modified where new information comes in stating an exception to the rule posited by the generalization.

Some would say that the kinds of cases we allow under the heading of defeasibility should instead come under the heading of belief revision, or perhaps theory revision. However, there is also some uncertainty on whether the modification of an old premise required by a new information positing an exception to a generalization should come under the heading of defeasibility or not. Many authors would include this kind of case under the heading of defeasibility. Indeed, the typical Tweety example,

4. MacCormick analyses this as an ambiguity between two deductive rules: If p' then q and If p" then q.

'Birds fly, Tweety is a bird, therefore Tweety flies', is generally treated as an instance of defeasible reasoning rather than as an instance of belief revision. On our analysis, all three kinds of defeasibility share a common basis, as all fit the dialogue model in which an argument needs to be seen as a move that may need to be modified as the dialogue proceeds and new arguments or information come in. As new arguments come in to the dialogue, on our model, premises of old arguments will have to be modified or given up, and conclusions of old arguments will have to be retracted because they have now been cast into doubt by the new arguments.

2.3 Types of defeasibility affecting legal reasoning

Having considered some of the ways that legal rules are defeasible, we proceed to consider several explanations of the nature of that defeasibility and its operation. Hage (2003, 2005) distinguishes five kinds of defeasibility having application in the law:

> ***ontological defeasibility*:** the defeat of a certain kind of legal fact,
> ***conceptual defeasibility*:** the defeat of the applicability of a (set of) legal concept(s) to a situation,
> ***epistemic defeasibility*:** the general fallibility and revisability of our beliefs and opinions,
> ***justification defeat*:** a form of belief revision which results from the defeat of our reasons or justifications for our beliefs, and
> ***logical defeasibility*:** the defeasibility of conditionals expressing legal rules.

Hage argues that justification defeat can play an important role in legal reasoning, and that it is best represented through a non-monotonic logic of the sort found in logical defeasibility. We have also seen how conceptual defeasibility plays a role in legal reasoning, how it could explain ontological defeasibility, and how, though it cannot be fully expressed formally, seems amenable to an inferentially-based treatment.

MacCormick (1995, p. 102), using the language of rights, argues that it is neither legal facts nor the legal concepts which are properly described as defeated.

> The 'right' is, after all, a theoretical object, an institutional fact. Such a fact exists only where there is a perfect and undefeated satisfaction of all conditions (the implicit as well as the explicit) actually required in a given case. It is the ascription of a right, or the asserting of a claim to it (or to what one purports to be entitled to by the right, e.g., payment of a widow's allowance), that can be defeated, not the right itself. So it is not after all the *concept* that is defeasible, but some formulated statement of conditions for instantiating the concept in given cases, or some assertion, ascription or claim based on a certain understanding of those conditions.

So it is perhaps best to understand all defeasibility in law as instances of justification defeat, whereby what is defeated is a claim (rather than a fact or a concept) whose reasons were undermined or overridden.

At this point it might seem as though, since the nature of defeasibility in law is almost entirely inferential, that the proper way to explain and model its operation is inferentially as well. Against this, Prakken (2001) and Prakken and Sartor (1996, 2004) have argued that defeasibility in law should be modeled dialectically. Prakken and Sartor (2004) describe three primary types of defeasibility in law: inference- based defeasibility, theory-based defeasibility, and process-based defeasibility. Theoretical defeasibility is distinguished from inferential defeasibility because "it concerns the holistic choice between theories, rather than the use of a [single] theory" (p. 136). In their view, defeasibility in law is inherently process-based because it "provides the dynamic context in which inference-based and theory-based defeasible reasoning take place, through the interaction of multiple agents" (p. 137).

3. Defeasibility in judicial opinion

We now apply the foregoing considerations to the situation of judicial opinion. Golding (1984, pp. 8-9) holds that *ratio decendi* can serve the function of rational persuasion as well as guidance through the principle of *stare decisis*. He further observes that common principles familiar to informal logicians such as premise truth or acceptability, and relevance serve as evaluative standards. In regards to sufficiency, or the strength of the inferential link between the premises and conclusion of a judicial opinion, we hold that something less than deductive validity is appropriate. As we noted at the outset, being subject to review on appeal, there can be little doubt that judicial opinions are defeasible in some sense, and therefore call for evaluative standards that reflect this inherent quality of them.

The question is: which theoretical framework provides the best explanatory model for this type of defeasibility in law? To answer this question, we first consider the possible grounds that might justify an appeal.

3.1 Grounds for Appeal [5]

In both civil and criminal matters, there are generally three distinct types of grounds for initiating an appeal proceeding. In the initial trial (1) there was some error of process, or (2) there was some error of law, or (3) subsequent to the initial trial, new facts not known or reasonably discoverable at the time of trial have

5. Due to the space limits of this paper we only consider defeasibility of judicial opinions in Anglo-American legal systems. As was observed by one of our anonymous referees, in several continental legal systems, appeal procedures work differently; for example in some instances appeal of the entire case is considered, including factual issues.

come to light which could conceivably have had a bearing on the outcome of the initial trial.[6]

Errors of process occur when a trial judge does not conduct a trial fairly or properly, and can be the result of mistakes or can indicate a(n apparent) lack of objectivity on the part of the presiding judge. Examples include the failure to ensure that witnesses are properly dealt with, the unbalanced summarizing of the evidence presented at trial, or the giving of faulty instructions to the jury. Errors of law occur when a court reaches the wrong conclusion on the basis of law, and are typically said to be the result of a trial judge 'misdirecting himself as to the law.' Examples include the failure of a trial judge take into account material facts in evidence that would have a bearing on the outcome of the case, his failure to recognize a prevailing line of cases when apparently conflicting precedents exist, or his rendering a decision which is *ultra viries* (exceeding the bounds of the court's power in some respect).

Importantly, neither of these two types of defeasibility normally involves any change to the factual information (the premises) on which the legal decision was made. Indeed, it is not the job of appellate courts to re-examine evidence or to make (new) determinations of findings of fact. Thus, the predominant types of defeasibility pertaining to judicial opinion do not arise from the addition or deletion of premissory information, and therefore cannot be represented through the logical defeasibility of some kind of non-monotonic logic. Rather, the defeasibility of judicial opinion in these types of cases involves the misapplication of (or

6. While we often hear about this last type of case in the media, as for example when a jailhouse informant recants his testimony or scientific advances allow for the testing of DNA evidence not possible at the time of trial, it should be noted that is somewhat of a *rara avis* in the normal course of the law. There is a strong professional and legal duty on counsel to be thoroughly diligent in preparing and presenting their cases at trial, and appeals are seldom granted on the basis of "oh, we forgot to mention <some pertinent fact or precedent>" type grounds where information that was available at the time of trial is later sought to be introduced during appeal.

outright failure to apply) legal rules which ought to have been applied (in the case of errors of law), or the failure to follow proper legal procedure. While the first of these types of errors can perhaps be modeled and explained at a purely inferential level, we note that the latter of these is inherently procedural and seems to call for a procedural or even dialectical treatment of the defeasibility arising therefrom.

That said, the legally permissible introduction of genuinely new and probative information can provide grounds for appeal, and fits standard logical notions of defeasibility whereby the introduction of new information occasions the retraction of a previously deduced conclusion. Further, some errors of procedure can affect the evidence before the court on the basis of which the initial judgment was made. For example, if a trial judge allowed the results of an illegal search warrant into evidence, then certain operative facts may have been considered in his reaching a judgment when they ought not to have been. Alternately, if a trial judge did not allow the opinion testimony of a properly accredited expert witness, then certain evidence which ought to have been considered in his reaching a judgment would not have been so considered. In these types of cases, the evidence at trial and the findings of fact there made, may be reviewed on appeal. This type of defeasibility, whether occurring as a result of the introduction of new information (non-monotonic justification) or the retraction of previously admitted information (justification defeat) seems more straightforwardly inferential rather than procedural. This might be taken to indicate that some types of defeasibility affecting judicial opinion can be modeled and explained as purely monolectical and logical without involving dialectical or procedural theoretical tools.

Indeed, it is important to note that, at the centre of all types of defeasibility affecting judicial opinion that do not involve outright bias, there is some defeasible or otherwise faulty inference. That is, the *ratio decendi* of the case will somehow be erroneous. This might result from a variety of factors familiar

to every informal logician, for example: its relying on faulty premises (mistaken findings of fact), or its failure to rely on pertinent premises (missing information or ignored evidence), or its relying on a faulty link between its premises and its conclusion (misapplication of, or failure to apply, a legal rule), or its not giving sufficient weight to arguments to a contrary conclusion. Purely procedural errors which could not conceivably have affected the outcome of the trial—which could not somehow result in a misapplication of the law in the case at hand—are not sufficient to defeat the initial finding of the court.

That said, we hold that the best explanatory model for the defeasibility of judicial opinion is procedural and dialectical. The reason is not merely that some of the sources of defeasibility cannot be explained in purely logical and monolectical terms. Many types of defeasibility in law are inferential in that they are either conceptual, logical or justificatory in nature. But even in these cases, defeat itself occurs through a set of legal procedures which are inherently dialectical and which play an important and irreducible part in explaining the operation of defeasibility in legal reasoning.

3.2 The explanatory role of the appeal process

Judicial opinion is only subject to defeat as a result of an appeal,[7] and this appeal process cannot be explained purely inferentially but is inherently procedural and dialectical.

This process begins with the filing of an application with the court requesting leave to appeal. This application is reviewed by a judge to determine whether there are sufficient grounds for an appeal on the basis of whether there is any reasonable likeli-

7. We ignore situations where new legislation would change the future course of legal decisions, as this does not (again, with rare exception) occasion the defeat of previously decided cases. Also, we only consider those aspects of the appeal judgement which form the *ratio decendi*, ignoring those parts of the judgement which may be *obiter dicta* or form part of a dissenting opinion.

hood that the appeal might be successful. Should leave to appeal be granted, oral and written arguments are presented before a (panel of) judge(s) by all parties involved in the appeal. Appeals, then, are initiated by submissions –which can be treated as speech acts– and proceed by a series of submissions (treated as other speech acts) made by the participants to the appeal. Unlike in cases at the trial level, appeal judges can involve themselves much more directly and actively in the argumentative dialogue that occurs in an appeal hearing, by questioning and even challenging and raising objections to the parties making arguments. Also, during the appeal hearing there is no (or at least rarely) presentation of evidence (e.g., the calling of witnesses); instead the 'subject matter' of the argumentation during appeal is provided by a record of the proceedings of the initial trial (compiled in a *trial record*), including the original pleadings (in a civil case), the filing of charges (in a criminal case), any motions filed through the case, transcripts of the trial itself, and of course the judgments giving the findings of the trial court and its decision. Decisions at appeal will be based only on the material and arguments presented before the court, or adduced in the dialogue between counsel and the court. Thus, the results of an appeal are inherently a product of the processes that produced them. Features that are procedurally excluded, such as the second-guessing of a finding of fact made by the trial court, or arguments not presented by the parties to the appeal, can make no contribution to the outcome of the appeal proceedings, and hence to the defeat of judicial opinion.

Importantly, while there is no legal burden of proof (which, properly speaking, applies to issues of fact) applicable in appeal proceedings, there is an argumentative burden which must be met by the (prospective) appellant at each stage of the proceedings. The effect of this is similar to the burden of persuasion in that the appellant bears the risk of non-persuasion should the judge(s) fail to be persuaded by her arguments.

Prakken (2001, p. 269) found these two components –the dialectical roles of the participants, and the allocation of argumentative burdens– sufficient to conclude that the defeasibility of reasoning in adversarial legal argumentation is best analysed dialectically. So, since these same features are inherent in the defeat of judicial opinion through appeal, if Prakken was correct in his conclusions then the same ought to be said of defeasibility in judicial opinion.

Yet, more can be said. There are four possible outcomes of an appeal which has been heard by the court: (i) the original decision and *ratio decendi* can be upheld (affirmed); (ii) the decision can be upheld but for reasons different from those given in the *ratio decendi*; (iii) the decision can be overturned (reversed on appeal); or (iv) the case can be sent back to a trial court for retrial. All but the first of these indicates some form of defeat of the original judicial opinion. Yet each of these forms of defeat result from the conclusions of appellate court judges. Further, the decisions of appellate courts are binding not merely because of the reasons given but also because of the authority vested in the courts. Finally, when a case is sent back for retrial at the trial court, the trial-level dialogue is begun afresh, new evidence is admissible and previous findings of fact may be subject to defeat.

3.3 The nature of a dialogic explanatory model

When we claim that the best explanatory model for the defeasibility of judicial opinion is procedural and dialectical, we refer to the notion of a formal system of dialogue as defining these concepts. A dialogue has three parts, a start point, a sequence of moves, and an end point. During the sequence of moves, the participants in the dialogue take turns in an orderly manner. The moves are paired as one party (the proponent) puts something forward and the other party (the respondent) reacts to what was previously put forward. At the start point there will already be certain conditions in place defining what each party has to prove

or to do in order to succeed. Such a requirement is sometimes called the obligation of each party (Hamblin, 1970). In a persuasion dialogue it is called the burden of persuasion (Prakken and Sartor, 2006). Hamblin (1971, p. 130) defined a move as a triple $\langle n, p, l \rangle$. n is the length of the dialogue, representing the number of moves made, p is a participant, and l is a locution. Below is an example of how a short dialogue with three moves in it looks in Hamblin's formal model. The first move is labeled as 0, the second as 1, and the third as 2.

$$\langle 0, P_0, L_4 \rangle, \langle 1, P_1, L_3 \rangle, \langle 2, P_0, L_2 \rangle$$

Participant zero puts forward locution 4 at move zero (the first move). Next, participant one puts forward locution three. At the third move, participant zero responds by putting forward locution two. For example, locution four might be the asking of a question, while locution three might be an assertion made, in answer to the question. Locution two might be the putting forward of an argument that gives a reason not to accept that answer. Such a finite sequence of this sort will always begin with move zero and end at some specific move (the end point) defined by conditions set at the at the start point.

3.4 Appeal as meta-dialogue

We have one hypothesis to put forward tentatively, concerning the first ground for initiating an appeal proceeding, namely that of an error of process. When another judge, let us call him judge 2, has to review an error of process that may have been committed by a judge in a trial, called judge 1, judge 2 has to examine the whole trial, or some part of it, in which judge 1 made a ruling. This framework involves a dialectical shift from one dialogue to another. First there is the earlier trial in which judge 1 made a ruling, based on the trial rules and procedures for that trial. Second, once the trial has been completed, judge 2 has to look at its records, and make a decision regarding the question of whether what actually happened in that trial met the proce-

dures and rules for it. We think that the best way to frame such a judgment is to see it as one argument about another. The argument of judge 1 reached a conclusion in the dialogue framework of the first trial. Judge 2 had to take a broader view in which he looked at the whole of that trial, and then used the evidence of the transcript of it to formulate arguments about its procedural fairness and correctness. The argumentation of judge 2 needs to be viewed as taking place within a secondary dialogue. It is called a metadialogue, or dialogue about a prior dialogue. In such a case, we need to distinguish between a ground level dialogue and a secondary level dialogue about that ground level dialogue.

A primary dialogue is a framework of argumentation in which participants in some definable type of verbal exchange supposedly adhere to procedural rules they have agreed to follow. For example, in a standard type of case two participants might agree to take part in a critical discussion where the goal is that of resolving a conflict of opinions by rational argumentation. A dialogue of this sort can be called a ground level dialogue, as contrasted with a metadialogue, or secondary dialogue about the ground level dialogue (Krabbe, 2003, p. 83). Suppose there is a disagreement about the correctness of some moves in a ground level dialogue. To resolve the disagreement, another dialogue may then begin that moves to a metadialogue level to determine whether some argument or other kind of move in the first dialogue can be judged to be correct criteria (Hamblin, 1970; Krabbe 2003).

According to Wooldridge, McBurney and Parsons (2005), argumentation in dialogue is inherently meta-logical, meaning that it does not just involve the putting forward arguments at one level of dialogue, but also the making of arguments about these arguments at a higher level of dialogue. In a hierarchical argument system, in addition to a first level, there needs to be a second level where judgments can be made about the success or failure of attack and defeat of an argument that was brought forward at

the first level. A second level encompasses the process of reasoning about the arguments that were used at the first level.

4. Conclusion

In this paper we considered the issue of defeasibility as it affects legal reasoning in judicial opinion as distinct from its affect on adversarial argumentation made at trial. We argued that this type of defeasibility in law is best explained and modeled as procedural instead of logical or inferential. This is not to say that the defeasibility of judicial opinion is not inferential in nature, but rather because its operation in law is inherently procedural. Wherever the decision of a trial court is defeated it is because that decision relied upon an inference that is somehow faulty or inapplicable to the actual case being decided. In rare situations, this defeat is occasioned by changes in the facts determined to be operative in the case. Thus, the standard logical accounts of defeasibility (due to premise retraction or non-monotonic inference) can only account for a fraction of decisions defeated on appeal. Much more common is the occurrence of some error in law or procedure which gave rise to a misapplication of the law to the facts in the case. These errors, while inferential in nature, become manifest through the process of appeal. Consequently, they are best explained procedurally as meta-dialogues which examine the correctness of the reasoning and argumentation which occurred in the trial-level dialogue.

Acknowledgements: Research for this paper was made possible by research grants from the Social Science and Humanities Research Council of Canada held by each author.

References

Ellsworth, Phoebe C. (2005). Legal reasoning. In Keith J. Holyoak, & Robert G. Morrison (Eds.), *The Cambridge*

Handbook of Thinking and Reasoning (685-703). Cambridge: Cambridge University Press.

Golding, Martin P. (1984). *Legal Reasoning*. New York: Alfred A. Knopf.

Hage, Jaap, (2003). Law and defeasibility. *Artificial Intelligence and Law*, *11*, 221-243.

Hage, Jaap: (2005). Entry for Law and Defeasibility. In IVR Encyclopedia of Jurisprudence, Legal Theory and Philosophy of Law. Available online at http://www.ivr-enc.info/en/article.php?id=40 accessed Jan. 31, 2007.

Hamblin, C.L. (1970). *Fallacies*. London: Methuen.

Hamblin, C.L. (1971). Mathematical models of dialogue. *Theoria*, 37, 130-155.

Hart, H.L.A. (1948). The ascription of responsibility and rights. *Proceedings of the Aristotelian Society*, *49*,, 171-194.

Hart, H.L.A. (1958). Positivism and the separation of law and morals. *Harvard Law Review*, *71*, 593-629.

Hart, H.L.A. (1961). *The Concept of Law*. Oxford: Clarendon Press.

Krabbe, Erik C.W. (2003). Metadialogues. In Frans H. van Eemeren, J. Anthony Blair, Charles A. Willard and A. Francisca Snoek Henkemans (Eds.), *Anyone Who Has a View: Theoretical Contributions to the Study of Argumentation* (pp. 83-90). Dordrecht: Kluwer.

MacCormick, Neil. (1978). *Legal Reasoning and Legal Theory*. Oxford: Clarendon Press.

MacCormick, Neil. (1995). Defeasibility in law and logic. In Z. Bankowski, *et al.* (Eds.), *Informatics and the Foundations of Legal Reasoning* (99-117). Dordrect: Kluwer.

Pinto, R.C. (2001). Argument schemes and the evaluation of presumptive reasoning. In *Argument Inference and Dialectic* (pp. 98-104). Dordrecht: Kluwer.

Pollock, John L. (1970). The structure of epistemic justification. *American Philosophical Quarterly*, monograph series *4*, 62-78.

Prakken, Henry. (2001). Modelling defeasibility in law: Logic or procedure? *Fundamenta Informaticae*, *48*, 253-271.

Prakken, Henry & Sartor, Giovanni. (1996). A dialectical model of assessing conflicting arguments in legal reasoning. *Artificial Intelligence and Law, 4*, 331-368.

Prakken, Henry & Sartor, Giovanni. (2004). The three faces of defeasibility in the law. *Ratio Juris, 17*, 118-139.

Prakken, Henry & Sartor, Giovanni. (2006). Formalizing arguments about the burden of proof. *Proceedings of the International Conference on Artificial Intelligence and Law*, ICAIL 07, Palo Alto, California.

Sartor, Giovanni. (1995). Defeasibility in legal reasoning. In Z. Bankowski, *et al.* (Eds.), *Informatics and the Foundations of Legal Reasoning* (pp. 119-157). Dordrect: Kluwer. [Also published in *Rechtstheorie, 24*, 1993, 281-316.]

Twining, William & Miers, David. (1999). *How to Do Things with Rules*, 4th ed. London, Butterworths.

Wooldridge, M., McBurney, P., &Parsons, S. (2005). On the meta-logic of arguments. In *Proceedings of the Fourth Inter-*

national Joint Conference on Autonomous Agents and Multi-Agent Systems (pp. 56—567). Utrecht.

III

Schemes and Dialogues

2001 Vol 21: Abductive, presumptive and plausible arguments

Douglas Walton

Abstract: Current practice in logic increasingly accords recognition to abductive, presumptive or plausible arguments, in addition to deductive and inductive arguments. But there is uncertainty about what these terms exactly mean, what the differences between them are (if any), and how they relate. By examining some analyses of these terms and some of the history of the subject (including the views of Peirce and Cameades), this paper sets out considerations leading to a set of definitions, discusses the relationship of these three forms of argument to argumentation schemes and sets out a new argumentation scheme for abductive argument.

Three kinds of inference –abductive argument, presumptive argument and plausible argument– are often confused. And it is not too surprising that they are confused. They seem to be quite similar in representing a kind of uncertain and tentative reasoning that is very common in everyday thinking, as well as in special contexts like legal argumentation and scientific hypothesis construction. And although there is quite a bit of writing on all three types of argument in logic, artificial intelligence, philosophy of science and cognitive science, there seems at this point to be no widely agreed upon systematic theory that clearly distinguishes between (or among) the three in any precise way. Another related notion in the same category is inference to the best explanation, now widely taken (see below) to be the same as abductive argument. The purpose of this paper is to survey how these related terms are used in the literature, to determine what the main differences are between (or among) them, and to draw out a basis for making a clear distinction between (or among) them that should help to explain and clarify these differences. Based on this survey and analysis, tentative

definitions of all these related concepts will be proposed. The definitions are not meant to be the final word that closes off all discussion of the matter. They are put forward as tentative hypotheses meant to clarify the discussion and move it forward constructively and openly.

The current convention is typically to postulate three kinds of argument –deductive, inductive, and the variously named third category– abductive, presumptive, or plausibilistic.[1] This convention poses an important question for logic text books, and for logic generally as a field that should include treatment of arguments in the third category. Should one of these variously named types fit in as the third kind of inference contrasting to the other two? Or should all of them fit into that category? Or should some subset of them fit? Or should some of them be nested under others as subcategories? The situation is complicated, and the terminology is unsettled. Many logic textbooks either don't recognize the third category at all, or show uncertainty about what to call it. Recent work in argumentation theory has studied forms of argument fitting into the third category. These forms are called argumentation schemes. The arguments fitting the schemes appear to be neither deductive or inductive. Could they be classified as abductive, or is that the wrong word? These questions are perplexing, but seem to be very important, not only for logic and computer science, but for many other fields, like law, where these arguments are so commonly used as evidence. By offering tentative definitions, it is hoped to throw light on these important questions. It will be shown that all three concepts in the cluster need to be defined, analyzed and evaluated dialectically –that is, with reference to the sequence of questions and answers in the context of dialogue in which they were used in a given case.

1. Peirce in 'Pragmatism and Pragmaticism' (1965, p.99) wrote: "Reasoning is of three types, Deduction, Induction, and Abduction".

1. Abductive Inference

Abductive inference is a notion that has become familiar to most of us, but the notion is a relative newcomer as something that is widely known or accepted in logic. There seems to be quite a bit of uncertainty about exactly how the notion should be exactly defined. It is thought that the American philosopher Charles Saunders Peirce was the originator of the notion of abduction. But that too is somewhat uncertain, in my opinion, even though Peirce's work on abduction is strikingly original and deep.[2] A paper by Harman (1965) is also often assumed to be an origin of the notion of abduction in philosophy. However, Harman's paper makes no specific mention of Peirce's work on abduction. Perhaps Peirce's work had not been "rediscovered" in 1965. Although many readers of this paper may have only a fuzzy notion about what abduction is, or is taken to be, they can be expected to have very firm opinions on how to define deductive and inductive inference.[3] Hence, the best way of introducing the notion is to begin by using a simple example to contrast abductive inference with deductive and inductive inference.

The best place to begin is to describe what are usually taken to be the success criteria for all three types of inference.[4] In a deduc-

2. It will be shown below that Greek philosophers were very familiar with forms of inference closely related to abductive inference, and that there is a long, but not well known history linking these ancient notions to modem notions of plausible inference. Much historical work on the development of informal logic remains to be done, and much is simply not yet known.

3. Wellman's category of conductive argument showed the importance of a third category in ethical argumentation. It is beyond the scope of this paper, however, to go into the question of whether conductive and abductive arguments are the same or different. The author is currently working on studying this question as a research project on the subject of ethical justification. The research is to be published in a book, Ethical Argumentation, Lexington Books, 2002.

4. Skynns (1966, p. 4) put forward the view that 'deductive' and 'inductive' are not the names of kinds of arguments, but should be seen as success criteria for arguments.

tively valid inference, it is impossible for the premises to be true and the conclusion false. In an inductively strong inference, it is improbable (to some degree) that the conclusion is false given that the premises are true. In an abductively weighty inference, it is implausible that the premises are true and the conclusion is false. The abductive type of inference tends to be the weakest of the three kinds. A conclusion drawn by abductive inference is an intelligent guess. But it is still a guess, because it is tied to an incomplete body of evidence. As new evidence comes in, the guess could be shown to be wrong. Logicians have tended to be not very welcoming in allowing abductive inference as part of logic, because logic is supposed to be an exact science, and abductive inference appears to be inexact. Certainly it is not final. It can be described as a form of guessing. It is subject to being overturned by further evidence in a case. It would seem to be more fallible and conjectural than the other two types of inference.

A nice illustration of the three-way distinction can be given by citing an example used in a recent paper of Preyer and Mans (1999, p. 12).

> ***Deductive Reasoning:*** Suppose a bag contains only red marbles, and you take one out. You may infer by deductive reasoning that the marble is red.
> ***Inductive Reasoning:*** Suppose you do not know the color of the marbles in the bag, and you take one out and it is red. You may infer by inductive reasoning that all the marbles in the bag are red.
> ***Abductive Reasoning:*** Suppose you find a red marble in the vicinity of a bag of red marbles. You may infer by abductive reasoning that the marble is from the bag.

This illustration indicates how abductive reasoning is different from deductive and inductive reasoning. Of course, deductive and inductive reasoning is already quite familiar to us, and it has been extensively analyzed in logic and statistics. But abductive reasoning appears to be mysterious. To some it might appear that it is a special kind of inductive reasoning. But as Woods (1999, p. 118) pointed out, Peirce did not think so. Peirce (1992, p. 142)

wrote, “There is no probability about it. It is a mere suggestion which we tentatively adopt.” Peirce also used the terms ‘hypothesis’ and ‘best explanation’ in describing abductive reasoning, as shown below.

Abductive reasoning is a kind of guessing by a process of forming a plausible hypothesis that explains a given set of facts or data. As Preyer and Mans (1999,p. 12) point out, in this case the hypothesis, ‘The marble is from the bag’ could “serve as part of the explanation for the fact that a red marble lies on the floor”. This account gives a clue about the nature of abductive reasoning, as being a distinctive kind of reasoning in itself, different from deductive and inductive reasoning. Consider the example, and how the conclusion is derived from the given data. I see the red marble on the floor. I see it is near the bag. I know that the bag contains red marbles. I then construct the hypothesis, or guess, that the red marble on the floor came from the bag. How? Well, the red marble didn’t just appear on the floor. It came from somewhere. There is no other obvious source, let’s say. Although there is no hard evidence it came from the bag, that hypothesis appears to be the only plausible explanation that offers itself. There are no other hypotheses that are more plausible. The explanation concerns the source of the marble. It could have gotten where it is by coming out of the bag, and somehow (we do not know how) arriving at its present location on the floor. What is significant in the given case is not only the known facts, but also the boundaries of what are known. There is the bare room, the bag of red marbles, and the single red marble on the floor near the bag. No other relevant facts of the case are known. From this set of data, one explanation of the given location of the marble stands out.

Abductive inference has often been equated with inference to the best explanation. Harman (1965, pp. 88-89) wrote that “inference to the best explanation corresponds approximately to what others have called abduction”. According to Harman, various kinds of reasoning can be shown to be instances of inference to the best explanation. One kind of case he cited is that of a detective who

puts the evidence together to arrive at the conclusion that the butler did it, in a murder case (p.89). Another kind of case is that of a scientist inferring the existence of atoms and other subatomic particles (p. 89). Another is the kind of case of witness testimony in which we infer that the witness is telling the truth (p. 89). Harman explicates the latter use of reasoning as an inference to the best explanation as follows (p. 89). Our confidence in his testimony is supported by the failure of there to be any other plausible explanation than that he actually did witness the situation he describes. Hence we draw the conclusion, by inference, that he is telling the truth of the matter. It is interesting to note that two of the three kinds of cases cited by Harman show the fundamental importance of abductive inference in legal argumentation.

As a species of inference to the best explanation, abductive inference can be defined as having three stages. First, it begins from a set of premises that report observed findings or facts –the known evidence in a given case. Second, it searches around among various explanations that can be given for these facts. Third, it selects out the so-called "best" explanation and draws a conclusion that the selected explanation is acceptable as a hypothesis. The sequence of reasoning in the red marble case could be represented schematically as follows.

> ***Positive Data:*** the red marble is on the floor, near the bag of red marbles.
> ***Hypothesis:*** the red marble came from the bag.
> ***Negative Data:*** no other relevant facts suggest any other plausible hypothesis that would explain where the red marble came from.
> ***Conclusion:*** the hypothesis that the red marble came from the bag is the best guess.

The best guess is just an assumption, or presumption. It could be overturned by new information that suggests otherwise. But given what is known and what is not known about the facts of the case, that hypothesis is the best guess, or the most plausible one. There are lots of other possible explanations. Somebody could have put the marble there to make it appear that it came from the bag, for

example. But in the absence of any relevant known facts of this sort, the hypothesis that the marble came from the bag is the only explanation that is given any plausibility by the actual facts of the case. Abductive inference is defeasible, meaning that the conclusion is only a hypothesis that is subject to retraction if further investigation of the facts in the case shows that another of the alternative explanations is "better".

Abduction is often portrayed as a kind of 'backwards' reasoning, because it starts from the known facts and probes backwards into the reasons or explanations for these facts. The etymological derivation of the term is from the Latin *ab* (from) and *duco* (lead). If you have a given knowledge base, then by abduction you are taking one proposition in the knowledge base, and trying to trace its derivation from prior propositions in the knowledge base. Knowledge-based reasoning is both common and important in computer science. And so abduction is a common and important kind of reasoning in computer science (Reiter, 1987). Abductive inference is tied to the known or presumed facts of a case, but can be altered should this set of given data be altered. It is for this reasoning that abductive reasoning has also been called "retroductive"(Woods, 1999, p. 118). It is a kind of reasoning that leads backwards from the given set of facts, to hypothesize a basis from which those facts could be inferred. From the positive and negative data above in the red marble case, a conclusion can be drawn by a process of negative reasoning sometimes called *argumentum ad ignorantiam.* Since there is no other plausible explanation of the red marble being on the floor that is suggested by the known facts, from closure of the boundaries of what is known in the case we can infer that the marble came from the bag of red marbles. If these boundaries are altered by new facts of the case, of course, that conclusion may have to be retracted. Negative reasoning from a knowledge base is called *argumentum ad ignorantiam* in logic. But in computer science, it is known as the lack-of-knowledge inference (Collins, Warnock, Aiello and Miller, 1975, p. 398). Abductive reasoning should be seen as not only a kind of knowl-

edge-based reasoning, but also as tied to what is not known in a case.

Abduction is often associated with the kind of reasoning used in the construction of hypotheses in the discovery stage of scientific evidence. A nice idea of how abductive inference works in scientific reasoning can be gotten by examining Peirce's remarks on the subject. Peirce (1965, p. 375) described abduction as a process "where we find some very curious circumstance, which would be explained by the supposition that it was a case of a certain general rule, and thereupon adopt that supposition." The description given by Peirce suggests that abduction is based on explanation of a given fact or finding, a "curious circumstance". The words 'supposition' and 'adopt' suggest the tentative nature of abduction. As noted above, you can accept an abductively derived conclusion as a provisional commitment even if it is subject to retraction in the future. The expression 'general rule' is significant. Abductive inferences are derived from the way things can normally be expected to go in a familiar kind of situation, or as a "general rule". A general rule may not hold in all cases of a certain kind. It is not based on a warrant of 'for all *x*', as deductive inferences so often are. It is not even based on a finding of most or countably many cases, as inductive inferences so often are. It holds only for normal or familiar cases, and may fail outside this range of "general rule" cases.

Two of the examples given by Peirce illustrate what he means by abductive inference. The first example quoted below came apparently from his own personal experience, and shows how common abductive inferences are in everyday thinking (1965, p. 375).

> I once landed at a seaport in a Turkish province; and, as I was walking up to the house which I was to visit, I met a man upon horseback, surrounded .by four horsemen holding a canopy over his head. As the governor of the province was the only personage I could think of who would be so greatly honored, I inferred that this was he. This was an hypothesis.

The second example quoted below (p. 375) illustrates the use of abduction in science. In this case it is the science of paleontology.

> Fossils are found; say, remains like those of fishes, but far in the interior of the country. To explain the phenomenon, we suppose the sea once washed over this land. This is another hypothesis.

The abductive inference in both these cases is easily seen to follow the pattern of inference to the best explanation. In the fossils case, Peirce actually used the word 'explain'. In the fossils case, we all know that fishes require water to survive. That could be described as a general rule a normal or familiar way that fish operate. But it could be subject to exceptions. Some fish can survive on land for some time. But how could fish survive this far into the interior where there is now no water? The observed fact calls for an explanation. A best explanation could be that there was water there at one time. In the four horsemen case, the given facts are also "curious". Why would one man be surrounded by four other men holding a canopy over his head? To hazard a guess, the general rule might be something like the following: only a very important person (like the governor) would be likely to have a canopy supported by four horsemen. But the 'only' should not be taken to refer to the 'for all *x*' of deductive logic, or to warrant a deductively valid inference to the conclusion that this man must necessarily be the governor. It's just a guess, but an intelligent guess that offers a "best" explanation.

As well as being important in scientific and legal reasoning, abduction is highly abundant in everyday argumentation, and in everyday goal-directed reasoning of the kind that is currently the subject of so much interest in artificial intelligence. An excellent and highly useful account of the form of abductive inference has been given in the influential work of Josephson and Josephson (1994). Their analysis is quite compatible with the account given by Peirce. They also describe abduction as equivalent to inference to the best explanation. Numerous examples of the use of abductive inference in everyday reasoning are cited by Josephson and

Josephson, showing how common this form of inference is. The one quoted below, in the form of a brief dialogue, is a good illustration.

> **Joe:** Why are you pulling into this filling station?
> **Tidmarsh:** Because the gas tank is nearly empty.
> **Joe:** What makes you think so?
> **Tidmarsh:** Because the gas gauge indicates nearly empty. Also, I have no reason to think that the gauge is broken, and it has been a long time since I filled the tank.

The reasoning used in this case follows Peirce's pattern of inference to the best explanation. Tidmarsh derives two alternative explanations for the given circumstances presented by the gas gauge. The obvious explanation is that the gas in the tank is nearly empty. But there is also a possible alternative explanation. The gas gauge could be broken. But Tidmarsh does remember that it has been a long time since he filled the tank. This additional evidence tends to make the hypothesis that the tank could be nearly empty more plausible. On balance, the best explanation of the all the known facts is that the gas tank is nearly empty. This conclusion could be wrong, but it is plausible enough to warrant taking action. Tidmarsh should pull into the next gas station.

According to Josephson and Josephson (1994, p. 14), abductive inference has the following form, which clearly shows its structure as based on inference to the best explanation. *H* is a hypothesis.

> *D* is a collection of data.
> *H* explains *D.*
> No other hypothesis can explain *D* as well as *H* does. Therefore *H* is probably true.

It can easily be seen how the two examples from Josephson and Josephson above fit this form of reasoning. If you reconsider the two illustrations of abductive inference from Peirce, it is not hard to see how they too fit this model. But how, you might ask, could such a form of inference be evaluated in a given case? How should

we evaluate the strength or weakness of an abductive argument in a given case?

The answer presented by Josephson and Josephson is that contextual factors of the given case, of various sorts, need to be taken into account. The multiplicity of these factors suggests that the evaluation of abductive inference is quite different from that of deductive or inductive inference. According to Josephson and Josephson (p. 14), the judgment of likelihood associated with an abductive inference should be taken to depend on several factors.

1. how decisively *H* surpasses the alternatives
2. how good *H* is by itself, independently of considering the alternatives (we should be cautious about accepting a hypothesis, even if it is clearly the best one we have, if it is not sufficiently plausible in itself)
3. judgments of the reliability of the data
4. how much confidence there is that all plausible explanations have been considered (how thorough was the search for alternative explanations)

Beyond these four factors of "judgment of likelihood", Josephson and Josephson (p. 14) also list two additional considerations required for the evaluation of an abductive inference.

1. pragmatic considerations, including the costs of being wrong, and the benefits of being right
2. how strong the need is to come to a conclusion at all, especially considering the possibility of seeking further evidence before deciding.

The process for evaluating abductive inferences presented by Josephson and Josephson is different from the process of evaluating deductive or inductive inferences. In a given case, several explanations of the queried fact are possible. The conclusion to be inferred turns on which is the "best" explanation at some given

point in an investigation or collection of data that may continue to move along. But the process of investigation may not be finished. Collection of more facts may suggest a new explanation that may even be better than the one now accepted. The conclusion is an intelligent guess, based on what is known at some given point in an investigation that may, or perhaps even should continue.

The account of abductive inference and inference to the best explanation presented above has emphasized the common elements found in the analyses given by Peirce, Harman and the Josephsons. It is necessary to add that this brief account may be misleading in some respects, and that a closer and more detailed explication of the finer points of the three analyses could reveal important underlying philosophical differences. Inferences to the best explanation, as expounded by Harman and the Josephsons, can involve deductive and inductive processes of a kind that would be apparently be excluded by Perice's account of abduction. A main thesis for Harman, argued at length in his article, is the proposition, "all warranted inferences which may be described as instances of enumerative induction must also be described as instances of inference to the best explanation."(Harman, 1965, p. 88). For Peirce, on the other hand, it would seem that deductive and inductive processes are distinct from the abductive proposal of a hypothesis to be tested. It could well be that, when analyzed in more depth, the notion of abduction presented by Peirce is different from the notion of inference to the best explanation presented by Harman and the Josephsons. However the examples presented above, along with the various definitions and characterizations given, suggest the hypothesis that abductive inference and inference to the best explanation can be taken to be equivalent notions. Peirce's frequent use of explanatory language in his account of abduction also suggests the closeness of the two notions in his view.

2. Plausible Inference

Plausibility, according to Rescher (1976, p. 28), evaluates propositions in relation to "the standing and solidity of their cognitive basis" by weighing available alternatives. Rescher (1976, p. 55) sees plausibility as closely related to presumption: "A positive presumption always favors the most plausible contentions among the available alternatives." A proposition stands as a plausible presumption until some alternative is shown to be more plausible. It is a controversial question whether plausibility is different from probability, and it is hard to entirely exclude the possibility that plausibility might turn out to be some special kind of probability. Rescher (1976, p. 30-31) puts the difference this way. Probability takes a set of exclusive and exhaustive alternative propositions and distributes a fixed amount (unity) across the set, based on the internal contents of each proposition. Plausibility does not assign weights on a basis of internal contents, but on a basis of the external support for each proposition being considered. The way plausibility is described in (Josephson and Josephson, 1994, p. 265-272) also makes it seem different from probability. As shown there, plausibility has often been measured by coarse-scale "confidence values" that seem to be good enough to decide actions, but are different from probability values. According to Josephson and Josephson (p. 266), confidence values are useful in expert medical diagnoses, but it is not helpful to treat them as though they were measures of probability (p. 270). I have presented a set of rules for evaluating plausible inferences (Walton, 1992). The rules are based on the distinction between linked and convergent arguments. How the rules work can be roughly explained as follows. In a linked argument, both (or all) premises are functionally related to support the conclusion. In a convergent argument, each premise is an independent line of evidence to support the conclusion. In a linked argument, Theophrastus' Rule applies. The plausibility value of the conclusion must be at least as great as that of the least plausible premise. In a convergent argument, the value of the

conclusion must be at least as great as that of the most plausible premise.

The notion of plausible inference can best be explained by citing the standard example of it in the ancient world. Plato attributed this example to Corax and Tisias, two sophists who lived around the middle of the fifth century BC (Gagarin, 1994, p.50). Aristotle attributed the example to Corax (Aristotle 1937, 1402a17 – 1402a28). According to the example, there was a fight between two men, and one accused the other of starting the fight by assaulting him. The man who was alleged to have started the fight was quite a bit smaller and weaker than the other man. His argument to the jury ran as follows. Did it appear plausible that he, the smaller and weaker man, would assault the bigger and stronger man? This hypothesis did seem implausible to the jury. The example illustrates how plausible inference can have the effect of shifting a weight of evidence to one side or the other in a legal case. In such a case, because the event happened in the past and there were no witnesses, other than the two principals, a small weight of evidence could shift the balance of considerations to one side or the other. But how does plausible inference work as a kind of evidence in such a case. It is not empirical evidence describing what actually occurred. But it does have to do with appearances. It has to do with how the situation appeared to the jury, and how the participants would be likely to react in that kind of situation.

Plausibility does not have to do with the statistical likelihood of what happened in a given case. It has to with the way things are normally expected to go in a type of situation that is familiar both to the participants and the onlookers, or judges of the situation. In the example, by an act of empathy, a juror could put himself into the situation just before the fight began. Then the juror can ask a hypothetical question. Would he, if he were the smaller man, assault the bigger man and start a fight with him? The answer is that there is a lot to be said against it. Why? Because such an attack would be imprudent. All else being equal, the chances of winning the fight would not be good. The expected outcome is that the

smaller man would take a painful beating, and experience a humiliating defeat. The person on the jury therefore reaches the conclusion that the larger man's allegation that the smaller man started the fight is somewhat implausible. It might be true, but there is something to be said against it.

One of the most interesting things about the example is that it is a typical sophistic argument that can be turned on its head. According to the example, as described by Aristotle (l402a11), the larger man used the following counter-argument. Since I am visibly so much larger and stronger than the smaller man, it was apparent to me that if I were to attack him, it would certainly look bad for me in court. Now, knowing this fact, is it plausible that I would attack the smaller man? The argument is similar to the previous one. The larger man alleges that he is aware of the likely consequences of his attacking a smaller man. It would be imprudent for him to do it. As long as any person on the jury is aware that the larger man would be aware of these consequences, he too can appreciate why the larger man would be reluctant to assault the smaller man. So by a kind of act of empathy, and an awareness of facts that would be familiar to both the jurors and the participants in the example, each member of the jury can draw a plausible inference. This inference gives a reason why it is implausible that the larger man would attack the smaller man. It can be seen that there are plausible arguments on both sides.

The plausible inference in the example only carries some·weight, all other factors in the case being equal. If the smaller man was known to be an experienced pugilist, whereas the larger man was not, the evidence in the case would be changed. This fact could explain why the smaller man had reason to think that he could win the exchange, or at least put up a good fight. This new fact would tend to alter the evidence in the case, and detract from the plausibility of his earlier argument. So a plausible inference can be defeated by new facts that enter a case. But plausible inference is different from probable inference, as shown by Rescher' s account (1976, pp. 31-32) of the functional differences between

the two types of reasoning. For example, in the probability calculus, the probability of a statement not-*A* is calculated as 1 – pr(*A*). In the ancient example of plausible inference, this equation will not work. It is plausible, other things being equal, that the smaller man did not start the fight, for the reason given. But it is also plausible, other things being equal, that the larger man did not start the fight. But it is an assumption of the case that either one or the other (exclusively) started the fight. In other words, if one started the fight, the other didn't. From a point of view of probable inference then, if it is highly probable that one started the fight, it can't be highly probable that the other did. But from a point of view of plausible inference, even though it is plausible, other things being equal, that one started the fight, it can also be plausible, other things being equal, that the other started the fight. The reason, as indicated above by Rescher's account of plausible reasoning, is that plausibility is localized to the body of evidence on the one side of the controversy. As is typical of many legal cases, there are two competing "stories", or accounts of what supposedly happened (Pennington and Hastie, 1991). Each one can be fairly plausible internally, and in relation to the body of evidence that exists. That body of evidence can be incomplete, so it may not rule out plausible accounts on both sides. It is for this basic reason, as Rescher has so rightly emphasized, that plausible inference is inherently different from probable inference.

The above account of plausible inference is clear enough perhaps. But it is very hard to get modern readers to come to accept plausible inference as having any hold on rational assent at all. We are so accustomed to the basing of our notion of rationality on knowledge and belief, we tend to automatically dismiss plausibility as "subjective", and therefore of no worth as evidence of the kind required to ration ally support a conclusion. The modern conventional wisdom is used to thinking of rationality as change of belief or knowledge guided by deductive reasoning and inductive probability. This modern way of thinking finds the notion of plausibility alien or even unintelligible, as an aspect of rational thinking. As an antidote to the pervasive influence of this modem way of thinking

about rationality, it may be useful to delve deeper into the history of plausibility as a philosophical notion.

3. History of Plausibility as a Basis for Rational Acceptance

It may come as surprise therefore to find out that the notion of plausible reasoning as a model of rational thinking actually has a long and continuous history. It did not die out with the sophists, or with Plato and Aristotle. The very best definition of plausibility was given by Cameades, a not very well known Greek philosopher who lived well after the time of Plato and Aristotle. Cameades (c. 213 – 128 B.C.), born in Cyrene, Cyrenaica (now in Libya) was the head of the third Platonic Academy that flourished in the second century B.C. His most important legacy to philosophy was his famous theory of plausibility. According to Cameades' theory, something is plausible if it appears to be true, or (is even more plausible) if it appears to be true and is consistent with other things that appear to be true. Or thirdly, it is even more plausible if it is stable (consistent with other things that appear to be true), and is tested. According to the epistemological theory of Cameades, everything we accept, or should accept, as reasonably based on evidence, is subject to doubt and is plausible only, as opposed to being known (beyond all reasonable doubt) to be true.

Carneades wrote nothing himself, but his lectures were written out by one of his students. Unfortunately, none of these survived either. But we do have some accounts of Cameades' theory of plausiblity in the writings of Sextus Empiricus. In *Against The Logicians (AL)*, Sextus tells us about the theory of plausibility Cameades proposed as a solution to problems he found in earlier skeptical and Stoic views. According to this theory, there are three criteria for plausible acceptance. The first one has to do with experiencing a presentation or appearance in a convincing way. When a subject experiences a "presentation" (something that appears to him), one kind of presentation is "apparently true" or seems convincingly to be true *(AL,* 168-170). Such a presentation, accord-

ing to Carneades' theory, represents a proposition that should be accepted as tentatively true. Of course, as a skeptic would point out, one could be mistaken. But the theory rules that if a proposition is based on a presentation that is apparently true, then that proposition should, for practical purposes, be accepted as true, even though it is not known for sure to be true, and might later be shown to be false or dubious. As Sextus puts it, sometimes we accept a presentation that appears true, but is really false, so "we are compelled at times to make use of the presentation which is at once both true and false." (*AL* 175). The second criterion is a presentation that is both plausible in the first sense, and is also "irreversible", meaning that it fits in with other presentations that also appear true (*AL* 176). Sextus offers a medical illustration in which a physician initially concludes that a patient has fever from his high temperature but then supports this inference by other findings like soreness of touch or thirst (*AL* 179-180). The third criterion involves the "tested" presentation (*AL* 182-183). Sextus cites the classic Carneadean illustration of the rope *(AL* 188). A man sees a coil of rope in a dimly lit room. It looks like a snake, and he infers the conclusion that it is a snake. Acting on this assumption, he jumps over it. But when he turns back, he sees it did not move. Then he readjusts his inference, inferring the new conclusion that it is not a snake, but a rope. But then again, he reasons, snakes are sometime motionless. Thus he carries out a test. He prods the object with a stick. If it still fails to move, that finding would indicate that the object is indeed a rope.

Carneades' theory provides the best definition of the basic notion of plausibility. Something is plausible if it seems, or appears to be true, or if it fits in with other things we accept as true, or if it is tested, and passes the test. According to this approach, if something is plausible to someone, it does not follow that this person knows it to be true, or even necessarily that she believes it to be true. Plausibility is not a theory of knowledge or belief. It is a guide to rational acceptance or commitment, a guide to action. Bett (1990, p. 4), using evidence from Cicero, argued that Carneades distinguished between two kinds of assent. There is

a strong kind of assent, based on knowledge or belief. But the alternative to this strong kind of assent is not indifference or skepticism. There is also a kind of attitude that could be called commitment or approval, that enables the skeptic to go ahead with the ordinary tasks of life. Carneades was reacting against Stoic and other ancient views that claimed rational thinking was based on knowledge and belief. Carneades argued that plausibility offers an alternative to these views that is compatible with skepticism. You might think, however, that the notion of plausibility was only a kind of answer to Greek skepticism, and that it was an obscure ancient notion that did not carry at all over into later philosophy. That hypothesis is not entirely true, however. It can be argued that some modem philosophers have also adopted and advocated the notion of plausibility as important in rational thinking.

A notion of plausibility was used to support a theory of degrees of assent by Locke in chapter 15 of his *Essay Concerning Human Understanding.* Locke defined "probability", or what should properly be called plausibility, by contrasting it with demonstration. Demonstration yields certainty. As an example of a demonstration, Locke cited a proof in Euclidean geometry (1726, p. 274). Arguments based on plausibility occur in cases where something "appears, for the most part to be so." (1726, p. 273), but where there is lack of knowledge and, hence, no basis in certainty on which we can say the proposition is true. Locke presented an interesting example to illustrate plausibility (1726, pp. 275-276). Locke (1726, p. 276) tells about a Dutch ambassador who was entertaining the king of Siam. The ambassador told the king that the water in the Netherlands would sometimes, in cold weather, be so hard that men could walk on it. He said that this water would even be so firm· that an elephant could walk on the surface. The king of Siam found this story so strange that he concluded that the ambassador had to be lying. The story makes the point that plausibility refers to an inference drawn on the basis of normal, commonplace expectations based on conditions that a person is familiar with. In the tropics, people were not familiar with freezing conditions, and hence the story of the freezing canal did not fit in with the nor-

mal expectations they were used to in their environment. They just found the whole story implausible and unconvincing.

The core of Bentham's so-called natural theory of evidence was his theory of probability, or probative force. It strongly appears that Bentham used these terms to refers to the same notion of plausibility described by Locke. In Bentham's natural system, there are two parts to plausibility. One is the establishing of the plausibility of a proposition, and the other is the testing of that plausibility by subsequent process of examining it. Bentham discussed the question whether plausibility can be measured by some number or ratio of numbers in the way that we are familiar with in handling statistical data. On the one hand, he wrote (1962, v.7, p. 64) that, on an individual occasion, the degree of strength at which a persuasion stands "would be capable of being expressed by numbers, in the same way as degrees of probability are expressed by mathematicians, viz. by the ratio of one number to another." But he seems to disagree that these numbers could be assigned in a way that would be consistent with the mathematical theory of probability. Thus Bentham's approach to plausibility would appear to be quite consistent with that advocated by Josephson and Josephson, above.

The second part of Bentham's method of evaluating probability is his so-called system of securities for testing the trustworthiness of a proposition put forward as plausible, for example, by a witness. The degree of plausibility of a proposition can be calculated, according to Bentham, by a formula. The outcome is a function of the initial probative force of the evidence supporting it minus the probative force of any of the contrary indicators which may have been introduced by the testing of the probability of the proposition in the subsequent analysis of it (Twining 1985, p. 55). Another part of the system involves a sequence of inferences called by Bentham (1962, v.7, p. 2) a "chain of facts". Bentham describes such a chain of facts (1962, v.7, p. 2) as originating in a so-called "principle fact", which leads, by a series of links, to succeeding evidentiary facts drawn by inference from the principle fact and from the previous conclusions drawn in the sequence of inferences. Bentham

then goes on to discuss (1962, v.7, p. 65) cases where there is an evidentiary chain composed of a number of links. Evaluating the plausible reasoning in such a chain is based on the principle that "the greater the number of such intermediate links, the less is the probative force of the evidentiary fact proved, with relation to the principle fact." (1962, v.7, p. 65) As the chain grows longer, the inference gives less plausibility for accepting the ultimate conclusion in the chain because the chain is weakened. As an example Bentham cited the following case (1962, v.7, p. 65): "The more rounds a narrative has passed through, the less trustworthy it is universally understood to be." This notion of the chain of reasoning is familiar in modem argumentation theory as the serial form of argumentation.

Through Locke and Bentham the notion of plausibility survived as the basis of a kind of reasoning that could support rational acceptance of an inference leading to a conclusion, based on something other than deductive reasoning or inductive probability. But did the notion of plausibility, of the kind captured in Cameades theory, survive even longer? Doty (1986) argued that the Cameadean notion of plausibility is manifested in the tests of truth –and rational inference advocated by modem pragmatists like William James. Whether Doty's hypothesis is supportable is controversial, and proving or disputing it requires a close reading of what the modem pragmatists wrote about rational acceptance. But Doty has, at any rate, made an interesting case that the Cameadean notion of plausibility has not altogether died out or remained obscure, and that traces of it can even be found in the writings of the modem pragmatists. But there is another way in which the Cameadean notion of plausibility has survived in an important way into modem ways of thinking about rational assent and evidence. It is made quite clear in the historical development of ideas outlined so very well in Twining (1985) that the Lockean and Benthamite notion of plausible reasoning formed the very basis of the influential theory of legal evidence developed by John H. Wigmore. One only has to look at modem rules of evidence in the Anglo-Ameri-

can system of law to see how the foundational notion of probative weight evolved into law through Locke, Bentham and Wigmore.

4. Presumptive Inference

Another kind of reasoning that is very important in legal argumentation is presumptive inference. In law, a person may be presumed to be dead, for purposes of settling his estate after a prescribed period, even though it is not known for sure that he is dead. As long as there has been no evidence that he is still alive, after a prescribed number of years, the conclusion may be drawn that he is (for legal purposes) dead. Of course, this conclusion may later be retracted if the person turns up alive. It is merely a presumption, as opposed to a proved fact. A presumption then is something you move ahead with, for practical purposes, even though it is not known to be true at the present time. It is a kind of useful assumption that can be justified on practical grounds, in order to take action, for example, even though the evidence to support it may be insufficient or inconclusive. Presumption and plausibility are both concerned with the practical need to take action, or to provisionally accept a hypothesis, even though the evidence is, at present, not sufficient to prove the hypothesis beyond doubt, or show it is known to be true.

Abduction also relates to hypotheses that are accepted provisionally, often for practical reasons, or to guide an investigation further along. Thus the practical motivation of using abductive inference is comparable to those of presumptive inference and plausible inference. Presumptive inference is easily confused with abductive inference, and the two often tend to be seen as either the same thing, or very closely related. The notion of presumptive inference tends to be more prominent in writings on legal argumentation, while the term ‘abductive inference’ is much more commonly used in describing scientific argumentation and in computer science. Both types of inference are provisional in nature. Both types of inference are also hypothetical in nature, and have to do with rea-

soning that moves forward in the absence of complete evidence. Judging from the account of abductive inference above, it seems like it can be described as presumptive in nature. But what does that mean? To explore the question, it is useful to begin with some account of what presumptive inference is supposed to be.

A dialectical analysis of presumptive inference has been put forward in Walton 1996, and the main points of the analysis have been nicely summarized in Blair, 1999, p. 56. The analysis presumes a structure of dialogue in which, in the simplest case, there are two participants. They are called the proponent and the respondent, and they take turns asking questions, putting forward arguments, and making other moves. In such a dialogue, when the proponent puts forward an assertion, there is a burden of proof attached to that move. If the respondent asks for justification of the assertion, the proponent is then obliged, at the next move, to either give an argument to justify the assertion, or to retract it. This requirement is a rule that applies to the making of assertions in certain types of dialogue. With respect to this rule, assumption may be contrasted with assertion. In a dialogue, a proponent can ask the respondent to accept an assumption at any point, and there is no burden of proof attached. Assumptions are free, so to speak. An assumption is just a hypothesis. It may be proved or disproved when later evidence comes into a dialogue. But you don't have to prove it right away. Presumption can be described as a move in dialogue that is mid-way between assertion and assumption. According to the dialectical analysis in Walton 1996, when the proponent puts forward a presumption, she does not have to back it up with proof, but she does have to give it up if the respondent can disprove it. As Blair (1999, p. 56) puts it, "A presumption so conceived has practical value by way of advancing the argumentation, and, in accepting something as a presumption, the interlocutor assumes the burden of rebutting it." As Reiter (1980) and Blair (1999, p. 56) indicate, presumptive inference, comes into play in cases where there is an absence of firm evidence or knowledge. The practical justification of presumptive reasoning, despite its uncertain and inconclusive nature, is that it moves a dialogue for-

ward part way to drawing a final conclusion, even in the absence of evidence for proof at a given point. Because of its dependence on use in a context of dialogue, it is different in nature from either deductive or inductive inference.

A legal example cited above can be used to illustrate how presumption has an inherently practical justification in moving a dialogue forward. As mentioned, the presumption that a person is dead is often invoked in legal reasoning in cases where the person has disappeared for along time, and there is no evidence that the person is still alive. In order to deal with practical problems posed by estates, courts can rule that a person is presumed to be dead as long there has been no evidence for a fixed period that she is still alive. For practical purposes, say to execute a will, the conclusion is drawn by presumptive inference that for legal purposes the person will be declared dead. This legal notion of presumptive inference fits the dialectical analysis. There may be insufficient positive evidence to prove that the person is dead. But for legal purposes, a court can conclude by presumptive inference that she is dead. The justification is the lack of positive evidence that she is alive. Presumption, according to the dialectical analysis, is comparable to assertion as a move in dialogue except that the burden of proof is reversed. Normally in a dialogue in which the goal is to resolve a conflict of opinions by rational argumentation, when you make an assertion, you are obliged to prove it or give it up (van Eemeren and Grootendorst, 1992). But when you put forward a presumption to be accepted, at least provisionally, by all parties to the dialogue, you are only obliged to give it up if the other party can disprove it. It is this dialectical reversal that characterizes presumptive inference. This type of legal case also illustrates quite well the connection between presumption and the argument from ignorance *(argumentum ad ignorantiam),* a type of argument often taken to be fallacious in logic. Such arguments from lack of evidence (often called *ex silentio* argument in history) are, however, not always fallacious (Walton, 1996). Under the right conditions, they can be quite reasonable presumptive arguments. These kinds of arguments are very common in legal reasoning. The most obvi-

ous cases are those associated with the so-called presumption of innocence in criminal law.

5. Argumentation Schemes

There are many different kinds of arguments that are best evaluated in a vast preponderance of cases by standards that are neither deductive nor inductive. These types of argumentation are often equated with traditional informal fallacies. However, in many cases of their use, they are not fallacious. In such cases, if seen as presumptive arguments, they do have some weight as rational arguments that could be used to support a claim. Many of them were identified in (Perelman and Olbrechts-Tyteca, 1969). Some of the best known examples are argument from analogy, *ad hominem* argument, argument from ignorance, argument from sign, argument from consequences, appeal to popular opinion, appeal to pity, and appeal to expert opinion. Each of these types of argument does appear to have a recognizable form. But that form is not, at least in the vast range of cases, either a deductively valid form of argument or an inductively strong form of argument. In fact, they all seem to fall into the third category of arguments having some presumptive (or perhaps abductive) weight of plausibility. Now there is a literature studying these forms of argument. They are usually called argumentation schemes in this literature. Many different argumentation schemes have been analyzed in (Hastings, 1963), (Kienpointner, 1992) and (Walton, 1996). To show the beginning reader, an analysis one of these argumentation schemes is presented below, with an account of how particular cases are evaluated using the scheme.

Argument from expert opinion is often also called the appeal to expert opinion in logic textbooks. According to the analysis given in (Walton, 1997, p. 210), argument from expert opinion has the following argumentation scheme, where *E* is an expert source and *A* is a statement.

Argument from Expert Opinion

Major Premise: Source *E* is an expert in subject domain *S* containing proposition *A.*
Minor Premise: *E* asserts that proposition *A* (in domain *S*) is true (false).
Conclusion: *A* may plausibly be taken to be true (false).

Argument from expert opinion shifts a weight of presumption in a dialogue favoring the acceptance of the statement put forward as true by the expert. If the premises are acceptable to the respondent, then the respondent should also, at least tentatively, accept the conclusion. But this acceptance (or commitment) is subject to retraction depending on the asking of appropriate critical questions by the respondent in the dialogue. Six appropriate critical questions for the appeal to expert opinion are cited in (Walton, 1997, p. 223).

1. *Expertise Question:* How credible is *E* as an expert source?
2. *Field Question:* Is *E* an expert in the field that *A* is in?
3. *Opinion Question:* What did *E* assert that implies *A*?
4. *Trustworthiness Question:* Is *E* personally reliable as a source?
5. *Consistency Question:* Is *A* consistent with what other experts assert?
6. *Backup Evidence Question:* Is *A*‘s assertion based on evidence?

Some discussion is needed to indicate how question 1 is different from question 4. Question 4, the trustworthiness question, queries the honesty or veracity of the source. This question is about the ethical character of a source. Question 1, the expertise question, queries the competence of the expert. An expert has credibility not only because of her knowledge in the field in question, but also because she has the judgment skills to use that knowledge as applied to a particular problem. When depending on expert opin-

ion, you can go wrong if the expert is lying, or if the expert is incompetent. The relevance of the other critical questions is more obvious, but the analysis of these critical questions in (Walton, 1997, chapter seven) gives full details. It is significant to note, however, that each of the six basic critical questions above can admit of critical subquestions, used to continue a dialogue in more detail.

The defeasibility of appeal to expert opinion as a type of argument is brought out by the dialectical evaluation of it, explained above. Argument from expert opinion has only a weight of presumption favoring one side in a dialogue. When subjected to critical questioning by the other side, the argument defaults, temporarily, until such time as the critical question has been answered satisfactorily. A question about how argumentation schemes should be used to evaluate arguments used in particular cases can now be posed. When has a dialogue reached the stage where all the appropriate critical questions to a proponent's argument have been satisfactorily answered so that the respondent must now accept the argument without going on and on asking more critical questions?

In the case of a deductively valid argument, if the respondent accepts the premises as true, then he must necessarily accept the conclusion. In the case of an inductively strong argument, if the respondent accepts the premises as true, then he must accept the conclusion as probably true. And the degree of probability can be calculated, in many cases, in relation to the degree of the inductive strength of the argument. The addition of new premises can make an inductively strong argument into an inductively weak argument. But an inductively strong argument can not be made inductively weak simply by asking a relevant question, like whether the sample is large enough to warrant the generalization. To make the argument less strong, evidence must be given by the respondent to show that the sample was too small. In the case of an argumentation scheme, the respondent is bound to tentatively accept the conclusion, given that he accepts the premises of such an argument, even if the argument is neither deductively valid nor inductively

strong. But the acceptance is only tentative depending on further progress of the dialogue. If the respondent just asks the right question, the acceptance of the worth of the argument to determine commitment is suspended. So when is an argument having the form of one of the argumentation schemes binding on the respondent? Even if all the critical questions have been answered satisfactorily by the proponent, can the respondent still go on asking critical subquestions? When is the argument finally binding on the respondent? This difficult question probes into the status of argumentation schemes as being based on a standard of argument evaluation that is different from the kinds of standards properly used to evaluate arguments that are supposed to be deductive and inductive.

The answer to this difficult question is that argumentation schemes represent a different standard of rationality from that represented by deductive and inductive argument forms. This third class of presumptive (or abductive) arguments result only in plausibility, meaning that if the premises seem to be true, then it is justified to infer that the conclusion also seems to be true. But seeming to be true can be misleading. You can go wrong with these kinds of arguments. For example, if an expert says that a particular statement is true, but you have direct empirical evidence that it is false, you had better suspend judgment. Or, if you have to act on a presumption one way or the other, go with the empirical evidence. But a presumptive argument based on an argumentation scheme should always be evaluated in a context of the dialogue of which it is a part. When the dialogue has reached the closing stage, and the argumentation in it is complete, only then can an evaluator reach a firm determination on what plausibility the argument has. And this evaluation of the argument must always and only be seen as relative to the dialogue as a whole. Typically, one individual argument has only a small weight of plausibility in itself. The significance of the argument is only that it can be combined with a whole lot of other relevant plausibilistic arguments used in the case. The important factor is the combined mass of evidence in the case. There will be two sides to the case, and there will be a mass of evidence on

both sides. The final outcome of the case should be determined by how the mass of evidence on both sides tilts the burden of proof set at the initial stages of the dialogue.

The answer to the completeness question sketched out above is brief. It raises a whole host of other related questions. But one central question stands out. Are these kinds of argument modeled by argumentation schemes abductive in nature? It is easily seen that they are presumptive in nature, and that the notion of presumption helps to understand how they should properly be evaluated. But how does abduction come into it? And what is the difference between presumption and abduction? That was a central question that motivated this investigation. What can be said in answer to it? The first observation to make is that some of the argumentation schemes are very readily cast as modeling abductive arguments. For example, argument from sign is clearly abductive. An example of argument from sign is the following inference: here are some bear tracks in the snow, therefore a bear recently passed this way (Walton, 1996, p. 47). This argument can be seen as an inference to the best explanation, as follows. The bear tracks in the snow are the observed facts or given data. What could explain them? A plausible, but not the only possible explanation is that a bear recently passed that way, producing the tracks. If the area is one where bears might be expected to pass, and there is no indication that someone has cleverly faked these imprints, it is reasonable to infer that a bear passed that way. Inference to the best explanation works fine here, but what about with other argumentation schemes, like appeal to expert opinion for example? If a physician tells me I have measles, using argument from expert opinion, it is a plausible hypothesis that I have measles. But is the argument abductive? Is my having measles the best explanation of what the expert said. Well maybe, but fitting the argument into this format does not seem to throw much light on its structure. The fit seems awkward, at best.

A better way to proceed is to begin with the insight of Blair (1999, p. 57) that some argumentation schemes seem to be more general,

or more abstract than others. In other words, there may be hierarchies of argumentation schemes. Could it be that some groups of argumentation schemes fall under other argumentation schemes? Following this line of reasoning, it seems possible that some argumentation schemes fit under abduction while other do not.[5] What this hypothesis suggests, in turn, is that abduction could be viewed as a distinctive form of argument in its own right. If this is so, there should be an argumentation scheme for abductive argument. Taking this line of reasoning to its logical conclusion, a new argumentation scheme for abductive argument is proposed below.

6. A New Argumentation Scheme for Abduction

What is suggested by the accounts of abductive inference presented above is that this form of inference should be evaluated in a context of use in an investigation of the facts that is dynamic. The data base is not fixed. New facts are coming into the circumstances of the case. This dynamic aspect suggests that abductive inference could be best evaluated in an evolving dialogue between two parties.[6] In other words, abductive inference could be seen as fitting into the standard scheme for evaluation of argumentation characteristic of the new dialectic (Walton, 1998). Several other aspects of the account of abductive inference given above also sug-

5. A controversial case in point is whether argument from sign is abductive. Many instances of argument from sign are clearly abductive, and viewing them as abductive inferences seems revealing and useful. But some arguments from sign are not abductive. For example, we take the presence of certain kinds of dark clouds as a sign that it will rain. Yet as the Josephsons (1994, p. 24) have convincingly argued, predictions are not abductions.

6. Cawsey (1992) has argued very convincingly, using many examples, that the concept of explanation can best be analyzed as an interactive notion of goal-directed dialogue. If abduction is to be defined as inference to the best explanation, it would follow that abduction is inherently dialectical in nature. This hypothesis is, of course, opposed to the traditional positivistic conception of explanation as being based on deductive and inductive inferences from laws (where laws are taken to be universally quantified statements or inductive regularities).

gest the contextual variability of this kind of reasoning. One is that abductive inference is typically triggered by the asking of a question. How did something happen, or why did it happen? Another aspect is that abduction is based on the notion of explanation. And it can be argued that explanation is itself a dialectical notion that can only be analyzed by seeing it in a context of dialogue between two parties. Another aspect is the Tidmarsh example presented by the Josephsons. It is in the form of a dialogue. And in fact, presenting the abductive inference in this form best shows the process of reasoning that is characteristic of abduction, and how it works. All these aspects combined suggest that abductive inference could very nicely be modeled as a presumptive form of reasoning, fitting the many other argumentation schemes (forms of inference) for presumptive reasoning presented in (Walton, 1996). Following up this dialectical approach, below is presented a new analysis of the form of abductive inference as a kind of argumentation scheme.

The argumentation scheme for abductive argument is based on two variables. The variable *F* stands for a set of what are called the given set of facts in a case. A given set of facts can be viewed as a set of statements that describe the so called "facts", or what are presumed to be the facts in a given case. They are called "facts" because they are presumed to be true statements, or at least their truth is not in question for the present purposes. The variable *E* stands for an explanation. But what is an explanation? According to the account on which the argumentation scheme below is based, the concept of explanation is dialectical, in the following sense. A set of statements *E* is judged to be a satisfactory explanation of a set of facts *F* if and only if *E* is a set of statements put forward by an explainer in a dialogue that gives the explainee in the dialogue a better understanding of *F.* An explanation, so defined, is a response offered to a particular type of question in a dialogue. The satisfactoriness of an explanation, so considered, depends on the type of dialogue the two parties are engaged in, on how far the dialogue has progressed, on what has been said in the dialogue before the explanation was attempted, and on the collective goal the dialogue is supposed to fulfill. So conceived, abduction is a form of argu-

ment that has the same kind of structure of an inference to the best explanation as postulated by the accounts of Peirce and the Josephsons. But instead, in the argumentation scheme presented below, the structure of the abductive form of argument is more explicitly dialectical.

Abductive Argumentation Scheme

F is a finding or given set of facts.
E is a satisfactory explanation of *F.*
No alternative explanation *E'* given so far is as satisfactory as *E.*
Therefore, *E* is plausible, as a hypothesis.

The term 'hypothesis' in the conclusion suggests that the abductive argument is a form of presumptive argumentation in a dialogue. The conclusion is only a tentative assumption, relative to the progress of the dialogue to a given point. It is not proved beyond doubt by the premises, but only sets in place an assumption that both parties to the dialogue should accept for the time being, so that the dialogue can progress further. As the dialogue proceeds, the abductive conclusion may stay in place, or further evidence may dislodge it. Things could go either way. The abductive conclusion can be seen as having a certain "weight" behind it. But that weight can be lightened, or even removed through the asking of appropriate critical questions by the other party in the dialogue. What are these critical questions? The evaluation factors of Josephson and Josephson, cited above, offer good guidance. The following critical questions provide a basis for evaluation that center on many of these same factors, or comparable ones.

CQ1: How satisfactory is *E* itself as an explanation of *F,* apart from the alternative explanations available so far in the dialogue?
CQ2: How much better an explanation is *E* than the alternative explanations available so far in the dialogue?
CQ3: How far has the dialogue progressed? If the dialogue is an inquiry, how thorough has the search been in the investigation of the case?

CQ4: Would it be better to continue the dialogue further, instead of drawing a conclusion at this point?

The evaluation procedure outlined above explicitly analyzes abductive arguments as dialectical. Each abductive argument put forward in a given case has some weight in a dialogue, making its conclusion an assumption that should be reasonably accepted for the present. But each single abductive argument needs to be evaluated in a dialogue containing other abductive arguments as well. Some abductive arguments can conflict with others, because none of them, by itself, tends to be conclusive, or have very much weight. The small weight of plausibility of each argument needs to be evaluated, and then possibly re-evaluated, within the larger body of evidence complied as the dialogue proceeds. Only once the dialogue is completed will the mass of evidence on both sides be weighed up and compared. The prior distribution of the burden of proof, presumably set at the beginning of the dialogue, will determine the final conclusion to be drawn. Typically however, single abductive arguments, as used in a given case, need to be evaluated provisionally at a mid-point of the dialogue. Hence such arguments are typically defeasible in nature. Even so they can be useful as rational arguments because they can play a small, but potentially important part, in the final outcome.

7. Tentative Conclusions

So what should be said in answer to the question about which is the third type of argument, as contrasted to deductive and inductive arguments? Is this third type of argument best described as abductive, presumptive or plausible? The best answer, although it will be unsatisfying to many who want a simple answer, is that this type of reasoning is both presumptive and plausibilistic, and it is very often abductive as well. It is perhaps even fair to say that it is typically abductive in nature. Plausible reasoning is like that. What characterizes it as a type of reasoning is that it selects from a set of alternatives, as Rescher's description of it (above) showed, and

is relativized to a given body of evidence. These two characteristics are also properties of abductive reasoning. But abductive reasoning has the additional characteristic that it is always based on an explanation, or set of explanations, of the given body of evidence, or set of facts in a case. So abductive reasoning seems to be a special kind of plausible reasoning. But abductive reasoning seems to be inherently presumptive in nature. As Peirce's account makes clear, abduction is a kind of supposition-based reasoning that proceeds by the construction of a hypothesis. A hypothesis is a provisional guess that may have to be given up later, when more experimental evidence comes in. So abductive reasoning is presumptive in nature. The burden of proof is not there. A guess is allowed, even if there is very little or no firm evidence to support it yet. But the hypothesis has to be given up, if later contra-evidence falsifies it.

When the deductive and inductive categories are contrasted with some third category, what is the basis of the distinction? Is it the strength of the link between the premises and the conclusion? It is this aspect that often seems to be stressed as important. As Blair (1999a, p. 4) pointed out, philosophers interested in the norms that govern argument have focussed on the illiative (logical) core, rather than on the social practice in which the argument is embedded. But perhaps that way of classifying arguments looks to the wrong place. What should be looked at is how the argument is useful to contribute to goals of social practices, and how the goals can be interfered with by fallacious arguments. Presumption, abduction and plausibility have a logical core, as types of reasoning. But it is not possible to grasp the important differences between (among) them, unless they are viewed dialectically as types of argument. Presumption is best understood dialectically, as indicated above, by seeing how it operates in a dialogue by reversing the obligation to prove. Abduction, as indicated by.the analysis above, is also best understood as a dialectical sequence with several distinctive steps. The first step is the existence of a given set of facts (or presumed facts) in a given case. A why-question or a how-question is then asked about this fact. In other words, an

explanation for this fact is requested by one participant in the dialogue. Then the other participant answers the question by offering an explanation. Through a series of questions and answers, several alternative explanations are elicited. Then there is an evaluation of these explanations and the "best" one is selected out. This best explanation is then detached by the first participant as the conclusion of the abductive argument. The dialectical nature of plausible argument has also been brought out by the analysis above, showing how plausible reasoning should be evaluated in a given case.

What should really be emphasized is that plausible reasoning is only based on appearances, on impressions of a case that could turn out to be misleading once the case has been studied in more depth. This aspect of it was brought out most clearly by the account of plausibility given by Carneades, with its three criteria for judging what is plausible. Plausible reasoning applies to cases where there is some evidence, but where there is doubt whether this evidence is veridical or conclusive. Something could appear to be true now, but when tested later, it may turn out to actually have been false. Or, at any rate, it may now appear to be false, on the balance of the evidence. Plausible reasoning is especially useful in cases where there is some unsettled issue or controversy, so that opinions on both sides of the issue are feasible. Plausible reasoning is best judged as relative to the given evidence in the case and even, or especially when that evidence is yet incomplete. Thus typically, in a kind of case in which plausible reasoning is most useful, there are two opposed theses, both are alternatives with some weight of evidence behind them, and the total evidential situation is incomplete. As Blair (1999a, p. 6) puts it, "in the kind of reasoning characteristic of argumentation schemes, there are both reasons to support a conclusion, and reasons to support the contradictory of the conclusion." The choice between alternatives is made on a balance of considerations. Neither alternative can be proved, but neither can be disproved. It is a decision between carrying the search for more evidence forward, or because of costs and practical exigencies, making a guess now. Plausible reasoning steers an evidence-gathering but open-minded dialogue ahead through a

mass of uncertainties in a fluid situation by making the presumptive inferences that point the best path ahead. Thus the context of dialogue is essential to the evaluation.

If this approach is on the right track, then maybe it is better to resist the triadic terminology of deductive, inductive, abductive (despite the attraction that the words have, since they go so nicely together). Instead, we should have dual classification. On the one side are deductive and inductive arguments. On the other side is plausible argument. Plausible argument is a kind of guessing that is especially susceptible to wrong impressions and fallacies. It is not very exact, and it is variable and presumptive in nature. It is vitally important for the user of plausible argument to be open-minded, steering a mid-path between respecting the facts of a case and asking critical questions. The two main faults are the extremes of being dogmatic and leaping too quickly or too firmly to a questionable conclusion. Being dogmatic is a failure to be open to further dialogue. Leaping too quickly or too firmly may be a failure to seek more evidence, or even a closure to new evidence. Thus plausible reasoning requires different skills from deductive and inductive reasoning. It is less a matter of exact calculation than a matter of steering a dialogue ahead by balancing and weighing up many complex arguments on both sides. Abduction is best defined as a special kind of plausibilistic argumentation that has a distinctive argumentation scheme. Many, but not all plausible arguments are abductive in nature. Abductive arguments, and plausible arguments generally, tend to be presumptive, resulting in conclusions that are hypotheses or partially supported guesses.

Josephson and Josephson (1994) have argued for a new taxonomy of basic inference types, as opposed to Peirce's tripartite taxonomy of deduction, induction and abduction. They classify inductive generalization as a subspecies of abduction (p. 28). They argue (pp. 19-22) that it is possible to treat every good (that is, reasonable or valid) inductive generalization as a species of abduction. They see abduction not as contrasted with deduction or induction, but with prediction. Their arguments for this new taxonomy are

impressive, and raise many interesting fundamental questions, but in view of the controversial nature of the subject, it is hard to see them as resolving the issue. Perhaps the most significant lesson that can be drawn from their work on abduction, for our purposes here, is their insistence on the important of plausible reasoning as a fundamental category. What should also be noted is the impressive body of evidence they have presented showing how abduction (and prediction as well) are best treated as species of plausible reasoning.

This paper will not offer any final word on this controversial issue. As abductive and defeasible reasoning is more and more an important topic in artificial intelligence and legal reasoning (Prakken, 1996; Verheij, 1996), the issue will become more and more hotly debated. Instead of trying to offer the final word, this paper will conclude by offering tentative definitions of the key concepts featured in the argumentation in the paper. These proposed definitions have partly a historical and conventional basis, as outlined above. But they also have a stipulative or persuasive aspect, in that they are based on the philosophical reasons given above that indicate how these terms ought properly to be defined in light of recent work in argumentation theory and informal logic.

8. Tentative Definitions of the Different Kinds of Inference

Abductive. From *ab* and *duco,* leading back. An abductive inference goes backwards from a given conclusion to search for the premises that conclusion was based on. Abductive reasoning is familiar in knowledge-based systems in computer science. For example, in an expert system, a user may want to ask what premises were used by the expert system, in the chain of reasoning the expert advice-giver used to arrive at a conclusion. Abductive inference is widely taken to be the same as inference to the best explanation.

Presumptive. The prefix *pre* indicates that a presumption is a kind of speech act assuming that something is taken as acceptable

in relation to something else later in the line of argumentation. A presumption is something that can be accepted by agreement temporarily as things go forward unless at some future point in the exchange it is shown to be unacceptable. A presumption is a proposition put forward by one party for acceptance by both parties to a discussion, subject to possible retraction of acceptance by the other party at some future point. A presumptive inference enables a conclusion to be drawn provisionally from premises, in the absence of refutation from either party to a discussion, and subject to future refutation by either party.

Plausible. To say something is plausible means that it seems to be true. A more specific definition was proposed by Carneades of Cyrene. According to this definition, a proposition is plausible if it seems to be true, and (even more plausible) if it is consistent with other propositions that seem to be true, and (even more plausible) if it is tested, and passes the test. A plausible inference is one that can be drawn from the given apparent facts in a case suggesting a particular conclusion that seems to be true. Both a proposition and its negation can be plausible, as the ancient legal case of the stronger and the weaker man showed.

Deductive. The notion of deductive inference is the one of this family of terms about which there is the least disagreement. Deductive inference is characterized by the notion of deductive validity, the success criterion to which a deductive inference is aimed. A deductively valid inference is one in which it is (logically) impossible for the premises to be true and the conclusion false. Logic textbooks and scholarly writings in logic widely agree on this way of defining deductive validity.

Inductive. This kind of inference is often defined using the term ‘probability’. But there are deep differences of opinion what this term should be taken to mean (Skyrms, 1966). There is an older meaning of the term ‘inductive’ coming from Aristotle and Greek philosophy, where it means something like generalizing from a set of particular cases. In modem terminology however, inductive

inference seems to be equated with probability of the kind characteristic of statistical reasoning.

Probable. Probable inference can be taken to mean many things, but perhaps the clearest definition of it comes from the axioms for the probability calculus. For example, the probability value of not-A (the negation of *A)* is defined as the probability value of unity minus the probability value of *A.* There is also an older meaning of 'probable', most evident in writings on casuistry, which goes back to Greek philosophy. The term used in Greek philosophy for what is, or should nowadays be translated as 'plausible' *(pithanon),* was traditionally translated as 'probable'. This translation is very confusing since the advent of the probability calculus, because modern readers assume that what is meant is the modern use of the term 'probability', referring to statistical inferences of the kind we are so familiar with in statistical polling and collection of data.

In examining the definitions above, a common element of 'presumptive' and 'plasuible' is apparent. Both are based on the idea of a process of collecting evidence that is moving forward. It could be a process of discussion of an issue or a process of collecting data, or both. The process is not conclusive, in the sense that the conclusion arrived at will be known to be true (or false) beyond doubt. But the process may entail that commitment to a proposition that seems to be true at a given point may be retracted or altered at some future point. For example, at a future point the proposition may seem to be false. Or sufficient doubts may arise so that it no longer seems to be true. The common process is one of dynamic collection and use of evidence in which things may go one way or another. Acceptance of a proposition can be contra-indicated, leading to its "defeat". Or the new evidence may yield additional reasons for its acceptance.

References

Aristotle. (1937). *Rhetoric,* Loeb Classical Library, Cambridge, Mass., Harvard University Press.

Bentham, Jeremy. (1962). *The Works of Jeremy Bentham, 7 vols,* ed. John Bowring, New York, Russell and Russell.

Bett, Richard. (1990). "Carneades' Distinction between Assent and Approval," *Monist,* 73:3-20.

Blair, J. Anthony. (1999). "Walton's Argumentation Schemes for Presumptive Reasoning: A Critique and Development," *Proceedings of the Fourth International Conference of the International Society for the Study of Argumentation,* ed. Frans H. van Eemeren, Rob Grootendorst, J. Anthony Blair and Charles A. Willard, Amsterdam, SicSat, 56-61.

_____. (1999a.) "Presumptive Reasoning/ Argument: An Overlooked Class," *Protosociology,* 13: 46-60.

Cawsey, Alison. (1992). *Explanation and Interaction: The Computer Generation of Explanatory Dialogues,* Cambridge, Mass., MIT Press.

Collins, Allan, Eleanor H. Warnock, Nelleke Aiello and Mark L. Miller. (1975). "Reasoning from Incomplete Knowledge", *Representation and Understanding: Studies in Cognitive Science,* ed. Daniel G. Bobrow and Allan Collins, New York, Academic Press, 383-415.

Doty, Ralph. (1986). "Cameades, a Forerunner of William James' Pragmatism," *Journal of the History of Ideas,* 47: 133-138.

Eemeren, Frans H. van and Rob Grootendorst. (1992). *Argumentation, Communication and Fallacies,* Hillsdale, N.J., Lawrence Erlbaum Associates.

Gagarin, Michael. (1994) ."Probability and Persuasion: Plato and Early Greek Rhetoric," in Ian Worthington (ed.), *Persuasion: Greek Rhetoric in Action,* London, Routledge, 46-68.

Harman, Gilbert. (1965). "The Inference to the Best Explanation," *Philosophical Review,* 74:88-95.

Hastings, Arthur C. (1963). *A Reformulation of the Modes of Reasoning in Argumentation,* Evanston, Illinois, Ph.D. Dissertation.

Josephson, John R. and Susan G. Josephson. (1994). *Abductive Inference: Computation, Philosophy, Technology,* New York, Cambridge University Press.

Kienpointner, Manfred. (1992). *Alltagslogik: Struktur und Funktion von Argumentationsmustern,* Stuttgart, Fromman-Holzboog.

Locke, John. (1726). *An Essay Concerning Human Understanding,* 9th ed., London, A. Churchill.

Peirce, Charles S. (1965). *Collected Papers of Charles Sanders Peirce,* vol. 2, 'Elements of Logic', and vol. 5, 'Pragmatism and Pragmaticism', ed. Charles Hartshorne and Paul Weiss, Cambridge, Mass., Harvard University Press.

_____. (1992). *Reasoning and the Logic of Things,* ed. Kenneth Laine Kettner, Cambridge, Mass., Harvard University Press.

Pennington, Nancy and Reid Hastie. (1991). 'A Cognitive Theory of Juror Decision Making', *Cardozo Law Review,* 13: 519-557.

Perelman, Chaim and Lucie Olbrechts-Tyteca. (1971). *The New Rhetoric: A Treatise on Argumentation,* trans. J. Wilkinson and P. Weaver, 2nd ed., Notre Dame, University of Notre Dame Press. (First published, as *La Nouvelle Rhetorique,* in 1958).

Prakken, Henry. (1996). "A Dialectical Model of Assessing Conflicting Arguments in Legal Reasoning," *Artificial Intelligence and Law,* 4: 331-368.

Preyer, Gerhard and Dieter Mans. (1999). "On Contemporary Developments in the Theory of Argumentation," *Protosociology,* 13: 3-13.

Reiter, Raymond. (1980). "A Logic for Default Reasoning," *Artificial Intelligence,* 13: 81-132.

_____. (1987). "Nonmonotonic Reasoning," *Annual Review of Computer Science,* 2: 147-186.

Rescher, Nicholas. (1976). *Plausible Reasoning,* Assen, Van Gorcum.

Sextus Empiricus. (1933). *Against the Logicians,* Vol. II of the Loeb Classical Library *Works,* Cambridge, Mass., Harvard University Press.

Skyrms, Brian. (1966). *Choice and Chance: An Introduction to Inductive Logic,* Belmont, Dickenson.

Twining, William. (1985). *Theories of Evidence: Bentham and Wigmore,* London, Weidenfeld and Nicolson.

Verheij, Bart. (1996). *Rules, Reasons and Arguments: Formal Studies of Argumentation and Defeat,* Doctoral Dissertation, University of Maastricht.

Walton, Douglas. (1992). "Rules for Plausible *Reasoning,"Informal Logic,* 14: 33-51. (1996). *Argumentation Schemes for Presumptive Reasoning,* Mahwah, N. J., Erlbaum.

_____. (1997). *Appeal to Expert Opinion,* University Park, Penn State Press.

_____. (1998). *The New Dialectic: Conversational Contexts of Argument,* Toronto, University of Toronto Press.

Walton, Douglas N. and Erik C. W. Krabbe. (1995). *Commitment in Dialogue: Basic Concepts of Interpersonal Reasoning*, Albany, State University of New York Press. Wellman, Carl. (1971). *Challenge and Response: Justification h1 Ethics*, Carbondale, Southern Illinois University Press.

Woods, John. (1999). "Peirce's Abductive Enthusiams," *Protosociology*, 13: 117-125.

2007 Vol 27: Advances in the Theory of Argumentation Schemes and Critical Questions

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Abstract: This paper begins a working-through of Blair's (2001) theoretical agenda concerning argumentation schemes and their attendant critical questions, in which we propose a number of solutions to some outstanding theoretical issues. We consider the classification of schemes, their ultimate nature, their role in argument reconstruction, their foundation as normative categories of argument, and the evaluative role of critical questions.We demonstrate the role of schemes in argument reconstruction, and defend a normative account of their nature against specific criticisms due to Pinto (2001). Concerning critical questions, we propose an account on which they are founded in the R.S.A. cogency standard, and develop an account of the relationship between critical questions and burden of proof. Our ultimate aim is to initiate a reconciliation between dialectical and informal logic approaches to the schemes.

1. Introduction

Argumentation schemes[1] are stereotypical patterns of defeasible reasoning that typically occur in common, everyday arguments (Blair, 1999, 2000; Walton, 1990a).[2] Standard accounts of argumentation schemes describe them as representing different types of

1. For a brief overview of the literature on argumentation schemes see Garssen 2001.

2. We agree with Blair (2000) that schemes represent patterns of reasoning or inference. Because they can be used to classify types, or forms, of argument these schemes have come to be called 'argumentation schemes'. We use the term 'schematic argument' to indicate a particular argument whose structure can be represented as being an instance of a given argumentation scheme.

plausible argument which, when successfully deployed, create presumptions in favor of their conclusions and thereby shift the burden of proof to an objector. Associated with each argumentation scheme is a set of critical questions to be used in the evaluation of arguments of the corresponding type. The posing of a critical question has the effect of defeating the initial presumption and shifting the burden of proof back on to the initial proponent.

In recent years, the literature on argumentation schemes has experienced a growth spurt and, despite the considerable theoretical and technical advances being made, we presently stand in danger of losing any cohesion that might have existed in the treatment of this important topic in argumentation. Yet, these advances have also demonstrated that changes in the existing accounts of argumentation schemes may be not only desirable but required.

The pressure for change has principally come from two directions. In applied argumentation theory (particularly in the field of artificial intelligence) various competing models of schemes and their accompanying critical questions are being developed and implemented, prompting important questions about how critical questions should be represented in argument diagrams. We leave this important topic for another occasion.

In the theoretically oriented literature several questions and criticisms have been posed that stand in need of resolution. Significantly, Blair (2001) has put a number of points on the theoretical agenda. These include:

i. the ultimate nature of argumentation schemes: Are schemes descriptive or prescriptive? What do schemes represent, patterns of reasoning or types of argument?

ii. the proper classification of schemes: How general should the schemes be? How should they be distinguished and classified?

iii. the foundation of argumentation schemes: If normative,

what is the grounding of their normativity? How do presumptive schemes relate to other forms of reasoning.

iv. the evaluation of schematic arguments: What is the role of critical questions in the evaluation of schematic arguments? How should the correct number and kind of critical questions accompanying a scheme be determined?[3]

Also, Pinto (2001a, 2001b, 2003) has raised several important challenges to the standard picture of argumentation schemes. Specifically, Pinto challenges the idea that schemes are especially useful in argument reconstruction (2003), and that they should be seen as normative (2001a, 2001b) because not all *bona fide* instances of argumentation schemes effectively create presumptions in favor of their conclusions. Similarly, Pinto (2003) challenges the standard account of the role of critical questions, arguing that they do not always have the argumentative force standardly accorded to them of shifting the burden of proof back to a proponent.

The purpose of this paper is to bring some of these divergent views into dialogue with one another, and to determine what progress can be made in the theory of argumentation schemes in light of recent developments. Specifically, we propose solutions to several theoretical problems surrounding argumentation schemes. We maintain that argumentation schemes are normative structures of plausible reasoning that have an important role in both argument reconstruction and argument evaluation. We argue that the critical questions associated with a scheme should be a function of two factors: their function and their foundation. The normative, or theoretical, foundation of critical questions as tools for the evaluation of schematic arguments is that they test one (or more) of the three aspects of argument cogency: relevance, acceptability and sufficiency [R.S.A.]. The function of a critical question is to test a typical or common way in which an argument of a certain

3. It should be noted that Blair himself (1999, 2000, 2001) has contributed significantly to the resolution of some of these issues.

schematic-type can fail to meet one (or more) of the R.S.A. criteria. Thus, critical questions are a kind of evaluative *topoi*, providing a list of individually necessary conditions for the success of particular schematic arguments. On the other hand, because they represent only commonplace ways in which arguments of some schematic-type can default, they are not jointly sufficient conditions for the success of a schematic argument. While we do not seek to resolve every question surrounding argumentation schemes and critical questions, we hope that the paper will contribute to a working-through of Blair's theoretical agenda, and provide at least provisional answers to some of Pinto's critical points.

2. Classification of schemes

Questions concerning the correct typology of argumentation schemes are pressing because typologies are proliferating –sometimes without any reference to existing typologies– and this development is one of the causes of the fragmentation in the literature. Historically, different typologies can be found in the classical works of *Rhetoric to Alexander* (cf. Braet, 2004), Aristotle, Cicero, Quintilian and Boethius, and the medieval works of Peter of Spain, Abaelard and William of Ockham (cf. Kienpointner, 1987, pp. 280-284). More recently, typologies have been given by Perelman and Olbrechts-Tyteca (1969), Hastings (1963) and Kienpointner (1992).

Several existing typologies are predominant in the literature today. The Pragma-Dialectical school recognizes three schemes corresponding to three basic relations that can obtain between premises and conclusions: a symptomatic relation (e.g., argument from sign), a relation of comparison (e.g., argument by analogy), and a causal relation (e.g., causal argument and means-end argumentation) (Garssen 2001, pp. 91-92; cf. van Eemeren and Kruiger, 1987, pp. 73-74; van Eemeren and Grootendorst, 1992, pp. 98-99). Situating himself in the tradition that begins with Aristotle's *Topics* and runs through Hastings (1963) and Kienpointner (1992), Wal-

ton (1996) recognizes a wide array of schemes corresponding to common patterns of reasoning employed in everyday argumentation such as argument from sign, argument from example, argument from position to know, argument from expert opinion, argument from cause to effect, argument from analogy, argument from precedent, etc. More recently, Katzav and Reed (2004a, 2004b) have developed a typology based upon different relations of conveyance, examples of which include the relations of genus to species, sameness of meaning, implication, conserved quantity, and singular cause to effect. Since relations of conveyance represent warrants (Katzav and Reed, 2004a, p. 5), such an approach amounts to classifying arguments according to the type of warrant involved in the argument.[4]

Given this multitude of typologies, it seems that we require some general set of principles by which to enumerate and classify argumentation schemes. From a purely theoretical point of view, we agree with Garssen (1994, pp. 106-107) that a minimal set of exhaustive, mutually exclusive schemes is desirable, and that the categories required will be a function of the purposes of classification. Walton and Reed (2003, p. 196) propose that a typology should be rich enough to encompass a significant portion of everyday argument types, simple enough to be effectively taught and usefully applied in analysis, fine-grained enough to be effective as an evaluative tool, rigorous enough to be implemented in automated models and clear enough to be integrated into traditional diagramming techniques. We also feel that a typology should

4. Katzav and Reed (2004a, p.5) write: "Premises represent conveying facts. Conclusions represent conveyed facts. Warrants represent (often not explicitly) the relationship between the conveying facts and the conveyed facts, and they usually have the form of conditionals. The classification of an argument… makes explicit which relation of conveyance the warrant represents." Katzav and Reed (2004a) actually provide a tree structure describing different types of relations of conveyance each of which can be instantiated by several specific relations. For example, the conveyance relation of implication is an instance of analyticity which is in turn a species of internal conveyance relation.

reflect distinctions among arguments made at an intuitive, common-sense, or pre-theoretic level by everyday arguers.

Perhaps the most developed solution to the classification question has been provided by Blair (2000) who holds that schemes are *reason-types* and can be individuated by the types of reasons employed in patterns of reasoning. "A scheme will be the scheme of a reason, and a reason is the smallest self-standing unit of support for a position." Descriptive schemes provide accurate representations of patterns of reasoning commonly employed by reasoners, even though these reasonings may not be cogent. (Thus fallacies are descriptive reasoning schemes on Blair's account, but instead of being characteristically good they are characteristically bad). Conceiving of schemes as *reason-types* does not entirely determine the level of abstractness or specificity at which the reasoning should be represented. On Blair's account, the warrant employed in the reasoning determines the level of specificity of a scheme: "a scheme must represent the particular warrant of the reasoning: the properties of the reasoning that are salient to its (alleged) cogency." Thus Blair's account agrees with that of Katzav and Reed (2004a) in that schemes can be distinguished according to their warrant or "relation of conveyance." Cogent schemes "portray patterns of reasons which can have instantiations that are cogent," and can thereby be said to represent normative categories of reasoning.

In our view, what is most important is that the aims of classification will determine the relevant classificatory categories. This means that a multitude of different typologies need not compete with one another and thereby pose a problem for a general theory, so long as the different systems serve different ends. In this respect, we agree with Blair's (2000) conclusion that "[s]ystems of classification are relative to their purposes. Consequently, there can be no 'correct' typology of reasoning schemes. The only pertinent question is whether any particular classification successfully or optimally fulfills its purpose." By the same token, a central aim of each classification system is to aid in the structural analysis and

evaluation of reasoning and argument. Thus, to whatever extent schemes can provide generalizable answers to the questions of how a particular piece of reasoning works (or is supposed to work), and whether it actually works, schematic classification will be a useful tool to theorists and arguers. The workings of a piece of reasoning are explained by the premises and warrant at work in the reasoning, and it is these features which ultimately provide a piece of reasoning with its rational and evidentiary structure.

3. The reconstructive role of argumentation schemes

Standardly, argumentation schemes have been assigned a role in the analytical reconstruction of argumentation, as well as its evaluation. In reconstruction it is thought that, by providing paradigms of certain common types of reasoning, argumentation schemes can be used to identify and categorize instances and can thereby help guide the analyst when identifying implicit claims and filling in the gaps in the reasoning of everyday arguers.

This view is challenged by Pinto (2003). By critically analysing an example offered by Walton and Reed (2003) Pinto claims that "we're able to identify applicable schemes only because we've *already* identified implicit premises and an unstated intermediate conclusion. Application of the schemes seems to be to be a consequence, and not a cause, or reconstructing the argument [in a particular way]."

To a point, Pinto is right here. Identifying an argument as being an instance of a particular scheme cannot rely solely on the scheme itself. Instead, the descriptive accuracy of reconstruction will be established by situational as well as textual and contextual features of the argument. Indeed, if Godden (2005) is correct, descriptively accurate reconstructions may well involve knowledge of, or rely on postulations regarding, facts about arguers themselves such as their goals, or intentions. Further, schematic classification of an argument instance might easily require supplying some missing or

unstated components of the argument. Clearly, if the schemes have a role to play in reconstruction, it cannot be this.

Yet, this is not to say that the schemes have no role to play whatsoever. Insofar as the schemes actually do capture types of argument commonly employed in everyday argumentation, a worthwhile interpretative strategy is to determine whether there are grounds (explicit, contextual, or situational) for thinking that the argumentative strategy being employed on some occasion is to offer an argument of some common type. Clearly, some kind of preliminary analysis is involved in classifying instances of argumentation according to schematic structure. The schematic categorization of an argument need not involve supplementing it with unexpressed claims. Instead, schematic classification can be based on expressed premises indicating an enthymematic statement of an argument of a certain type, as well as relying on textual cues (such as indicator phrases), and contextual and situational information. These same factors might also justify supplementing the argument with unexpressed claims. While these claims might form parts of argument schemes, their addition at this stage does not depend on the classification of the argument as being an instance of that scheme. The role of a scheme at this stage of analysis is not to supply missing material to an argument, but to serve as a model for comparison. It is by comparing the argumentative material presented in a case with the known schemes that an argument can be classified as an instance of a certain scheme. The schematic identification of an argument, then, is a kind of interpretative, or hermeneutic, hypothesis which must always be checked against available information throughout the processes of analysis and evaluation.

Once an argument is identified as being an instance of a particular type, the schemes can play a significant role not only in the evaluation of that argument, but also in subsequent stages of its reconstruction. Insofar as the schemes capture all and only those premises and warrants involved in some particular type of reasoning, then the knowledge that a particular argument aims to embody an inference of that type contributes significantly to the structural

analysis of that argument. Thus, if an instance of argumentation embodies *some* of the features of a particular scheme, that can give the analyst enough cause to see whether *other* aspects of the scheme can justifiably be used to describe the particular instance under consideration. In this way, knowledge of the schemes can help to rule out particular reconstructions as well. For example, if it is determined that some feature of the scheme cannot reasonably be used to describe some particular instance under reconstruction (e.g., there is evidence that the arguer would reject commitment to it), then that provides grounds for thinking that the arguer might have been using some other argumentative strategy. Alternately, the author of the argument under analysis might be deliberately misusing it, or failing to correctly deploy it, as an instance of some scheme. That is, she might not understand, or might wish to avoid, her commitment to claims involved in the proper use of arguments having this scheme. Thus, even if the claims identified in the scheme are not properly attributable to the author of the argument under analysis, the schematic classification of an argument will aid the analyst and critic in determining on what the structural integrity and argumentative success of such an argument depends. So, in the project of analysis, argument schemes serve as models of comparison during the initial identification of the type of reasoning at work in an argument, and further provide a complete profile of all the required components of the argument once such an identification is made. Finally, we note in passing that argumentation schemes also can play an important role in argument invention (or the generation and composition of argument) (Walton 2005a).

4. Nature and normativity of argumentation schemes

Another central question in the theory of argumentation schemes concerns whether they are primarily normative or descriptive in nature. We take it as obvious that the schemes can be descriptive of at least some instances of reasoning, and questions regarding the frequency with which such schemes are employed in everyday argument is an empirical one which will not be addressed here (see

Hitchcock, 2001). Above, we have shown the role that schemes can have in the primarily descriptive project of argument reconstruction. On the standard account, argumentation schemes are also normative, in that schematic arguments provide at least provisional support for their conclusions. Walton (1996, p. 10) has described the nature of this normativity as a kind of 'binding' on arguers capable of creating rational and discursive obligations: "If the hearer accepts the premises of the speaker's argument, and the argument is an instance of a genuine and appropriate argument scheme (for the type of dialogue they are engaged in), then the hearer must or should (in some binding way) accept the conclusion [at least provisionally]."

Yet, a satisfactory explanation of the source of the normativity of schematic arguments is more difficult to come by. Justifying schematic arguments is an important task because, until recently, many common but defeasible forms of argument were identified as fallacious. Yet it has been shown that, in many instances, arguments of these types are not fallacious but instead provide provisional support for their conclusions. A completely systematic justification of defeasible schematic arguments is ruled out by their non-monotonicity and the situational determination of their acceptability (Blair, 1999, p. 56; Pinto, 2001b, p. 111). Hence, Walton (2005b) has argued that schematic arguments require not only a systematic but also a pragmatic justification. Walton writes: "The pragmatic dimension requires that such arguments need to be examined within the context of an ongoing investigation of dialogue in which questions are being asked and answered" (2005b, p.8). Thus critical questions play an integral role in the evaluation of individual schematic arguments, and because of this they also function in the overall justification of argumentation schemes.

Yet, even when this is accepted, the issue of whether the argumentation schemes represent "patterns of *good* reasoning" (Blair, 2000, emphasis added) remains open to question (Pinto, 2001a; 2001b). Perhaps the most developed answer to this question is pro-

vided by Blair (2001, p. 376) and is worth quoting at length. Blair writes:

> What is the source of the probative force of a 'valid' inference or argument using such a scheme? The short explanation, I take it, lies in the irrationality of accepting the premises but rejecting the conclusion of such an inference or argument in those particular circumstances. … In the case of deductive validity, the reasoning or arguing derives its normative force or cogency from the fact that the truth of the premises of such a scheme on that occasion guarantees the truth of the conclusion. Thus, to accept the premises, and yet to refuse to accept the conclusion, is irrational by virtue of being strongly inconsistent. …
>
> In the case of presumptively cogent reasoning or argument, it is plausible to understand the probative force of the scheme in question in those circumstances in a similar fashion. The reasoning or argument derives its cogency from the fact that to accept the premises and grant the validity of the inference using that scheme yet deny the plausibility of the conclusion, under the circumstances –without suggesting that any conditions of rebuttal exist– is pragmatically inconsistent. Given a strong presumption, to refuse to accept the conclusion without denying the evidence or finding a rebutting condition implies believing that there is some rebutting condition or circumstance for which there is no evidence. The skeptic in such a case is holding that the less plausible is the more plausible.

We find that Blair's explanation contributes significantly to an understanding of the schemes as normative patterns of reasoning and structures of argument. Yet, this account does not specifically address the challenges raised by Pinto. In the remainder of the section we consider and attempt to answer these concerns.

4.1 Pinto's argument against the normativity of argumentation schemes

The view that schemes are normative in nature has been challenged by Pinto (2001a, 2001b). Pinto argues that, since not every instance of a recognized argument scheme should be presumed

to be a good presumptive argument – even accepting that good presumptive arguments can be defeated in special circumstances – we should conclude that argument schemes are not themselves normative (Pinto, 2001a, p. 101). Pinto's reasoning goes like this: schematic arguments can fail for at least two categorically different kinds of reasons.

a. Schematic arguments can fail because the *inference involved is itself somehow defective* –that is, the information presented *within* the argument itself is somehow unable to establish a presumption in favor of its conclusion.

b. Schematic arguments can fail because of other considerations beyond the argument itself –that is, because new information external to the argument itself somehow defeats the inference at work in the original schematic argument.

Of the first kind of problem, Pinto lists the unacceptability of one or more of the premises, and a variety of reasons whereby the warrant (or unexpressed generalization at work in the inference) might be challenged. A schematic argument having problems of this type suffers from some internal defect; it fails to create a presumption in favor of its conclusion, and thereby fails to shift the burden of proof to an objector. Importantly, as Pinto recognizes, problems of this first type are not specific to non-deductive arguments.[5]

Of the second kind of problem, Pinto (2001a, pp. 102-103; emphasis removed) lists *underminers* ("additional facts that undermine the inference [at work in the schematic argument]") and *overriders*

5. We hold that terms such as "deductive" and "presumptive" indicate standards of evidence against which arguments can be measured, not types of arguments. (They can also properly be used to indicate classes of arguments meeting the relevant standard of evidence.) In this paper, the terms are loosely used as if they named types of argument which, roughly, aim to meet the relevant standard of evidence. We take the general sense of this usage to be familiar.

("additional evidence that overrides the inference in question, by supporting the negation of its conclusion").[6] A schematic argument having problems of this second type might initially create a presumption in favor if its conclusion, but subsequently default when new information that somehow defeats the initial inference comes to light. Clearly, the second set of problems relates to the non-monotonic nature of schematic arguments.

It is their susceptibility to problems of the first sort that prevent argumentation schemes from marking normative categories of argument. Pinto's claim is that, since some schematic arguments can have problems of the first sort, these arguments will fail to initially establish presumptions in favor of their conclusions, despite their being an instance of some recognized scheme. Because not all schematic arguments successfully establish presumptions in favor of their conclusions, the schemes themselves should not be viewed as normative categories of argument (2001a, pp. 103-104; cf. 2001b, pp. 109-111). Instead, Pinto (2001b, p. 111) argues that

> the normative force and authority of any particular type of evidence or argument doesn't derive from the fact that it exemplifies a recognized 'normative' argument scheme. Its normative force is grounded in pragmatic considerations of the sort… that would justify the use of *this* sort of evidence in *this* sort of context to settle *this* sort of question. The *schemes* can't be what provide the validation of presumptive reasoning, because the use of a particular scheme on a particular occasion itself always *stands in need of validation or justification*.

For Pinto, the theoretical value of argumentation schemes does not arise from the mistaken view that they are normative in nature, but comes instead from their association with a set of critical questions which can guide a respondent in evaluating a schematic argument. On Pinto's (2001a, p. 104) view, "it isn't the schemes that do the evaluative work, it's *we* who do the evaluative work."

6. The names "underminers" and "overriders" are suggested by Pinto's text, though he does not use them himself. These faults appear similar to Pollock's (1970) undercutting defeaters and rebutting defeaters (Hitchcock, 2005).

4.2 A response to Pinto's argument

While we agree with Pinto's analysis that schematic arguments having the first kind of defect fail to create presumptions in favor of their conclusions and fail to shift the burden of proof to their objectors, we disagree that argumentation schemes thereby fail to be normative categories of argument. In the first place, a consequence of Pinto's argument is that deductively valid argument forms should not be seen as normative either.[7] Since arguments that are instances of deductively valid forms can also have problems of type (a) (they can have false premises or rely on a warrant that is circular), not all instances of valid argument forms will successfully establish, or provide good reasons for, the truth of their conclusions. Since the normativity of argument schemes and valid argument forms stand or fall together on Pinto's argument, argumentation schemes can remain "formal pragmatic structure[s] that … [are] the counterpart[s] to logical forms of inference in semantics" (Walton, 1996, p. x; cited in Pinto, 2001a, p. 100) despite Pinto's criticisms.

We feel that it is important to retain a conception of both schematic arguments and instances of valid argument forms as normative categories of argument. The second category marks a class of arguments having no counter-example, and whose warrants are truth-preserving. This is an important standard of evidence (Godden, 2005) which, though it may not be appropriate to all argumentative circumstances, is worthy of distinction as a standard which arguments can either meet or fail to meet. Similarly, the category of schematic arguments marks a class of arguments having no known counter-example (relative to some information state), and whose warrants are presumption-establishing in normal circumstances and in the absence of defeating evidence or countervailing considerations. This too is an important standard of evidence which, though it may not be appropriate to all argumentative cir-

7. This is a consequence Pinto seems willing to concede (implicitly on 2001a, p. 104, and explicitly in 2001b, p. 110, fn. 20).

cumstances, is worthy of distinction as a standard which arguments can either meet or fail to meet. Neither category is exhaustive of arguments meeting their associated standard, yet all arguments belonging to these categories meet the corresponding standard of evidence.

We agree with Pinto (2001b, p. 111) that the application of a particular standard of evidence as an evaluative standard for some argument on a particular occasion itself stands in need of justification, that this justification will involve pragmatic considerations, and that as a result the evaluation of argument, and the normative (i.e., probative or persuasive) force of arguments deployed in particular circumstances cannot be determined by the form or scheme of the argument alone. Indeed, in our view, the evaluation of situated argument is best approached dialectically. But these considerations are independent of the claim that standards of evidence constitute normative standards. As such, arguments meeting particular standards of evidence have normative properties.

Perhaps the best way to think about argument schemes is to think of them as the counterparts to informal fallacies. While not every instance of a fallacious type of argument is itself fallacious (there can be legitimate and acceptable employments of *argumentum ad hominem* for instance), not every instance of an argument scheme is a good presumptive argument. Nevertheless, argument schemes represent a species of argument that are standardly capable of presumptively establishing their conclusions, if only in a defeasible way.

5. Evaluation of Schematic Arguments

Schemes are also normative in the sense that instances of a given scheme can be evaluated using similar measures, namely the critical questions. By instantiating a stereotypical pattern of reasoning, schematic arguments are subject to stereotypical errors of reasoning that can be associated with them. Because of this, they can be

evaluated with questions general to arguments of their schematic-type.

The argumentative role of critical questions is explained in relation to argumentation schemes. To each scheme a certain number of critical questions are attached. These questions have a role in the evaluation of arguments with the relevant scheme, but their precise function and foundation have not been agreed upon. Originally, the critical questions evolved as did the schemes themselves, and they seemed to have a heuristic –even pedagogical– role, acting as a guide for arguers in their evaluation of arguments of certain recognizable types. Given that the schemes represented stereotypical patterns of reasoning used in commonplace, defeasible arguments, it intuitively seemed that the critical questions accompanying a scheme should capture the stereotypical kinds of errors or defeaters that might pertain to reasoning of that type. Yet, Blair (2001, p. 370) has recently challenged this heuristic course of development of critical questions by asking for a more rigorous and definitive specification of the correct number and kind of critical questions to be associated with each argumentation scheme.

5.1 Theoretical foundations of critical questions

It is our position that the critical questions associated with a scheme should be a function of two factors: their function and their foundation. The general function of critical questions is to assist in the evaluation of reasoning of a specifiable type. If critical questions are to have this role, they must be founded in the general principles of the evaluation of inferences and arguments.

A standard theory of argument evaluation for informal logic and argumentation theory claims that an argument is cogent if and only if (i) its premises are rationally *acceptable*, (ii) its premises are *relevant* to its conclusion and (iii) its premises provide *suf-*

ficient reason to accept the conclusion.[8] (Following Johnson and Blair we will call this the R.S.A. test for argument cogency.) These three criteria are sometimes augmented with a fourth criterion: (iv) that there are no known better reasons for an opposite conclusion, which we here treat as an aspect of sufficiency.[9] These criteria combine to test the adequacy of premises and the link between premises and conclusion. Searches for underminers (undercutting defeaters) and overriders (rebutting defeaters) can be seen as applications of the sufficiency criterion of cogency, the latter of which explicitly tests condition (iv).

Our thesis is that the normative theory informing the critical questions approach to the evaluation of schematic arguments is not opposed to –but rather derives from– the R.S.A. standard of argument cogency. Critical questions are not supplied as an alternative to the R.S.A. standard; rather they are best seen as an application of it to arguments of particular types –arguments that involve distinctive patterns of reasoning– deployed in unique dialectical circumstances. Thus, the legitimacy of a critical question derives from the fact that it tests some aspect of its target argument against one of the R.S.A criteria. Questions are scheme-specific because they address some general way in which arguments of some particular schematic type can fail to meet the R.S.A. standard. Such an account agrees with Blair's (2000, p. 25) thesis that "the critical questions associated with a reasoning scheme are generated by knowledge of the types of circumstances in which there are exceptions to what is normally good reasoning."

Consider, for instance, the argument from expert opinion (Walton 2002, pp. 49-50; 1997b, 211-225).

8. Johnson and Blair, (1994) call this the R.S.A. test, while Govier (2005, pp. 63-76) calls it the A.R.G. (acceptability, relevance and good grounds) condition of argument cogency.

9. While (iv) can be seen as an element of (iii), it is often both pedagogically and theoretically valuable to distinguish the two.

Argument from expert opinion

***Major Premise*:** Source E is an expert in subject domain S containing proposition A.
***Minor Premise*:** E asserts that proposition A is true (false).
***Conclusion*:** A is true (false). Critical questions:

1. *Expertise Question*: How credible is E as an expert source?
2. *Field Question*: Is E an expert in the field that A is in?
3. *Opinion Question*: What did E assert that implies A?
4. *Trustworthiness Question*: Is E personally reliable as a source?
5. *Consistency Question*: Is A consistent with what other experts assert?
6. *Backup Evidence Question*: Is E's assertion based on evidence?

Each of these critical questions tests some component of the R.S.A. criteria. The *expertise question* tests the sufficiency condition of the inferential strength between premise and conclusion by asking whether an undermining condition applies. In this case, issues of bias or lack of credibility would give reason to doubt the accuracy of E's testimony despite her being an expert in the relevant subject field S. The *field question* raises issue with the acceptability of the major premise in the inference. An obvious way that this type of premise could fail is that the supposed expert is either unqualified, or is only qualified in some unrelated field of knowledge. In some versions of the scheme from expert opinion, where the domain of expertise is not explicitly stated in the major premise, the *field question* would challenge the relevance of the premise, and raises a point that could potentially undermine the inference. The *opinion question* challenges that acceptability of the minor premise. Similarly to the credibility question, the *trustworthiness question* also tests the sufficiency condition by rais-

ing an issue that could potentially undermine the inference. If the expert's reliability can be called into question, this would give some reason to doubt the accuracy of her testimony despite her expertise in the field. The *consistency question* tests the overall sufficiency of the inference by raising an issue that could both override and undermine it. If the testimony of the selected expert does not concur with the prevailing opinion of other experts in the field then (i) the reliability of the expert's testimony could be called into doubt thereby undermining the inference, and (ii) the contrary opinions of other experts could provide good grounds for an opposite conclusion thereby overriding the inference. Finally, the *backup evidence* question challenges the sufficiency of the inference. Roughly, it is checking to see whether there is a rational basis for the expert's opinion in this case –whether the expert has specifically looked into the matter at issue, or whether she is simply 'giving an opinion'. The absence of an adequate rational basis for the expert's opinion would potentially undermine the inference.

We have seen, then, that the critical questions applying to the argument scheme from expert opinion all serve to raise issue with some aspect of the cogency of such arguments under the R.S.A. standard. Accepting that the foundation of the critical questions is to be found in the fact that they each test some element of the R.S.A. cogency criteria, it might be argued that there is no need for any additional evaluative tools such as critical questions, and that they should be dispensed with entirely. After all, any argument that passes the R.S.A. test will be a good argument. (NB: This would equally well justify dispensing with the schemes entirely as well.) In spite of this, we still feel that critical questions have an important role in the dialectical evaluation of schematic arguments. As we said above, we hold that the critical questions associated with a scheme should be determined by two factors: their foundation and function. Having established their theoretical well-foundedness, the question of whether critical questions should be employed as tools of argument evaluation becomes a utilitarian one. We feel that the unique function of critical questions justifies their continued usage as distinct set of evaluative tools.

Since argumentation schemes are stereotypical pattern of defeasible reasoning, schematic arguments are subject to stereotypical errors of reasoning that can be associated with them. That is, there may be typical, or common ways in which the R.S.A. cogency conditions could apply to arguments of a given schematic type that would not typically apply to other common types of argument. Blair (1999, p. 56) described the function of critical questions as evaluative tools in this way:

> the role of… [critical questions] is to remind its user of the types of circumstances that typically derail reasoning of the pattern represented by the scheme. The critical questions function as a checklist to help determine whether any of the standard types of excepting conditions that should cancel the default represented by the scheme are presented in that particular instance of its employment.

We note in passing that taking this approach towards the provenance of critical questions helps to supply an answer to Blair's question concerning the correct number and kind of critical questions that apply to some given scheme. But more to the point, we hold that this account of the function of critical questions (which we take to roughly coincide with that of Pinto, discussed below) gives them a unique and important role in the dialectical evaluation of plausible argument.

6. The Evaluative Role of Critical Questions

While critical questions clearly function in the evaluation of schematic arguments, their exact role is unclear, especially in the context of an argumentative dialogue. Sometimes critical questions are described as if they were necessary conditions for the acceptability of any schematic argument. Blair, for instance, writes that critical questions "are questions that must be answered appropriately if any substitution instance of a reasoning scheme is to be cogent" (Blair, 2000). At other times, critical questions are said to function "like a traditional topic as a memory device" "offer[ing] the user … a choice among strategies for probing into the weak

points in an argument" (Walton and Reed, 2003, p. 202).[10] Which description more accurately portrays their actual role in the evaluation of argument?

Walton (1996) conceived of the questions as pedagogical tools, with a heuristic role in the dialectical evaluation of argument (Walton, 2003, p. 31). So conceived, critical questions play the second role more than the first. On the other hand, the effect of raising a critical question is to temporarily defeat the target argument, at least until the question has been satisfactorily answered. So, at the very least, it is a necessary condition for the acceptability of a schematic argument that all questions posed be satisfactorily answered.

Yet this is only a partial answer to the question of the actual role of critical questions in the evaluation of schematic arguments. Is the answering of all critical questions posed a sufficient condition for acceptability? Is it necessary that critical questions be posed at all?

6.1 Is there a burden of questioning?

Let us consider the second question first. Is it incumbent on arguers presented with schematic arguments to pose the relevant critical questions?[11] If critical questions give acceptability criteria for schematic arguments, then it would seem that there is a burden upon respondents to pose critical questions of schematic arguments before accepting their conclusions. Similarly, if one is not willing to accept or concede a standpoint at issue, it would seem that there is some obligation to raise objections to any supporting

10. At times, Blair describes the role of critical questions with language similar to that used by Walton and Reed, as for instance when he says that "[t]he critical questions function as a checklist to help determine whether any of the standard types of excepting conditions that should cancel the default is present in the given case" (Blair, 2000).

11. This question has already been addressed by Walton (2003) in the context of legal argumentation.

argument. On the other hand, if questions are simply heuristic devices designed to help critics find objections, then it is perhaps not necessary that they be asked as part of the evaluation of schematic arguments. So, part of the answer concerning whether there is a burden of questioning is given by the nature of critical questions themselves.

Several points bear on the answer to this question. First, once critical questions have been posed, it is incumbent on the proponent to satisfactorily respond to those critical questions in order to preserve the acceptability of her argument. So, it is a necessary condition of argument acceptability that, in principle, the critical questions could be answered, if posed. In practice, though, this requirement will be counterbalanced by several more practical considerations.

First, the rules governing commitment and retraction will have a bearing on the decision to raise questions. Some frameworks of dialogue (law, for example) operate with a notion of inference whereby an inference permits, rather than requires, the drawing of a conclusion from certain premises.[12] In dialogues with a permissive notion of inference, dialogue participants are not obliged to accept a claim that has been argued for by an opponent, even though that argument provides some support for the claim and the

12. In the context of a critical discussion (van Eemeren and Grootendorst, 1992) or a persuasion dialogue (Walton and Krabbe, 1995) it is clear that a dialogue participant is rationally and dialectically obliged to concede (i.e. accept) any conclusions reached in accordance with the rules governing the dialogue. As such, should a dialogue participant be unwilling to make this concession, he is under considerable obligation to raise objections to the argumentation by which that conclusion was reached. In a permissive persuasion dialogue (Walton and Krabbe, 1995), where retraction is possible the participant might be able meet this rational obligation by retracting some previous commitment(s). By contrast, in law, while disputants cannot ignore facts entered into evidence, they can ignore arguments made by opposing council from those facts to other conclusions. The reason for this is that the jury, or fact-finding body in the case, is permitted to draw conclusions from the facts entered as evidence on the basis of their own best rational lights (rather than being required to draw the conclusions proposed by the disputants).

argument itself has passed without challenge. Under these sorts of conditions it may not be necessary to question, or otherwise object to, an argument even though one is unwilling to accept its conclusion. Similarly, considerations such as whether, and under what conditions, a respondent is able to retract his commitment to a claim once it has been admitted into a dialogue will certainly have a bearing on whether, and to what extent, a respondent ought to raise questions about any given argument.

In addition to these factors, there will be practical considerations such as whether it is better just to press ahead with the dialogue and return to the critical questions only if it is deemed necessary or important at a later stage. Further, there will be strategic considerations that will help to determine whether critical questions ought to be raised. Such considerations might include: the significance of the particular claim at issue in the overall context of the dialogue and the mass of evidence involved, or whether there is a better way of objecting to the schematic argument, for instance by providing a stronger argument for an opposing claim.

In any real situation, then, the issues guiding critical questioning will be informed by a number of considerations, practical as well as strategic. So, there is a sense in which critical questions do provide necessary criteria for the acceptability of schematic arguments. But, it is not a necessary condition of every schematic argument that it in fact answer each associated critical question in order that its conclusion be accepted.

6.2 Do critical questions provide sufficient criteria for acceptability?

Let us now turn to the question of whether the critical questions give sufficient conditions for the acceptability of schematic arguments. Several factors have a bearing on the answer to this question. One of the problems involved in the evaluation of defeasible argumentation schemes is the problem of completeness (Walton, 2001, pp. 159-160; Walton and Reed, 2003, p. 203). Is the evalua-

tion of an argumentation scheme ever sufficiently complete so that its conclusion should be accepted? And if so, when?

A first point to consider is that the schemes under consideration are non-monotonic. That is, the probative weight provided to a conclusion by the reasons is always subject to defeat in light of new information. In view of this, the answer to the completeness problem seems to be that the evaluation of any defeasible argumentation scheme can never be closed in any final sense, but can only be closed in some local context, in relation to some specified body of information. Within the global context in which it may be subject to new information which might bring about its default, a defeasible argument provides some, though not conclusive, evidence in support of its conclusion. In the absence of any reasons to the contrary, these reasons provide sufficient grounds for the provisional acceptance of the conclusion. As a result, the argumentative effect of this type of argument is to shift the burden of proof to any objector. It is for this reason that Walton described argumentation schemes as presumptive in nature (1996; forthcoming). Their effect is to create a presumption in favour of their conclusions.

A second aspect of the problem is whether the critical questions alone provide sufficient criteria within this more limited context, i.e. for the provisional acceptance of a conclusion, relative to a fixed body of information. The answer here seems to be that, while the questions contribute to the assessment of schematic arguments, they are not exhaustive of it. Critical questions apply the R.S.A. cogency criteria in which they are theoretically grounded, but they do not constitute a comprehensive application of them. Instead, their function is to capture a set of typical ways in which arguments of a particular schematic-type might fail to meet the R.S.A. criteria. As such, even if all critical questions are satisfactorily answered there may be other factors affecting the cogency of a particular schematic argument, or the acceptability of its conclusion. Ultimately, as Walton has argued (forthcoming) “[t]he solution to the completeness problem is that … [schematic arguments] should never be regarded as complete and closed to further questioning,

until the dialogue itself has been closed. Only at that point is all the relevant evidence on both sides of the issue weighed up."

6.3 The completeness problem

Another dimension to the completeness problem can be framed in terms of the asking of critical questions themselves (Walton, 2001, pp. 159-160; Walton and Reed, 2003, p. 203). That is, in the context of a dialogue, when, if ever, is a respondent obliged to stop asking critical questions of an argument and concede the standpoint at issue? Should there be a procedural rule that puts an end to the process of critical questioning, and if so, what should determine that point?[13]

Part of the answer to this question depends on whether the critical question has been satisfactorily answered. If ever a question cannot be satisfactorily answered, then the questioning can be halted, because the target argument will have been diffused. But, to get a more theoretically robust answer to the completeness problem, it is worthwhile to consider some of the other argumentative features of critical questions. Suppose that a question has been given a preliminary answer. Can the questioning proceed with sub-questions, or with different questions? Here again the answer seems to be dialectical (Walton, forthcoming), and will ultimately be explained in terms of the burden of proof (Walton, 1988).

In these terms, the question of completeness is linked to the issue of whether there is a burden attached to posing critical questions. If we are right on this point, then the ultimate answer to the completeness problem is that, for any specific question and the argumentation which follows directly thereto (i.e., is devoted to settling the matter of whether the question has been satisfactorily answered), the questioning process (like the larger process of raising objections) halts whenever a local burden of proof cannot be met.

13. This problem has also been addressed by Walton (forthcoming).

7. Critical Questions and the Burden of Proof

In the end, the answer to the completeness problem must fall back on the notion of burden of proof. There is a burden upon the proponent to satisfactorily answer all critical questions relevant to the schematic argument posed by a respondent. There may or may not be an obligation on the part of a respondent to raise, or to pose such questions. But, in many cases, having received some response from the proponent to the question, it will be incumbent on the respondent to show that the answer is not adequate. That is, posing the question defeats the argument, until it is satisfactorily answered. But, as Pinto (2003) has observed, in many cases, a satisfactory answer to the critical question will not require the introduction of new information, reasons or argument into the dialogue. In many cases, the answer can be perfunctory, or the question might simply prompt a reflection on the part of the proponent regarding the considerations made in reaching her standpoint. Yet, answering the question is sufficient to restore the initial presumptive status of the standpoint supported by the schematic argument, and shift the burden of proof back to the opponent. The only condition under which this move fails is if the answer is not satisfactory. But, we claim that it is the job of the questioner to show this. The point is that, eventually, it will fall to the questioner, not the proponent, to introduce new evidence into the dialogue. This accords with the argumentative effects of presumptive arguments, which shift the burden of proof to the respondent.

It is not the job of the answerer (i.e., the proponent) to show that her answers are satisfactory. Rather, the burden is on the questioner to show that an answer is unsatisfactory. This raises the important question of whether there is a burden of proof attached to questioning.

7.1 Is there a burden in questioning?

When the issue of critical questions was first discussed in the literature, the prevailing view was that no burden of proof was attached

to asking critical questions. It is commonly accepted that parties making assertions incur a burden of proof to successfully defend their assertions with acceptable reasons, and that they bear an obligation to retract those assertions that they cannot successfully defend. Yet, such a burden is not commonly associated with asking questions. In the first place, it was tacitly held that there was no burden on the part of a respondent to pose any critical questions in the first place. And secondly, it was thought that "to ask an appropriate critical question in a dialogue shifts the burden of proof back onto the side of the proponent of the original argument to reply to this question successfully" (Walton, 1996, p. 15). Recent developments have challenged both of these views.

As mentioned above, Walton (2003) has recently argued that there may be a burden to question –that is to raise critical questions– in certain types of dialogues, or in certain argumentative circumstances. In the second place, Pinto (2003) challenged the standard view concerning the role of critical questions and their effect on the burden of proof in schematic arguments, claiming that in many cases the posing of critical questions by a respondent may not actually shift a burden of proof back to a proponent. Subsequently, when trying to specify how critical questions can be represented in models diagramming the structure of argument schemes, it was proposed that certain critical questions might best be seen as having a burden of proof attached to them (Walton and Reed, 2003; Prakken, Reed and Walton, 2004). In what follows, we set forth this new approach to the role of critical questions in argumentation schemes, and show how it addresses Pinto's concerns.

Prakken, Reed and Walton (2004), and Walton and Reed (2003) have argued that, since different critical questions relate to their associated schematic arguments in different ways, sometimes there is a burden of proof attached to raising a critical question while in other cases there is not. For example, if a critical question is addressed to some assumption at work in the argument as an implicit premise, then there is no burden of proof attached to raising questions about the acceptability of those assumptions. These

critical questions seem to function normally, automatically shifting the burden of proof back to the original proponent of the argument, without themselves bringing any burden of proof back to the questioner. On the other hand, some critical questions appear to instead raise *allegations* against an argument. That is, in order that the questions have the critical force they do, they themselves rest on some implicit claim which serves as an objection to the argument. As a result, it would seem that some critical questions do not automatically shift the burden of proof back to the proponent. Rather, some critical questions seem to have a positive burden of proof attached. In summary, some critical questions represent "additional assumptions of the argument … while others function as staring points for finding rebuttals" (Walton and Reed, 2003, p. 208). While the former have no burden of proof attached, the latter do.

7.2 Analysis of a sample scheme: Practical reasoning

Walton, Reed and Prakken based their conclusions on the analysis of the scheme from expert opinion. To show how this new account might accommodate Pinto's (2003) criticisms of the standard one, we consider how this analysis applies to the scheme of practical reasoning as given below (Walton, 1990b, p. 48; Walton 1997a, p. 165).

Practical Reasoning: Necessary Condition Schema

(N1) ***Goal Premise:*** My goal is to bring about *A*.
(N2) ***Alternatives Premise:*** I reasonably consider on the given information that bringing about at least one of [B_0, B_1,…,B_n] is necessary to bring about *A*.
(N3) ***Selection Premise:*** I have selected one member B_i as an acceptable, or as the most acceptable necessary condition for *A*.
(N4) ***Practicality Premise:*** Nothing unchangeable prevents me from bringing about B_i as far as I know.
(N5) ***Side Effects Premise:*** Bringing about *A* is more acceptable to

me than not bringing about B_i.
Conclusion: Therefore, it is required that I bring about B_i.

Critical questions

1. *Alternative Means Question:* Are there alternative means of realizing *A*, other than *B*?
2. *Acceptable/Best Option Possible Question:* Is *B* an acceptable (or the best) alternative?
3. *Possibility Question*: Is it possible for agent *a* to do *B*?
4. *Negative Side Effects Question*: Are there negative side effects of *a*'s bringing about *B* that ought to be considered?
5. *Conflicting Goals Question*: Does *a* have the goals other than *A*, which have the potential to conflict with *a*'s realizing *A*?

In the case of argument from expert opinion, whether there is a burden attached to questioning can be determined according to whether the question acts to challenge an implicit assumption or whether it serves as a starting point for objections. Let us see whether this test applies to the scheme of practical reasoning introduced above.

Here, it would seem that the test criteria cannot be applied in a clear-cut way. In the first place, each critical question is clearly associated with some premise explicitly stated in the argument. So, it would seem that none of the questions have a burden attached to them.

This is correct to a point, since these questions can be posed in a relatively innocuous manner, where they do not have a refuting or objecting function, but simply serve to probe a bit further into the argument. As such, while the proponent has a burden to answer each question asked, this burden can be met in a relatively perfunc-

tory way. For instance, as Pinto (2003) suggests, with the alternative means question the proponent might respond simply by saying something like "No. I can't think of any alternative means of realizing *A* other than those given in the list of *B*" or "Well, those are all of the options I can think of. Can you think of any others?" On the standard account, by responding to the question, the proponent has met her burden, and the presumptive status of her original argument is restored.

We can see that, if the question is to serve as an objection in any further sense something else must happen. Namely, it must be shown that the proponent's answer is unsatisfactory. Yet, as we have stated above, it is the responsibility of the respondent to show this. In this case this would be done by finding examples of alternatives not considered in the initial argument. Indeed, in the latter answer above, the proponent explicitly shifts the burden of proof associated with the question back upon the questioner by inviting him to come up with alternatives not initially considered. Such alternatives would have the force of objections and would go towards showing the unacceptability of the move from the alternatives premise to the selection premise in the initial argument.

This reveals the second sense in which a question can be posed, namely as an objection to the argument. Here, the question is asked in a rhetorical voice, whereby a negative answer is implicit in the question. For example, in the alternative means question, it is assumed that there actually is some alternative means that has not been considered by the proponent in her initial argument. Yet, this implicit assertion on the part of the respondent comes with a burden of proof attached. As such, if the question is to serve as an objection in this stronger sense, there is some burden in questioning.

In examining the practical reasoning scheme, it seems that each of the critical questions can be posed either in a weak sense (as a means of probing further into the argument) or in a strong sense (as a challenge, or objection to the argument). Further, whether the

question has a burden attached depends on how it is asked. If it is asked in the weak sense, then it functions normally in shifting the burden of proof back on the proponent. Importantly, this alone may be enough to diffuse the initial argument if, for instance, the proponent realizes on reflection that there are several options which she had not initially considered. On the other hand, if the question is to go further and act as an objection then it has a positive burden of proof attached to it. This can be explained in several ways. First, it is the dialectical responsibility of the questioner to show that the proponent's answers to the questions are unsatisfactory. Second, in serving as an objection there will generally be some implicit assertion at work in the question giving it its force as an objection. Yet, assertions (even implicit ones) come with positive burdens of proof attached.

So, the issue of whether there is a burden of proof attached to questioning can be explained in terms of how the question functions in the argument. Questions which expose and challenge implicit assumptions in an argument, or simply seek to probe a bit further into an argument do not come with any burden of proof attached. But, questions which act as "starting points for finding rebuttals", or as rhetorical questions served to introduce an objection, come with a positive burden of proof attached. Thus, we agree with Pinto's (2003) "other account" of critical questions whereby the function of critical questions is to guide a critic or respondent who is looking for evidence that would cancel the force of the argument. The "burden" of finding overriding or undermining evidence does not lie with the proponent; it lies with the respondent. And the critical questions are signposts pointing the respondent in directions where such evidence might lie.

It is crucial to recognize this as an important and common function of critical questions which effectively changes the standard account of how they affect burden of proof in argumentative dialogues. It remains the burden of a proponent to satisfactorily answer all critical questions posed. But, when questions can be answered in a perfunctory way, without making any new asser-

tions, the burden of showing that such answers are unsatisfactory will fall to the questioner (i.e., respondent), and it will be his job to introduce new and defeating evidence into the dialogue. This effectively places a burden of proof on the questioner.

On the other hand, we hold that Pinto's "other account" describes only one of the functions that critical questions can have in an argumentative dialogue. As such, we disagree with Pinto's (2001b, p. 112) conclusion that "their function is [solely] *heuristic*, and that the mere *posing* of such questions has no *normative* force." Sometimes, critical questions can function normally: they have no burden of proof attached, and posing them temporarily defeats an argument (until they are satisfactorily answered). Further, we disagree with Pinto's (2003) conclusion that "critical questions occur, not in the dialogue itself, but in the reasoning of a respondent who is searching for a way to counter an argument made by a proponent." Even critical questions which serve as signposts for new and potentially defeating counter-evidence can be meaningfully posed in a dialogue, and they serve to map out a set of standard dialogic moves available to an arguer.

8. Conclusion

While we have by no means provided a comprehensive account of argumentation schemes and critical questions, we have sought in this paper to propose a number of solutions to some of the outstanding theoretical issues surrounding them. We endorse Blair's (2000) account of schemes as reason-types, whose purpose is to represent structural patterns of defeasible reasoning commonly employed in argument, and whose classification will depend to a significant extent on the evidentiary structure the reasoning –the reason-types and the "relation of conveyance" (Katzav and Reed, 2004a) at work in the inference. We further endorse an account of argumentation schemes as normative categories of argument, and sought to show how such a view can be maintained in the face of important criticisms. We have demonstrated the reconstructive

role of argumentation schemes, and the evaluative role of critical questions. On the latter issue, we maintain that the questions associated with a scheme can be determined by their foundation and their function. We have proposed an explanation of the theoretical foundation of critical questions as evaluative tools: namely that they apply some element of the R.S.A. standard of cogency. We maintain a standard account of the dialectical function of critical questions and attempted to show how this account is partly consistent with, and partly resists the criticisms of, Pinto's "other account." In attempting to work through some Blair's (2001) theoretical agenda , we hope to have advanced the theory of schemes and critical questions by beginning to reconcile a straightforwardly dialectical account of them with an account founded more squarely in the informal logic approach. Ultimately, these approaches are not at odds with one another, but share a common tradition, a common set of theoretical, analytical and evaluative projects, and common views about the nature and foundation of good argument.

Acknowledgements

An earlier and much abridged version of this paper was presented at the conference *The Uses of Argument* (McMaster University, 18-21 May, 2005) under the title "The Nature and Status of Critical Questions" and appears in the proceedings (David Hitchcock and Daniel Farr (eds.), pp. 476-484; © the authors; circulated only to attendees). Sections 6 and 7 of the current paper are slightly revised adaptations of material presented in this earlier version. The authors would like to thank R.C. Pinto for his helpful comments on earlier drafts of this paper. Research for this paper was made possible by separate research grants from the Social Science and Humanities Research Council of Canada held by each of the two authors. David Godden would also like to recognize the support of the University of Windsor.

References

Blair, J. Anthony. (1999). Presumptive reasoning/ argument: An overlooked class. *Protosociology,* 13, 46-60.

Blair, J. Anthony. (2000). A theory of normative reasoning schemes. In Hans V. Hansen, Christopher W. Tindale, and Elmar Sveda (Eds.), *Proceedings of the Third OSSA Conference: Argumentation at the Century's Turn*. St. Catherines, ON: OSSA.

Blair, J. Anthony. (2001). Walton's argumentation schemes for presumptive reasoning: A critique and development. *Argumentation*, 15, 365-379.

Braet, Antoine C. (2004). The oldest typology of argumentation schemes. *Argumentation*, 18, 127-148.

Eemeren, Frans H. van and Tjark Kruiger. (1987). Identifying argumentation schemes. In Frans H. van Eemeren, Rob Grootendorst, J. Anthony Blair and Charles A. Willard (Eds.), *Argumentation: Perspectives and Approaches*, pp. 70-81. Dordrecht: Foris.

Eemeren, Frans H. van and Rob Grootendorst. (1992). *Argumentation, Communication and Fallacies*, Hillsdale, NJ: Lawrence Erlbaum Associates.

Garssen, Bart. (1994). Recognizing argumentation schemes. In Frans H. van Eemeren and Rob Grootendorst (Eds.), *Studies in Pragma-Dialectics*, pp. 105-111. Amsterdam: Sic Sat.

Garssen, Bart. (2001). Argumentation schemes. In Frans H. van Eemeren (Ed.), *Crucial Concepts in Argumentation Theory*, pp. 81-99. Amsterdam: Amsterdam University Press.

Godden, David. (2005). Deductivism as an interpretative strategy: A reply to Groarke's defense of reconstructive deductivism. *Argumentation and Advocacy*, 41, 168-183.

Govier, Trudy. (2005). *A Practical Study of Argument*, 6th edition. Toronto: Thomson/Wadsworth.

Hastings, Arthur. (1963). *A Reformulation of the Modes of Reasoning in Argumentation*, PhD dissertation, Evanston, IL: Northwestern University.

Hitchcock, David. (2001). Sampling scholarly arguments: A test of a theory of good inference. In Hans V. Hansen, Christopher W. Tindale, J. Anthony Blair, Ralph H. Johnson, Robert C. Pinto (Eds.), *Proceedings of the Fourth OSSA Conference: Argumentation and its Applications*. Windsor, ON: OSSA.

Hitchcock, David. (2005). Good reasoning on the Toulmin model. *Argumentation*, 19, 373-391.

Johnson, Ralph H. and J. Anthony Blair. (1994). *Logical Self Defense*, 3rd edition. Toronto: McGraw-Hill.

Katzav, Joel and Chris Reed. (2004a). On argumentation schemes and the natural classification of arguments. *Argumentation*, 18, 239-259.

Katzav, J. and C.A. Reed. (2004b). A classification system for argument. In Department of Applied Computing, University of Dundee Technical Report. http:// babbage.computing.dundee.ac.uk/chris/publications/2004/ ClassifyingArguments.pdf, retrieved October, 2005.

Kienpointner, Manfred. (1987). Towards a typology of argumentative schemes. In Frans H. van Eemeren, Rob Grootendorst, J. Anthony Blair and Charles A. Willard (Eds.), *Argumentation: Across the Lines of Discipline*, pp. 275-287. Dordrecht: Foris.

Kienpointner, Manfred. (1992). *Alltagslogik, Struktur und Funktion von Argumentationsmustern*, Stuttgart –Bad Cannstatt: Frommann-Holzboog.

Perelman, C and L. Olbrechts-Tyteca. (1969). *The New Rhetoric: A Treatise on Argumentation*. Notre Dame//London: University of Notre Dame Press.

Pinto, R.C. (2001a). Argument schemes and the evaluation of presumptive reasoning. In *Argument, Inference and Dialectic*, pp. 98-104. Dordrecht: Kluwer.

Pinto, R.C. (2001b). Presumption and argument schemes. In *Argument, Inference and Dialectic*, pp. 105-112. Dordrecht: Kluwer.

Pinto, R.C. (2003). Commentary on C. Reed and D. Walton 'Argumentation schemes in argument-as-process and argument-as-product. In J.A. Blair, D. Farr, H.V. Hansen, R.H. Johnson and C.W. Tindale (Eds.), *Informal Logic at 25: Proceedings of the Windsor Conference*. Windsor, ON: OSSA.

Pollock, John L. (1970). The structure of epistemic justification. *American Philosophical Quarterly*, monograph series 4, 62-78.

Prakken, Henry, Chris Reed and Douglas Walton. (2004). Argumentation schemes and burden of proof. In F. Grasso, C. Reed, and G. Carenini (Eds.), *Working Notes of the 4th International Workshop on Computational Models of Natural Argument (CMNA 2004)*. Valencia: CMNA.

Reed, Chris and DouglasWalton. (2003). Argumentation schemes in argument-as-process and argument-as-product. In J.A. Blair, D. Farr, H.V. Hansen, R.H. Johnson and C.W. Tindale (Eds.), *Informal Logic at 25: Proceedings of the Windsor Conference*. Windsor, ON: OSSA.

Verheij, Bart (2003). Dialectical argumentation with argumentation schemes: An approach to legal logic. *Artificial Intelligence and Law*, 11, 167-195.

Walton, Douglas. (1988). Burden of proof. *Argumentation*, 2, 233-254.

Walton, Douglas. (1990a), What is reasoning? What is an argument? *Journal of Philosophy*, 87, 399-419.

Walton, Douglas. (1990b). *Practical Reasoning: Goal-Driven, Knowledge-Based, Action-Guiding Argumentation*. Savage, MD: Rowman and Littlefield.

Walton, Douglas. (1996). *Argumentation Schemes for Presumptive Reasoning*. Mahwah, NJ: Lawrence Erlbaum Associates.

Walton, Douglas. (1997a). Actions and inconsistency: The closure problem of practical reasoning. In Ghita Holmstrom-Hintikka and Raimo Toumela (Eds.), *Contemporary Action Theory*, Vol. 1, pp. 159-175. Dordrecht: Kluwer.

Walton, Douglas. (1997b). *Appeal to Expert Opinion*. University Park, PA: Penn State UP.

Walton, Douglas. (1999). *Slippery Slope Arguments*. Newport News, VA: Vale Press. Walton, Douglas. (2001). Abductive, presumptive and plausible arguments. *Informal Logic*, 21, 141-169.

Walton, Douglas. (2002). *Legal Argumentation and Evidence*. University Park, PA: Penn State UP.

Walton, Douglas. (2003). Is there a burden of questioning? *Artificial Intelligence and Law*, 11, 1-43.

Walton, Douglas. (2005a). An automated system for argument Invention in law using argumentation and heuristic search procedures. *Ratio Juris*, 18, 434-463.

Walton, Douglas. (2005b). Justification of argumentation schemes. *Australasian Journal of Logic*, 3, 1-13.

Walton, Douglas. (forthcoming). Presumptions, critical questions and argumentation schemes. In Hans V. Hansen and Fred Kauf-

feld (Eds.), *[Title Unknown; Edited Collection on Presumption]*, Penn State University Press.

Walton, Douglas and Erik Krabbe. (1995). *Commitment in Dialogue: Basic Concepts of Interpersonal Reasoning*, Albany, NY: SUNY Press.

Walton, Douglas and Chris Reed. (2003). Diagramming, argumentation schemes and critical questions. In F.H. van Eemeren *et al.* (Eds.), *Anyone Who Has a View: Theoretical Contributions to the Study of Argumentation*, pp. 195-211. Dordrecht: Kluwer.

2010 Vol 30: Why Fallacies Appear to be Better Arguments Than They Are

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Abstract: This paper explains how a fallacious argument can be deceptive by appearing to be a better argument of its kind than it really is. The explanation combines heuristics and argumentation schemes. Heuristics are fast and frugal shortcuts to a solution to a problem. They are reasonable to use, but sometimes jump to a conclusion that is not justified. In fallacious instances, according to the theory proposed, such a jump overlooks prerequisites of the defeasible argumentation scheme for the type of argument in question. Three informal fallacies, *argumentum ad verecundiam*, *argumentum ad ignorantiam* and fear appeal argument, are used to illustrate and explain the theory.

In the informal logic tradition, fallacies are commonly used sophisms or errors in reasoning like hasty generalization, *argumentum ad hominem* (argument against the person), *argumentum ad verecundiam* (appeal to authority, especially inappropriate argument from expert opinion), *post hoc ergo propter hoc* (false cause), straw man argument, *peititio principii* (begging the question) and so forth. Many of the most common forms of argument associated with major fallacies, like argument from expert opinion, *ad hominem* argument, argument from analogy and argument from correlation to cause, have now been analyzed using the device of defeasible argumentation schemes (Walton, Reed and Macagno, 2008). Recent research in computing has also embraced the use of argumentation schemes, linking them to key logical notions like burden of proof (Gordon, Prakken and Walton, 2007). Argumentation schemes have been put forward as a helpful way of characterizing structures of human reasoning, like argument from expert opinion, that have proved troublesome to view deductively.

Many of the schemes are closely related to specific informal fallacies representing types of errors that come about when a scheme is used wrongly. Such schemes represent the structure of correct forms of reasoning used wrongly in specific instances where an argument is judged to be fallacious. Studies of fallacies in argumentation and informal logic have mainly taken a normative approach, by seeing fallacies as arguments that violate standards of how an argument should properly be used in rational thinking or arguing.

However, fallacies also have a psychological dimension. They are illusions and deceptions that we as human thinkers are prone to. They are said to be arguments that seem valid but are not (Hamblin, 1970, 12). Even so, little is known about how the notion 'seems valid' should be explained (Hansen, 2002). Could it be psychological? Psychology studies heuristics and cognitive biases in human decision-making (Tversky and Kahneman, 1974). Heuristics may be broadly characterized as rules of thumb that enable us to rapidly solve a problem even where information is insufficient to yield an optimal solution, but in some cases they are known to lead to errors and cognitive biases. In this paper, it is shown how heuristics are closely connected to fallacies in a way that helps to explain why fallacies appear to be better arguments than they really are. Three examples of heuristics that are also known to be fallacies are used to bring the normative dimension better into relation with the psychological dimension.

The problem is solved by placing the notion of a heuristic as a mediating concept between the notions of fallacy and defeasible argumentation scheme. These are the three heuristics, as we will call them. If it is an expert opinion, defer to it. If there is no reason to think it is false, accept it as true. If it is fearful, avoid taking steps to whatever might lead to it. These three heuristics are interposed between three argumentation schemes underlying three informal fallacies by introducing a new device called a parascheme. The parascheme represents the structure of the heuristic. Each parascheme sits alongside a given scheme in the back-

ground, like a ghostly double. It comes into play to explain the relationship between a reasonable argument that fits an argumentation scheme and the same kind of argument that has been employed in a way that makes it fallacious. It is shown how the parascheme, along with the scheme and the heuristic, can be used to explain what has gone wrong in fallacious instances of these three kinds of arguments.

1. Heuristics and paraschemes

Gigerenzer et al. (1999) explore the cognitive theory that we have two minds –one that is automatic, unconscious, and fast, the other controlled, conscious, and slow. In recent years there has been great interest in so-called dual-process theories of reasoning and cognition. According to dual process theories in cognitive science, there are two distinct cognitive systems underlying human reasoning. One is an evolutionarily old system that is associative, automatic, unconscious, parallel, and fast. It instinctively jumps to a conclusion. In this system, innate thinking processes have evolved to solve specific adaptive problems. The other is a system that is rule-based, controlled, conscious, serial, and slow. In this cognitive system, processes are learned slowly and consciously, but at the same time need to be flexible and responsive.

The old system uses what are called heuristics to rapidly jump to a conclusion or course of action. An example would be the use of trial and error when one cannot find a better way of solving a problem. Argument making has been combined with heuristic thinking by Facione and Facione (2007) to help explain the complexity of human reasoning of the kind used in decision-making. They distinguish between two kinds of thinking (Facione and Facione, 2007, 5). One, based on heuristics, applies to situations that are familiar, like making a fast decision to brake while driving on a freeway. The other is useful for judgments in unfamiliar situations, processing abstract concepts and deliberating where there is sufficient time to plan carefully and collect evidence.

Heuristics are said to be "fast and frugal" in use of resources (Gigerenzer et al., 1999). They are extremely useful in arriving at a decision to proceed tentatively on a defeasible basis under constraints of time pressure and lack of complete knowledge. Gigerenzer et al. (1999, 4) offer the example of a man who is rushed to a hospital while having a heart attack. The physician needs to decide under time pressure whether he should be classified as a low risk or a high risk patient. This can be done using three variables. (1) The patient who has a systolic blood pressure of less than 91 is classified as high risk without considering any other factors. (2) A patient under age 62.5 is classified as low risk. (3) If the patient is over that age, the additional factor of sinus tachycardia (heart rhythm of greater than 100 beats per minute) needs to be taken into account. These three variables can be applied using the decision tree in Figure 1.

This decision strategy is very simple and ignores quantitative information, hence it makes us suspicious that it might be inaccurate compared to a statistical classification method that takes much more data into account. A heuristic is only a shortcut, and if there is enough time for more evidence to be collected, a better method can often be found. The controlled, conscious and slow system of reasoning can pose critical questions, looking at evidential considerations pro and contra. An argument based on a heuristic might stand up or not under this more detailed kind of scrutiny. Still, heuristics can not only be useful but often highly accurate. According to Gigerenzer et al. (1999, 4-5), the decision tree heuristic "is actually more accurate in classifying heart attack patients according to risk status than are some rather more complex statistical classification methods".

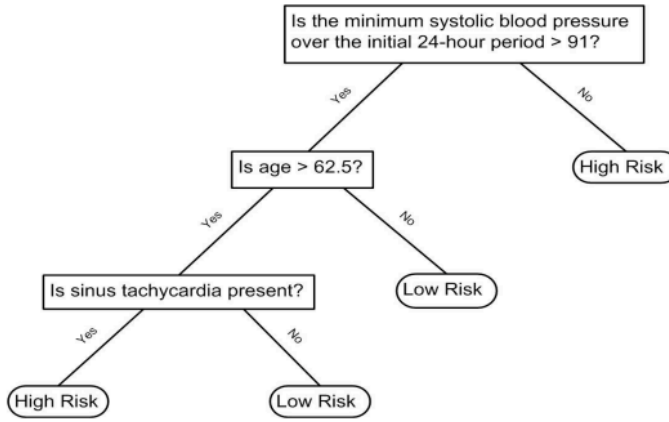


Figure 1. Decision Tree for Heart Attack Victim (adapted from Gigerenzer et al., 1999, 4)

We need to be aware, however, that the term 'heuristic' has different meanings in different disciplines. In psychology it refers to the use of simple and efficient rules that can be used to explain how people make decisions and solve problems under conditions of incomplete information. Such rules can be practically useful and work well in many situations, but they can also be known to lead to errors in some cases. Philosophers of science have emphasized the importance of heuristics for invention of hypotheses in scientific investigations. In engineering, a heuristic is a rule of thumb based on practical experience that can be used to save time and costs when solving a problem.

Russell and Norvig (1995, 94) have presented a brief history of how the meaning of the term 'heuristic' has evolved in computer science. Originally the term was used to refer to the study of methods for discovering problem-solving techniques, especially ones that can be used to find mathematical proofs. Later, the term was used as the opposite of an algorithm. In other words, it was defined as a process that may solve a problem, but offers no guarantee of solving it. Still later, during the period when expert systems dominated artificial intelligence, "heuristics were viewed as rules of thumb that domain experts could use to generate good solutions

without exhaustive search" (Russell and Norvig, 1995, 94). However, this notion of a heuristic proved to be too inflexible, leading to the current usage that refers to heuristics as techniques designed to solve a problem even if the solution cannot be proved conclusively to be the correct one. This usage is the one used in work on devising intelligent search strategies for computer problem solving. Many examples of typical uses of heuristics in computer problem solving are given by Pearl (1984). An example Pearl gives (1984, 3) is the case of the chess master who decides that a particular move is most effective because it appears stronger than the positions resulting from other moves. This method is an alternative to rigorously determining which sequences of moves force a checkmate by precisely comparing all these available sequences. Heuristics are clearly related in some way both to defeasible argumentation schemes and to fallacies, as we can see by comparing them. For example, the heuristic 'If it's an expert opinion, defer to it' is clearly related to the argumentation scheme for expert opinion. The heuristic appears to be a fast and shorter version of the scheme, which, as will be seen in the next section, is longer, depending on which version of the scheme is selected. Perhaps the heuristic, since a heuristic is known to be capable of leading to error, is part of the fallacy, or can be used to explain how the fallacy works. To explore this suggestion, here we introduce a new concept into logic.[1]

A parascheme is a device that can be used to represent the structure of a heuristic as a speedy form of inference that instinctively jumps to a conclusion and is commonly used to make decisions. Here are three examples of paraschemes. I name the first the parascheme for expert opinion: an expert says *A* is true, therefore *A* is true. I name the second the parascheme for lack of a better reason: *A* is not known to be false (true) therefore *A* is true (false). I name the third the parascheme for fearful consequence: consequence *C* is fearful, therefore, do not carry out any action *a* that would have

1. It may not be all that new, if one recalls that one of the words Aristotle used for fallacy was paralogism.

consequence *C*. These paraschemes are obviously related in some interesting way to two well-known informal fallacies, *argumentum ad verecundiam* (fallacious appeals to authority), *argumentum ad ignorantiam* (arguments from ignorance), and to fear appeal arguments, sometimes associated in logic textbooks with fallacious *ad baculum* arguments, or arguments that appeal to threats.

2. Variants of the scheme for argument from expert opinion

Argument from expert opinion has long been associated with the fallacy of appeal to authority, but recent work in informal logic has shown that it is very often a reasonable argument that has the structure of a defeasible argumentation scheme. The following form of reasoning represents its argumentation scheme: if *E* is an expert and *E* says that *A* is true then *A* is true; *E* is an expert who says that *A* is true; therefore *A* is true. This scheme is defeasible. It is not deductively valid, since what an expert says often turns out to be wrong, or at least subject to revisions as new information comes in. Such a defeasible scheme is inherently subject to critical questioning. Moreover the conditional in the major premise is not the material conditional of the kind used in deductive propositional logic. It is a defeasible conditional. Here is the version of the scheme for argument from expert opinion from Walton, Reed and Macagno (2008, p. 309). Let's call it the simple version of the scheme.

> **Major Premise:** Source *E* is an expert in subject domain *S* containing proposition *A*.
> **Minor Premise:** *E* asserts that proposition *A* is true (false).
> **Conclusion:** *A* is true (false).

The simple version is short, having only two premises. It expresses the nature of the basic type of argument very well. It brings out how argument from expert opinion works as a fast and frugal heuristic in everyday thinking. But there are some problems with it.

The first problem was pointed out by Walton and Reed (2002). The scheme above, usually taken to represent the basic scheme for argument from expert opinion, seems to be incomplete. Walton and Reed (2002, 2) suggest that the structure of the argument could be more fully expressed in the following version, which they call Version II.

> **Explicit Premise:** Source *E* is an expert in subject domain *S* containing proposition *A*.
> **Explicit Premise:** *E* asserts that proposition *A* (in domain *S*) is true (false).
> **Conditional Premise:** If source *E* is an expert in subject domain *S* containing proposition *A* and *E* says that *A* is true then *A* may plausibly be taken to be true (false).
> **Conclusion:** *A* is true (false).

Let's call this version of the scheme the conditional version. It has what appears to be a *modus ponens* structure, but it represents a defeasible variant of this form of argument that is not well modeled as deductive or inductive. Note that it even adds a new dimension from the simple scheme by adding 'may plausibly be taken to be' in the conditional premise. These remarks suggest a second problem. A distinction needs to be drawn between the deductive form of argument commonly called *modus ponens* and its defeasible variant defeasible *modus ponens*, called *modus non excipiens* by Verheij (1999, 5). This type of argument has the following form: if *A* then (defeasibly) *B*; *A*; therefore (defeasibly) *B*. It is a type of argument that can hold tentatively under conditions of incomplete knowledge of the full facts of a case, but that can defeated by exceptions. It is not a deductively valid form of inference. In defeasible logic (see Nute, 1994), a rule-based non-monotonic formal system, a conclusion derived is only tentatively accepted, subject to new information that may come in later. Where $\Rightarrow$ represents the defeasible conditional, the statement $A \Rightarrow B$ reads: if *A* then defeasibly *B*. It means that 'if *A* then *B*' holds tentatively, subject to new information that might come in, providing an instance where *A* holds but *B* doesn't.

Taking into consideration how such arguments can be defeated or cast into doubt brings us to the asking of appropriate critical questions matching each defeasible scheme. The six basic critical questions matching the argument from expert opinion are given in Walton, Reed and Macagno (2008, 310) as follows.

> CQ_1: ***Expertise Question***. How credible is *E* as an expert source?
> CQ_2: ***Field Question***. Is *E* an expert in the field that *A* is in?
> CQ_3: ***Opinion Question***. What did *E* assert that implies *A*?
> CQ_4: ***Trustworthiness Question***. Is *E* personally reliable as a source?
> CQ_5: ***Consistency Question***. Is *A* consistent with what other experts assert?
> CQ_6: ***Backup Evidence Question***. Is *E*‘s assertion based on evidence?

The critical questions are provided to teach skills of critical thinking concerning how best to react when confronted with a particular type of argument.

There is also a third problem with the simple version of the scheme. This problem was first noticed in a general discussion of schemes and critical questions by Verheij (2001). The problem as applied to the simple version of this scheme is that the field question appears to be redundant, because the major premise already states that the field (domain) of the proposition that is claimed to be true matches the field (domain) of the expert. Since this assertion is already made in the premise, there is no need to add consideration of it as a critical question as well, because anyone who disagrees with the argument, or wants to question it, can simply disagree with the premise, and ask for support for it. So it might seem that, in order to use these critical questions, the simple version of the scheme could be shortened even further. We return to this problem in the next section.

Four of the six critical questions of the scheme for argument from expert opinion can be modeled as implicit premises that supplement the explicit premises of the scheme (Walton and Gordon, 2009). These four questions are modeled as additional assumptions, added to the ordinary premises. First, consider CQ_1. When you put forward an appeal to expert opinion, you assume, as part of the argument, that the source is credible, or has knowledge in some field. Second, consider CQ_2. You assume that the expert is an expert in the field of the claim made. Third, consider CQ_3. You assume that the expert made some assertion that is the claim of the conclusion, or can be inferred from it. Fourth, consider CQ_6. You assume that the expert's assertion was based on some evidence within the field of his or her expertise.

Questions are not premises, but the Carneades model represents the structure of the scheme to represent them as premises. The new fully explicit argumentation scheme no longer needs critical questions in order for it to be subject to evaluation. The premise can be questioned or argued against in the usual way, shifting a burden of proof onto the arguer to defend it, or to the questioner to back up his criticism. That does not end the process of questioning if critical sub-questioning is possible. But this process can be modeled by Carneades in the same way, just by moving the process another step.

Questions CQ_4 and CQ_5 can also be modeled as implicit premises of the scheme for argument from expert opinion, but they need to be handled in a different way. One does not assume the expert cited is untrustworthy without some evidence to back up such a charge. The burden of proof to support such a claim, once made, would shift to the respondent to back up his charge before the given argument from expert opinion would fail to hold up. To successfully challenge the trustworthiness of a witness, some evidence of bias or dishonesty must be produced. Nor would one assume, without further evidence, that what the expert said is inconsistent with what other experts say. To successfully challenge the consistency of an expert's claim with what other experts in the same field say, some

evidence of what the others say must surely be produced. The difference between these two kinds of critical questions can be seen as one of burden of proof (Gordon, Prakken and Walton, 2007). Before they refute the argument from expert opinion, CQ_4 and CQ_5 have a burden of proof that needs to be met, whereas the other critical questions refute the argument just by being asked, unless the proponent offers some appropriate reply to the question.

The Carneades model of argumentation uses the following procedure for determining the acceptability of an argument (Gordon and Walton, 2006).

- At each stage of the argumentation process, an effective method (decision procedure) is used for testing whether some proposition at issue is acceptable given the arguments of the stage and a set of assumptions.
- The assumptions represent undisputed facts, the current consensus of the participants, or the commitments or beliefs of some agent, depending on the task.
- The evaluation of an argument depends on the proof standard applicable to the proposition at issue in a type of dialogue appropriate for the setting.
- A decidable acceptability function provided by the Carneades model of argument is used to evaluate how strong or weak an argument is.

The Carneades model for reasoning with argumentation schemes distinguishes three types of premises, ordinary premises, assumptions and exceptions. Assumptions are assumed to be acceptable unless called into question (Gordon and Walton, 2006). Like ordinary premises, they have a burden of proof on the proponent, who must either give an appropriate answer or the argument is refuted. Ordinary premises and assumptions are assumed to be acceptable, but they must be supported by further arguments in order to be judged acceptable. Exceptions are modeled as premises that are not assumed to be acceptable. They only become acceptable

when the appropriate evidence is given to show they hold. On the Carneades model, the major and the minor premise of the scheme above are classified as ordinary premises, while the first four questions are treated as assumptions and the last two are treated as exceptions.

Following the proposal above that argument from expert opinion has a defeasible *modus ponens* form (DMP), the scheme for argument from expert opinion can be presented in an amplified form that reveals its implicit premises as follows.

> **Ordinary Premise:** *E* is an expert.
> **Ordinary Premise:** *E* asserts that *A*.
> **Ordinary Premise:** If *E* is an expert and *E* asserts that *A*, then *A* is true.
> **Assumption:** *E* is an expert in field *F*.
> **Assumption:** *A* is within *F*.
> **Assumption:** It is assumed to be true that *E* is a credible expert.
> **Assumption:** It is assumed to be true that what *E* says is based on evidence in field *F*.
> **Exception:** It is an exception to the generalization stated in the conditional premise if it is found to be false that *E* is trustworthy.
> **Exception:** It is an exception to the generalization stated in the conditional premise if it is found to be false that what *E* asserts is consistent with what other experts in field *F* say.
> **Conclusion:** *A* is true.

This list of premises and conclusion represents the Carneades style of modeling the scheme for argument from expert opinion. In effect, the critical questions have been absorbed into the scheme as additional premises. Another aspect of the Carneades version of the scheme that requires comment is that the three ordinary premises can be taken as explicit premises whereas the assumptions and the exceptions, although they are also premises required to support the conclusion, are implicit in nature.

In this section we have observed that there are various reasons why the scheme for argument from expert opinion is potentially useful and interesting. One reason is that one might want to use argumentation schemes in an argument map that represents premises and conclusions as statements in text boxes, but has no straightforward way of representing critical questions matching a particular scheme. The Carneades style of representing arguments solves this problem. Another reason is that we might want to study the relationship between the scheme and its corresponding parascheme.

3. Relation of the parascheme to the scheme

How is the parascheme for argument from expert opinion related to the above versions of the full scheme? First, note that the parascheme is even simpler than the simple version of the scheme above. The simple scheme at least takes the field of expertise into account. But above, it was questioned, following Verheij's observations, whether this was necessary, since the field of expertise is already taken into account in one of the critical questions. Should the simple scheme be made even simpler as in the following version, which could be called the simplest version of the scheme.

> **Explicit Premise:** *E* is an expert.
> **Explicit Premise:** *E* asserts that proposition *A* is true (false).
> **Conclusion:** *A* is true (false).

This simplest version matches the parascheme. A simpler variant of the conditional variant of the scheme can also be considered.

> **Explicit Premise:** *E* is an expert.
> **Explicit Premise:** *E* asserts that proposition *A* is true (false).
> **Conditional Premise:** If *E* is an expert and *E* says that *A* is true then *A* is true.
> **Conclusion:** *A* is true (false).

So which of these versions of these schemes for argument from expert opinion should be taken as the correct one, at least for stan-

dard purposes of analyzing and evaluating arguments? The disadvantage of the simplest version is that it does not take the domain of expertise into account. But is that more of an asset than a liability, if it can be taken into account in the critical questions, or in the assumption on that matter in the Carneades version of the scheme? Another solution would be to leave the domain issue in the ordinary premise of the scheme but delete the field question from the critical questions. In other words, we delete the parts of the ordinary premises pertaining to domain of expertise and leave it as an assumption in the Carneades list of premises.

A nice approach that seems to works very well for our purposes is to opt for the simplest variant of the conditional version of the scheme. One reason for selecting this version as the main one for general use is that it is important to include the conditional, because it acts as the so-called warrant or inference license linking the premises to the conclusion. It expresses the rationale, the presumption on which the inference is based to the effect that what an expert states is generally reliable as a defeasible reason for accepting something as true, in the absence of contravening reasons to think it is false. Another reason is that the defeasibility of the conditional will turn out to be important for analyzing the fallacy of argument from expert opinion. If the conditional is treated as a material conditional of the kind used in deductive logic, it makes the inference inflexible, in a way that ties it in with fallacious argument from expert opinion, as will be shown below. Let's provisionally work with the simplest conditional variant.

The parascheme jumps straight to the conclusion from the first two ordinary premises to the conclusion. It does not take the conditional ordinary premise of the simplest variant of the conditional scheme into account, nor does it take any of the assumptions or the exceptions made explicit in the Carneades version of the scheme into account. The structure of the reasoning can be modeled by defeasible logic. A defeasible rule has the form of a conditional, $A_1, A_2,\ldots, A_n \Rightarrow B$, where each of the A_i is called a prerequisite, all the A_i together are called the antecedent, and B is called the con-

sequent. Argumentation schemes, like the one for argument from expert opinion, take the following general form in defeasible logic.

$A_1, A_2,\ldots, A_n \Rightarrow B$
$A_1, A_2,\ldots, A_n$
B

The parascheme omits one of the prerequisites of the scheme. The fallacy is not one of a false premise, or of a premise that is inadequately supported by evidence. It is one of overlooking a premise that is a prerequisite of the scheme.

How the parascheme works in an instance of the scheme for argument from expert opinion is shown in Figure 2, where the argument jumps ahead from two of the ordinary premises to the conclusion without taking the other premises into account.

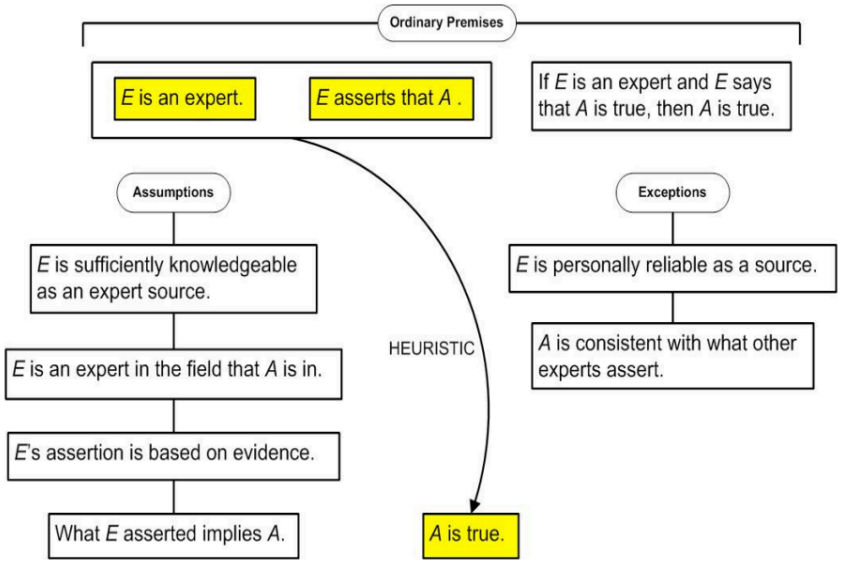


Figure 2. Heuristic of Argument from Expert Opinion

Look at the two premises in the darkened boxes at the top left of Figure 2, and the arrow representing the inference to the conclusion in the darkened box at the bottom. This inference represents

a simplified version of the scheme that is understandable enough as a familiar heuristic, but does not take the other factors into account. These other factors include the conditional premise linking other two ordinary premises to the conclusion (shown in the top box at the right) and the implicit premises, the assumptions and the exceptions (shown below the top boxes on the left and right respectively). So here we see the problem. The heuristic takes us by a fast and frugal leap directly to the conclusion. It is the old cognitive system of reasoning. However it overlooks the implicit conditional premise, the assumptions and the exceptions, all factors that need to be taken into account by the controlled, conscious, and slow inferential procedure of the new cognitive system. The first problem is how this analysis relates to the *ad verecundiam* fallacy.

4. Fallacious arguments from expert opinion

Argument from expert opinion can be a reasonable argument in some instances of its use, while in other instances of its use, it can be fallacious. But there can be different kinds of problems in using it as an argument. Some uses are merely blunders or errors that make the argument either weak or worthless, depending on the standard of proof required to make the argument of some probative worth to prove a point. On this dynamic approach, a distinction has to be drawn between two kinds of fallacies. In some cases, a fallacy is merely a blunder or an error, while in other cases, it is a sophistical tactic used to try to get the best of a speech partner in dialogue unfairly, typically by using verbal deception or trickery. The evidence of the use of such a tactic is found in the pattern of moves made by both sides in the exchange. It is important for fallacy theory to avoid confusing these two types of problematic argumentation moves. To deal with the problem, a pragmatic theory of fallacy (Walton, 1995) distinguished between two kinds of fallacies. The paralogism is the type of fallacy in which an error of reasoning is typically committed by failing to meet some necessary requirement of an argumentation scheme. The sophism type

of fallacy is a sophistical tactic used to try to unfairly get the best of a speech partner is an exchange of arguments.

To cite an example of this latter type of problem in arguments from expert opinion, consider a case where a movie star who is not a physician makes claims about the healing properties of a skin cream to cure acne or other skin conditions. This person may be a role model, and may think that the cream cured her skin condition, but she is not an expert of the type required to provide scientific or medical evidence of the kind required to support her claim, based on the scheme for argument from expert opinion. The error could be diagnosed as a failure of the ordinary premise of the scheme for argument from expert opinion claiming that the source cited is an expert. Alternatively, if the movie star is being put forward as some sort of expert, the problem is that she may not be an expert in the right field needed to support the claim. Let's take up these two kinds of cases separately, beginning with the second one.

This kind of case takes us back to the question of formulating the scheme studied in Section 2. Should we use a version of the scheme for argument from expert opinion where it is required that the field of the subject proposition *A* is the same as the field of the expert cited? This requirement holds in the conditional version called Version II by Walton and Reed (2002, 2). Or should we use a version of the scheme for argument from expert opinion where it is not required that field of the subject proposition *A* be the same as the field of the expert cited? This requirement does not hold in the simple version of the scheme in Section 2. Nor does it hold in the simplest version of the scheme presented in Section 3, or in the simpler version of the conditional version of the scheme (also in Section 3). Another variant of the scheme that needs to be considered is the Carneades version, where there are two assumptions as premises, one stating that *E* is an expert in field *F* and another stating that *A* is within *F*. This version dispenses with the critical questions and ensures by having these two assumptions as premises that the field of the claim matches the field of the expert. In this instance the argument is a failure to fulfill the assumption that the

supposed expert is an expert in the field appropriate for the argument.

Now let's consider the first kind of case, where the movie star cited was not an expert at all, even though she was put forward as an expert in the appeal to expert opinion argument. A problem posed by such cases is whether the failure should be classified as an instance of the *ad verecundiam* fallacy or merely as a false explicit premise. The problem here is that the notion of fallacy is generally taken in logic to represent a fallacious inference of some sort, an argument from premises to a conclusion, and not merely a false or insufficiently substantiated explicit premise in the argument. This problem appears to recur in all the versions of the scheme. Even in the Carneades version '*E* is an expert' is an explicit premise. On the other hand, the failure to fulfill the assumption that the supposed expert is an expert in the field appropriate for the argument could plausibly be diagnosed as a fallacy on the ground that the assumption is implicit in the argument. If the fault is merely the failure of an ordinary premise, which is part of the parascheme, and which is explicit, it is harder to make a case for classifying it as a fallacy. The reason, to repeat, is that a sharp distinction needs to be drawn in logic between a fallacious argument and an argument that merely has a false premise. If the premise is an implicit assumption that corresponds to a critical question however, the case is different.

To cite another side of the problem, consider a different type of case of fallacious argument from expert opinion where the proponent of the argument treats it as infallible, and refuses to concede that it is open to critical questioning. That would be a fallacious misuse of the argument. For example, let's suppose he dismisses the respondent's attempts to question the argument critically by counter-attacking, replying, "Well, you're not an expert". This move attempts to block critical questioning, in effect treating the argument as holding by necessity. But argument from expert opinion is defeasible in nature, and needs to be seen as open to critical questioning. If you treat it as a deductively valid argument, serious

problems can arise. When examining expert witness testimony in law, for example, it would be against the whole process of examination to assume that the expert is omniscient. There is a natural tendency to respect expert opinions and even to defer to them, but experts are often wrong, or what they say can be misleading, so one often needs to be prepared to critically examine the opinion of an expert. Openness to default in the face of new evidence is a very important characteristic of defeasible reasoning. If the conditional premise in the simple conditional version of the scheme is treated as a material conditional of the kind used in deductive logic, it makes the scheme deductively valid. It is no longer defeasible, and open to critical questioning.

This second kind of case represents an even more serious instance of a fallacious appeal to authority (*argumentum ad verecundiam*)[2]. The problem is that the argument from expert opinion has been put forward in such an aggressive fashion that it shuts down the capability of the respondent to raise critical questions. For example, suppose the proponent puts forward an argument based on expert medical opinion, and in response to critical questioning, she replies aggressively by saying, "You're not an expert in medicine, are you? Are you a doctor? What you're saying is merely anecdotal". There might be some truth in these claims. The respondent may not be a doctor. He is not an expert in medicine. It may be indeed true that what he's saying is not based on scientific findings that have been proved by published medical studies. All this may be true, but what makes the proponent's reply fallacious is the way it was put forward to leave the respondent no possibility of critically questioning the claim. No room is left for critical questioning, and for undergoing the controlled, conscious, and slow process of questioning the assumptions made and the exceptions that need to be taken into account.

This parascheme treats the conditional premise as not defeasible. As shown above, defeasible logic has defeasible rules of the form

2. Literally it means argument from modesty or respect.

$A \Rightarrow B$, but it also has strict rules. Strict rules are rules in the classical sense: whenever the premises are indisputable (e.g., facts) then so is the conclusion, e.g. 'Penguins are birds'. A strict rule has the form of a conditional, $A_1, A_2,\ldots, A_n \Rightarrow B$, where it is not possible for all the A_i to be true and the B false. Defeasible rules are rules that can be defeated by contrary evidence, e.g. 'Birds fly'. The problem in this fallacious case of argument from expert opinion is that the argument is set forth as if it should be treated as deductively valid. The major premise is put forth as the rule that what an expert says must always be true, without exception. Hence the conclusion follows necessarily from the premises. If the premises are true, that conclusion must be accepted. To accept the premises but not the conclusion is logically inconsistent. Such an argument is not defeasible, and not open to critical questioning. The fallacy is the shutting off of the possibility of critical questioning of the argument by putting forward the heuristic in a strict (non-defeasible) form.

The explanation of why the fallacy is deceptive in the first kind of case is quite different. Corresponding to the argumentation scheme for argument from expert opinion, there is the following parascheme: *E* is an expert and *E* says that *A* is true; therefore *A* is true. This heuristic jumps to the conclusion in a way that is fast and frugal but overlooks other implicit premises in the scheme for argument from expert opinion that also need to be accounted for. In the first type of case above, the argument is fallacious because it either overlooks an ordinary premise or an assumption.

These two examples may not be the only kinds of problems, blunders and deceptive moves associated with the *ad verecundiam* fallacy. But they show how the deceptiveness of two important kinds of instances of the fallacy can be explained using paraschemes.

5. Generalizing the parascheme approach

The question now posed is whether the kind of analysis of the fallacy of *ad verecundiam* given above using paraschemes applies

to other informal fallacies. Of the major informal fallacies, the following twelve need to be analyzed with defeasible argumentation schemes of the sort that can be found in (Walton, Reed and Macagno, 2008, Chapter 9).

1. *Ad Misericordiam* (Scheme for Argument from Distress, 334)
2. *Ad Populum* (Scheme for Argument from Popular Opinion and its subtypes, 311)
3. *Ad Hominem* (*Ad Hominem* Schemes; direct, circumstantial, bias, 336-338)
4. *Ad Baculum* (Scheme for Argument from Threat, p. 333; Fear Appeal, 333)
5. Straw Man (Scheme for Argument from Commitment, p. 335)
6. Slippery Slope (Slippery Slope Schemes; four types, 339-41)
7. *Ad Consequentiam* (Scheme for Argument from Consequences, 332)
8. *Ad Ignorantiam* (Scheme for Argument from Ignorance, 327)
9. *Ad Verecundiam* (Scheme for Argument from Expert Opinion, 310)
10. *Post Hoc* (Scheme for Argument from Correlation to Cause, 328)
11. Composition and Division (Argument from Composition, p. 316; Division, 317)
12. False Analogy (Scheme for Argument from Analogy, 315)

These may not be the only fallacies that can be analyzed with the help of argumentation schemes, but they certainly are some promi-

nent ones. Other fallacies, like equivocation, amphiboly, accent, begging the question, fallacies of irrelevance, like red herring and wrong conclusion, and many questions, do not appear to fit specific argumentation schemes, or benefit directly from schemes when it comes to analyzing them.

There is no space to try to even comment on all the twelve fallacies listed above, but some of them do look like they could fit the parascheme model very well. For example the *post hoc* fallacy could be analyzed as the employment of the following parascheme: *X* is correlated with *Y*, therefore *X* causes *Y*. Especially the emotional fallacies like appeal to fear seem to be based on heuristics that would respond well to paraschematic treatment. Argument from ignorance is classified by Gigerenzer at al. (1999) as a prominent heuristic, and would also appear to be amenable to this treatment.

The simplest formulation of the scheme for the *argumentum ad ignorantiam* is this: statement *A* is not known to be false (true), therefore *A* is true (false). Calling it argument from ignorance makes it plausibly seem fallacious, but this form of argument is often reasonable when supplemented by a conditional premise: if *A* were false (true), *A* would be known to be false (true) (Walton, 1996, 254-255). For example there is no evidence that Roman soldiers received posthumous medals in war, only evidence of living soldiers receiving such awards. From this lack of evidence, the conclusion can be drawn by inference that Roman soldiers did not receive posthumous decorations in war. If historical evidence did show a posthumous decoration, the conclusion would have to be withdrawn, showing that the argument is defeasible. But if after much historical research through all the known record no such evidence was found, the conclusion could be a fairly reasonable one, depending on the evidence backing it up (Walton, 1996, 66). It is commonly called the lack of evidence argument in the social sciences or the *ex silentio* argument in history, where it is regarded as a reasonable but defeasible argument.

The structure of the lack of evidence argument, as it could be called less prejudicially, can be represented by a more complex argumentation scheme (Walton, Reed and Macagno, 2008, 328) that uses two variables. *D* is a domain of knowledge and *K* is a knowledge base. Most knowledge bases, of the kind used in scientific investigations, for example, are incomplete, and the reasoning based on the knowledge in them is defeasible.

If *K* is complete, a lack of evidence argument based on it could be deductively valid perhaps, but otherwise it should be seen as a defeasible inference that is open to critical questioning. For example, suppose that after a through security search *X* has never been found guilty of breaches of security. Here, because of the thorough search, it can be said that the conditional premise is supported by good evidence: if *X* were a foreign spy, it would be known to be true that he is a foreign spy. It could be concluded defeasibly, subject to further investigations, that it has been proved (up to whatever standard of proof is appropriate) that *X* is not a foreign spy. However, the possibility remains that *X* could have avoided detection through these security searches, as Kim Philby did. Hence lack of evidence arguments having the form of the argumentation scheme set out above are best analyzed as defeasible arguments that hold or not at some stage of an investigation in which evidence is being collected in a knowledge base and assessed.

Reasoning from lack of evidence [negative evidence] is recognized as a heuristic in computing. If you search through an expert database, and don't find statement *S* in it, that finding can be a reason for provisionally concluding that *S* is false. 'Guyana is a not major coffee producer' can be concluded after searching through an expert system on coffee producing countries and finding Guyana is not listed. The reason is the assumption that the expert system knows all about coffee producers in South America, and if Guyana were a major coffee producer, it would be in the experts system's knowledge base.

An even simpler argumentation scheme for the lack of evidence argument is based not just on what is known or not known to be true, but also on what would be known if it were true (Walton, 1996, 254).

> **Conditional Premise:** If *A* were true, *A* would be known to be true.
> **Lack of Knowledge Premise:** *A* is not known to be true.
> **Therefore**, *A* is false.

This scheme is a form of defeasible *modus tollens* argument (assuming, as well, the rule of double negation that tells us that *A* is false if and only if *A* is not true). Even though a knowledge base is incomplete, and the search for new knowledge may still be underway, this scheme can still enable a conclusion to be tentatively drawn by defeasible reasoning. In such an instance, the argumentation scheme becomes a defeasible form of argument, holding only tentatively, subject to the asking of critical questions during a search for more knowledge that may continue. The first premise above is associated with the assumption that there has been a search through the knowledge base that would contain *A* that has been deep enough so that if *A* were there, it would be found. One critical question is how deep the search has been. A second is the question of how deep the search needs to be to prove the conclusion that *A* is false to the required standard of proof in the investigation. It is not necessary to go into all the details here, given space limitations, but enough has been said to draw a parallel with the analysis of argument from expert opinion above.

The parascheme is the simple argument from the two basic premises in the simplest formulation of the scheme given above. How it works is shown in Figure 3, where we can see the linked argument based on the scheme for argument from lack of evidence with its two ordinary premises. We have not shown the assumption and exceptions for the argument from lack of evidence, in addition to the ordinary premises, but the reader can imagine them appearing on the right and left, in a way comparable to Figure 2. In Figure

3 the heuristic is even simpler. It is the fast inference from the lack of evidence premise all by itself to the conclusion, without taking the conditional premise into account. The lack of evidence premise and the conclusion are shown in the darkened boxes, showing the heuristic parts of the inference.

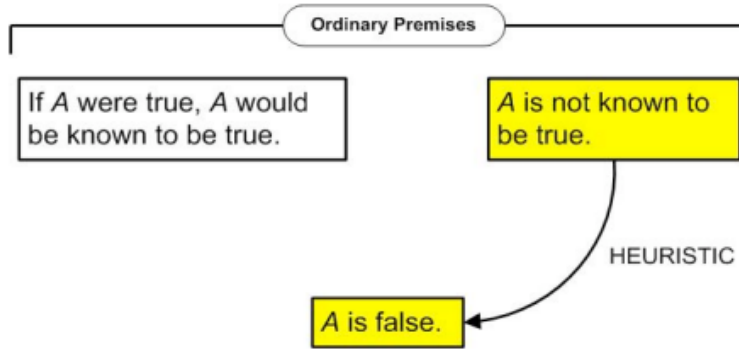


Figure 3. Heuristic of the Lack of Evidence Argument

In contrast to the quick leap of the heuristic, the controlled, conscious, and slow inferential procedure of analyzing and evaluating any given instance of a lack of evidence argument may require the consideration of the conditional premise and the critical questions matching the scheme. To judge whether an alleged argument from ignorance is fallacious the heuristic has to be examined in relation to whether other assumptions and exceptions need to be taken into account that may be acceptable or not.

Another type of argument that is well worth taking a look at is the fear appeal argument. Many of these arguments bypass logical reasoning and hope to convince by raising fears about some horrible consequences of a policy or action directly. The problem is that an argument may all too easily bypass other important aspects of a given situation that should properly be taken into account. Fear is an emotion that moves people powerfully to action and may tend to make them put more careful considerations of the complex features of a situation aside. An immediate response may be to jump to a conclusion, powerfully motivated by fear, instead of taking a

more realistic look at all the factors involved in a decision. The heuristic for this kind of reasoning runs as follows. If I carry out action *a*, it may bring about consequence *C*. Consequence *C* is really scary. Therefore, there is no way I am going to bring about action *a*. An example is the exploitation of fear appeal arguments in public policy-making on President Obama's proposed health care reforms, which called for more of a government role in health care funding. There was a sign outside an August 2009 town hall meeting in New Hampshire saying, "Obama lies, grandma dies" (Begley, 2009, 41). This fear appeal argument has the effect of suggesting to the reader the immediate action of stopping any health care reform that might condemn one of his/her loved ones to death because a government panel has ruled that treating her disease is too expensive. Because of the emotional fear appeal of this argument, viewers of the sign may tend to jump to the conclusion that the proposed health care reform is scary and should be resisted. It raises the scary idea that government death panels could make decisions to terminate medical treatment for elderly patients based on calculations of health care costs. When examined critically in relation to the facts, and the particulars of the proposal, this argument may not be very persuasive, but as a heuristic that appeals to fear, it may work very well as a rhetorical strategy.

6. Arguments that appear to be better than they are

The two most fully developed theories of fallacy so far (Tindale, 1997) are the pragmatic theory (Walton, 1995) and the pragma-dialectical theory (van Eemeren and Grootendorst, 1992). According to the earlier version of their theory, a fallacy is a violation of a rule of a critical discussion where the goal is to resolve a difference of opinion by rational argumentation (van Eemeren and Grootendorst, 1992). The theory has been more recently been strengthened by the work of van Eemeren and Houtlosser (2006) on strategic maneuvering. Even more recently, a fallacy has been defined as "a speech act that prejudices or frustrates efforts to resolve a difference of opinion" (van Eemeren, Garssen and Meuffels, 2009,

27). According to the pragmatic theory (Walton 1995, 237-238), a fallacy is a failure, lapse, or error that occurs in an instance of an underlying, systematic kind of wrongly applied argumentation scheme or is a departure from acceptable procedures in a dialogue, and is a serious violation, as opposed to an incidental blunder, error, or weakness of execution. Both theories can benefit from investigating further how schemes are wrongly applied when a fallacy has been committed. The problem is that neither theory has fully taken into account that longstanding intuition, very much evident in Aristotle's treatment of the *sophistici elenchi*, that fallacies are deceptive. They are not just arguments that prejudice efforts to resolve a difference of opinion, wrongly applied argumentation schemes, or departures from acceptable procedures in a dialogue, although they are all that. They are arguments that work as deceptive stratagems. They are arguments that seem correct but are not.These remarks take us back to the notion attributed to Hamblin in the introduction that a fallacy can be characterized as an argument that seems to be valid but is not. What Hamblin (1970, 12) actually wrote was, "A fallacious argument, as almost every account from Aristotle onwards tells you, is one that *seems to be valid* but *is not so*"[his italics]. Using this sentence to define 'fallacy' is problematic in a number of ways. First, whether or not an argument seems to be valid to any individual or group of individuals is not of much use to us in attempting to determine whether it is an argument that really is fallacious or not. Second, the term 'valid', is typically taken to refer to deductive validity, making the definition too narrow, or even mistaken. Third, a survey of leading logic textbooks, from Aristotle to the present (Hansen, 2002, 151) has shown that the fallacies tradition does not support wide acceptance of the claim made in Hamblin's sentence quoted above. According to Hansen (2002, 152), however, this tradition does support a comparable generalization: "a fallacy is an argument that appears to be a better argument of its kind than it really is". Either way, the notion of fallacy is taken to have a dimension that could be classified as psychological (in a broad sense, including cognitive psychology), meaning that such a fallacious argument has

strong potential for deception. It can often seem correct when it is not, or can appear to be better than it really is.

Hansen's rephrasing of the expression that says that fallacy is an argument that seems valid but is not is highly significant. We have two choices here. We can expand the use of the term 'valid' so that it no longer just applies to deductively valid arguments, and allow it to include structurally correct arguments of the inductive and plausible types. Or we can just drop the word 'valid', and accept Hansen's way of expressing the criterion by saying that a fallacy is an argument that appears to be better argument of some kind than it really is. By using the expression 'of some kind', we can include argumentation schemes as well as deductive and inductive forms of argument. If we rephrase this expression to say that the fallacy is an argument that appears to be a better argument of its kind that really is, we can widen the account of fallacy to apply both to inductive arguments, and to presumptive argumentation schemes that go by defeasible reasoning to a conclusion that is tentatively acceptable but that that may need to be withdrawn in special circumstances.

7. Conclusions

How then are fallacies deceptive? The explanation offered as a hypothesis in this paper is that many of them are based on heuristics. On this hypothesis, a fallacious argument might look better than it really is because it has the basic structure of a parascheme, and therefore looks reasonable because it is a heuristic of the kind we use all the time in everyday reasoning. However, it may be an inference from a set of premises to a conclusion that only seems to prove the conclusion, but does not, because it fails to meet conditions required for the success of a reasonable argument of that type. When an arguer jumps to a conclusion by a parascheme, while ignoring implicit assumptions and exceptions that ought to be taken into account, or even worse, moves dogmatically to the conclusion while failing to allow that such considerations are rel-

evant, his argument is fallacious. The error here is an unwarranted leap to a conclusion that is not justified by a careful analysis of the argument that takes its conditional premise, as well as its assumptions and exceptions, properly into account.

This new theory of fallacy began by introducing the new notion of a parascheme, and by using it to connect the logical notion of an argumentation scheme to the psychological (cognitive science) notion of a heuristic. The parascheme helps to explain why an argument seems better than it is, because it represents a heuristic that is a very natural way of unreflective thinking. Heuristics can be extremely useful under some conditions even if they arrive at a suboptimal solution, and there may be nothing inherently fallacious or logically incorrect (in principle) in using them. We can cite again the example of the heuristic used in medicine (Gigerenzer, 1999, 4) when a man is rushed to a hospital while he is having a heart attack. We recall from Section 1 that according to Gigerenzer et al. (1999, 4-5), this particular medical heuristic is actually more accurate in properly classifying heart attack patients than some more complex statistical classification methods. The point to be emphasized is not only that heuristics are useful, but that we often need them and rely on them.

However, precisely because heuristics are shortcuts, or fast and frugal ways to proceed tentatively when there is not enough data and time to arrive at a definitive conclusion, they can be dangerous, and can sometimes take us to a wrong decision. As the cases we have examined show, in some instances they can even be deceptive. We are so used to employing them, almost without thinking, we can sometimes be more easily be persuaded by them than perhaps we should be, if there is time for more careful and deliberate rational thinking on how to proceed. The old system of cognition (the automatic and fast mind) uses a heuristic to jump to a conclusion. It might be right or might not. Under constraints of time, cost and lack of knowledge, it might be the way to go. But if there's time, the new (controlled, conscious and slow) system can come in and ask critical questions, looking at logical considera-

tions pro and contra. The old argument might stand up to this kind of scrutiny, or it might not.

The analysis presented so far offers an explanation of how the paraschemes can explain why people sometimes reason carelessly, and how the argumentation scheme corresponding to a particular parascheme can show us what has gone wrong with the hasty use of the parascheme when a fallacy has been committed. But how, more precisely, does this process work in a real case? Is it that the person who commits the fallacy has both the parascheme and the argumentation scheme in mind and then confuses the two, and reasons only on the basis of the parascheme? This explanation of the process implies that the reasoner explicitly knows the argumentation scheme with its matching list of critical questions, as well as implicitly knowing the parascheme. Such explicit knowledge may not be there, in many cases where fallacies are committed. The fallacy may be a thoughtless error of jumping too hastily to a conclusion. So this explanation of how fallacies are committed will not generalize to all of the cases we need to explain as fallacies that are arguments that appear to be better, as arguments of a certain type, than they really are.

A better explanation is based on the fact that the use of such paraschemes is habitual, instinctive and natural. As explained in Section 1, in evolutionary terms the parascheme is part of as a system of thinking that is associative, automatic, unconscious, parallel and fast. Thinking in this manner, a reasoner instinctively jumps to a conclusion to accept a proposition as true or to accept a course of action as the right one for the circumstances. To make the mistake that is at the basis of the fallacy that is committed, the reasoner naturally or even automatically jumps to this conclusion by reacting in the same way he has so often acted in the past where this rapid form of action has so often proved to be successful. To make this kind of mistake, the reasoner does not need to have the argumentation scheme in mind. This mistake is that in this instance he is in a set of circumstances where he would do much better if he would only take the time to think twice, and use the rule-based,

controlled, conscious, serial and slow cognitive system of bringing the premises and conclusion of the argumentation scheme to bear, while taking into account the appropriate critical questions matching the scheme. But he may not have time for this, or he may simply not think about it, or he may be pressured into not a fast and instinctive but premature action by the argumentation of the other party with whom he is engaged in a discussion. It is this explanation that fills out the meaning of how arguments appear to be better than they really are, and thereby lead to the committing of fallacies either by a single reasoner, or by an arguer engaged in a dialogue with another arguer.

In this paper, a new interpretation of the psychological aspect of the concept of fallacy has been proposed, put forward as a hypothesis that can enable us to explain how fallacies of the kinds based on argumentation schemes have potential for deception and ease of sliding into error. The defeasible argumentation scheme offers a structure such that, if a given argument fits the requirements of the scheme, it is defeasibly tenable, meaning that it tentatively holds, subject to potential defeat as new evidence comes in, and in particular as its implicit assumptions and exceptions are taken into account. In cases where such additional premises are not taken into account, especially where they are highly questionable, or evidence shows they do not hold, a fallacy may have been committed. The argument may appear to be better than it really is, and hence the error of jumping to the conclusion too quickly may be overlooked. Even worse, if the proponent has actively tried to suppress consideration of premises that really need to be taken into account in a more carefully considered assessment of the argument before the respondent should accept the conclusion, a more serious sort of fallacy may have been committed.

This paper has presented a hypothesis that shows promise of helping us to better define the notion of a fallacy, and to better explain its psychological dimension. It provides a theoretical basis for further research on many other fallacies, to see whether they fit the hypothesis or not. The notion of parascheme has been applied

more fully to fallacious arguments from expert opinion, and more cursorily to lack of evidence arguments and fear appeal arguments. However, enough has been done with these examples so that work can go ahead applying it more carefully to these latter two fallacies, as well as to the other fallacies in the list given at the beginning of Section 5.

References

Begley, S. (2009). Attack! The Truth about 'Obamacare', *Newsweek*, August 24 and 31, 41-43.

Eemeren, F.H. van and Grootendorst, R. (1992). *Argumentation, Communication and Fallacies*, Hillsdale, N. J.: Erlbaum.

Eemeren, F.H. van and Houtlosser, P. (2006). Strategic Maneuvering: A Synthetic Recapitulation, *Argumentation*, 20, 381-392.

Eemeren, F.H. van, Garssen, B. and Meuffels, B. (2009). *Fallacies and Judgments of Reasonableness*. Dordrecht: Springer.

Facione, P.A. and Facione, N.C. (2007). *Thinking and Reasoning in Human Decision-Making: The Method of Argument and Heuristic Analysis*. Millbrae, California: The California Academic Press.

Gigerenzer, G. Todd, P.M. and the ABC Research Group (1999). *Simple Heuristics That Make Us Smart*, Oxford: Oxford University Press.

Gordon, T.F. and Walton, D. (2006). The Carneades Argumentation Framework, *Computational Models of Argument: Proceedings of COMMA 2006*, ed. P. E. Dunne and T. J. M. Bench-Capon. Amsterdam: IOS Press, 195-207.

Gordon, T.F. and Walton, D. (2009). Legal Reasoning with Argumentation Schemes, *12th International Conference on Artificial*

Intelligence and Law (ICAIL 2009). ed. Carole D. Hafner. New York: ACM Press, 137-146.

Gordon, T.F. Prakken, H. and Walton, D. (2007). The Carneades Model of Argument and Burden of Proof, *Artificial Intelligence*, 171, 875-896.

Hamblin, C. (1970). *Fallacies*. London: Methuen.

Hansen, H.V. (2002). The Straw Thing of Fallacy Theory: The Standard Definition of Fallacy, *Argumentation*, 16, 133-155.

Nute, D. (1994). Defeasible Logic. In *Handbook of Logic in Artificial Intelligence and Logic Programming*, volume 3: Nonmonotonic Reasoning and Uncertain Reasoning. Ed. Dov M. Gabbay et al. Oxford: Oxford University Press, 353-395.

Pearl, J. (1984). *Heuristics: Intelligent Search Strategies for Computer Problem Solving*. Reading, Mass.: Addison-Wesley.

Russell, S. and Norvig, P. (1995). *Artificial Intelligence: A Modern Approach*. Upper Saddle River: Prentice Hall.

Tindale, C.W. (1997). Fallacies, Blunders and Dialogue Shifts: Walton's Contributions to the Fallacy Debate, *Argumentation*, 11, 341-354.

Tversky, A. and Kahneman, D. (1974). Judgment Under Uncertainty, *Science*, 185, 1124-1131.

Verheij, B. (1999). Logic, context and valid inference. Or: Can there be a logic of law?, *Legal Knowledge Based Systems. JURIX 1999: The Twelfth* Conference, ed. J. van den Herik, M. Moens, J. Bing, B. van Buggenhout, J. Zeleznikow and C. Grütters. Amsterdam: IOS Press.

Verheij, B. (2001). Book Review of D. Walton's The New Dialectic, Ad Hominem Arguments and One-Sided Arguments, *Artificial Intelligence and Law*, 9, 305-313.

Walton, D. (1995). *A Pragmatic Theory of Fallacy*. Tuscaloosa: University of Alabama Press.

Walton, D. (1996). *Arguments from Ignorance*. University Park, Pennsylvania: Penn State Press.

Walton, D. and Gordon, T.F. (2009). Jumping to a Conclusion: Fallacies and Standards of Proof, *Informal Logic*, 29, 215-243. Walton, D. and Reed, C. (2002). Argumentation Schemes and Defeasible Inferences, *Proceedings of the Workshop on Computational Models of Natural Argument* (CMNA), ed. Carenini, G., Grasso, F. and Reed, C., 1-5.

Walton, D. Reed, C. and Macagno, F. (2008). *Argumentation Schemes*, Cambridge: Cambridge University Press.

2009 Vol 29: Dialectical Shifts Underlying Arguments from Consequences

Douglas Walton

Abstract: Eight structural criteria are developed as part of a dialogical method by testing them against seven examples of arguments from negative consequences. The aim is to provide a method for evaluating the arguments in the examples as fallacious or not. It is shown that any method that can be satisfactorily used to evaluate such examples needs to be based on two techniques. The first is careful application of argumentation underlying shifts from one type of dialog to another schemes. The second is consideration of contextual factors concerning.

The task undertaken by this paper is to extend the dialog methodology of (Walton and Krabbe, 1995) to get help with attacking the problem of using the notion of a dialectical shift more effectively as a tool to help us to evaluate problematic cases of arguments from negative consequences, especially those associated with certain informal fallacies. Argument from negative consequences has a distinctive argumentation scheme, and so does argument from threat, a subspecies of argument from negative consequences famously associated with the *ad baculum* fallacy. But based on seven key examples, it is shown how the schemes for these two types of argumentation are insufficient as tools to enable us to fairly judge, in any given case, whether such an argument is fallacious or not. The schemes required to analyze the examples are presented in section 1. The examples are used to show that argument from negative consequences, including argument from threat, are sometimes quite reasonable, but that, in some instances, both

can be used as deceptive sophistical strategies.[1] The problems are (a) to put in place normative structures that can be used to analyze and evaluate these arguments, and (b) to use this methodology as a basis for determining whether a given instance is fallacious or not. It is shown that this procedure needs to be carried out at two levels. At an inferential level, it requires employment of argumentation schemes, but also at a dialectical level it needs to take dialectical shifts into account (transitions as a chain of argumentation moves from one conversational context to another).

It is shown that once these tricky types of argument are clearly defined using argumentation schemes that exhibit the forms of reasoning on which each is based, each individual instance can be analyzed and evaluated using a retrospective model that takes dialectical shifts into account. A retrospective analysis is then applied, using formal dialectical models of rational argumentation (Wells and Reed, 2006) that have rules that specify when a progression over a dialectical shift is legal or not. This task is taken to be dialectical, or logical in nature, but it does suggest another problem that is rhetorical in nature. This other problem is that of explaining why these arguments are often so persuasive even when they are fallacious. Why is it that they are so rhetorically powerful in everyday conversational argumentation, and commonly effective as widely exploited rhetorical techniques of persuasion used in media argumentation? No direct attempt is made to solve this rhetorical problem, but at the end of the paper some dialectical resources for approaching it are suggested.

1. Argumentation schemes

The argumentation scheme for argument from consequences represents a very common form of argumentation. In argument from positive consequences, a particular policy or course of action is

1. The thesis that fear and threat appeal arguments are often reasonable, but are fallacious in some instances of their use, has been supported through the analysis of both kinds of argument in (Walton, 2000).

recommended by citing positive consequences of carrying it out. Argument from negative consequences cites negative consequences of carrying the policy out, and uses that as a reason to argue against carrying it out. Such arguments are quite often reasonable. For example, your physician might recommend against your nutritional habits by arguing, "Eating too much salt has the consequence of raising blood pressure; raising blood pressure is a bad consequence for you; therefore you should not eat too much salt." Argument from consequences is also often used in ethical and political deliberations on what course of action to take, given a choice. Aristotle clearly recognized how this form of argument can be used by both sides in a disputation in *Rhetorica* (1399a14 – 1399a15).[2]

> . . .since in most human affairs the same thing is accompanied by some bad or good result, another topic consists in employing the consequences to exhort or dissuade, accuse or defend, praise or blame. For instance, education is attended by the evil of being envied, and by the good of being wise; therefore we should not be educated, for we should avoid being envied; nay, rather, we *should* be educated, for we should be wise.

A topic is a defeasible form of argument of a kind that is nowadays called an argumentation scheme. It is not hard to appreciate how common argumentation from consequences is, and how it is often used as a reasonable form of argumentation. Still, an inherently reasonable form of argument can sometimes be used as a sophistical tactic to try to get the best of an opponent unfairly in disputation.

Two argumentation schemes representing the two forms of argumentation from consequences have been put forward in (Walton, 1996, p. 75). The scheme for argument from positive consequences takes the following form.

2. The quotation is from the Loeb Classical Library Edition (311).

Argumentation Scheme for Argument from Positive Consequences

PREMISE: If *A* is brought about, good consequences will plausibly occur.
CONCLUSION: *A* should be brought about.

The scheme for argument from negative consequences takes the following form.

Argumentation Scheme for Argument from Negative Consequences

PREMISE: If *A* is brought about, bad consequences will plausibly occur.
CONCLUSION: *A* should not be brought about.

According to (Walton, 1996, pp. 76-77), three critical questions match the scheme.

CQ1. How strong is the probability or plausibility that these cited consequences will (may, might, must) occur?
CQ2. What evidence, if any, supported the claim that these consequences will (may, might, must) occur if *A* is brought about?
CQ3. Are there consequences of the opposite value that ought to be taken into account?

The argument has a presumptive status, once the positive or negative consequences are cited as reasons to support the proposed course of action. But the argument is cast into doubt if there is a failure to answer any of these critical questions adequately, once they have been asked. So conceived, argument from consequences can be strong in some cases, weak in others. It can be weak if it fails to answer appropriate critical questions that have been or might be asked in a dialogue.

Argument from consequences is closely related to another argumentation scheme called practical reasoning.

Scheme for Practical Reasoning

MAJOR PREMISE: I have a goal *G*.
MINOR PREMISE: Carrying out this action *A* is a means to realize *G*.
CONCLUSION: Therefore, I ought (practically speaking) to carry out this actions *A*.

Critical Questions

CQ_1:What other goals do I have that should be considered that might conflict with *G*?
CQ_2:What alternative actions to my bringing about *A* that would also bring about *G* should be considered?
CQ_3:Among bringing about *A* and these alternative actions, which is arguably the most efficient?
CQ_4:What grounds are there for arguing that it is practically possible for me to bring about *A*?
CQ_5:What consequences of my bringing about *A* should also be taken into account?

It can be seen from the last critical question how argument from consequences is related to practical reasoning. There is also another argumentation scheme that is closely related to argument from consequences.

Schemes for Arguments from Values Variant 1: Argument from Positive Value

PREMISE 1: Value *V* is *positive* as judged by agent *A* (judgment value).
PREMISE 2: The fact that value *V* is *positive* affects the interpretation and therefore the evaluation of goal *G* of agent *A* (If value *V* is *good*, it supports commitment to goal *G*).
CONCLUSION:*V* is a reason for retaining commitment to goal *G*.

Variant 2: Argument from Negative Value.

PREMISE 1:Value *V* is *negative* as judged by agent *A* (judgment value).
PREMISE 2: The fact that value *V* is *negative* affects the interpretation and therefore the evaluation of goal *G* of agent *A* (If value *V* is *bad*, it goes against commitment to goal *G*).
CONCLUSION: *V* is a reason for retracting commitment to goal *G*.

How value-based argumentation works in persuasion dialogue and relates to practical reasoning is well explained by (Bench-Capon, 2003) and (Atkinson, Bench-Capon and McBurney, 2006). Argument from values is combined with practical reasoning in the type of argumentation called value-based practical reasoning (Bench-Capon, 2003; Atkinson, Bench-Capon and McBurney, 2006). A scheme for value-based practical reasoning combining these elements is formulated below (Walton, Reed and Macagno, 2008, chapter 9).

Scheme for Value-based Practical Reasoning

PREMISE 1: I have a goal *G*.
PREMISE 2: *G* is supported by my set of values, *V*.
PREMISE 3: Bringing about *A* is a means for me to bring about *G*.
CONCLUSION:Therefore, I should (practically ought to) bring about *A*.

Thus it can be seen that there is a cluster of argumentation schemes combining practical reasoning with argument from consequences and argument from values. Precisely how the schemes are related to each other, and how they should be classified as forming an organized cluster of schemes, are problems for future research.

There is also another group of argumentation schemes that forms part of this cluster. These schemes have to do with the making of

a threat within an argument from consequences, and form part of the structure of the kind of argumentation traditionally classified under the heading of *argumentum ad baculum* in logic. The essential condition that differentiates the threat type of *ad baculum* argument from a regular argument from consequences that is not an *ad baculum* argument requires that a special premise must be present. This premise is the making of a threat by the proponent. In the speech act of making a threat, the speaker declares the intention of carrying out a designated action not wanted by the hearer, unless the hearer carries out another designated action (Nicoloff, 1989; Guerini and Castelfranchi, 2006). Following this view, making a threat can be defined as a speech act (type of move) in a dialog exchange. This speech act that takes the following form: I (the proponent) am making a commitment to see to it that the negative consequences for you (the respondent) come about, unless you bring about the action I request. This expression of commitment by the proponent is an essential characteristic of the appeal to threat type of *ad baculum* argument. If the proponent only makes a warning to the respondent in a case, but not a threat, the argument should be classified under the category of argument from negative consequences, but not under the category of the threat appeal subtype. For the speech act to really be the making of a threat, the proponent must convey his commitment to seeing to it that the negative consequences occur.

Accordingly, argument from threat has the following argumentation scheme (Walton, Reed and Macagno, 2008, 333), where *A* and *B* represent outcomes that can be brought about by an agent.

Scheme for Argument from Threat

PREMISE 1: If you bring about *A*, some cited bad consequences, *B*, will follow.
PREMISE 2: I am in position to bring about *B*.
PREMISE 3: I hereby assert that in fact I will see to it that *B* occurs if you bring about *A*.
CONCLUSION:Therefore you had better not bring about *A*.

It is clear from the discussion above that argument from threat should be classified as a subspecies of argument from negative consequences. It should also be clear that although such an argument should be seen as defeasible and subject to critical questioning, it is not generally fallacious, but only fallacious in certain instances under certain conditions. One such condition is where there has been a dialectical shift of a certain sort from one context of dialog to another.

2. Dialectical shifts

In the dialog typology of Walton and Krabbe (1995), there are six primary types of dialog: information-seeking dialog, inquiry dialog, persuasion dialog, negotiation dialog, deliberation dialog and eristic dialog. These dialogs are technical artifacts called normative models, meaning that they do not necessarily correspond exactly to real instances of persuasion or negotiation, etc. that may occur in a real conversational exchange. Each model of dialog is defined by its initial situation, the participants' individual goals, and the collective goal of the dialog as a whole.

Dialectical shifts were analyzed in (Walton and Krabbe, 1995, pp. 100- 116). In a common kind of example, there is a shift from deliberation dialogue to an information-seeking type of dialogue. For example suppose there is a debate in a legislative assembly on whether to pass a bill to install a new dam. Before those in the assembly will vote on this question, they will want to find out many facts about how the dam will be constructed, what its ecological consequences will be, and what it will cost to install it. In order to examine these questions they will call in experts, like experts in engineering and ecology, and they might also interview accountants who have calculated the cost of the dam, and persons whose property might be affected by the dam. When this happens there has been a shift from a deliberation dialog on whether it would be a good idea to install such a dam to an information-seeking dialog about matters like what the consequences of installing the dam

would be and what its costs would be. In this kind of case the dialectical shift is classified as an embedding (Walton and Krabbe, 1995, 102), meaning that the goal of the first dialogue, the deliberation, is supported by the advent of the second dialog, the information-seeking interval.

However, some dialectical shifts are classified as illicit, meaning that the advent of the second dialogue blocks or interferes with the progress of the first (Walton and Krabbe, 1995, p. 107). To make this analysis precise, two theoretical tasks have to be carried out. First, we need to have a model of deliberation as a type of dialog, so that it can be distinguished form other types of dialog, like persuasion dialog and negotiation. Second, we need to use these models of dialog to get more precise idea of when such shifts occur to help us judge whether they are licit or illicit.

How a dialectical shift works in the case of a threat appeal argument can sometimes be explained in the common kind of case in which there is a shift from a critical discussion to a negotiation type of dialog. The making of a threat to influence the other side is in many cases a reasonable kind of argument strategy in negotiation. Threats are risky in negotiation, and can sometimes be inappropriate, but generally they are regarded as a reasonable sort of argumentation in negotiation. For example in union management negotiations, threats of various kinds are commonly made by both sides, and are part of the central fabric of the argumentation used in such cases. However, threats are irrelevant and obstructive in a critical discussion. If an argument starts out to be a critical discussion, but then shifts to a negotiation dialogue, the *ad baculum* argument used during the sequence of argumentation could be fallacious.

Wells and Reed (2006) constructed two formal dialectical systems to model dialectical shifts from persuasion dialog to negotiation dialog based on specifying a unified architecture for argumentation. When two participants are engaged in a persuasion dialog, and they want to shift to a new sub-dialog, they must make a

request for the shift to be legal (licit), and several requirements need to be met. When these requirements are met by a shift initiated by one party, the other party has the option of continuing in the current dialogue or agreeing to carry over into the shift. Wells and Reed have designed rules for both the persuasion dialog and the negotiation dialog specifying termination rules for both. Their rules are designed to allow for a clean progression, as they call it, from one type of dialog to another. For example, one party could take advantage of the opportunity to shift to a negotiation dialog by making the appropriate move, but the respondent could make a counteroffer. Such metadialog negotiations can help the two parties reach agreement, because even though they have run out of arguments in the persuasion dialogue, still they might reach agreement on how to proceed further by making a shift. There seems to be no reason why their analysis cannot be extended to other kinds of shifts, like the shift from a persuasion dialog to a deliberation dialog. However, we need to have a clear account of the characteristics of both types of dialog.

In a persuasion dialog, one participant puts forward a thesis to be proved, and the other puts forward an opposed thesis, or else expresses doubt about the first party's thesis. As in all types of dialog, there are three main stages, the opening stage, the argumentation stage and closing stage. The purpose of a persuasion dialog is to resolve this initial conflict of the opening stage by putting forward arguments on both sides at the argumentation stage (Prakken, 2006). The overarching principle of burden of proof, called the burden of persuasion, the requirement that he who asserts must prove, is set at the opening stage. Meeting the burden of persuasion is determined by three factors: (1) what strength of argument is needed to win the dialog for a participant at the closing stage (standard of proof), (2) which side bears the so-called burden for producing such an argument, and (3) what kind of argument is required for this purpose. 'Winning' means producing an argument that is stronger enough than the opponent's argument to lift the burden of persuasion set at the opening stage. In contrast to the burden of persuasion that applies over the whole dialog from open-

ing to closing, there is also the evidential burden (called the burden of production in law) that applies during the argumentation stage when a particular claim is made or a particular argument is put forward. Both burden of persuasion and evidential burden are burdens of proof.

In the formal model of deliberation dialog presented by McBurney, Hitchcock and Parsons (2007, 100), a deliberation dialog consists of an opening stage, a closing stage, and six other stages making up the argumentation stage.

> **Open:** In this stage a governing question is raised about what is to be done. A governing question, like 'Where shall we go for dinner this evening?', is a question that expresses a need for action in a given set of circumstances.
> **Inform:** This stage includes discussion of desirable goals, constraints on possible actions that may be considered, evaluation of proposals, and consideration of relevant facts.
> **Propose:** Proposals cite possible action-options relevant to the governing question
> **Consider:** this stage concerns commenting on proposals from various perspectives.
> **Revise:** goals, constraints, perspectives, and action-options can be revised in light of comments presented and information gathering as well as fact- checking.
> **Recommend:** an option for action can be recommended for acceptance or non- acceptance by each participant.
> **Confirm:** to participant can confirm acceptance of the recommended option, and all participants must do so before the dialog terminates.
> **Close:** The termination of the dialog.

An important property of deliberation dialog is that an action-option that is optimal for the group considered as a whole may not be optimal from the perspective of an individual participant (McBurney, Hitchcock and Parsons, 2007, 98). In a deliberation dialog, a participant must be willing to share both his/her prefer-

ences and also information with the other participants. The initial situation of deliberation is the need for action arising out of a choice between two or more alternative courses of action that are possible in a given situation. The ultimate goal of deliberation dialog is for the participants to collectively decide on what is the best available course of action for them to take.

Both deliberation and persuasion dialogs can be about actions, and therefore we have to try to draw a bright line more carefully between these two types of dialog. Deliberation is not centrally an attempt by one participant to persuade another to become committed to a particular proposal, although it is quite common for there to be a shift to persuasion dialog as reasons for or against a proposed action are supported were criticized. There appears to be no burden of proof in a deliberation dialog, comparable to the central notion of burden of proof in persuasion dialog, but this matter has so far not been studied. Argumentation in deliberation is primarily a matter of supporting one's own proposal with reasons to accept it, and critiquing the other party's proposal. Also, one's proposal may need to be abandoned if the reasons given against it are strong enough to show that the opposed proposal is better to solve the problem posed at the opening stage. Deliberation dialog is different from negotiation dialog, which deals with competing interests, because the participants evaluate proposed courses of action according to standards that may be contrary to their personal interests.

3. Problematic examples of arguments from negative consequences

Argument from consequences (*argumentum ad consequentiam*) has been cited as a fallacy in some modern logic textbooks. Rescher (1964, p. 82) warned that "logically speaking", it can be "entirely irrelevant that certain undesirable consequences might derive from the rejection of a thesis, or certain benefits accrue from its acceptance". He (1964, p. 82) cited the following exam-

ple, which could be called the classic case, because it illustrates the error very well to logic students.

The Mexican War Example

> The United States had justice on its side in waging the Mexican war of 1848. To question this is unpatriotic, and would give comfort to our enemies by promoting the cause of defeatism.

In this instance, argument from consequences is classified as a fallacy on the ground that is not relevant to the issue supposedly being discussed. The issue was supposedly the historical/ethical conflict of opinions on which side was in the right in the Mexican war of 1848. It seems that there has been a shift to a different issue when one side argues from negative consequences by saying that questioning that the U.S. was in the right would promote defeatism.

The Mexican-American War, called the Mexican War in the United States and the United States Invasion in Mexico, was an armed military conflict between the United States and Mexico from 1846 to 1848. The war arose because Mexico did not recognize the secession of Texas when the U.S. annexed Texas in 1845. The Mexican government permitted a few hundred American families to settle the area, and English speaking settlers formed a majority in Texas. Texans became unhappy with the Mexican government, and this situation led to the conflict.

The Mexican war argument would seem to be an example of a dialectical shift that should be classified as illicit, given the judgment that the prudential deliberation about whether questioning whether the U.S. had justice on its side would give comfort to our enemies is not relevant to resolving the issue of which side had justice on its side in the Mexican war. Rescher (1964, 82) classified this case as an instance of a fallacy of relevance. On this evaluation of the fallacy of relevance, the shift to this prudential issue is merely a distraction that interferes with the progress of the original

critical discussion by distracting the audience away by introducing another issue that may be more pressing, but is not useful to resolve the original dispute. It may indeed have been true that saying so would have bad consequences for the national interest. Still, this assertion is not relevant to the issue of which side was in the right.

However, to show exactly why not is tricky. We have to have some criterion of relevance, and we have to show precisely why the argument in this case violated that criterion.

Argument from consequences is closely associated with other types of arguments traditionally recognized as informal fallacies.

The Riots Example

> If the defendant is acquitted, there will be riots. Therefore, he should be found guilty.

It may be true that there will be riots if the defendant is acquitted, but if there is to be fair trial, it should not follow that the defendant should be found guilty. In this case it is easy to recognize the fallacy right away, because of what we know about fair trials. The consequence of riots is not evidence of the kind required in a fair trial. Spelling out exactly which requirement of a fair trial (notions of relevance, admissibility and evidence) is involved, would not be a trivial job, however, for an argumentation theorist.

Another example does not seem fallacious at all when you first look at it.

The Drinking Example

> You should stop drinking unless you want to die young like your father.

This example seems reasonable enough as a piece of advice, but it depends on the circumstances. The parallel between the case of the

respondent and his father may be open to challenge. As an argument from negative consequences it might be reasonable or not. It doesn't seem to be fallacious, perhaps just weak or questionable.

In short, there are problems in evaluating all three examples to judge whether they are reasonable or fallacious. A specific problem with the first two examples is that there seems to be an underling shift from an issue about whether a proposition is true or false, based on the evidence, to a prudential issue about actions. In the drinking example, the issue seems to be prudential, from all we can judge, and so there seems not to be such a shift. Note that the riots example in particular, but perhaps the other two examples well in lesser degree, may invoke the traditional fallacy category of *argumentum ad baculum*, since it may suggest something threatening to the respondent. Certainly it may act as a fear appeal.

Other kinds of arguments associated with fallacies, like the slippery slope argument, are sometimes based on argumentation from negative consequences. Many of the examples of the fallacious *argumentum ad baculum* found in logic textbooks involve the use of a threat of negative consequences. The logic textbooks tend to define *argumentum ad baculum* as the use of force or a threat by one party in a dispute, to try to get the other party to accept an argument he is advocating (Walton, 2000, chapter 2). Many accounts, however, have a more inclusive treatment that includes arguments that appeal to fear, even if no threat is made. In this paper, we are not directly concerned with use of force (say, by taping your opponent's mouth shut) or with fear appeals. The type of *ad baculum* argument we are concerned with concerns the use of a threat. The scheme for this form of argument is that of argument from negative consequences, along with the additional premise that the speaker makes a threat to the hearer. When the proponent makes a threat in this type of argument, she is not only telling the respondent that the bad state of affairs *B* will or may happen, unless he brings about *A.* This premise adds a personal factor to the effect that the proponent is declaring that she will bring about

the event *B*, unless the respondent takes the proposed action with respect to *A*. The fear appeal argument is not based on a threat.

It is known that whether *ad baculum* arguments are fallacious depends on the context of the dialog in the case at issue (Walton, 2000). In negotiation dialog, threats are accepted (within limits) as normal argumentation strategies, whereas in a critical discussion, threats are not relevant. In a critical discussion, participants are not supposed to prevent the other party from advocating his viewpoint or critically questioning the other's viewpoint (van Eemeren and Grootendorst, 2004, 190). The making of a threat as an argument could go against this rule of a critical discussion. The making of a threat could also be irrelevant by violating the relevance rule of a critical discussion (192).

The Free Will Example

A professor and a student are discussing the issue of free will versus determinism in a philosophy seminar, and the professor says, "You had better stop advocating that argument against free will or I'll give you a failing grade in this course!"

It would be evident to the participants in the class that this argument is inappropriate. The shift from the critical discussion to some sort of prudential act of warning or threat is a clear indicator that the professor has committed an *ad baculum* fallacy. It is an argument from negative consequences, and prudentially, it may be wise for the student to act in accord with it, but it is not relevant to the discussion supposedly taking place.

Ad baculum arguments that are based on the use of a threat often take the form of an indirect speech act. The following example is a classic case.

The Firebombing Example

The last person who didn't buy protection from our association was the victim of an unfortunate accident. Therefore, it would be prudent

> for you to buy our protection insurance in order to prevent such unfortunate consequences of not having it.

This example looks on the surface like a warning, as in the drinking example. The indirect threat allows for plausible deniability for the proponent of the threat. Later the "insurance salesman" can say it was just a warning, even if, at the time, respondent, at the time the threat was made, would recognize it as a threat.[3] The indirect threat involves the use of a strategy of deception.

Consider another example made up to represent a common type of case.

The Jury Intimidation Example

> In a case of jury intimidation, a jury member realizes quite well that a motorcycle gang's threat to kill him is irrelevant as legal evidence that should be considered in the trial. But he asks to be taken off the jury because he fears for his life.

In this example, the threat used to intimidate the jury member is direct rather than indirect, assuming there was no attempt to disguise it as a warning. Still, it is credible and effective because of who has made it, and because of the respondent's normal commitment to his own interests and safety. The logic texts would probably classify the argumentation in the example as fitting under the heading of the *argumentum ad baculum*, and as such, it would no doubt be taken to commit the *ad baculum* fallacy. It is similar to the riots example in certain respects, but also introduces some new factors that will be considered in section 5.

In his book, *The Enemy at Home*, right-leaning author Dinesh D'Sousa employed a novel and interesting argument against left-leaning politicians, celebrities and activists to blame recent ter-

3. Many examples of indirect threat arguments of this sort are studied in (Walton, 2000).

rorist attacks by Islamic fundamentalists. The description of the argument presented in the example is a very brief summary.[4]

The Domestic Insurgency Example

> D'Sousa denounced America as having sunk into decadent moral values, he argued that religious fundamentalists, with some justification, judged America as the worst civilization for decadent values. Examples of decadent actions he cited include widespread use of intoxicants, gambling, and fornication. He argued that the attempts to promote gender equality in the developing world can be seen as promoting values considered disgusting and deviant by traditional cultures. He named more that a hundred left-leaning politicians, celebrities and activists whose actions, he argued, were responsible for the causing the hatred of the terrorists because of their attempts to promote these decadent moral values and impose them on the rest of the world. He did not accusing them of being terrorists themselves, or of even of actively working to promote the interests, of the terrorists. However, he argued that because of the consequences of their actions, they were taking part in a "domestic insurgency" that was, in effect, "working in tandem" with Osama bin Laden to defeat George W. Bush.

This example of the use of argument from negative consequences is highly controversial, and no doubt many of those attacked by it are antagonized by it. D'Sousa cited many activities to promote their "decadent" views by activists, intellectuals and celebrities that, he alleged, had negative consequences for America. Can we conclude that the argument in the domestic insurgency example is a fallacious instance of argumentation from negative consequences? We return to a discussion of this question in section 5.

4. A review of the book presents a summary on which some details of the example are based: Jerry Adler, 'America's Most Wanted' (review of The Enemy at Home) Newsweek, Feb. 5, 2007, p. 46.

4. Analysis of the Mexican War example

We now return to a discussion of each of the examples in turn, beginning with the Mexican war example. In each case should begin by trying to see which argumentation scheme fits the argument in the example. In order to do this, we have to analyze the argument in the example and identify its premises and conclusion. An analysis of the structure of the Mexican war argument is shown in Figure 1.

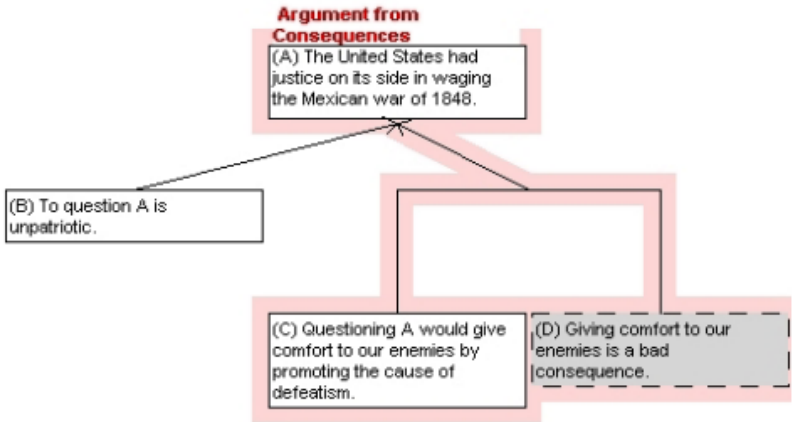


Figure 1: First Argument Diagram of the Mexican War Example

In the diagram in Figure 1, the missing premise D has been inserted. It is shown in a darkened box, indicating that it has been added as an implicit premise. The argumentation scheme (argument from consequences) that links premises C and D to conclusion A has been represented on the diagram.[5]

What is tricky about the argument can be approached by looking at Figure 1. Figure 1 represents the routine way that the argument in the Mexican war example should be represented by an argument diagram. But when the argument is represented in this way, it

5. In this instance it is argument from negative consequences.

seems blatantly wrong, because the arguments composed of B and C&D do not support the truth of the conclusion A. But what has gone wrong? What these two arguments do support is another conclusion A+: 'You (the respondent) should not question (in public) the proposition that the United States had justice on its side in waging the Mexican war of 1848'. This way of analyzing the argument is represented in the argument diagram in Figure 2.

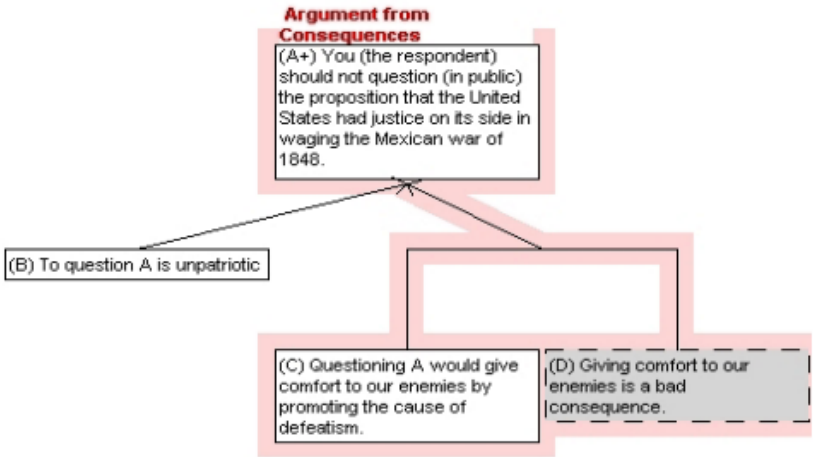


Figure 2: Second Argument Diagram of the Mexican War Example

Looking at the argument as shown in Figure 2, it seems reasonable. The two arguments can correctly be seen as offering reasons to support the conclusion (A+).

Comparing the two argument diagrams, we begin to get some inkling of what has gone wrong. The argument could be classified as an instance of the fallacy of arguing to the wrong conclusion. The fallacy can be diagnosed using this triad.

> **Remark 1:** B and C&D do not give reasons to support acceptance of conclusion A.
> **Remark 2:** B and C&D do give reasons to support acceptance of conclusion A+.
> **Remark 3:** It is easy to confuse A with A+.

> Remark 3 is a plausible statement because the difference between A and A+ is subtle. It is the difference between saying that some statement is true (or not), as supported by evidence, and saying that saying this statement is true (or not) is commendable (or not). A is a statement about something, while A+ is a statement about talking about A.

What could be called the fallacy of arguing to the wrong conclusion is an argument fitting the following pattern (Walton, 2004, 35): the arguer is supposed to prove conclusion A, but he puts forward an argument for conclusion A+, a proposition that looks like (or appears to be the same as) A. Aristotle seemed to have something like this fallacy in mind when he made the following remark about what he called the fallacy of misconception of refutation: "When the argument stated is a demonstration [*apodeixis*] of something, if it's something other than that leading to the conclusion, it will not be a syllogism about that thing."(*Topica* 162a13-162a16; quoted from the translation in Walton, 2004, 35). Seen in this way, the fallacy in the Mexican war example can be diagnosed as a failure of relevance of a specific kind, namely the fallacy of arguing for the wrong conclusion. But why would anyone be fooled by such an error of arguing for the wrong conclusion? More must be involved than the simple error revealed by the juxtaposition of the inferential structures shown in Figures 1 and 2.

What gives the fallacious argument its aura of plausibility is the melding together of the reasonable argument from consequences shown in Figure 2 with the patently unreasonable argument shown in Figure 1. What could lead a respondent to blend these arguments together and take them to be the same? Why is the argument so highly deceptive because of this concealed blending? How could we train students of critical thinking to recognize such a deception that conceals the shift from the one argument to the other one? How do such arguments have such a powerful persuasive effect as rhetorical strategies of strategic maneuvering (van Eemeren and Houtlosser, 2000)? It will now be argued, by proceeding to a sec-

ond level of analysis, that the reason for this deceptiveness is a failure of relevance concealed by an implicit contextual shift.

As noted, Rescher (1964, 82) categorized the fallacy as a failure of relevance. This diagnosis calls into question why the argument should be considered not relevant. This suggests examining the context of dialog in which the argument was used. This argument could be relevant if the dialog were that of a deliberation on how to act in a given situation. We see from the wording of the case that "enemies" are involved, so let us imagine that the situation is one in which there is some current conflict or war. In this scenario, giving comfort to enemies would be a negative consequence, and might even lead to loss of life for the soldiers on our side. This wording suggests a deliberation on how to act prudently. But suppose on the other hand the context of dialog is that of a persuasion dialog, of the kind one might have in a history class or an ethical discussion about which side was in the right in the Mexican war. Here the very same argument could be judged to be irrelevant, because the original discussion was supposed to be about the ethical/historical issue of which side "had justice on its side" in waging the war. Relevant arguments in such a persuasion dialog would be historical facts like who started the conflict, what were the territorial claims of each side, and so forth. Only these kinds of argument can fulfill the original burden of persuasion.

In order to back up the claim that the argument in the example commits a fallacy of irrelevance because the discussion was not originally supposed to be a deliberation dialog, it can be hypothesized there has been a shift from one type of dialog to another inherent in the argumentation in the example. The original dialog was supposedly, from all we can tell from the information given in the example, a persuasion dialog on which side had justice on its side in waging the Mexican war of 1848. The goal of such a discussion is to resolve this conflict of opinions by examining the rational arguments on both sides. However, there was a kind of shift made when the premises were brought forward that to question whether the United States had justice on its side is unpatriotic,

and that doing so would give comfort to our enemies by promoting the cause of defeatism. What needs to be carefully observed is that these two statements may very well be true, and the analysis in the argument diagram in Figure 2 could be judged to be a reasonable argument. It is based on an argumentation scheme that has true premises. In this format, the argument would reasonably provide a prudential argument against questioning whether the United States had justice on its side by citing negative consequences of such questioning, namely that it would give comfort to our enemies by promoting the cause of defeatism. This prudential argument only becomes irrelevant and fallacious when expressed in its original form in Figure 1. Thus there are two levels of analysis that need to be considered together –an inferential level and a dialectical one.

This bi-level analysis depends on how the notion of relevance is defined, but it has been argued (Walton, 2004) that an argument should be judged to be relevant in a case only if it is part of a connected sequence of argumentation used in a dialog leading to an ultimate *probandum* to be proved in that case. In a particular case, whether an argument is judged to be relevant or not depends on how far the sequence has gone forward at the stage where it was put forward. Such matters need to be judged by examining the text of discourse in the given case being analyzed, and asking what the purpose of the discourse is supposed to be. Some cases can be difficult to decide, because the argument simply is not finished yet, or even if it is finished, because there are a lot of gaps and missing premises, and it may not even be clear what type of dialog the participants are supposedly engaged in. however in the case is being considered here, the key indicator of irrelevance is that of the dialectical shift.

The issue of the case was whether the United States had justice on its side in waging the Mexican war of 1848. Presumably the type of dialog here was some sort of persuasion dialog on which country had justice on its side in that war. This issue is a historical question, or perhaps an ethical question, of a kind commonly dis-

puted by historians, or by anyone interested in this kind of issue. The arguer goes on to claim that questioning the initial claim is unpatriotic, and would give comfort to our enemies. This argument from negative consequences seems like a reasonable one if considered as part of a deliberation dialog. Perhaps raising this question might indeed give comfort to our enemies, as the claim states. But the question is whether this claim is relevant to the original issue being discussed. Using the second (dialectical) level of analysis it can be argued that it is not, because there has been a dialectical shift to prudential questions concerning the consequences of discussing the original issue of whether the United States had justice on its side in the Mexican war. This kind of case is quite common one, and all comparable examples presumably share this bi-level underlying structure. For example comparable arguments commonly occur in cases of freedom of speech.

5. Discussion of the other examples

The riots example is interesting because there is clear evidence of a dialectical shift. The issue in the case is supposed to be that of whether the defendant should be acquitted of the crime he was charged with. This is an issue to be decided by a trial in which evidence for and against the charge is considered and evaluated by a judge or jury. Acquitting the defendant for the practical reason that there will be riots in the streets, while being in principle a reasonable argument from negative consequences, is not relevant to the conclusion that the defendant should be found guilty as the outcome of the trial. This argument is a clear instance of an inappropriate use of public pressure, in the form of argument from negative consequences, brought to bear on a trial in the judicial system. When the argument is shown in this light, it is quite clear that there has been a dialectical shift from a persuasion type of dialogue to a prudential argument about matters of public safety, or damage caused by riots. This argument is very similar to the Mexican war argument, and is fallacious for much the same reasons.

The drinking example is also interesting because, at least on the surface, it seems to be a highly reasonable argument directed to the respondent to support the conclusion that he should stop drinking. The reason given is that continuing this action may make him die young, like his father. However, we can critically question premises and implicit assumptions in the argument. Did his father really die young, and if so was it because of his drinking? How similar is the case of the father to that of the son? Maybe there was some difference, for example, in how each individual reacted to alcohol, or in how much alcohol each one was drinking. But failure to substantiate a premise of an argument, whether explicit or implicit, should not be sufficient reason to judge it fallacious. Here we have a prudential argument that does present a reason for the conclusion, based on alleged negative consequences. It is not a fallacious argument from consequences.

In the free will example, even though the dialectical shift is implicit, the illegitimate nature of the move in argumentation is obvious to everybody. It is seen as shockingly inappropriate. It meets the general requirements for the speech act of making a threat as a move in dialog (Walton, 2000). The proponent of the threat warns the respondent that something that negative consequences may happen to him. The proponent also indicates to the respondent that she (the proponent) will see to it that these negative consequences come about, unless the respondent complies by carrying out (or omitting to carry out) some designated action. In the analysis of (Walton, 2000, 113-114), there are three essential conditions for the speech act of making a threat.

- The preparatory condition states that the respondent believes that the proponent can bring about the negative consequences.
- The sincerity condition states that both the proponent and the respondent presume that the respondent wants to avoid the negative consequences.
- The essential condition states that the proponent is mak-

> ing a commitment to bring about the negative consequences if the respondent does not comply.

In the free will example, the threat is an explicit one, and it is clear to everyone that it is inappropriate in relation to the critical discussion that the professor and student are supposed to be engaging in. In contrast, in the firebombing example, the "insurance salesman" is making an indirect threat. An indirect threat is meant to be recognizable to the respondent as a threat, but is also an implicit speech act that leaves room open for plausible deniability.

An interesting aspect of the free will example is its contextual sensitivity. Changes to the circumstances of the example could make what was formerly an outrageously irrelevant argument into a perfectly good argument. Consider the following two modifications of the original circumstances of this example.[6] First, suppose that the student's argument was based on racist or other pernicious views. In this kind of case the position adopted by the student is itself unacceptable, and therefore the professor could be justified in telling the student that if he continues to maintain this unacceptable view, he will fail the course. Second, suppose the position advocated by the student showed a misunderstanding of the material in the course. For example, suppose the student had put forward an argument that had already been rejected in the course as untenable because it had been shown to be based on a false assumption, like 2 + 2 = 5. Similarly, in this kind of case the professor could be justified in telling the student that he will fail the course if he continues to maintain this unacceptable view. The interesting aspect brought out by consideration of these two kinds of examples is that this threat argument that was previously fallacious now has become a non-fallacious argument. It shows that an argument that is clearly a fallacious instance of argumentation from negative

6. These two modifications of the free will example, and their implications, were expressed in comments made by Trevor Bench-Capon on February 13, 2008, during a talk at the University of Groningen.

consequences can be turned into a reasonable argument provided only that the circumstances of the case are slightly different.

Another interesting aspect of the free will example is that there appears to be a shift to a different level of dialog when the professor puts forward his counterargument to the student. The student began, in the discussion of the issue of free will versus determinism, by putting forward an argument for determinism. The professor, at his next move, does not put forward an opposing argument for free will, nor does he criticize the student's argument for determinism, at least directly. Instead, he makes a remark about the students advocating the argument for determinism, by giving a reason why the student should stop advocating that argument. This move by the professor can be seen as a dialectical shift to a meta-dialog. If the original persuasion dialog about the free will issue can be called a ground level dialogue, then a meta-dialog could be defined as a dialog about that original dialog (Krabbe, 2003, p. 83). In this instance, when the professor puts forward his argument telling the student that he had better stop advocating determinism or he will get a failing grade, there has been a shift to a meta-dialog. The reason is that the professor is now discussing the original dialog, a persuasion dialog, and telling the student to stop it, or at least stop his part in it that consists of giving arguments for determinism. He is telling the student to either stop it, or he will give him a failing grade in the course. This observation would also apply to the Mexican war example.

As noted in the discussion above of the jury intimidation example, here we have a prudential threat appeal argument used to intimidate somebody into taking a course of action, but nobody is being deceived by it. Or let's say, at any rate, to make the example interesting, that the jury member is not deceived by the threat, but simply acts in accord with it for prudential reasons, because he fears for his life. In such a case, although the *ad baculum* argument was clearly irrelevant to the discussion, it did not fool anybody into thinking it was a relevant argument. In such cases, the *ad baculum* could still have quite an effect by inhibiting the respondent. In such

a case, the *ad baculum* strategy may work as a fallacy, even when there is no deception that it is relevant. Thus deception is not the only basis for judging an *ad baculum* argument to be fallacious. In some cases, the respondent is quite aware that the threat appeal is irrelevant, but gives in to it anyway on the basis of self-interest.

But has the motorcycle gang, the jury member, or anyone else, really committed a fallacy? You could argue not, on the ground that a fallacy always requires deception, and all parties might clearly recognize that the tactic used is wrong. Nobody is being deceived. But the gang might use the argument anyway, and the jury member might be persuaded to act in accord with it anyway. In this kind of case, the fallacy could result from a dialectical shift from one setting in which an argument was used to a different setting. It could be prudentially justified for the jury member to respond to the threat, but in the setting of the trial, the threat is not relevant evidence, or should not be treated as such. It should not influence the jury member to decide whether the accused party is guilty or not. As in the other examples, the burden of persuasion in the trial is not met by the purely prudential argument directed against the juror.

On the surface, the argumentation in the jury intimidation example looks very similar to that in the case of the riots example. There is a trial involved, but the argument shifts to prudential concerns by using argument from negative consequences. We do want to say in the jury intimidation example that something is wrong. It is improper that a jury member should be intimidated, and in fact this type of act is illegal, on grounds of obstruction of justice, the reason being that it makes a fair trial difficult or impossible. So the tactics used by the motorcycle gang are certainly illegal, as well as being unethical. But do they commit a fallacy? There could be some grounds for saying so, because they are shifting the argument from the kind of critical discussion based on evidence used in a trial to purely pragmatic matters of safety because a person fears for his life. Although it is possible that nobody is being deceived by this move, still there could be grounds for classifying

the argument as a fallacious *ad baculum*, or use of a threat. These grounds would be that of relevance. As stated in the jury intimidation example, the threat to kill the jury member is irrelevant as legal evidence that should be considered in the trial. On these grounds, a case could be made that a fallacious *ad baculum* argument is committed in this example.

Still, if this evaluation is correct, it takes us back to the riots argument, where there was a similar dialectical shift from a trial to a prudential argument based on negative consequences. On these grounds, the riots argument could perhaps also be judged to be an instance of a fallacious *ad baculum* argument. The grounds are that the possibility or probability of riots should not be taken to be a good or adequate reason to support the conclusion that the defendant should be found guilty. It is irrelevant, even though it may be relevant to drawing other conclusions as prudential courses of action, like shifting the venue of the trial to a different location, or rescheduling the time of the trial.

What makes the argument in the domestic insurgency example most interesting, and different from the other examples, is the added element that a kind of practical inconsistency is alleged. It is argued that the liberals that are the target of the argument have certain values, like gender equality, that the terrorists are opposed to. But then it is argued that their attempts to promote these values and impose them on the rest of the world are actually undermining the same values by promoting the interests of the terrorists. Thus it is alleged that the consequences of the liberals' attempts to promote their position and values are in fact undermining them. This argument against the liberals accuses them of being committed to a pragmatic inconsistency of the same kind we are already familiar with in circumstantial *ad hominem* arguments. Thus the argument in this example is certainly an interesting and subtle one as an attack, but is it fallacious?

In the domestic insurgency example there has been a dialectical shift from a discussion about ethical values to a citing of alleged

negative consequences of the expression and promotion of these values by certain parties. Thus it seems similar to the Mexican war example as an instance of argument from negative consequences. However, the argument in the domestic insurgency example is more subtle and indirect than that of the Mexican war example. D'Sousa did argue at length that the political activism of the persons and groups cited had bad negative consequences. He did not argue that that these people have no right to express their views or to promote them politically, however. But, like the case of the Mexican war example, it was argued that the bad consequences involve loss of life. In the Mexican war example, loss of morale in war was cited as the bad outcome –giving comfort to our enemies. In the domestic insurgency example, the consequences cited are even worse. The argument equates the bad consequences with loss of life in terrorist attacks, and even appears to partially lay blame for these attacks on the parties cited. Thus there is a dialectical shift from a discussion of the political views in question to a deliberation dialog about the allegedly bad consequences of these views. The secondary dialog even takes the form of laying guilt for these bad consequences on the parties who are alleged to have contributed to them, even if unknowingly.

The argumentation in this case is much more complex than the one in the Mexican war example, because it was put forward in a whole book, and because of its politically divisive nature. Those on the right will like the argument in the book, while those on the left will be strongly inclined to disagree with its argument. But it would be an error to leap too quickly to one side or the other. To properly evaluate the argument, one would have to examine the specific claims made in the individual cases cited, and the arguments offered to back up these claims. There is no space for that here. Still, it is interesting to cite the example to show how argumentation from negative consequences is used in everyday conversational arguments of the most common kind, for example in political rhetoric, in a subtle way. Such cases verge on the fallacious, because of the shift concealed within the sequence of argumentation, and can certainly be highly deceptive. But it would be

erroneous to declare them fallacious in a wholesale fashion, and each case needs to be judged on its merits or demerits, taking the dialectical shift into account.

6. Retrospective evaluation

The remaining problem is how one should approach a particular case, like the examples presented in section 1, where it appears evident to a reader or viewer of the example that argument from consequences may be involved. The initial piece of advice would be to look to see if the argument has the wrong conclusion. But how could one be expected to know or to prove that it has the right conclusion or the wrong conclusion? The next required step is to make some determination of what type of dialog the argument is supposed to be contributing to. For example, there may be evidence that the argument was supposed to originally take place in the context of a persuasion dialog. Yet a problem may arise if there is also evidence that the argument has been put forward in such a way that it can only be reasonable if it is taken to be part of some other type of dialog like a deliberation dialog. What these observations suggest is that the ordering of the two dialogs is crucial. We have to approach the case by identifying dialog type *x* that the argument appears to part of, and then analyze the whole sequence of argumentation in the case retrospectively, tracing back to dialog type *y* at an earlier point in the sequence.

Analyzing the Mexican war example needs to take a retrospective approach, an approach based on the assumption that there has been a dialectical shift from one type of dialog to another. The alleged shift is from a persuasion dialog on an issue to a different type of dialog, a prudential type of deliberation dialog. The case is similar to many threat appeal and fear appeal arguments where the argument may be reasonable, when considered in itself, but becomes fallacious when considered in the context of dialog. Consideration of the context may indicate there has been a dialectical shift, and that this shift is evidence of the committing of a fallacy. However,

one problem in this case is how we can be sure the original issue was supposed to be part of a critical discussion. There is very little evidence in the case. There are no indicator words or other textual evidence to show that to participants were originally engaged in a critical discussion on the issue of which country had justice on its side in the Mexican war of 1848. The only evidence is that the first statement in the Mexican war argument is put forward as an assertion. The statement is made that the United States had justice on its side in waging the Mexican war of 1848. The statement appears to be a claim made by one party in a dispute, because the second statement in the Mexican war argument appears to respond to it by giving a reason against questioning it. When the first statement is made therefore, it would appear that there is a burden of persuasion set on the party who made the claim, because presumably it is a claim being made to attempt to overcome the doubt of some other party in the dialog. But the requirement of lifting this burden was not met, because of the shift to the second type of dialog.

The structure of this kind of shift is illustrated in Figure 3 below.

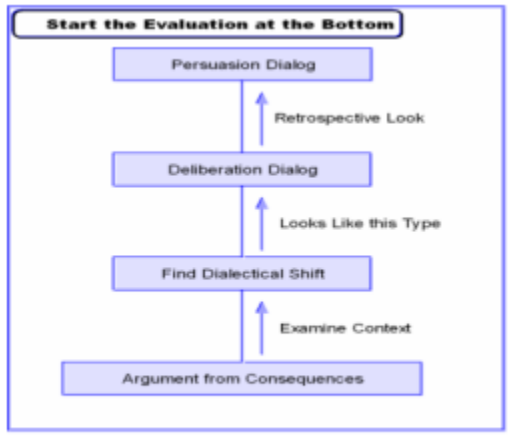


Figure 3: Retrospective Evaluation of Argumentation from Consequences

Figure 3 portrays the progress of a sequence of argumentation from a given argument in an example that has been identified as fitting the scheme for argument from consequences. But when we

evaluate how this argument has been used in the example retrospectively, we need to trace it back to the original persuasion dialog it was supposedly part of. To critically analyze an *ad baculum* argument used in such a case, or other type of argument coming under the heading of argument from consequences, we have to adopt a backwards or retrospective viewpoint, starting with the bottom box in Figure 3. From the bottom box, where the argument was put forward in the example, we need to look backwards to the original rules of the persuasion dialog. From this perspective, the argument can be judged to be fallacious if there was an illicit shift from the original persuasion dialog represented in the top box to another type of dialog represented beneath it. Thus looking backwards we can reconsider the argument in its original context of dialog, and judge it to be irrelevant if the text and context of the argument supports that interpretation of the example. This methodology is called a retrospective analysis of the argumentation, as shown in Figure 3.

The point was made in (Walton and Krabbe, 1995, p. 104) that shifts from persuasion dialog to another type of dialog are not always fallacious, but that the shift is fallacious, or can be associated with a fallacy, when it is a shift of an illicit or inappropriate type. In a case cited there (p. 104), a minister of finance argued for a certain kind of tax exemption, and he went on to propose that if his critics would abstain from moving for penalties for these exemptions, he will refrain from opposing a bill that these critics would profit from. In this case, the minister evaded the issue by illicitly abandoning the original persuasion dialog and moving to a negotiation dialogue. The shift is illicit because the negotiation dialog does not support the original persuasion dialog, but moves away from it leaving it unfinished, and perhaps even preventing it from continuing in a more productive manner towards its goal. It is this kind of shift, as shown by the examples above, that is characteristic of many instances of fallacious argumentation from consequences, including the *ad baculum* fallacy.

In the system of formal persuasion dialog set out by Wells and Reed (2006, 7) a shift to a different type of dialogue, like a negotiation dialogue, can take place only if the party making the shift has requested this sort of move to the other party. They also make it a rule of their formal persuasion dialog that a progression to another type of dialog is only allowed if the party requesting the shift first provides the defense of his thesis. In their system, a shift is only licit after the party requesting the shift has first discharged the burden of proof to support his previous argument in the persuasion dialog. These requirements are put in place because a shift is held by Wells and Reed to be useful in a persuasion dialog only if one party is getting nowhere with trying to persuade the other party, with appropriate arguments that supports his thesis. If the persuasion dialog is failing because of a deadlock, where one party simply cannot go further to persuade the other, that is the appropriate kind of situation where a shift to a negotiation might prove to be useful. They see the rules of their system of persuasion dialog as blocking the inappropriate type of dialectical shift, where the party making the shift is using the argument in a secondary dialog to fallaciously fulfill a burden of proof required for a prior argument put forward in the primary dialog.

How can we support the hypothesis that we should interpret the text of discourse in cases like of the Mexican war argument in such a way that it shows evidence of an illicit dialectical shift? The invocation of the normative model of the critical discussion, by itself, is insufficient as a basis for such an interpretation. In addition, what is required is an analysis of the text to back up the hypotheses that this normative model fits the argumentation in this case and that there has been a shift from this prior dialog to a deliberation dialog. On this view of the matter, when we examine the text of discourse, we can see that the argumentation in the case fits a certain type of dialog, in this case a kind of historical discussion about values of the familiar kind. Since all of us as participants in everyday conversational argumentation can recognize this type of dialog, we can then fit it into a normative model like that of the critical discussion. As shown above, just before Figure 3, the evi-

dence is that the first statement in the Mexican war argument (that the United States had justice on its side in waging the Mexican war of 1848) is put forward as a claim made by one party in the dialog. When this statement is made, a burden of proof is set on the party who made it. When this claim is in question by the other party, the burden needs to be lifted by the claimant, and that is how the persuasion dialog needs to properly proceed. However, the shift to the second type of dialog, put in place by the reason the claimant gave to support his claim, interfered with the proper continuation of the dialog by taking it in a different direction. The requirement of lifting this burden was therefore avoided, or at least that was the sophistical strategy used to try to avoid meeting the requirement at the next step in the persuasion dialog.

The dialectical structure of this kind of fallacious argumentation is displayed in Figure 4.

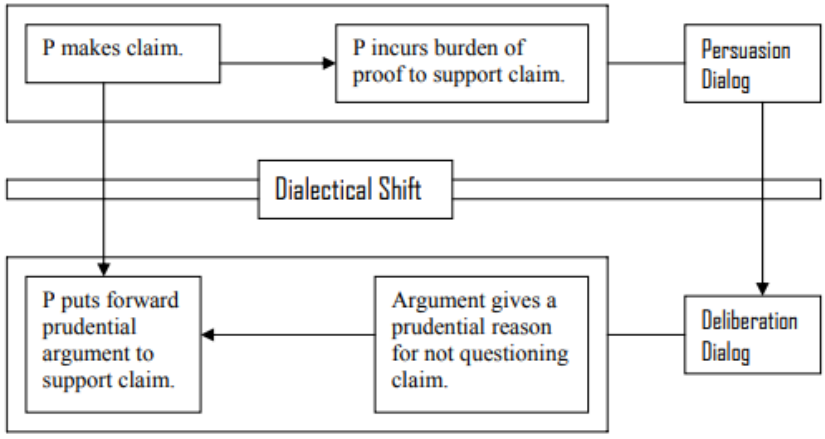


Figure 4: Dialectical Structure Underlying Shifting from Burden of Proof

The fallacy is a failure to lift a burden of persuasion that was set in place against the proponent when he made a claim in the original persuasion dialog. Such a failure is not in itself fallacious, but the problem was that, at his next move, the proponent offered a prudential argument for the respondent to accept the claim he had

just made. The offering of such a prudential argument did give the respondent a practical reason not to dispute or question the claim, but unfortunately it only functions in this way if there is a shift to a deliberation dialog. The problem is that proponent is shifting away from fulfilling the requirement of burden of proof in the persuasion dialog by presenting a kind of argument that moves to a deliberation dialog. This move interferes with the progress of the persuasion dialog, because it cannot move forward towards realizing its goal until the proponent either backs up his claim by giving evidence that it true or withdraws it.

7. Conclusions

The examples studied suggest that evaluation of cases of supposed informal fallacies needs to be carried out both by identifying the type of argument that is involved, and by examining how that argument is used in the context of dialog. This way of proceeding is supported by the theory of fallacy in (Walton 1995, 255). People generally recognize kinds of arguments that are typically reasonable (in principle) but defeasible, and best seen as heuristics to guide action under conditions of uncertainty even though they are subject to failure in some instances. People also recognize that these kinds of arguments can be used very effectively as deceptive tactics, and thus they are on their guard against them if they see any evidence at all of exaggeration or sophistical maneuvering. These arguments have two sides. They are necessary and useful, but at the same time slippery and dangerous. When it comes to evaluating such arguments, instead of routinely dismissing them as fallacious, we need to realize that they can fall into one of three standard categories: (a) reasonable, when considered in the context of dialog; (b) weak but not fallacious; (c) fallacious. To take a given argument in a real case, like the examples considered above, and to marshal the textual evidence to justify placing them in one of these categories, attention should be paid both to the form of reasoning and to the appropriateness of using this reasoning in the context of dialog for the given case.

On this approach, a fallacy is an argumentative move that goes counter to the direction of a dialog and poses an obstacle to the realization of the goal of the dialog it is supposed to contribute to. An instance is the group of fallacies associated with dialectical shifts.

The evaluation of arguments from consequences depends not only on the logical form of the argument, abstracted from its context, but also on the dialectical context of how the argument was used for some purpose in a dialog setting. The very same argument that was appropriate and reasonable when used as part of a deliberation dialog can be irrelevant, and for this reason fallacious, when used in a persuasion dialog. Such arguments need to be evaluated using a retrospective model in which one looks backwards to identify the original type of dialog that the argumentation was supposed to be a contribution to. It is from the viewpoint of this original type of dialog that the argument should be evaluated, according to the methodology presented above. Using the formal model of Wells and Reed (2006), we have to ask whether the rules specifying requirements for starting a new sub-dialog have been met. Only if these rules are followed can the shift properly be made from the initial dialog that was already under way to a new sub-dialog. Only then can there be a clean and visible progression from the one type of dialog to the other. The problem, however, in the cases we have examined, is that in an ordinary conversational argument, the underlying shift may be invisible. It lies under the surface of the text, and the participants are quite likely not even to be aware of its occurrence.

In this paper eight structural characteristics help to explain how the argument in the Mexican war example, and other cases studied, can be identified as a fallacious use of argument from consequences. First, there was a dialectical shift from a persuasion dialog to a deliberation dialog. Second, when we evaluate the argument in the deliberation dialog retrospectively, by looking back to the rules and requirements of the original persuasion dialog, we can see that the deliberation dialog is not helping the original per-

suasion dialog move forward towards realizing its goal of resolving the original conflict of opinions. Third, there was no agreement made between the parties that the shift to the second type of dialog was acceptable to both. Fourth, no rule that allows such a shift from the first dialog the argument was cited or met. Fifth, the argument put forward in the deliberation dialog has a different conclusion from the one that the arguer was originally supposed to prove in the persuasion dialog. It is the wrong conclusion. Sixth, there was a shift to a meta-dialog, visible in the contrast between conclusions A and A+ in the two argument diagrams for the Mexican war example (Figures 1 and 2). Proposition A+ is about questioning proposition A in public. Seventh, the argument put forward in the deliberation dialog does not fulfill the requirements for burden of persuasion. Eighth, a structural characteristic that holds for the examples studied in this paper is that the shift is specifically from a persuasion dialog to a deliberation dialog. Whether this characteristic holds for all examples of fallacious use of argument from negative consequences is merely a hypothesis, however, and remains to be studied in future work.

The analysis of the structural characteristics of the argumentation in these relatively simple examples puts us in a position to analyze much more complex and subtle cases. These cases are common, controversial and interesting. They typically involve arguments citing the negative consequences of artistic or political communication. For example, the film *Clockwork Orange*, and many other films and literary works as well, have been criticized on the grounds that they tend to promote violence. Indeed, murderers have sometimes admitted that their violent acts were inspired by books or movies. It may be true in some instances that these works of art have had unfortunate consequences. But is that the basis of a good argument for condemning them? It might be, in some respects, but one has to be careful not to commit the fallacy of improper argument from consequences. For such a work of art may have literary or artistic merit, even though it did have the bad consequences cited. Still, from a prudential or deliberative point of view, the argument may have some worth, provided it is not

directed to condemning the work as bad art, but rather to arguing for restricting its communication to a public audience on grounds of danger to life. Classic cases of freedom of speech typically tread on the borderline of this kind of fallacy.

The examples studied in this paper reveal that arguments from consequences are often reasonable in shifting the burden of proof under conditions of uncertainty and lack of knowledge. But these examples also show that such arguments are often dangerous in that they have a powerful persuasive effect that goes far beyond the force of rational persuasion that they should be properly taken to carry. The question is how they work as rhetorical strategies of strategic maneuvering (van Eemeren and Houtlosser, 2000). It may be suggested as a hypothesis, based on what has been shown, that the reason for this deceptiveness is that failures of relevance associated with these kinds of fallacies are concealed by dialectical shifts. According to this hypothesis, rhetorical persuasiveness of these arguments depends on concealed dialectical shifts that need to be brought out by analysis of cases, which show how criteria that need to be used to judge such arguments fallacious or not in specific cases must take such dialectical shifts into account.

One problem with all the examples studied in this paper is that they are short, and appear to be quite simple on the surface, but once a critic attempts to analyze the example, it is found that there is a lot of implicit communication under the surface. All of the examples can be analyzed at two levels. At the inferential level, the fallacy of *argumentum ad consequentiam* can straightforwardly be identified as one of wrong conclusion. But to pinpoint in depth what is wrong, to teach students to properly identify and analyze the fallacy in such cases, and to grasp rhetorically how such arguments can be powerfully deceptive, one needs to proceed to the dialectical level. One needs to ask what conclusion the given argument actually does support. A problem exposed here is that the given argument may fit the argumentation scheme for value-based practical reasoning, and thereby give the respondent a reason for taking action or not. Looked at in this way, the argument seems reason-

able, and indeed it may be a reasonable, provided the dialectical shift is not taken into account, and the prudential conclusion is taken as the real one to be proved. Once the shift is taken into account, the diagnosis of the failure is that meeting the requirement of fulfilling the burden of persuasion has not been met by the prudential argument that has been put forward.

Acknowledgements

The author would like to thank the Social Sciences and Humanities Research Council of Canada for a research grant that helped to support the work in this paper. An earlier version of the paper was read on February 14, 2007 as a keynote address at the International Conference on Strategies of Argumentation held at the University of Groningen, held in conjunction Erik Krabbe's Valedictory Lecture. I would like to thank Trevor Bench-Capon, Erik Krabbe, Henry Prakken and Bart Verheij for especially useful questions and comments on this earlier version.

References

Aristotle (1937). *The Art of Rhetoric*. Trans. John Henry Freese. Loeb Classical Library. Cambridge, MA: Harvard University Press.

Atkinson, Katie, Trevor J. M. Bench-Capon and Peter McBurney (2006). Computational Representation of Practical Argument. *Synthese* 152, 157- 206.

Bench-Capon, Trevor J. M. (2003). Persuasion in Practical Argument Using Value-based Argumentation Frameworks. *Journal of Logic and Computation* 13, 429-448.

Eemeren Frans H. van and Rob Grootendorst (2004). *A Systematic Theory of Argumentation*. Cambridge: Cambridge University Press.

Eemeren, Frans H. van and Peter Houtlosser (2000) Strategic Maneuvering in Argumentative Discourse: a Delicate Balance. In Frans H. van Eemeren and Peter Houtlosser (eds), *Dialectic and Rhetoric: the Warp and Woof of Argumentation Analysis*. Dordrecht: Kluwer, 131-159.

Guerini, Marco and Cristiano Castelfranchi (2006). Promises and Threats in Persuasion. *6th Workshop on Computational Models of Natural Argument (CMNA 6)*. European Conference on Artificial Intelligence (ECAI 06). Riva del Garda, Italy: August 28.

Jacobs Scott and Sally Jackson (2006). Derailments of Argumentation. In Peter Houtlosser and Agnes van Rees (eds), *Considering Pragma-Dialectics*. Mahwah, NJ: Erlbaum, 121-133.

Krabbe, Erik C. W. (2003). Metadialogues. In Frans H. van Eemeren, J.Anthony Blair, Charles A. Willard and A.Francisca Snoek Henkemans (eds), *Anyone Who Has a View: Theoretical Contributions to the Study of Argumentation*. Dordrecht: Kluwer, 83-90.

McBurney, Peter, David Hitchcock and Simon Parsons (2007). The Eightfold Way of Deliberation Dialogue. *International Journal of Intelligent Systems* 22, 95-132.

Nicoloff, Franck (1989). Threats and Illocutions'. *Journal of Pragmatics*, 13, 501-522.

Prakken, Henry (2006). Formal Systems for Persuasion Dialogue. *The Knowledge Engineering Review*, 21, 163-188.

Rescher, Nicholas (1964). *Introduction to Logic*. New York: St. Martin's Press. Walton, Douglas (1995). *A Pragmatic Theory of Fallacy*. Tuscaloosa, AB: University of Alabama Press.

Walton, Douglas (1996). *Argumentation Schemes for Presumptive Reasoning*. Mahwah, NJ: Erlbaum.

Walton, Douglas (2000) *Scare Tactics: Arguments that Appeal to Fear and Threats*. Dordrecht: Kluwer.

Walton, Douglas (2004). *Relevance in Argumentation*. Mahwah, NJ: Erlbaum.

Walton, Douglas (2006). How to Make and Defend a Proposal in Deliberation Dialogue. *Artificial Intelligence and Law*, 14, 177-239.

Walton, Douglas and Erik C. W. Krabbe (1995). *Commitment in Dialogue*. Albany: State University of New York Press.

Walton, Douglas, Chris Reed and Fabrizio Macagno (2008). *Argumentation Schemes*. Cambridge: Cambridge University Press.

Wells, Simon and Chris Reed (2006). Knowing when to Bargain: the Roles of Negotiation and Persuasion in Dialogue. *6th Workshop on Computational Models of Natural Argument (CMNA 6)*. European Conference on Artificial Intelligence (ECAI 06), Riva del Garda, Italy, August 28.

2015 Vol 35: Formalizing Informal Logic

Douglas Walton and Thomas F. Gordon

Abstract: In this paper we investigate the extent to which formal argumentation models can handle ten basic characteristics of informal logic identified in the informal logic literature. By showing how almost all of these characteristics can be successfully modelled formally, we claim that good progress can be made toward the project of formalizing informal logic. Of the formal argumentation models available, we chose the Carneades Argumentation System (CAS), a formal, computational model of argument that uses argument graphs as its basis, structures of a kind very familiar to practitioners of informal logic through their use of argument diagrams.

1. Introduction

In this paper we investigate the extent to which formal argumentation models can handle ten characteristics of informal logic identified in the literature. We show how almost all of these characteristics can be successfully modelled formally, and on this basis we claim that good progress is being made toward the goal of formalizing informal logic. This is to assume that one accepts that these ten characteristics are sufficient, defining characteristics of informal logic. Seen in another way then, our analysis may open the way for further discussion to identifying other defining conditions of informal logic, which may or may not be amenable to formalization.

To begin then, we need to decide what requirements something has to meet to be an informal logic. We take the following ten characteristics of informal logic as our guide. (1) Informal logic recognizes the linked-convergent distinction, (2) serial arguments and (3) divergent arguments. Informal logic includes three postulates of good argument in the RSA triangle: (4) relevance, (5) premise

acceptability and (6) sufficiency. (7) Informal logic has recognized the importance of pro-contra (conductive) arguments. (8) Informal logic is concerned with analyzing real arguments. Johnson (2006, 246) expressed this characteristic as follows: "[Informal logic] may be seen as a turn toward seeing *argument in a real-life setting* as opposed to the artificiality of the examples associated with formal deductive logic". There is also a ninth characteristic, (9) the appreciation of the importance of argument construction: "If one is to teach students about real arguments, then it is not enough to focus only on evaluation; one must include the task of argument construction—an emphasis taken from colleagues in rhetoric" Johnson (2006, 248). Argument construction was traditionally called the art of argument invention in rhetoric (Kienpointner, 1997). (10) There is also a tenth characteristic, one that is very important for rhetoric, the notion of audience. Blair (2001, 366) stated that there is general agreement among argumentation scholars that argumentation is a complex social, speech activity involving more than one party, adding "One cannot argue without at least an imaginary audience or interlocutor".

The fulfillment of these particular conditions by a formal system justifies our hypothesis that informal logic can be formalized because, as shown by our survey of the literature in search of definitions of informal logic, although no definition was found which enjoys broad consensus, the ten characteristics identified play a central role in all the proposed definitions. Thus a formal model that exhibits all of these characteristics would satisfy all of the proposed definitions, without having to accept any one definition in particular. This however leaves open the possibility that none of the definitions proposed thus far are adequate, leading to continued discussion to search for other characteristics and a new definition. However, in this paper we do not consider if there are any other conditions whose fulfillment allows for a better formalization. Instead of trying to define informal logic ourselves, we limited our task to the question of the amount of progress made toward formalizing informal logic as it is defined in the literature.

The word ‘formal’, as used in writings on logic and philosophy, can have seven different meanings. One of these meanings, distinguished by Barth and Krabbe (1982, 14-15), is that of a fundamental general term for a concept. For example, one might cite the term ‘triangle’, which in the Platonic philosophy refers to a general concept of triangularity that is common to all triangles. The second meaning is that of a well- formed formula, for example in a propositional or predicate logic. This meaning is syntactic in nature. The third meaning is that of a formal system, with a set of axioms and inference rules used to derive theorems from the axioms. The fourth meaning refers to formal logic, which is a species of a formal system. A fifth meaning is that of a formal theory, that is, an axiomatization of a theory in a formal logic. A sixth meaning is that of a mathematical structure consisting of sets and operations on the sets. An example would be an algebraic structure. The seventh meaning is that of a formal procedure, for example the kinds of procedures used in court cases.

There are many automated systems to assist with argument diagramming (Scheuer et al., 2010). CAS, however has one of the few argument diagramming tools based on a formal, computational model of argument. CAS is named after the Greek skeptical philosopher Carneades (Gordon and Walton, 2006), and is open source software, available for downloading at http://carneades.github.io/. The point is worth emphasizing that there are formal systems other than calculi for classical logic, and that CAS is a formal, computational model of argument. It is computational, because the model consists of a mathematical structure whose operations are all computable. It is formal, because there is a formal calculus for computable functions (lambda calculus). The rest of this paper presents CAS in more detail and then shows how CAS can be understood as a formalization of informal logic, realizing all of its leading characteristics.

There are other formal argumentation systems that have been developed in computer science to analyze and evaluate argumentation and that use argument diagrams and other tools comparable

to those used in CAS (Besnard et al., 2014). Any one of these systems could be used to formalize argumentation of the kind we have identified as being centrally important for informal logic in our ten characteristics of informal logic. An important property of these systems is that they use argumentation schemes, and although they are quite capable of modeling deductive reasoning and inductive reasoning of certain kinds, like CAS they treat many argumentation schemes as representing forms of argument that are inherently defeasible (Verheij, 2003; Prakken, 2011). Again, like CAS, they formally model the conditions under which an argument can be either supported or defeated by the pro and con arguments in a given case.

One such system ASPIC+ (Modgil and Prakken, 2014), is built around the notion of defeasibility attributed to (Pollock, 1995), that is based on a distinction between two types of argument attacks called undercutters and rebutters. ASPIC+ is based on a logical language consisting of a set of strict and defeasible inference rules used to build arguments from a knowledge base of premises that can be combined with the inference rules to generate a sequence of argumentation in the form of a directed graph leading to an ultimate conclusion in a tree structure (Prakken, 2011). The logical system DefLog (Verheij, 2003, 2005) uses an argument diagramming tool called ArguMed that can be used to analyze and evaluate defeasible argumentation. This logical system is built around two connectives called primitive defeasible implication and dialectical negation.

Either of these systems can be used to do many of the same tasks that CAS will be shown to do in this paper. There are also many more resources available in artificial intelligence that could also be applied to the task of formalizing informal logic, in somewhat different ways, by using comparable tools that would produce comparable results in modeling typical tasks of argument evaluation and analysis carried out in informal logic.

2. The Carneades Argumentation System

CAS formalizes *argument graphs*, as bipartite, directed graphs, consisting of *argument nodes* linked to *statement* nodes. The CAS User Manual for the latest version can be found at https://carneades.github.io. A graph is defined mathematically as a set of vertices, also called points or nodes, and a set of edges, also called lines or arcs. The graph is called a directed graph if every pair of its elements is an ordered pair. CAS argument graphs model relationships among arguments and statements (propositions). CAS can be used for argument construction as well as argument reconstruction. In the species of *argument reconstruction* familiar in informal logic, arguments are identified and analyzed, typically using an argument diagram, from source documents, for example court documents or social or political commentaries of the kind found in magazines newspapers, or on the Internet. In *argument construction*, also called argument invention (Walton and Gordon, 2012), arguments represented in an argument graph can be extended to build up new arguments constructed from a knowledge base consisting of evidence and facts. Argument nodes are of two types, pro and con. Carneades argument diagrams (or maps) visualize the arguments found in such sources as argument graphs. Conceptually it is important to distinguish such visualizations from the underlying mathematical structure being visualized. Argument graphs can be visualized in different ways and levels of abstraction, for different purposes.

Argument graphs model inferential relationships among arguments and statements. An *argument graph* is a bipartite, directed, labeled graph, consisting of statement nodes and argument nodes connected by premise and conclusion edges. Formally, an argument graph is a 4-tuple $\langle S, A, P, C \rangle$, where S is a set of *statement nodes*, A is a set of *argument nodes*, P is a set of *premises*, and C is a set of *conclusions*. The 4-tuple does not model a single argument, but rather a set of arguments, a whole argument graph. A single argument is a subgraph of the argument graph, where the subgraph is a tree (no cycles) and none of the leaves of the tree are issues but

rather assumed to be true or false or rejected or accepted by the audience.

To see an example, look ahead to figure 3. The statement nodes are shown as the rectangular text boxes in the figure containing statements. The argument nodes are the two circles containing the plus signs. The two premises are the statements in the text boxes on the right. The conclusion is the statement that the death penalty is wrong.

Let L be a propositional *language*, consisting of a set of propositional letters. Each statement node in S is labeled with a propositional letter in the language L. Each argument node in A is a structure $\langle id, s, d \rangle$, where id is some unique term naming the argument and s is a Boolean value which is true if the argument node is *strict* and false if it is *defeasible*. d is also a Boolean value, representing the *direction* of the argument, which is true if the argument is *pro* its conclusion and false if it is *con* its conclusion. The premises and conclusions of an argument graph represent the edges of the graph, connecting the statement and argument nodes.

Each premise in P is a structure $\langle s, a, p \rangle$, where

1. $s \in S$,
2. $a \in A$,
3. p is a Boolean value denoting the *polarity* of the premise, i.e. positive or negative. If p is true, then the premise is positive, otherwise it is negative.

Each conclusion in C is a structure $\langle a, s \rangle$, where

1. $a \in A$, and
2. $s \in S$

Every argument node has exactly one conclusion. That is, for every argument $a \in A$ there exists exactly one $\langle \_a, \_ \rangle \in C$. An argu-

ment node may have zero or more premises. No two argument nodes in an argument graph have the same identifier. Argument graphs are evaluated, relative to *audiences*, to determine the acceptability of statements in a stage (Gordon and Walton, 2009). Audiences are modeled as a set of assumptions and an assignment of weights to argument nodes. A *literal* is either a propositional variable or its negation. Where L is a propositional language as defined above, an audience is a structure <*assumptions*, *weight*>, where *assumptions* $\subseteq L$ is a consistent set of literals assumed to be acceptable by the audience and *weight* is a partial function mapping arguments to real numbers in the range 0.0…1.0, representing the relative weights assigned by the audience to the arguments (Gordon and Walton, 2011). More recently we have found a method to evaluate cyclical argument graphs in a way compatible with the semantics of the original system, via a mapping from argument graphs to Dung abstract argumentation frameworks (Dung 1995), similar to the mapping of ASPIC+ (Prakken 2010; Bin and Prakken, 2012).

In (Gordon, Prakken & Walton, 2007) the acceptability of statements was defined directly, via a set of mutually recursive functions, but only for acyclic argument graphs. Conflicts between pro and con arguments are resolved using proof standards. The proof standard of a statement determines how much proof is required for the statement to be taken as acceptable (presumably true). The proof standard is used by the formal model argument to determine the acceptability of the statement. Proof standards have a legal flavor, and the notions of proof standards and burdens of proof modeled in CAS are motivated by an interest in legal applications. Several legal standards of proof exist, for example the preponderance of the evidence standard, also known as the balance of probabilities, the standard applicable in civil cases. The preponderance standard is met by the proposition at issue if its pro arguments are stronger than its con arguments, no matter how much stronger they may be. The beyond reasonable doubt standard, the highest standard used in Anglo-American jurisprudence, and the standard applicable in criminal law, requires that the arguments supporting

the claim must not be amenable to any opposing arguments from critical questions that can leave any doubt open on whether the claim is acceptable. This standard does not require a proof to show that a claim is true with absolute certainty. It is not a standard of beyond all doubt. It only needs to be strong enough to overcome a reasonable doubt that can be raised by arguments or questions put forward by the defense. The clear and convincing evidence standard, lying between the other two standards, is higher than the preponderance of the evidence standard but not as high as the beyond reasonable doubt standard. These are just some examples of standards of evidence that are applicable in legal argumentation. The standards modelled in CAS are defined more precisely in section 6, where the question of how CAS models argument sufficiency is raised.

CAS also formalizes argumentation schemes. Schemes can be used to construct or reconstruct arguments, as well as to check whether arguments are "valid", i.e. whether they properly instantiate the types of argument deemed normatively appropriate for the type of dialogue. In CAS, *argument evaluation* is the process of critically assessing arguments by four means: (1) revealing implicit premises, (2) validating whether the arguments are formally correct, by instantiating accepted argumentation schemes, (3) asking critical questions appropriate for a scheme, and (4) determining which claims are acceptable, taking into consideration the assumptions of the audience and its assessment of the relative weights of conflicting pro and con arguments. The first three of these tasks can be accomplished by comparing the argument with its argumentation scheme.

You can view a list of the argumentation schemes available in CAS and choose which one to apply. For example if you type in the term 'practical-reasoning', CAS will display the scheme containing this term, as shown below. A1, A2, . . ., An represent actions and S1, S2, . . ., Sn represents "states" which we can think of as circumstances of a case. The argument identifier is represented by an *id*.

- ***id:*** *practical-reasoning*
- ***conclusion:*** *A1 should be performed.*
- ***premises:***
    - *circumstances: S1 is currently the case.*
    - *action: Performing A1 in S1 would bring about S2.*
    - *goal: G would be realized in S2.*
    - *value: Achieving G would promote V.*
- ***assumptions:***
    - *CQ1: V is indeed a legitimate value.*
    - *CQ2: G is a worthy goal.*
    - *CQ3: Action A1 is possible.*
- ***exceptions:***
    - *CQ4: There exists an action that, when performed in S1, would bring about S2 more effectively than A1.*
    - *CQ5: There exists an action that, when performed in S1, would realize G more effectively than A1.*
    - *CQ6: There exists an action that, when performed in S1, would promote V more effectively than A1.*
    - *CQ7: Performing A1 in S1 would have side-effects which demote V or some other value.*

Whenever a scheme is selected, the form will be customized to include premises and exceptions fields for the chosen scheme. The roles of the premises and exceptions will be modified to match the selected scheme. If no scheme matches the argument in a given

text you are trying to reconstruct, you can put in your own scheme, put in no scheme, or classify the type of argument under a more general scheme such as deductive *modus ponens* or defeasible *modus ponens*.

CAS is capable of representing instances of any kind of argumentation scheme, whether deductive, inductive or defeasible, such as argument from expert opinion. The conclusion of a defeasible argument is only presumptively true. Defeasible arguments can be defeated by counterarguments of various kinds. CAS has mainly been tested on examples of legal argumentation, but it is open domain software, meaning that it can be applied in other contexts of use, including everyday conversational argumentation.

3. Single, linked, convergent, serial and divergent arguments

The first step in understanding an argument diagramming system is to see how it represents linked and convergent arguments. A linked argument is one where the two (or more) premises go together to support the conclusion. A convergent argument is one where each premise (or group of premises) function together to support the conclusion.

As types of structures that appear in argument diagrams, informal logic recognizes five kinds of arguments, single, linked, convergent, serial and divergent. In the simplest kind of case, called the single argument, there is only one premise and one conclusion (Walton, 1996, 84). The following example of a single argument is cited in (Walton, 1996, 84).

> Webb was promoted to vice president, therefore she will move to Pittsburgh.

How this example is represented by CAS is shown in figure 1, where the plus symbol in the argument node indicates that this is a pro argument. CAS uses a minus sign in the argument node to indicate a con argument.

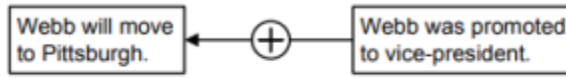


Figure 1: Single argument in Carneades

A linked argument is an argument that has more than one premise, and its premises function together to give support to the conclusion (Walton 1996, 85). According to (Copi and Co- hen, 1990, 20) in a linked argument with two premises, each premise supports the conclusion through the mediation of the other so that neither supports the conclusion independently. One of the examples given in (Walton, 1996, 87) is an instance of practical reasoning.

My goal is to get to Leiden, taking the maaldrift is the way to get to Leiden, therefore I should take the maaldrift:

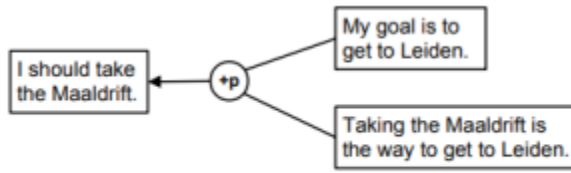


Figure 2: Linked argument in Carneades

The letter p in the circular argument node stands for the argumentation scheme for practical reasoning. The plus sign in the node indicates that the argument fitting the scheme is a pro argument. The practical reasoning scheme (in its bare-bones form) represents the following form of argument: I (an agent) have a goal *G*; carrying out action *A* is the way to obtain *G*; therefore I should carry out *A*.

In a convergent argument each premise gives independent support to the conclusion. An example (paraphrased from Copi and Cohen, 1990, 22) has the conclusion that the death penalty is wrong. The two premises given to support this conclusion are (1) there is not enough evidence to show that the death penalty is a deterrent and

(2) there are better and more effective ways to deal with violent crime.

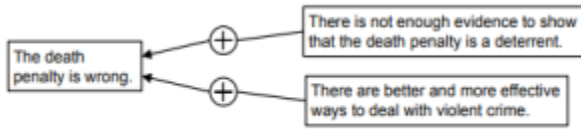


Figure 3: Convergent argument in Carneades

As indicated in figure 3, convergent arguments are repre- sented using multiple argument nodes, instead of using a bracketing line to join the premises together and then drawing the ar- row from the bracketing line to the conclusion.

In a serial argument, often called a chain argument, the conclusion of one argument also functions as a premise in a second argument, and so forth, forming a chain of arguments. Typical Carneades argument maps display lots of chained arguments, as the example in figure 4 shows.

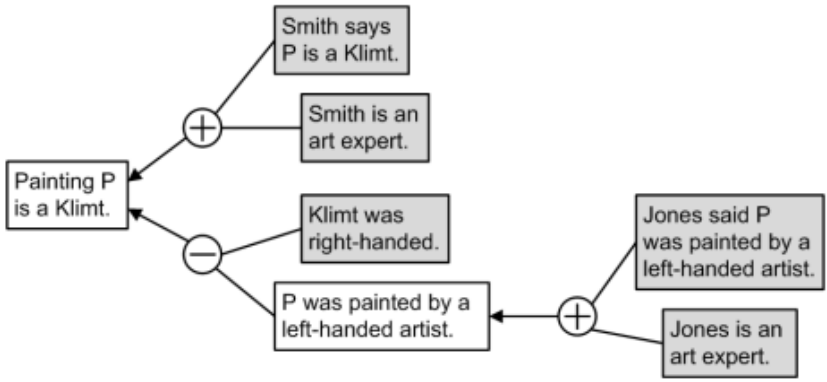


Figure 4: CAS argument map with a chained argumentation structure

This map includes an example of a con argument, indicated by the minus sign in the node at the bottom left. It also shows a chained argument. The linked argument at the right, an argument from

expert opinion, leads to the conclusion that the portrait showed evidence of being drawn by a left handed artist. This proposition, in turn, serves as a premise in the linked con argument rebutting the conclusion that painting P is a Klimt. This example can also be used to illustrate some points about how CAS evaluates arguments.

The top argument is also an argument from expert opinion. Note that although argumentation schemes are not displayed in figure 4, they are represented in the underlying data model of the argument graph. Note that the scheme for argument from expert opinion could be applied to two arguments, in each in- stance showing that there is a missing premise. For example the implicit premise 'Attributing painting P is in the domain of art' can be added to the top argument.

Figure 4 can also be used to illustrate how an argument graph can be evaluated by the computational model. Statement and argument nodes are evaluated to be one of three values: *in*, *out*, or *undecided*. In figure 4, the five *in* nodes representing statements that the audience accepts, are shown filled with gray (green normally, but since we can't use color here, they are shown in gray). Statements that the audience rejects, *out* nodes, are filled with a red color, but none of these are shown in this example. The two statements that the audience neither accepts nor rejects, *undecided* nodes, are shown with a white background. The values of the remaining statement nodes are com- puted using proof standards and the weights assigned by the au- dience to the argument nodes. Whether a proposition is in or out initially is determined by whether or not the audience accepts it. In figure 4, the audience has accepted all the five propositions shown in boxes with gray backgrounds. The only propositions the audience does not accept (at least so far) are the two shown with white backgrounds. Given this information about what the audience accepts or does not, CAS can calculate whether the argument justifies acceptance of its conclusion or not.

In this instance, both premises of the top linked argument are accepted, and so the conclusion should also be accepted, assuming

this argument meets its standard of proof and is therefore sufficient to prove the conclusion. Just on this basis alone, the conclusion should be shown as accepted by showing it with a gray background. But this argument is not sufficient to justify acceptance of the conclusion that the paining is a Klimt, because the con argument at the bottom also has to be taken into account. So we have to look at the bottom argument. The bottom premise, the statement that P was painted by a left handed artist, is shown as 'not accepted' by the audience. But it is supported by the con argument showing at the right, a linked argument that has both premises accepted. Therefore CAS automatically computes that proposition 'P was painted by a left-handed artist' is justified, and colors it gray. So now we have a pro argument with all its premises accepted pitted against a con argument with all its premises accepted. Which one wins the battle of the experts? This will depend on two factors: (1) the standards of proof assigned each of the two arguments, and a weighing of the comparative strength of the two arguments. Later it will be shown how this is done.

A divergent argument (Walton 1996, 91) is one in which two separate conclusions are each supported by the same premise. The following example from (Walton, 1996, 91) was originally taken from a Sherlock Holmes story. Smith is not the murderer, therefore (1) Robinson had nothing to do with the crime, and (2) Lady Gregg's display of grief was merely a tactic to cover up the finding of the revolver. Figure 5 shows how divergent arguments are modeled in Carneades.

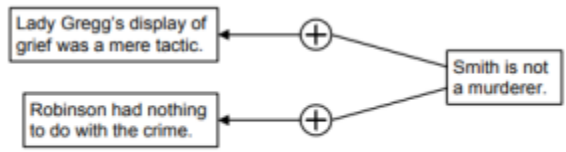


Figure 5: Carneades argument map of a divergent argument

In CAS, premises and conclusions are *relations* between argument nodes and statement nodes. The same statement node can be a premise or conclusion of more than one argument node. Figures

3 and 5 provide illustrations. In Figure 3, the statement node for "The death penalty is wrong" is a conclusion of two argument nodes, with different premises. In Figure 5, the statement node for "Smith is not a murderer" is a premise of two different argument nodes, with different conclusions.

Finally in this section, we reply to an objection. Can CAS handle the following kind of convergent argument, where the premises support the conclusion independently? The conclusion is "Foreigner X can communicate in English" and the two premises are "X has CAE" and "X has CPE", where CAE is the Certificate in Advanced English and CPE is the Certificate of Proficiency in English. Both premises treated separately as single arguments support the conclusion, but since CPE is a much weaker and more restricted test of English linguistic ability than CAE, taken together as a convergent argument they do not support the conclusion independently. The influence of CAE is marginal, if it has any at all. Can CAS allow for representation of the argumentation structure in this kind of case?

CAS can handle this example, since it does not assume that arguments are independent. Argument weights are not automatically aggregated (e.g. summed) by the model. Only the strongest pro and con arguments are compared against each other by the proof standards. Arguments can be aggregated manually and then weighed again, but this weighing is done manually by the audience, not the formal model, and it is the audience's responsibility to not count common features of the arguments multiple times.

4. The RSA Triangle

Blair (2012, 87) wrote that when he and Ralph Johnson first wrote their textbook *Logical Self-defense* (first edition, 1977), they used the relevance sufficiency acceptability (RSA) triangle to determine whether an argument is a good one. According to the RSA principle, an argument is a good one if its grounds (or premises) singly or in combination meet three criteria. First, the premises have to be

individually acceptable. Second, taken together the premises have to be sufficient to support the claim that is the conclusion of the argument. Third, the argument needs to be relevant as a support for the conclusion. Blair (2012, 88) wrote that he and Johnson had the RSA criteria in mind as a replacement for what he called the traditional soundness criterion, which maintains that a good argument is a sound argument, and a sound argument is one that is deductively valid and has true premises.

Formal argumentation systems of the kind currently being developed in artificial intelligence use argumentation schemes to model defeasible forms of argument that are subject to critical questioning. Such systems evaluate an argument as a good one or not on a balance of pro and con considerations. The model used is a dialectical one in which an argument that is a good one shifts the burden of proof to a critic or opponent to provide reasons for not accepting it. In particular CAS evaluates an argument in relation to whether the premises of the argument are accepted by the audience to whom the argument was directed, and the appropriate inferential link joining the premises to a conclusion, generally represented as an argumentation scheme, transferring acceptance from the premises to the conclusion.

5. Acceptability

A simple example of how CAS uses the device of an audience to evaluate arguments is shown in figure 6. Let's consider a case of a deliberation dialogue where Bob has acid indigestion and is considering taking a medication M to treat his condition. He is examining the pros and cons in trying to reach a reasonable decision on whether he should take M or not. He has a bottle of M handy and is trying to decide what to do. Bob might reason as shown in figure 6. Let's say that Bob is thinking that if he takes M, it would relieve his acid indigestion. He tells his partner Alice, "I should take M". Using the argumentation scheme for value-based practical reason-

ing presented in section 2 to fill in some implicit premises, Bob's reasoning could be represented in CAS as shown in figure 6.

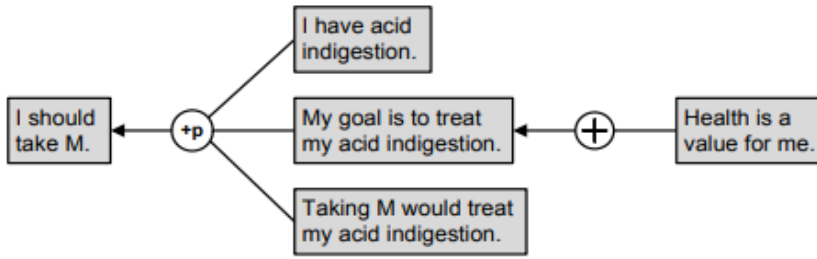


Figure 6: First argument diagram for the indigestion example

Notice that this way of modeling the argument follows the standard way of representing value-based practical reasoning (Atkinson, Bench-Capon and McBurney, 2006). On this model, the value of health is shown as supporting the agent's goal of treating his acid indigestion. When premises are put forward to support a claim, in an example of this sort, the normal premises that fit the scheme are represented as assumptions rather than exceptions. Critics only need to question assumptions, after which they act like ordinary premises which must be proved by the proponent of the argument. (This is how assumptions differ from exceptions, where the critic has the burden of proof (evidential burden) and must put forward an argument proving the exception.) So the four premises of the practical reasoning argument are displayed in text boxes with gray backgrounds, indicating audience acceptance. Since the argument fits the scheme for value-based practical reasoning, let's also assume that the audience accepts the argument strongly enough to meet the required standard of proof to prove the conclusion 'I should take M' shown at the left of figure 6. So far then, the outcome is that CAS replaces the white background of the conclusion box with a gray background.

But let's continue the dialogue a little further. Suppose that Alice reads the small print on the bottle, and sees that it warns that taking M could have a side effect of gastrointestinal bleeding. Here the

side-effects critical question CQ7, shown in the CAS scheme presented in section 2, comes into play. CQ7 is listed as an exception, and it says that performing A1 in S1 would have side-effects which demote V or some other value. So how could one proceed further to represent the structure of the new sequence of argumentation? By raising a critical question, Alice's next move in the dialogue in effect poses a counterargument, and therefore we have to examine how CAS treats critical questions and counterarguments.

In the most recent versions of CAS, exceptions are treated as Pollock-style undercutters. (Pollock, 1995) distinguished be- tween two kinds of counter-arguments he called rebutting de- featers and undercutting defeaters (often referred to as rebutters and undercutters). A rebutter gives a reason for denying a claim by offering reasons to think it is false (Pollock, 1995, 40). An undercutter attacks the inferential link between the claim and the reason supporting it by undermining the reason that supported the claim. CAS has three ways in which one argument can at- tack and defeat another, based on this distinction. A rebutter is an argument that attacks the conclusion of a prior argument by presenting a reason to think the conclusion is false. An undercutter attacks the argument link between the premises and the conclusion, for example by asking a critical question pointing to an exception to the holding of the argument. For example, an argument that fits the argumentation scheme for argument from practical reasoning could be defeated by the asking of any one of the critical questions shown in section 2.

6. Sufficiency

CAS is built around the idea of modeling sufficiency by using proof standards to aggregate pro and con arguments (Gordon, Prakken and Walton, 2007). The proof standard of a statement determines how much proof is required for the statement to be deemed acceptable (presumably true). The proof standard is *used* by the computational model of argument to compute the acceptability of the statement (Gordon and Walton, 2009). As promised

in section 2, it will now be shown how four proof standards employed in CAS are defined.

The conclusion of an argument is *in* (acceptable) if it has been accepted by the audience or it satisfies the proof standard appropriate for the type of dialogue. The standard of dialectical validity (DV) is met if at least one pro argument is *in* and no con argument is *in*. The preponderance of evidence (PE) standard is met if at least one pro argument is *in* that weighs more than any *in* con argument. The clear and convincing evidence (CE) standard is met if the preponderance of evidence standard is met and, in addition, the difference between the strongest *in* pro argument and the strongest *in* con argument is above a certain threshold.

The beyond reasonable doubt (BRD) standard is met if the clear and convincing evidence standard is met and, in addition, the weight of the weakest *in* con argument is below a certain threshold. The default proof standard is preponderance of the evidence, and for most applications this proof standard is sufficient. Note that the preponderance of evidence standard is met whenever the dialectical validity standard is met. The preponderance of evidence, clear and convincing evidence and beyond reasonable doubt standards are ordered by the amount of proof required, with beyond reasonable doubt requiring the most proof. Whenever one of these standards is met, all of weaker standards are also met.

Next we use the indigestion example to show how CAS models the notion of argument sufficiency using proof standards. Basically, an argument is sufficient to prove its conclusion if it fulfills its burden of proof required to prove the conclusion. Burden of proof is set by the standard of proof appropriate for the argument, as determined by the user when the user puts one of the four standards of proof defined above. So far, as shown in figure 6, all three premises in the present example have been accepted and are thus *in*, and so the conclusion is also shown in a gray box. But in figure 7, Alice's critical question is modeled as an undercutter. In CAS, an under-

cutter is modeled as a secondary argument that attacks the original argument.

In figure 7, CQ7 is represented as a con argument with a premise stating that taking M would have side effects that demote V or some other value. The counterargument is shown not as attacking any premise or the conclusion of the original practical reasoning argument used by Bob, but instead its argument node is joined by an arrow to the argument node above it representing the scheme for practical reasoning. This example shows the distinctive way in which CAS models an undercutter as one argument attacking another. To see how CAS models this kind of situation, we have to see how it distributes the burden of proof in a dialogue when critical questions corresponding to an argumentation scheme are asked.

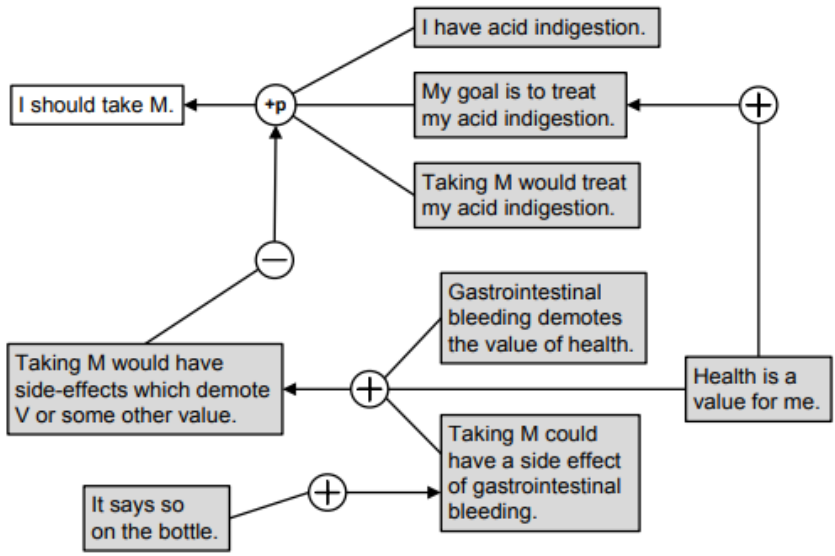


Figure 7: Second argument diagram for the indigestion example

How strongly the audience accepts the argument can be represented numerically in CAS. This feature can be used to break

deadlocks between an opposed pair of arguments. These numerical weights are used by some proof standards to evaluate arguments.

The approach taken in CAS to the problem of determining how the burden of proof should be distributed is as follows (Gordon and Walton, 2011). The burden of production is distributed by dividing premises into different types: evidence for ordinary premises and assumptions (once challenged) must be produced by the proponent of the argument, while evidence for exceptions must be produced by the respondent. There are two kinds of burden of proof. One is the so-called burden of persuasion set at the opening stage of dialogue. The burden of persuasion is allocated by assigning the appropriate proof standard. The other is the so-called burden of production, sometimes also called the evidential burden, which can shift from side to side as the dialogue proceeds. CAS allows the burdens of production and persuasion to be allocated separately to either the proponent or the respondent and modified during the course of the dialogue. The initial allocation of the burden of production is regulated by the premise types of the argumentation scheme applied. The values (*in*, *out*, *undecided*) of the nodes in the argument graph are computed by the model once the user has put in whether the audience accepts the premises or not, unless a critic questions the assumption (No reasons or arguments need to be put forward to question assumptions, in contrast to exceptions). Then the argument is evaluated using the standards of proof.

Looking back to figure 7, let's see how CAS evaluates the argument once Alice's move of putting forward her critical question has been made. First it needs to be recalled that CQ7 is classified in the scheme for practical reasoning as an exception. This means that the burden of proof is on Alice to back up her premise that taking M would have side effects which demote V or some other value by offering an additional argument to support this claim. If she fails to provide such an argument, her critical question will fail to shift the burden of proof back onto Bob's side. But as the reader can see by looking at figure 7, Alice has provided a pro-argument supporting her exception. This pro argument has three premises,

one of which is the reused statement that health is of value for me. Note that CAS can reuse a premise in a different argument.

Not only that, Alice presents another pro argument to back up her premise that taking M could have a side effect of gastro-intestinal bleeding. Assuming that all the premises of Alice's counter-argument are accepted by the audience (they are assumptions), Alice has fulfilled her burden of proof to support her assertion about the side effects of taking M. Hence CAS will automatically remove the gray background from the text box containing the conclusion that Bob should take M. In other words, Alice's critical question has undercut Bob's original argument based on practical reasoning, and has thereby shifted the burden of proof back onto Bob side to make another move. Bob could respond by providing additional arguments to back up his original argument, or by attacking Alice's counterargument in some appropriate way.

7. Relevance

Ballnat and Gordon (2010) provided a method of argument construction for CAS, and Walton and Gordon (2012) have shown how the method can be applied to arguments of the kind that are of central interest for informal logic. To apply the method, the arguer needs to build his argument with the goal of getting the audience to accept some designated proposition that represents his thesis to be proved by basing his arguments on premises that his audience either accepts or can be led to accept by argumentation. If the audience accepts the premises, and if the argument is structurally correct by application of argumentation schemes, the audience will also need to accept the conclusion, or give arguments to show why it should not. To use the system, an arguer provides input on which premises the audience has accepted or not. Then it searches for a path leading from these premises (along with others) to the ultimate *probandum*. When it finds such a path, it tells the user which premises remain to be accepted. If it finds no such path, it gives

advice on what positions could be useful to work towards finding a path.

Relevance of arguments has not yet been formally modeled in CAS, but here we can briefly outline how this research project could plausibly be carried out, based on some previous work in the informal logic area. One important point (Walton, 2004) is the argumentation schemes and their matching critical questions can, in many instances, be used to determine whether one argument is relevant to another, or whether a question or a statement is relevant to an argument. But the problem is that a single argumentation scheme by itself is very often not enough to determine relevance. The reason is that in typical cases arguments are chained to each other, the conclusion of one argument being a premise in the next. Hence proving an argument is relevant to some ultimate claim representing the issue, the conflict of opinions in the case at issue, requires a model that can show how the argument links up through a series of successive arguments moving toward the ultimate claim. Analyzing relevance in such cases requires building an argument diagram, a graph structure showing a sequence of inferences from premises to conclusions where the sequence ultimately concludes in an end-point.

According to the analysis of relevance in argument given in (Walton, 2004), relevance needs to be defined and evaluated in a tree structure comparable to argument graphs in CAS. There needs to be a central claim, often called an ultimate *probandum* in law, at the root of the tree. This framework follows the classical stasis theory well known in rhetoric (Hohmann, 1989; Freeman, 1998; Tindale, 1999). Let AG be an argument graph containing a statement node, C, for the claim. It is a conjecture made in (Ballnat and Gordon, 2010) that an argument node, A, in AG is *relevant* to C if and only if there is a path from A to C in AG. Many examples of relevance, both in legal and ordinary arguments, are provided in (Walton, 2004). Although CAS could turn out to be an excellent system for modeling relevance of this kind, so far the project of carrying out such this research task has not yet begun.

Our proposed model of relevance, determined by the existence of a path between the argument and claim in an argument graph, seems plausible to us but remains a project for future work. Unfortunately, we have to admit that this section devoted to the topic of relevance is very short and preliminary. We have not yet attempted to build a model of relevance. It is a centrally important topic of research for argumentation studies, but at the same time it is a highly contested and slippery topic that is hard to say anything very useful about in a short space. The lack of such a model of relevance is the main reason why we do not claim to have yet modeled all the characteristics of informal logic, but only to have made considerable progress towards this worthy goal.

8. Conductive Arguments

We take conductive arguments to be the same as pro-contra arguments. Whatever term you choose, the characteristic of them as a class is that they need to be evaluated by taking into account both the arguments for (pro) some contested claim as well as the (contra) arguments against it, and weigh the one side against the other. The term 'conductive argument' is taken to have been coined by Wellman (1971), but actually the way the word is used currently in informal logic is different from the narrower meaning of it given by Wellman. Wellman defined conductive reasoning as meeting four requirements (1971, 52). (1) It is about a conclusion in some individual case. (2) It is drawn inconclusively. (3) It is drawn from one or more premises about the same case. (4) It is drawn without appeal to other cases. Amplifying the fourth point tells us as well that the most striking feature of all the examples of conductive reasoning he has given is that they all deal with particular cases. This definition clearly excludes arguments from analogy as fitting under the conductive category, since arguments from analogy compare two different cases. However, this restriction is widely ignored in current discussions of conductive argument. Argument from analogy is a very important kind of argument for informal logic, on our view. Much then depends on whether we stay with

Wellman's meaning of the term or use it a broader way to refer to all pro-contra argumentation. This broader way does not exclude deductive arguments. A deductive argument rebuts any opposing defeasible argument. Opposing pro and con deductive arguments are also possible, but cannot be *in* simultaneously unless the statements accepted by the audience are inconsistent.

Wellman tells us that there are three patterns of conductive reasoning. The first is one where a single reason is given for the conclusion. He cited this example: "You ought to help him for he has been very kind to you" (1971, 55). This would be the single type of argument, of the four types classified above. The second one is where several reasons are given to support the conclusion. He cites this example: "You ought to take your son to the movie because you promised, and you have nothing better to do this afternoon" (1971, 56). This would be a convergent argument. The third one draws the conclusion from both positive and negative considerations. He cites this example: "Although your lawn needs cutting, you want to take your son to the movies because the picture is ideal for children and will be gone by tomorrow" (1971, 57). The third pattern shows the paradigm pro-contra feature of conductive arguments.

The last example can also be classified as a convergent argument, but has an additional feature of interest. It is associated with the "balancing" notion of weighing the arguments on both sides of a disputed issue. This notion is one that many in the informal logic community have found so appealing while others dismiss is it as metaphorical (Blair and Johnson, 2011). This balance notion of deciding an issue by weighing one side against the other has also been found highly appealing in law, but there too, others have strongly criticized it as an inadequate substitute for deciding cases on the legal rules and the facts of a case (McFadden, 1988).

Either of these arguments can be modeled by CAS, and that may remove some of the doubts about pro-contra argument on the ground that they are merely metaphorical. CAS models it using

the pro-contra feature, but in a different way than the arguments that McFadden objected to. He objected to it as a balance of interests, or as a balancing of factors on either side of a disputed issue. But CAS models it as a balance between opposed arguments. Carneades can map the lawn example as shown in figure 8.

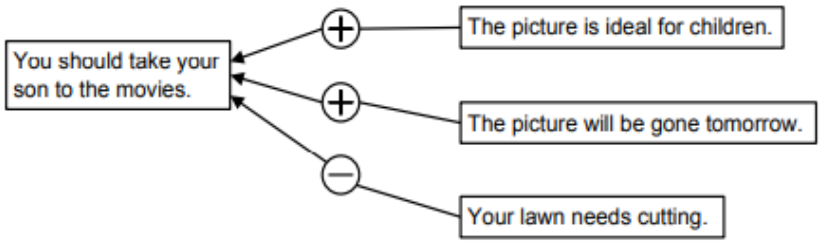


Figure 8: CAS argument map of Wellman's lawn example

As shown in figure 8, the two pro arguments are "balanced" by the con argument, meaning that all three arguments are "good" arguments that carry some evidential weight even though none of them individually, nor any subset of them, is decisive in proving or disproving the conclusion. Should the conclusion be acceptable (*in*) or not? Even though there are two pro arguments against one contra argument, the number of arguments is not the deciding factor. What is the deciding factor is the audience. Let us presume the audience has accepted all three of the premises. Let's assume that family values outweigh home care values. Then the two pro arguments, taken together, should prevail over the contra argument.

Adler (2013) argued that conductive arguments, as they are commonly characterized, are impossible and therefore can't exist. According to Adler, their property of non-conclusiveness makes conductive arguments impossible, backing up this attack by pointing out that Wellman never provided any definition or explication of 'conclusiveness'. Blair (2013) responded by arguing that Adler's refutation of conductive arguments is based on a misreading of the term 'non-conclusive' and that therefore his dismissal

of conductive argumentation fails. Much depends in this issue on what ‘conclusive’ and ‘inconclusive’ should be taken to mean.

The word ‘conclusive’, as applied to arguments, is slippery and ambiguous. In one sense, it refers to the drawing of a conclusion from a set of premises implying that this particular conclusion has now been selected so that other conclusions no longer need to be considered. This meaning of the word does not rule out that the argument may have to be revised at some point in the future, if a different conclusion is arrived at that will replace the previous one. This meaning of the term can also be called detachability, implying that the conclusion can now be detached from the argument used to support it or arrive at it. The idea is that it can now be seen as separately acceptable in its own right, and used as an acceptable premise in a new argument. In a different meaning of the word, to say that an argument is conclusive means that its conclusion has been proved to such a degree of certainty that there will or should be no need to withdraw it in the future. It is easy to confuse the two meanings, and it is not certain which of them should be taken as the best meaning of the term for logic and philosophy.

The first meaning appears to be a narrower one, whereas the second one seems to be more important for the field of philosophy, where there is always a quest to look for an argument or proof that is conclusive. The basic idea behind the second meaning is that a conclusive argument leaves no room for doubt that its conclusion is true. But this notion is philosophically controversial, because there is a school of thought in epistemology called skepticism that claims that no real argument is so strong (conclusive) that no room at all for doubting its conclusion is left. But even this view can maintain that an argument is conclusive if it removes enough room for doubt so that the conclusion can be accepted as strong enough to eliminate the need for further pro-con argumentation.

Deductive arguments are not conclusive, in the sense that a deductive argument proves its conclusion beyond all doubt. Deductive arguments can be attacked in two ways. First, a counterargument

can be found that shows that one (or more) of the premises of the deductive argument does not hold. Second a deductive con argument can be brought forward based on premises more strongly accepted than the first argument, and attack it. The first form of con argument is called a premise attack and the second is called a rebuttal.

Conductive arguments, judging by the examples of Wellman analyzed in this paper, certainly do seem to be defeasible, and if defeasibility implies inconclusiveness, in Adler's sense of the term, then Blair is certainly right to reject Adler's rejection of conductive arguments. One of the merits of such arguments is that they are distinctly different from deductive arguments precisely because they have the property of defeasibility. In any event, an interesting issue is opened concerning what meaning 'conclusiveness' should be taken to have. CAS can throw some light on this issue insofar as it relates to burdens and standards of proof.

The default proof standard in CAS is preponderance of the evidence, and this standard is met whenever the dialectical validity standard is met. Arguments can be weighed numerically in CAS or not, and if they are not weighed, the dialectical validity and preponderance of evidence standards give the same results. The preponderance of evidence, clear and convincing evidence and beyond reasonable doubt standards are ordered from the weakest to the strongest. When one is met, all of weaker standards are also met.

It should be mentioned in passing that CAS also allows argumentation to have an opening stage, an argumentation stage and a closing stage, bringing in the possibility of a procedural side to the issue of how to determine conclusiveness of an argument. From a procedural point of view, an argument may be viewed as conclusive if no further evidence or arguments may be put forward in the dialogue, according to the procedural rules (protocol) governing the dialogue. This depends on how the closing stage is reached in any given case, depending on closure rules. However, this is merely an

aside, showing another of the many sides to the controversial question of conclusiveness. Here the main justification of our claim that CAS can model the concept of argument sufficiency rests on its use of proof burdens and standards. Whether informal logic should be seen as dialectical or not, in our opinion, needs to be treated as a separate issue, albeit an important one for further discussions.

The proof standards presented above and the weights assigned by the audience to the arguments can at least arguably be taken to represent a way of thinking characteristic of systems of legal reasoning, such as adopted in the common law. But there can also be a philosophical justification offered for supporting the use of standards of proof in epistemology. People who take this approach are generally categorized as qualified skeptics, who take the view that no claim can be proved beyond all doubt, even a claim based on an immediate perception, such as 'I now see a red light in front of my face'. On this skeptical view, what determines whether a claim is justified is the weighing of the pro and con arguments as evidence is collected and evaluated during a procedure of asking and answering critical questions. For acceptance of the claim to be rationally justified, the pro arguments have to be stronger than the con arguments against it to a degree stipulated at the opening stage of the inquiry. This degree of required strength for an argument to be a proof is called the standard of proof.

Carneades the ancient philosopher was a qualified skeptic who held the view that no argument is conclusive in the sense that it proves its conclusion beyond all doubt. As skeptical philosophers such as Carneades have long argued, even the argument "I now see a red light in front of my face, therefore there is a red light in front of my face" might turn out not to prove its conclusion beyond all doubt, even granting that its premises are accepted as true. For the qualified skeptic, there can be conclusive arguments, provided a conclusive argument is defined as one that meets its standard of proof, perhaps even the very high standard of beyond reasonable doubt. According to the qualified skeptic, this is the highest standard that can be met by real arguments. In other words, according

to this viewpoint, a conclusive argument should not be defined as one that proves its conclusion beyond all doubt, for this is a standard of proof that fallible agents can never attain.

The proof standards modeled thus far in CAS do not compare the set of pro arguments against the set of con arguments, but rather only compare each pro argument against each con argument. Summing the weights of arguments to check if the sum of the weights of the pro arguments outweigh the sum of the weights of the con arguments only makes sense if the arguments are independent, to avoid double counting. CAS can be easily extended with further proof standards for comparing sets of pro and con arguments, but users would need to take responsibility to assure that these proof standards are used only when the arguments are independent.

These issues are discussed more thoroughly in (Gordon and Walton, 2009). More could be said about how to model Wellman's lawn-mowing example. For example we could put in an enthymeme stating that lawn-cutting would leave no time for movie-going, and so forth. But basically CAS can handle the pro-contra aspect, however you decide on the details or put in more information about what the propositions the audience accepts, how they weigh the arguments, and what proof standards are required.

9. Conclusion

Have we proved that CAS allows for a representation of all informal logic-based arguments? Our answer is that we do not claim to have proved this, since not all of the ten characteristics have been successfully modeled, at least not in a way which would meet with broad consensus. This applies in particular to the characteristic of relevance. As stated at the beginning, our proof of progress towards the goal of formalizing informal logic is premised on the assumption that these ten characteristics are adequate. If one does not accept this assumption, one need not accept our claims. However, if you read our paper as a discussion of whether any formal system (particularly CAS) can fulfill the ten postulated require-

ments, it is much more interesting as a way forward to finding the relationship between formal models of argumentation of the kind currently being in artificial intelligence and informal logic as practical set of tools for helping users identify, analyse and evaluate real arguments of the kind all of us have to deal with every day in our professional work and education, and indeed in all daily life.

Reconstructing arguments found in a text of natural language discourse is an informal logic skill that often requires an ability to grasp all kinds of subtle nuances such as implicit premises and Gricean implicature. This kind of skill can be enhanced by teaching students to use such informal logic tools as argument diagramming and argumentation schemes. Using a computational tool such as CAS will not automatically analyze or evaluate arguments in natural language texts by itself (autonomously), replacing the need for such skills to be taught. But it can help users carry out such tasks of critically assessing arguments as (1) testing whether the argument supposedly identified in a natural language text fits an argumentation scheme, (2) finding implicit premises need to make the given argument fit the scheme, (3) asking appropriate critical questions matching this scheme, and (4) determining which claims are acceptable by using input concerning assumptions the audience presumably accepts.

Hence a formal argumentation system such as CAS is not an automated informal logic that can be mechanically applied to evaluate an argument without relying on the intuitions of a human user, or on using linguistic markers such as argument indicator words and the like. Nevertheless, as shown in this paper a formal and computational argumentation system such as CAS, because it has a well-defined logical structure that is applicable to the concepts and tasks characteristic of informal logic, does offer a formalization of informal logic. This has been proved by showing how the logical structure of CAS applies to key characteristics of informal logic as a working discipline designed to carry out specific tasks.

In this paper we formulated ten characteristics of informal logic, based on at least some of the literature that has attempted to set them out in an orderly and clear manner, and showed why they are identifiable with the discipline of informal logic as a school of thought and methodology for logic. We have made our case that CAS can model all of these characteristics within its formal structure. We do not claim that CAS is the only formal argumentation system that can formalize informal logic, but we also hope we have shown that it might have some advantages for doing it in a useful way that can be applied to "real" arguments. Even though in this paper we did not use CAS to model the argumentation in a fairly large real case, this work has already done elsewhere, for example in (Walton, 2013).

The weakest link in our chain of argumentation is our hypothesis that CAS can be used to model relevance. We admit this claim requires further research. According to Johnson (2009, 29) although there have been many attempts to develop a theory of relevance, none of them has been entirely successful. However, he also added (29) that sufficiency is the RSA criterion that has received the least attention, and that is where CAS is the strongest. We claim that a strong point of CAS is its use of proof standards to evaluate arguments. This move is unusual in logic and epistemology, fields that have long suffered from their failure to use proof burdens and standards to determine when defeasible argumentation can be closed off.

There remain some differences of opinion within the informal logic community on three key issues. One is how to define a conductive argument. A second one is whether conductive argument is essential for informal logic. In answer to an email query of mine (Sept. 12, 2012), Ralph Johnson agreed with the definition of conductive argument as evaluating argumentation by taking into account the arguments for some contested claim as well as the arguments against it, and weighing the one side against the other. He also agreed that this type of argument was characteristic of informal logic. Tony Blair (also on Sept. 12, 2012) had a different

approach. He specified a conductive argument as one where the arguer has decided (or already determined) that the arguments for the claim in question are good reasons for accepting it, and has also decided that the arguments against the claim in question are good reasons for rejecting it, but none on either side is decisive, and the strength of the combined arguments for accepting the claim outweighs the strength of the combined arguments for rejecting it. He remarked that he didn't see a commitment to conductive arguments as essential for informal logic. These matters might be clarified in Blair's OSSA paper on conductive argument.

The third issue is whether informal logic is dialectical. CAS argument graphs are evaluated in stages of dialogue, as indicated in the last example. Modeling shifts in the burden of proof in real arguments, we have argued using the last example, is part of the process of rational argumentation in dialogues that in our opinion, should also be a characteristic of informal logic. However, there are some in the informal logic community, and very many in the formal logic and epistemology communities, who might disagree that evaluating an argument requires reference to a conversational (dialogue) setting. On this point there appears to be a difference of opinion in the informal logic community. Some accept dialogue structures as useful tools for informal logic methodology, while others appear reluctant to do so. As noted in section 8, it is unclear to us how the issue of the role of dialogue in informal logic is related to the issue of whether or not informal logic can be formalized. These need to be treated as separate (orthogonal) issues for the purpose of this paper, given that we have shown that informal logic can be formalized, no matter what position one takes on the issue of the role of dialogue in informal logic.

Acknowledgements

Both authors would like thank the Social Sciences and Humanities Research Council of Canada for In- sight Grant 435-2012-0104 that supported the work in this pa- per.

References

Adler, J.E. (2013). Are conductive arguments possible? *Argumentation* 27, 245-257.

Atkinson, K., Bench-Capon, T. J. M. and McBurney, P. (2006). Computational Representation of Practical Argument, *Synthese*, 152 (2), 157-206.

Ballnat, S. and Gordon, T. F. (2010). Goal Selection in Argumentation Processes, *Computational Models of Argument: Proceedings of COMMA 2010*, ed. P. Baroni, F. Cerutti, M. Giacomin and G. R. Simari, Amsterdam, IOS Press, 51-62.

Besnard, P., Garcia, A., Hunter, A., Modgil, S., Prakken, H., Simari, G. and Toni, F. (2014), Introduction to Structured Argumentation, *Argument & Computation*, 5(1), 1-4. DOI: 10.1080/19462166.2013.869764

Barth, E. M. and Krabbe, E. C. W. (1982). *From Axiom to Dialogue*. Berlin: de Gruyter.

Bin W. & Prakken, H. (2012). Determining the Structure of Arguments with AI Models of Argumentation. *Proceedings ECAI-12 Workshop on Computational Models of Natural Ar– gument*. Montpellier, France, 2012, to appear with Springer.

Blair, J. A. (2001). Walton's Argumentation Schemes for Presumptive Reasoning: A Critique and Development, *Argumentation*, 5, 365-379.

Blair, J. A. (2012). *Groundwork in the Theory of Argumentation*. Dordrecht: Springer.

Blair, J.A. (2013). Are conductive arguments really not possible? In *Virtues of Argumentation. Proceedings of the 10th international conference of the Ontario Society for the Study of Argu-*

mentation (OSSA), 22-26 May 2013, ed. D. Mohammed and M. Lewiński, 1-13. Windsor, ON: OSSA.

Blair, J. A. and Johnson, R. H. eds. (2011). *Conductive Argument: An Overlooked Type of Defeasible Reasoning*. London: College Publications.

Copi I. and Cohen, C. (1990). *Introduction to Logic*, 8th ed. New York: Macmillan.

Dung, P. (1995).On the Acceptability of Arguments and its Fundamental Role in Nonmonotonic Reasoning, Logic Programming and n-person Games, *Artificial Intelligence*, 77(2), 321–357.

Freeman, J. B. (1998). What Sorts of Statements Are There? A Philosophical Look at Stasis Theory, Argumentation & Rhetoric. *Argumentation & Rhetoric*. CD-Rom. Edited and produced by Hans V. Hansen and Athena Colman. St. Catharines, Ontario. OSSA, August, 1998, 1-15. Downloaded from this site on January 26, 2015: http://scholar.uwindsor.ca/cgi/viewcontent.cgi?article=1883&context=ossaarchive

Gordon, T. F. (2010). The Carneades Argumentation Support System, *Dialectics, Dialogue and Argumentation*, ed. C. Reed and C. W. Tindale, London: College Publications.

Gordon T. F. and Walton, D. (2006). The Carneades Argumentation Framework, *Computational Models of Argument: Proceedings of COMMA 2006*, ed. P. E. Dunne and T. J. M. Bench-Capon. Amsterdam: IOS Press, 195-207.

Gordon, T. F., H. Prakken, and D. Walton (2007). The Carneades Model of Argument and Burden of Proof, *Artificial Intelligence* 171: 875–96.

Gordon, T. F., and Walton, D. (2009). Proof Burdens and Standards. In *Argumentation in Artificial Intelligence*, I. Rahwan

and G. Simari, Eds. Springer-Verlag, Berlin, Ger- many, 2009, 239-260.

Gordon, T. F., and Walton, D. (2011). A Formal Model of Legal Proof Standards and Burdens. In *7th Conference on Argumentation of the International Society for the Study of Argu- mentation (ISSA 2010)* (Amsterdam, 2011), F. van Eemeren, B. Garssen, J. A. Blair, and G. R. Mitchell, Eds., no. 1969, Sic Sac, 644-655.

Hohmann, H. (1989). The Dynamics of Stasis: Classical Rhetorical Theory and Modern Legal Argumentation, *American Journal of Jurisprudence*, 34, 1989, 171-197.

Johnson, R. H. (2006). Making Sense of Informal Logic, *Informal Logic,* 26(3), 231-258.

Johnson, R. H. (2009). Some Reflections on the Informal Logic Initiatives, *Studies in Logic, Grammar and Rhetoric,* 16 (29), 17-46.

Johnson, R.H. and J.A. Blair. (1977). *Logical Self-Defense*. Toronto: McGraw-Hill Ryerson.

Kienpointner, M. (1997). On the Art of Finding Arguments: What Ancient and Modern Masters of Invention Have to Tell Us about the *Ars Inveniendi*, *Argumentation*, 11 (2), 225-236. McFadden, P. M. (1988). The Balancing Test, *Boston College Law Review*, 29(3), 585-656.

S.J. Modgil & H. Prakken (2014). The ASPIC+ Framework for Structured Argumentation: a Tutorial. *Argument and Computation*, 5, 31-62. http://www.cs.uu.nl/groups/IS/archive/henry/ASPICtutorial.p df

Pollock, J. L. (1995). *Cognitive Carpentry*. Cambridge, Mass.: The MIT Press.

Prakken, H. (2010). An Abstract Framework for Argumentation with Structured Arguments. *Argument and Computation* 1, 93-124.

Prakken, H. (2011). An Overview of Formal models of Argumentation and their Application in Philosophy. *Studies in Logic*, 4(1), (2011):65-86. http://www.cs.uu.nl/groups/IS/archive/henry/china11.pdf

Scheuer, O., Loll, F., Pinkwart, N. and McLaren, B. M. (2010). Computer-supported Argumentation: A Review of the State of the Art, *Computer-Supported Collaborative Learning*, 5 (1), 43–102.

Tindale, C. W. (1999). *Acts of Arguing: A Rhetorical Model of Argument*. Albany: State University of New York Press.

Verheij, B. (2003). Dialectical Argumentation with Argumentation Schemes: An Approach to Legal Logic, *Artificial Intelli- gence and Law*, 11, 167-195.

Verheij, B. (2005). *Virtual Arguments. On the Design of Argument Assistants for Lawyers and Other Arguers.* The Hague: TMC Asser Press.

Walton, D. (1996). *Argument Structure: A Pragmatic Theory*. Toronto: University of Toronto Press.

Walton, D. (2004). *Relevance in Argumentation*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Walton, D. and Gordon T. F. (2012). The Carneades Model of Argument Invention, *Pragmatics & Cognition,* 20(1), 1-31.

Wellman, C. (1971). *Challenge and Response: Justification in Ethics*, Carbondale, Southern Illinois University Press, 1971.

IV

Former Walton Students and Collaborators

1.

Fallacy overlap and the pragmatics of fallacies

Fabrizio Macagno

Abstract: A logical or argumentation theory should provide clear criteria for distinguishing between types of arguments and fallacies. Fallacy overlap, namely the possibility of classifying a case under two distinct fallacies, poses a substantial challenge to the systematicity and theoretical and practical reliability of a theory. However, despite its central role in testing the acceptability of a theory, this analytical dilemma is normally not even taken into account. Walton devoted one of his earliest papers to this problem, which fully represents and illustrates the basic challenge underlying all his work: analyzing real arguments and testing the limitations of his theory against the complexity of everyday argumentation. By addressing the puzzle of fallacy overlap tackled by Walton – a case that can be both considered as an instance of *petitio principii* and post hoc – it is possible to bring to light the reasons of his pragmatic approach to arguments and fallacies and show how it can be used to solve such dilemmas.

A theory of argument needs to provide tools for identifying arguments and their possible problems – either weaknesses or manipulative uses. More importantly, such a theory needs to set out criteria for *distinguishing* between distinct arguments and fallacies. Thus, cases that seem to involve more than one fallacy, or that can be explained equally well in terms of more than one fallacy, pose a substantial challenge to any attempt to account for fallacies, both at a theoretical and practical level. This phenomenon is referred to as "fallacy overlap;" however, despite its crucial and extremely dangerous role for any logical or argumentation theory, it is very little taken into account – or more precisely, almost

ignored. Walton devoted one of his earliest papers to this problem. The pragmatic approach to arguments and fallacies that he developed in his dozens of volumes and hundreds of books can solve it. However, the cost that came with it was extremely high: challenging the traditional logical approach, and proving that the alternative that he was proposing was actually able to explain real-life uses of argument in a systematic, non-subjective way (Walton 1984, p. 3).

Fallacy overlap and the dilemmas of real arguments

One of the clearest insights into Walton's challenge of designing a theory for the analysis of real arguments and fallacies is a paper devoted to the so-called "fallacy overlap." Some cases can be classified as falling equally well in distinct fallacies, and for this reason they pose a problem for the logic of fallacies, and an issue for their assessment. A very clear case is the following (Woods and Walton 1984, p. 5):

Example 1: The bus route case

> The residents of an outlying suburb take forward a plebiscite to City Hall in favor of improving the bus service in their neighborhood. City Hall replies: "Why should we add more buses when the ones currently assigned to that route are operating at a deficit because not enough people are using them?" The residents […] suggest that it is for the very reason that the present service is so poor that nobody takes the bus. Nobody takes the bus because the present service is poor!

Walton underscored that this excerpt seems to involve a *petitio principi*: the City Hall grounds its conclusion that "the bus service should not be improved" (C) on the premise that "the bus service is underused" (P), while the residents attack it claiming that it is because of the non-improvement that the service is underused (not-C, therefore P). However, this case also involves a post-hoc fallacy: it is a causal circle as a correlation between two states of

affairs (1. bus service underused and 2. bus service in poor conditions) is taken for granted as causal, but the direction of this causal relation (1 → 2 vs. 2 → 1) is not shared (Woods and Walton 1977).

This example poses a dilemma, and shows how, when faced with real examples, the distinctions used in logical textbooks are extremely problematic, as the clear theoretical boundaries seem to overlap and the definitions be of little use for classification purposes. However, this case can be also used for illustrating the explanatory power of Walton's theory, as its analysis involves all the instruments that he developed in his work.

Petitio principii and acceptability

This analytical dilemma brings to light all the limitations of the traditional logical approach that Walton challenged, starting with the account of *petitio principii*. According to Walton, classical logic cannot explain this fallacy for four different reasons. First, first-order logic takes for granted its data, without providing criteria for identifying arguments (Walton 1980, p. 46). However, the distinction between arguments and explanations is essential for determining whether the very concept of fallacy applies, as in the following case (Walton 1994):

Example 2: The economic slump

> When asked to prove that the economy in a certain state is in a slump, an economist replies: "A lot of people are leaving the state. Things are very poor in the building industry, for example, because there is no need for new housing." Next question: "How can you show that people are leaving the state?" The economist's answer: "Well, the state of the economy is poor. People just don't seem to be able to get jobs, with the economy being so slow at the moment."

The first step in the analysis of this reasoning should be the determination of its goal: the economist is explaining the possible causes of a phenomenon, not arguing in favor of a possible pre-

diction. Thus, he may be simply reporting the circularity of human behavior that exacerbates the economic crisis. Without taking into account what a move or sequence is for – namely without considering its pragmatic purpose (Walton 1990) –, it is impossible to establish whether it is an argument, and thus a fallacy, or when an argument simply mirrors a causal circle that characterizes human actions (Walton 1991, chap. 7).

The second limitation of classical logic is the failure to provide a procedure for distinguishing between premises and conclusions. Why should a proposition be considered as a premise in an argument? This question highlights another fundamental problem affecting the analysis of question begging. If this fallacy is defined by either the equivalence between the premise and the conclusion (*p*, therefore *p*) or the mutual dependency between premise and conclusion (P, therefore C, and C, therefore P), the mere assessment of the truth conditions and the relationship between premise and conclusion makes this reasoning perfectly valid (Walton 1994). Moreover, if a classical disjunctive syllogism is advanced (P V Q, ¬P, therefore Q), but the speaker's goal is to establish P V Q by using Q by implication (Q → P V Q), a *petitio principii* is committed. However, if not criteria are provided for distinguishing premises from conclusion, and the notion of "linked" argument is not accounted for, this fallacy is not detected in this case (Walton 1980, p. 43). Finally, this fallacy cannot be explained also if we consider the perspective of intensional logic. As Walton put it, "a proposition '*p* or *q*' is put forward intensionally when one knows that one, at least, of *p*, *q* is so, but does not know which" (Woods and Walton 1975, p. 110). Thus, a disjunctive syllogism of the kind "*p* or *q*; *p*; therefore, *not q*" seems to be either epistemically circular or self-contradicting (indefensible): either I know already that not *q*, as I know that *p* and *p or q*, or at the same time I both commit myself to *p* (minor premise) and not commit to *p* (disjunctive premise). A similar treatment would make deductive arguments or the use of definitions necessarily circular (Woods and Walton 1975, pp. 119–23).

The third criticism is strictly related to the aforementioned problem of identifying the premises and the conclusion of an argument, and concerns the relationship between arguments, or argument chains. Without mapping the structure of interdependencies between the arguments in a text, it is impossible to determine whether a conclusion rests solely on a premise that is "begged" or instead is grounded on other independent premise, which breaks the circle. Thus, as Walton underscored, the lack of the representation of the complex argumentative structure results in the failure to distinguish between a clear case of *petitio principii* (scenario 1 in Figure 1) from an acceptable argument (scenarios 2 and 3).

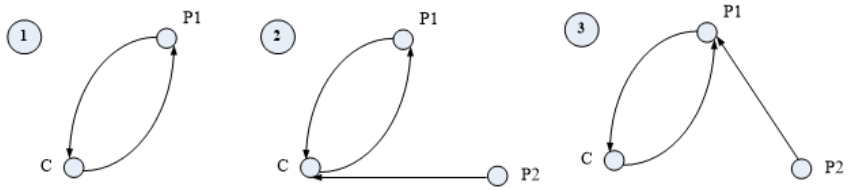


Figure 1: Argument graphs in petitio principii

A last criticism concerns the nature of the inference. Classical logic does not provide instruments for determining how a conclusion follows from a premise, especially when the conditional (if any) is not explicit. Thus, it is virtually always possible to defend an argument presented as deductive as merely inductive or plausible. Without an account of the relationship between premises and conclusion, it is hard to spot the circularity of the following argument (Walton 1991, chap. 7):

Example 3: The true love

> Paul maintains the claim that true love never ends in separation or divorce; however, when he is presented with examples of true love followed by divorce, he insists that such cases were not cases of true love.

Here, Paul's circularity depends on the definitional nature of his claim, which allows him to exclude any contrary evidence. How-

ever, if the claim were merely empirical, the argument would be deceiving, but not circular. To address the *petitio principii*, Walton had to provide a new account of argument, which could account for the different dimensions of this fallacy.

The pragmatic intrusion and petitio principii

The challenges of real arguments and the failure of classical logic to explain a fallacy such as the *petitio principii* led to a new concept of argument, characterized by a fourfold pragmatic intrusion – namely the inclusion of contextual, pragmatic aspects in the concept of argument.

The first pragmatic dimension is the dialogical one, which was developed from Hamblin's formal dialectical approach. Hamblin's challenge was the same: he intended to move beyond a view of argument defined as a "set of propositions" to account for *ad hominem* fallacies, question-begging, or the distinction between arguments and explanations (Hamblin 1970, p. 225). To this purpose, he analyzed arguments and fallacies considering their "dialectical" dimension, namely the shared (and formalizable) rules governing a dialogue (Hamblin 1970, p. 256). Logic was regarded as a part of dialectics, as representing "a set of dialectical conventions." Walton developed in detail the different dimensions that in Hamblin were reduced to dialectical rules. However, his program was radically different, as it was focused on real dialogues, which can be hardly captured by formal dialectical systems. Hamblin's ideal rules needed to be replaced by dialogical conventions (Walton 1984, p. 3) that differ according to the interlocutor's joint and individual goals defining the difference between a dialogue such as a persuasion dialogue from a quarrel, an inquiry, or a deliberation (Krabbe 2003; Macagno and Bigi 2017; Walton 2010; Walton and Krabbe 1995, p. 66).

The second crucial dimension of pragmatic intrusion concerns the nature of premises and conclusions. Based on Aristotle's theory of argument, Walton pointed out that arguments rest on premises

need to be more acceptable than the conclusion (Walton 2004; Woods and Walton 1972). Premises have a specific pragmatic function, which consists in throwing their probative weight onto a conclusion when the argument is structurally correct (Walton 1994, p. 119; 2004, p. 140). Thus, the distinction between premises and conclusion is drawn at a purely pragmatic level – and not only at an epistemic one as maintained by Aristotle (Walton 1980, p. 52). The acceptability of a premise can be grounded on the previous dialogical contexts, or inferred from the "common ground," i.e., propositions commonly shared among a community or, Aristotelian terms, "presumed to be true, or thought to be true by the wise or some other source" (Walton 1984, p. 3).

Third, the relationship between premises and conclusion can be represented according to different roles that they can play in a discussion. Conclusions can become premises of further arguments, and the premises can be backed by evidence and be connected to other premises in linked or convergent structures. Thus, to analyze an argument it is necessary to represent the network of probative relations in which a conclusion is placed (Walton 1980, pp. 48–51).

Finally, from a logic-semantic perspective, the (argumentative) relationship between premises and conclusion is not merely a truth-conditional operator (the logical conditional) but a semantic connection (Walton 1979a; Woods and Walton 1977). Interpreting the Aristotelian notion of *topos* and its medieval development (*loci*)(Abaelardus, *Dialectica*; Bird, 1960), Walton underscored how inferences are grounded on specific warrants that represent commonly accepted relations between the properties of the premises and the ones of the conclusion, such as causation, similarity, authority, or the semantic ones (definition, genus…)(Walton 1979b, p. 5). This "semantic relatedness" was later developed in the notion of argumentation scheme to account for the prototypical combinations of semantic relations and logical rules or axioms that characterize the most common natural arguments (Macagno and Walton 2015; Walton et al. 2008).

These four pragmatic principles can explain the mechanism of question begging. The fallacy is described as a pragmatic failure of supporting a conclusion through a premise that is more acceptable and able to increase its probative weight. This pragmatic probative function can be fulfilled in different ways: the premise can be grounded on stronger evidence, be presumably stronger, or, in case of circular arguments, be backed by a further premise or combined with an independent one. Moreover, the commonly accepted semantic relation between premises and conclusion can help determine the probative weight of a premise – and ascertain whether a premise can be presumed to be definitional or merely as an empirical statement.

However, the determination of a question-begging fallacy depends primarily on the context of dialogue to which the argument belongs. In explanatory context, expert systems, some contexts of interrogation or examination, circular arguments can be acceptable, as they fulfill a specific dialogical function, such as representing causal connections or forcing the commitment to a specific proposition (Walton 1991, chap. 7). Even in persuasion dialogue circular arguments can be useful when the goal is to reveal a speaker's reliance on premises of which s/he was unaware. Walton's account of "context of dialogue" includes also the crucial dimension of common ground, which is the basis for establishing the acceptability or probative force of a premise. The same circular argument ("God is benevolent because God has all the virtues") is a clear instance of question-begging if the interlocutor is a non-believer (and thus does not share the acceptability of any premise taking for granted the existence of God), but a perfectly sound argument in a discussion between believers (who may be uncertain of the conclusion but cannot dispute the premise) (Walton 1994, p. 128).

Fallacy overlap and argument dimensions

The different dimensions of an argument can be used for analyzing Example 1, starting with the identification of the context of dialogue and the parties' commitments (Walton 1998, pp. 249–52). The dialogue is clearly a deliberation dialogue, in which the intervening parties have different goals (improving the quality of life vs. reducing the city expenses) that can become incompatible. Their positions are opposed: while the residents claim that the bus service needs to be improved, the City Hall maintains that it needs to be kept as it is. These conclusions are practical, namely aimed at supporting a commitment to a course of action, and so are the arguments that can be provided to ground them. In this example, there are no appeals to external authorities or sources, and for this reason the possible argumentation schemes that can capture this excerpt are limited to the ones represented in Figure 2 below (Macagno and Walton 2015).

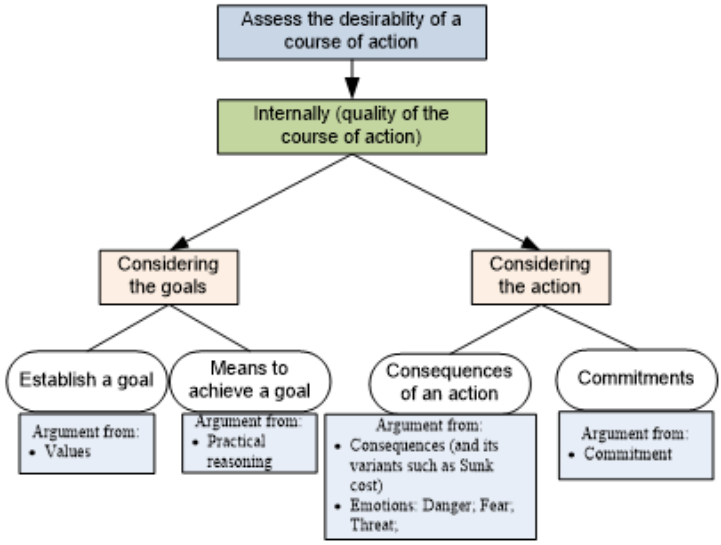


Figure 2: Internal practical arguments

In particular, the City Hall's argument consists in three connected argumentative steps, each instantiating a different argumentation scheme. First, the conclusion that "No buses shall be added to the route" is grounded on the consequences of its hypothetical improvement, namely no benefits for the citizens and higher costs for the City Hall. This argument can be represented as an argument from consequences (Walton et al. 2008, p. 332):

Argumentation scheme 1: Argument from consequences

Premise 1	If Agent *A* (*City Hall*) brings about *B* (*increases the number of buses*), then *C* (*no benefits for the population and higher costs for the city*) will occur.
Negative consequence premise	*C* is a bad outcome (*City Hall is committed to minimize costs and increase the citizens' benefits*), and bad outcomes should *avoided* by not bringing about their causes.
Conclusion	Therefore, *B* should not/should (practically speaking) be brought about.

However, this scheme rests on the consequence C ("more buses will bring no benefits for the population"), which is a prediction. For this reason, it needs to be supported by further other arguments. The first is a partially explicit argument from best explanation (Walton et al. 2008, p. 171):

Argumentation scheme 2: Argument from best explanation

Premise 1	*F* (*not enough people are using the bus route*) is a finding or given set of facts.
Premise 2	*E* (*people do not like/need buses*) is a satisfactory explanation of *F*.
Premise 3	No alternative explanation *E'* given so far is as satisfactory as *E*.
Conclusion	Therefore, *E* is plausible, as a hypothesis (*in this city, people do not like/need buses*).

In Example 1, premise 2 (and the corresponding best explanation) is left implicit in the argument, and implicitly used for supporting a further predictive argument from cause to effect (Walton et al. 2008, p. 168):

Argumentation scheme 3: Argument from cause to effect

Premise 1	Generally, if *A* (*people do not like (need) buses IN GENERAL*) occurs, then *B* (*people do not use buses in any circumstance in the future*) will (might) occur.
Premise 2	In this case, *A* occurs (might occur).
Conclusion	Therefore, in this case, *B* will (might occur).

The causal (predictive) argument is clearly grounded on the only premise that can justify the conclusion (more buses will not increase the people's use thereof). However, this premise can be hardly accepted by the residents, who challenge both the best explanation and the following causal argument. The overall argument structure can be represented in the following Figure 3.

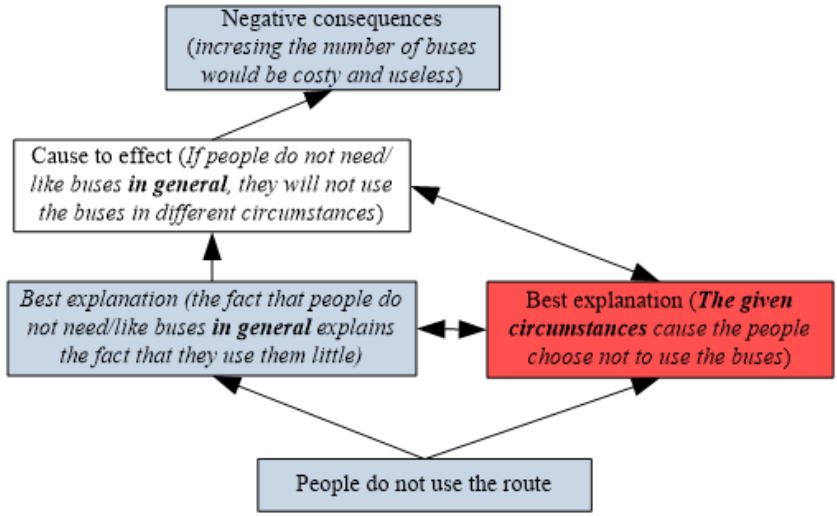


Figure 3: Argument structure of Example 1

The problem now is to establish the type of fallacy committed by the City Hall, as the residents move a specific attack that rebuts the argument from best explanation and undermines both the argument from cause to effect and the one from consequences. Is this a case of fallacy overlap? What is a fallacy overlap, precisely?

A possible solution can be found in Walton's dimensions of an argument. At an epistemic level, the residents' challenge targets the foundation of the best explanation: the bus route is underused because the citizens do not like the bus; however, the only way to establish the premise is the conclusion itself (citizens do not like the bus because they do not use the bus route). At a logical and semantic level, it is clearly a post-hoc: the residents' challenge can be interpreted as an attack to the causal connection (the citizens' choice not to use buses causes their underuse – and their scarce number) claiming that the two facts (there are few buses; citizens choose not use them) are linked by an opposite causal relation (it is the scarce number of buses that causes the citizens' choice to underuse them).

These two explanations, however, seem to be at the same time partial and involving additional interpretative elements. First, both fallacies involve extra assumptions. The residents do not claim that the City Hall's explanation is circular, but simply that it is unacceptable because the best explanation is radically different. Moreover, the City Hall is not claiming that he buses are few because the residents are not using them, but that the residents choose not to use the existing service. Second, the residents' challenge does not merely point out a circularity in the opponents' argument, but rather provide a ground for reaching the opposite practical conclusion. Additionally, the claimed circularity concerns an explanation, and in this perspective the residents' challenge seems to suggest that the explanation is incomplete, as the explanandum involves a twofold causal relationship (less use, then less buses; less buses then less use). However, this is not the accusation that they are making. Moreover, the different causal relation that they propose is not merely rebutting a cause-to-effect argument, but a best explanation. Finally, both fallacies fail to explain the other dimension of a fallacy, namely the cause of its deceit (Walton 1994, p. 120). By claiming that the argument is circular or involves a false cause cannot explain why the City Hall's argument can deceive the citizens.

The best explanation of this example can be found at the level that defined Walton's approach to arguments and fallacies, namely the dialogical one. The residents are challenging that the premises (commitments) on which the City Hall's best explanation is provided are different from the ones commonly accepted. Both parties agree that buses are underused, but the City Hall ignores a fundamental qualification, namely that the buses are scarce. This qualification affects the explanatory generalization, which is presented in terms of a general behavior (preference) of the residents (they do not like buses in general), and not a reaction to a very specific circumstance (they cannot use an ineffective service). The commitments are similar, but the City Hall distorts what is commonly accepted by omitting the relevant and essential qualification, committing a *secundum quid* (Macagno 2022). This analysis

can account for both the epistemic level without resorting to an accusation of circularity, and the semantic one without modifying the structure of the argument.

Conclusion

The "fallacy overlap" is a crucial challenge for argumentation theory. Unless clear criteria are defined for distinguishing between fallacies and their identification, it is hard to develop tools that can be used for analyzing real-life argumentation. Walton pointed out the problem, and his theory can provide the instruments for solving it. In particular, in the fallacy overlap case he detects a crucial manipulative move, the *petitio principii*, which reveals all the complexity and depth of his thought. The question begging sophism brings to light the different aspects of his challenge to traditional logic, and the distinct pragmatic dimensions of his approach to arguments.

Arguments are pragmatic for their dialectical, epistemic, dialogic, and semantic dimensions, which crucially involve the interlocutors' common or shared knowledge, the context of their conversational activity, and the presumptions governing their behavior. Fallacy overlap can be explained in this perspective by considering not only the different argumentative steps that a complex argument may involve, but also the best explanation of how a deceptive tactic affects the distinct argumentative dimensions. In this sense, there is no fallacy overlap: either more than one argument is involved in an argumentative excerpt, or a fallacy can explain better than the other how the argumentative context is manipulated.

References

Abaelardus, Petrus. 1970. *Dialectica*. Assen, Netherlands: Van Gorcum.

Bird, Otto. 1960. The formalizing of the topics in mediaeval logic. *Notre Dame J. Form. Log.* 1(4):138–49.

Hamblin, Charles Leonard. 1970. *Fallacies*. London, UK: Methuen.

Krabbe, Erik. 2003. Metadialogues. In *Anyone who has a view*, eds. Frans van Eemeren, Anthony Blair, Charles Willard and Francisca Snoeck Henkemans. Dordrecht, Netherlands: Springer.

Macagno, Fabrizio. 2022. Secundum quid and the pragmatics of arguments. The challenges of the dialectical tradition. *Argumentation*.

Macagno, Fabrizio and Sarah Bigi. 2017. Analyzing the pragmatic structure of dialogues. *Discourse Stud.* 19(2):148–68.

Macagno, Fabrizio and Douglas Walton. 2015. Classifying the patterns of natural arguments. *Philos. Rhetor.* 48(1):26–53.

Walton, Douglas. 1979a. Relatedness in intensional action chains. *Philos. Stud.* 36:175–223.

———. 1979b. Ignoratio elenchi: The red herring fallacy. *Informal Log.* 2(3):3–7.

———. 1980. Petitio principii and argument analysis. *Informal Log. first Int. Symp.* Inverness, CA: Edgepress.

———. 1984. What Is Logic About? *Informal Log.* 4(1):2–4.

———. 1990. What is reasoning? What is an argument? *J. Philos.* 87:399–419.

———. 1991. *Begging the question: Circular reasoning as a tactic of argumentation*. Westport, CT: Greenwood Press.

———. 1995. *A pragmatic theory of fallacy*. Tuscaloosa, AL: University of Alabama Press.

———. 1998. *The New Dialectic. Conversational contexts of argument*. Toronto, ON: University of Toronto Press.

———. 2004. Classification of fallacies of relevance. *Informal Log.* 24(1):183–85.

———. 2009. Dialectical shifts underlying arguments from consequences. *Informal Log.* 29(1):54–83.

———. 2010. Types of dialogue and burdens of proof. *Comput. Model. Argument*. Amsterdam, Netherlands: IOS Press.

Walton, Douglas and Erik Krabbe. 1995. *Commitment in dialogue*. Albany, NY: State University of New York Press.

Walton, Douglas, Christopher Reed and Fabrizio Macagno. 2008. *Argumentation schemes*. New York, NY: Cambridge University Press.

Walton, Douglas N. 1994. Begging the question as a pragmatic fallacy. *Synthese*. 100(1):95–131.

Woods, John and Douglas Walton. 1972. On Fallacies. *J. Crit. Anal.* 4(3):103–12.

———. 1975. Petitio principii. *Synthese*. 31(1):107–27.

———. 1977. Post hoc, ergo propter hoc. *Rev. Metaphys.* 569–93.

———. 1984. Puzzle for Analysis: Find the Fallacy. *Informal Log.* 1(2):.

2.

Informal Logic: Contrasting the Waltonian and Windsor Approaches

David M. Godden

Informal Logic: A Canadian Approach to Argument

It has been claimed that informal logic is usefully viewed as a distinctively Canadian approach to argument (Puppo 2019, 2020).[1] Such a distinction, for example, is helpful in marking differences not only between informal and formal logic, but between informal logic and other non-formal approaches to the study of argument, like critical thinking, forensics and debate, and communication-theoretic approaches—since the origins of these programs are to be found elsewhere. Yet, to whatever extent that's so, it should be added that there are (at least) two distinctively Canadian approaches to the informal logic of argument.[2] The first, which might be called the "Windsor-centric approach," had its beginnings in the work of Ralph Johnson and J. Anthony Blair in the early 1970s—work which was first canonized in their 1977 textbook *Logical Self Defense*.[3] Contrastively, the second could be

1. The discussion offered in this paper draws upon the author's work as it appears in Walton and Godden (2007), Godden, Groarke, and Hansen (2011), and Godden and Wells (2022).

2. Arguably, Sharon Bailin and Mark Battersby's inquiry-based method constitutes a third, independent approach.

3. Within the "Windsor-centric approach" I mean to include more than merely those prominent informal logicians at the University of Windsor. While, over the years,

called the "Winnipeg approach," although a more just and accurate nomenclature would label it the "Waltonian approach."

Much of the history of informal logic, as it emerged in Canada, has already been told. Starting in 1980 and continuing to the present, Blair and Johnson regularly published "state of the discipline" papers (1980, 1985, 1987b, 1994, 2000, 2002; Blair 2009, 2015, 2019) which not only reflected on recent advances in the field and speculated as to its future prospects, but carefully recounted its development. These primary sources have been supplemented by the extensive and commendable historical work of Takuzo Konishi (2009, 2011, 2016a, 2016b, 2019, 2020) and Federico Puppo (2019, 2020).

Yet, a conspicuous feature of the historicizing of Canada's informal logic movement is how Windsor-centric the story is. Largely neglected has been the Western arc of that story, and with it any serious telling of Douglas Walton's influence on the development of informal logic. Thus, the episodes in the Canadian history of informal logic that have been well-told so far might appropriately be indexed as the "Windsor chapters" of a longer story that has yet to be told in full.[4]

Part of this bias is surely due to the efforts and inclinations of those writing, and making, that history. In contrast to Blair and Johnson, Walton didn't so much write the history as make it. Rather than stop to tell us what he had done, Walton simply did it, and expected

the confluence of scholars to that program is noteworthy (beyond the founding patriarchs Ralph Johnson and Tony Blair, I think of Bob Pinto, Kate Parr, Marcello Guarini, Cate Hundleby, Hans Hansen, Chris Tindale, and Leo Groarke), there are other, equally recognizable figures—Maurice Finocchiaro, James Freeman, Michael Gilbert, Trudy Govier, and David Hitchcock all come to mind—whose academic careers were passed in Windsor's orbit without their actually having offices there.

4. By contrast, Katie Atkinson, Trevor Bench-Capon, Floris Bex, Thomas Gordon, Henry Prakken, Giovanni Sartor, and Bart Verheij (2020) have, following Walton's death that year, provided an extensive record of Walton's influence in the field of Artificial Intelligence and Law. Nothing so comprehensive will be undertaken here.

to rest of us to keep up. As Christopher Tindale wrote in *Informal Logic*'s (2020) memorial for Walton: "he imagined a future for our field and then sat down to bring it about" (2).

In this essay I seek to provide a prefatory contribution to the "Walton chapters" belonging in a complete telling of the story of informal logic in Canada. In order to do so, I offer the reader a survey of Walton's approach to informal logic, by roughly tracing out its contours and early development. I present this story in relief of an even more cursory overview of the Windsor approach, so as to illuminate some of the distinctive features of Walton's approach. I conclude by considering some of the ameliorative efforts undertaken on behalf of the Windsor approach to reconcile the two approaches and incorporate the basic insights motivating a Waltonian approach.

The Windsor Approach

In 1977, the same year that Daniel O'Keefe published "Two concepts of argument," and two years after Wayne Brockriede advised that "people will find arguments in the vicinity of people," Ralph Johnson and J. Anthony Blair first published their pivotal text *Logical Self Defense*. There, they characterized the new field of informal logic as follows:

> By 'informal logic,' we mean to designate a branch of logic whose task is to develop non-formal standards, criteria, and procedures for the analysis, interpretation, evaluation, critique and construction of argumentation in everyday discourse. (Johnson and Blair 1977: 148; as quoted in their 2002: 358; cf. their 1980: 4, 2000: 95)[5]

It is salient that this vision of a new approach to logic first appears in a textbook. For, as Takuzo Konishi (2009, 2016a, 2016b) aptly

5. cf. Johnson and Blair (1994: 10-11) for a brief reflection on their developing conceptions of IL, and their (2002: 356-358) where they reject a variety of alternative conceptions of informal logic.

describes, the Windsor approach is best understood as "pedagogy-led" (2016a: 29): It offered a new perspective on logic as a discipline by reimagining the place of logic instruction in an undergraduate liberal-arts education.

"Informal logic," Blair tells us (2009: 47), "originated with the rejection of the use of formal logic for the purpose of the analysis and the evaluation of natural language discursive arguments." Johnson and Blair (2002: 340-352; cf. 1980: 5) identify three critiques which motivated the shift to an informal approach to this curriculum: The *pedagogical critique* criticized the methods of formal logic as unhelpful in analyzing everyday conversational argument. The *internal critique* criticized premise truth (best understood as epistemic certainty) and logical validity (such that the premise truth guarantees conclusion truth) as evaluative standards suitable for ordinary argument. And, the *empirical critique* criticized the idea that learning formal logic improved one's skills at ordinary reasoning and argument.

In answer to these three critiques, Johnson designed an "Applied Logic" class, which first appeared in the 1971-72 University of Windsor undergraduate calendar. Johnson explained:

> The aim of this course is to teach the student how to discriminate good arguments and bad ones. Among the topics to be considered are: the basic principles of deductive inference, the different kinds of fallacy; the nature of inductive inference; the difference between proof and persuasion. Examples will be taken not only from philosophical writings, but also from political speeches, advertising, newspapers and periodicals. (cited in Konishi, 2009: 4)

Initially, Howard Kahane's *Logic and Contemporary Rhetoric* (1971) was selected as the text for Applied Logic. Subsequently, in developing the content and materials for the class, Johnson and Blair came to develop their own text, *Logical Self Defense*.

As the title implies, informal logic is there conceived of as defense against the "dark arts" of rhetorical sophistry. Indeed, Johnson and

Blair were deliberate and insistent on this conception. Their "notes of organizational meeting for applied logic text, October 1, 1974" record the following:

> Our angle will be that we are treating that part of critical thinking that might be called "defensive thinking." This angle provides a (rough) principle of unity: everything in the text can (more or less) go under the rubric of "something you need to know to be able to think well defensively." (cited in Konishi 2009: 9)

Later the following year (1975), in responding to a review which criticized the approach in their textbook for not employing the informal method of counterexamples, Blair and Johnson reiterate this conception as their reason to not undertake the requested revisions:

> To discuss it [the method of counterexamples] would get us into territory we've deliberately avoided: strategies of logical offense. We've designed the whole text around what might be called "defensive logic"—how to avoid being taken in by others' bad logic. It would call for an entirely new section—and in fact a different orientation; a different book—to catalogue and teach the methods of logical attack. (cited in Konishi 2009: 12)

Several pivotal advancements emerged from this anti-formalist, assessor-centric, defensive approach to argument analysis and evaluation. First are the "R.S.A" cogency criteria: relevance, sufficiency, and acceptability. On the R.S.A conception, a good argument is an argument which has (1) premises acceptable to the argument's audience (typically understood as the assessing subject), (2) premises that are relevant to, or bear upon, the conclusion, and finally (3) premises that provide sufficient reason to accept the conclusion on the basis of the argument's premises. Importantly, all three criteria are to be applied from the assessor's point of view. The R.S.A. conception of cogency provides a viable evaluative alternative to the logical, consequence-based standards of necessary truth preservation (premise truth and formal entailment). Yet, the pedagogical focus of this three-part condition is

readily apparent, since, theoretically understood, relevance is a component of inferential sufficiency. Still, keeping them distinct has good instructional and heuristic value, especially when it comes to categorizing the fallacies.

A second advancement is a re-centering of the fallacies in argument evaluation. The fallacies promise to provide a topoi of characteristically deceptive patterns of argument—patterns of reasoning that appear to be cogent but, in fact, aren't. Different fallacies can be categorized according to the cogency criteria which they violated—so, e.g., false dichotomy violates the premise acceptability condition; red herring violates the relevance condition, and hasty generalization violates the inferential sufficiency condition. Being on the lookout for fallacious argument, audiences can be on-guard against argumentative sophistry—specifically against mis-appraising incogent argument as cogent.

Nevertheless, despite these revisions to the logic curriculum, the Windsor program of informal logic, as seen in the work of Johnson and Blair, retained several prominent features of the conception of logic to which it had responded. Most importantly, the Windsor approach retained a "product-centric" conception of argument: arguments are conceived of as static, propositional artifacts. Later, the Windsor approach would come to embrace a view of these artifacts as "products of the process of arguing," but the subject matter of informal logic remained, at best, snippets of conversations, viewed at least one step removed from those conversations themselves. This perspective—one that tries to stand detached from the activities of transacting reasons—is reinforced by the deliberate and insistent attitude that informal logic is "defensive logic." This attitude casts individual reasoners as assessors, and undertakes to provide them with the tools needed to rightly and responsibly make up their own minds (i.e., form their own judgements) about the cogency of arguments. On this approach, assessors are conceived of as "consumers" of "found reasoning"—they are largely passive observers of reasons-being-transacted, rather than participants in the process of argumentation. The context of assessment

remains situationally and discursively removed from the activities by which arguers transact reasons with one another.

Unfortunately, taking up this detached attitude distorts one's subsequent understanding of the foundation and force of rational, argumentative norms, since they seem to be things which somehow stand outside of, and independently of, our practices of transacting reasons. Put differently, taking the detached attitude of an assessor or rational judge, rather than the engaged attitude of another arguer, encourages the view that the soundness of one's appraisals of the cogency of argument is somehow disconnected from the activity of argumentation. After all, on this view, argument is the thing that we are assessing, not the activity we are engaged in when making our assessments. This, as we will see, is an attitude that becomes far less tenable on a Waltonian, dialectical view.

The Waltonian Approach

Walton's work in informal logic began with a decade-long collaboration (from 1972-1982) with his doctoral thesis supervisor, John Woods.[6] Inspired by the 1970 publication of C.L. Hamblin's monumental work, *Fallacies,* Woods and Walton set about to together revive the serious study of the fallacies as part of the logical enterprise.

While study of fallacies had occupied a central place in the logical curriculum from the time of Aristotle through the end of the 19th century (as evidenced by landmark works like Whately's *Elements of Logic* (1826) and *Elements of Rhetoric* (1828), and John Stuart Mill's *A System of Logic* (1843)), the mathematization of logic (which might be dated to Frege's *Begriffsschrift* (1879)) unseated fallacy theory as properly logical topic—let alone an essential one. DeMorgan, for instance, wrote in his *Formal Logic* (1847) that

6. Woods's (2021) recounting of the early years of Walton's academic career, and their collaborative work together, provides an invaluable record for posterity.

"There *is* no such thing as a classification of the ways in which men may arrive at an error: it is much to be doubted whether there ever *can be*" (as cited in Hamblin 1970: 13). Remedy for the resultant deliberate and systematic neglect of the fallacies in the study of logic was only taken up in earnest nearly a century later, beginning with Hamblin's *Fallacies*. Importantly, Hamblin not only criticized the "standard treatment" of fallacies, as arguments that *seem to be valid* but *are not so* (12), but he further advanced a compelling case that a proper treatment of the fallacies calls not for a logical, nor even an epistemic, conception of argument—but rather for a dialectical one. On Hamblin's view, the way to identify, diagnose, explain, and remediate fallacious reasoning is only to be found by understanding its operation *within* the framework an argumentative dialogue.

As Walton and Johnson together wrote in their Editors' Introduction to the (2011) special issue of *Informal Logic* dedicated to the work of Hamblin:

> it is fair to say that the advances [in theorizing the fallacies] that were made during the last half of the 20th century were made mainly in the textbooks themselves. Yet the textbooks struggled with the subject matter, and their treatment of the topic lacked consistency, theoretical organization, and the depth of treatment needed to make the methods they proposed very effective. (i)[7]

Hamblin recognized this theoretical lacuna, writing "We have no theory of fallacy at all, in the sense in which we have theories of

7. Walton and Johnson nevertheless disagreed about the adequacy of Hamblin's criticisms of the standard treatment of the fallacies and his proposed remedy, as evidenced by their exchange in *Philosophy & Rhetoric* (Johnson 1990a, 1990b; Walton 1991). In that exchange, Walton accuses Johnson of having "missed the forest for the trees" (359), and of showing "a lack of sympathy for Hamblin's general approach of using dialectical structures for the normative evaluation of arguments" (353). Johnson seems only to have fathomed Hamblin's project in *Fallacies* by his 2011 contribution to that special issue "The coherence of Hamblin's *Fallacies*"—something Walton had already well understood for several decades by that point.

correct reasoning or inference" (1970: 11), and explicitly proposed the dialectical framework of *Fallacies* to fill this theoretical void.

Hamblin's critique of the "standard treatment" prompted Woods and Walton to undertake their extensive study of the fallacies. Those papers, collected in a 1989 volume *Fallacies: Selected Papers 1972-1982*, not only revived the study of informal fallacies through a series of penetrating case studies, but provide a careful re-examination of fallacy theory itself. Woods and Walton did not, though, provide their own theory of fallacies (Woods 2021: 29); this Walton would do only later. Nevertheless, this theoretical focus alone marks a significant difference with the Windsor approach, which took merely a pedagogical interest in the fallacies. By contrast to an ad-hoc, pedagogical-led approach, Konishi (2016a: 29-30) writes, "John Woods and Douglas Walton were more interested in making use of dialog logic and clarifying fallacies in their collaborative work as a reply to Charles L. Hamblin's (1970) challenge on the standard treatment of fallacies, so in this respect they were 'theory-led' informal logicians."

The new picture of fallacies to emerge from this post-Hamblin treatment, which has come to be known as the Woods-Walton approach,[8] conclusively establishes that fallaciousness is not merely a matter of an argument's form or structure. There are, for example, both fallacious and non-fallacious uses of arguments affirming the consequent, *ad verecundiam*, *ad populum*, or *ad hominem*. The "fallacies," understood merely as patterns of argument, can be *used* non-fallaciously (i.e., cogently) in ordinary argumentation. (In Walton's later work, these fallacy-neutral argument types would come to be incorporated into the catalogue of presumptive argumentation schemes (Walton, Reed, and Macagno, 2008).)

8. As Woods (2021: 19) remarks:The moniker "the Woods-Walton approach" was coined by Frans van Eemeren, who in his 2001 book, *Crucial Concepts in Argumentation Theory*, … writes that it is "the most continuous and extensive post-Hamblin contribution to the study of fallacies."

Importantly, though, as Woods (2021: 27-30) recounts, not only did the work resulting from the Woods-Walton collaboration not propose a unifying theory of the fallacies, it did not foreground Hamblin's explicitly dialectical approach to the fallacies. "To the best of my recollection," Woods writes ,"Doug and I had formed no express intention to shape our joint work on the model of the Hamblin approach to argument and fallacy" (28). Casting himself as a "committed member" of the "unvoiced solo-reasoning crowd" (27), Woods takes solace in this. Following a natural and amicable end to this decade-long collaboration, Walton pursued his work—work that quickly extended well beyond the fallacies—in an overtly Hamblin-esque, dialogical framework.

As one exemplar of Walton's post-collaborative approach, consider his 1985 paper "Are circular arguments necessarily vicious?" (*American Philosophy Quarterly*), which won the APQ essay prize that year. Using the formal technique of directed graph theory to model argumentative dialogue, Walton demonstrated that apparently question-begging argument can be cogent despite its circular pattern of reasoning (whereby the same claim appears both as a premise and as a conclusion) just so long as there is another edge (or vector) leading to one of the nodes in the circle. (In non-formal terms: So long as there is another, independent path of argument leading to one of the claims in the otherwise vicious circle.) This paper neatly exemplifies not only the centrality of the dialectical framework in Walton's theorizing the fallacies, but also the utility he found in formal methods, specifically those of formal dialogue theory, for theorizing argument and the fallacies. Consequent to the Woods-Walton approach, fallacy analysis and evaluation is not a matter or mere categorization or type-identification. Instead, Walton went on to argue, one must consider dialectical features of the argumentation itself, understood as a rational, communicative human activity.

The other point to be noted from Walton's APQ paper is his use of formal models of dialogue in developing his theories. The influences of Hamblin's formal dialogical framework on Walton's

subsequent work cannot be overstated. Woods (2021: 19), for example, recollects:

> I cannot over-emphasize the impact of chapter 8 [Hamblin's chapter on Formal Dialectic in *Fallacies*] on Doug. Before long, he would see formal dialectic as the true path to fallacy-theory's repatriation in modern formal logic. Since dialogue is the natural home of dialectical contestation, Doug also came to the view that fallacy-making was an intrinsically dialogical error. It was a view that he held fast with for the rest of his life …

The dialogic-lens Walton adopted from Hamblin shaped nearly every aspect of Walton's perspective on informal logic, from its subject matter, to the framework to be adopted for its analysis, to the nature and the foundations of the norms to be theorized.

Starting with the subject matter itself: Walton came to define argument, in his landmark paper "What is reasoning? What is an argument?" (*Journal of Philosophy*, 1990) as "a social and verbal means of trying to resolve, or at least contend with, a conflict or difference that has arisen between two parties engaged in a dialogue" (411). According to this definition, arguments occur within argumentative dialogues, and have the end or function of rationally resolving, or at least managing, disagreement. Put differently, argument necessarily involves dialogue and disagreement, because it requires two parties, one of whom contends a standpoint, and another who doubts or rejects that standpoint. The interactional roles of proponent and opponent are "baked in" to the structure of argument itself.

Turning next to the analytical framework provided for the study or argumentation: Walton, following Hamblin's lead, took it that the only framework up to the task of modeling both the human-situatedness and the normativity of argumentation was dialectical—indeed, dialogical. Hamblin's work seems to have convinced Walton of the theoretical potential of formal models of dialogue. This is readily seen, for example, in Walton's *Logical Dialogue-Games and Fallacies* (1984), which develops Hamblin's work by

showing how the operation of fallacies can be modeled in formal dialogue logics.

Yet, Walton noted that Hamblin did not offer a robust conception of the different kinds of dialogue in which argumentation serves a role.

> Hamblin (1971) did not explicitly classify such formal dialogues as having the purpose of rational persuasion, but portrayed them as having an information-seeking goal. Hamblin made no attempt to systematically classify different types of dialogue representing goal-directed frameworks in which argumentation takes place. (Walton 2019: 197)

One of Walton's major accomplishments in the decade following his collaboration with Woods was to develop a typology of these argumentative dialogues, each of which can be formally modeled, together with an elegant theory of how dialectical argument norms can be (roughly) hewn from an understanding of some principal distinguishing normative features of the different dialogue types. Starting in 1987, Walton began a collaboration with Eric Krabbe which, by 1995, resulted in their landmark book *Commitment in Dialogue* articulating this account (Krabbe and Verheij 2021: 515).

There, Walton and Krabbe proposed a typology of six types of argumentative dialogue, to which a seventh (Discovery) was added following the work of McBurney and Parsons (2001).

Type of Dialogue	**Initial Situation**	**Participant Goals**	**Goal of Dialogue**
Persuasion	conflict of opinions	persuade other party	resolve or clarify issue
Inquiry	need to have proof	find and verify evidence	prove / disprove hypothesis
Discovery	need to find an explanation of facts	find and defend a suitable explanatory hypothesis	choose the best hypothesis
Negotiation	conflict of interests	maximize one's interests	reasonable settlement / compromise both parties can accept
Information–seeking	need for information	acquire or give information	exchange information
Deliberation	dilemma or practical choice	co-ordinate goals and actions	decide best available course of action
Eristic	personal conflict	verbally hit out at opponent	reveal deeper basis of conflict

Table 1: Seven Basic Types of Dialogue

In this system, types of dialogue are distinguished from one another according to three principal features:

i. their initial situation: the discursive catalyst to argumentative discussion, and relevant features of conversa-

tional context, e.g., background information, shared commitments

ii. the overall conversational goal: a shared goal to which discussants commit themselves by virtue of their participation in a dialogue of that type

iii. the goals of individual discussants: which can be different and which can be a source of conversational adversariality or competitiveness

The basic idea is that these features, while shared in common by all dialogues of a given type, distinguish dialogues of one type from those of another. Moreover, these typological features of dialogues are taken to underwrite and explain the distinct normative features of dialogues of each type. That is to say, dialectical norms of arguing are taken to derive from these differentiating features. As an illustrative example, while arguing from negative (practical) consequences could be a legitimate move in deliberation and negotiation dialogues (because they can advance progress towards the overall conversational goal), they would be prohibited in inquiry (because they would impede progress towards the overall conversational goal).

Dialogues themselves are modeled as sequences of conversational moves (speech acts), played out according to certain procedural rules which, at any given stage of the dialogue, permit, prohibit, or oblige moves of certain sorts by each discussant. Dialectical norms, then, are procedural in nature—another important difference with the Windsor approach. In taking on a commitment in dialogue (e.g., asserting a standpoint), discussants undertake a burden of proof, understood as a discursive obligation. In another landmark paper, "Burden of proof" (*Argumentation*, 1988) Walton defines burden of proof as "an allocation made in reasoned dialogue which sets a strength (weight) of argument required by one side to reasonably persuade the other side" (234). (Walton (2011) would later show how the more robust notion of burden of proof needed in his theory can be formally operationalized in a modi-

fied, "Why-Because," Hamblin dialogue system.) The extent, and even the existence, of such conversational responsibilities is a function both of the nature of the commitment undertaken (e.g., of the speech act type) and of the type of dialogue in which one is engaged. Proposing a hypothesis in inquiry, for example, incurs different dialectical obligations—and, concomitantly, grants different discursive entitlements to one's interlocutor—than does asserting a standpoint in a persuasion dialogue. In this way, the specific type of dialogue can affix burdens of proof to discussants at the outset, based on their opening commitments and the conversational move and conversational context beginning the dialogue. As the dialogue progresses, the different conversational moves made by discussants changes the "conversational scorecard" in several ways: (i) by adding, removing, or modifying the commitments of each discussant; (ii) by changing the conversational moves available to each discussant (i.e., modifying their discursive entitlements and obligations); and (iii) by shifting the burden of proof with respect to certain claims back and forth between discussants.

For example, consider the effect of offering an argument (a complex speech act) in an argumentative dialogue. Having contended a standpoint, the proponent of that standpoint incurs a burden of proof: an obligation to defend that standpoint against doubt or criticism, if called upon to do so. Offering an argument is one way of meeting that obligation, and the effect of doing so is to shift the burden of proof to an objector. Having been offered an argument, the respondent is now obliged to either concede the standpoint at issue, or to give reason for not accepting the standpoint on the basis of the reasons offered in argument. This might be done in any of several ways. One is to decline to accept the premises offered in support of the claim; respondents may, for example, indicate that they are not committed to the premises or, depending on the type of dialogue, withdraw their commitment from a premise. Another response involves finding fault with the reasoning offered. In this way, the different standards of proof involved in assessing inferential sufficiency come into play. If the proponent contends that

their conclusion follows deductively, as a consequence of their premises, then the job of the respondent might be to produce a counterexample on which the argument's premises are true but its conclusion false. Yet, if only inductively strong support is contended, the respondent could instead show something like this: the plausibility of some counterexample is greater than the plausibility that the argument's conclusion is true on the grounds that its premises are.

Walton realized that many of the types of argument we typically rely on in conversational argumentation have a plausibilistic (rather than a deductive or probabilistic) nature. He operationalized this notion of plausibility by saying that such arguments defeasibly shift a burden of proof on to an objector. In Walton's terminology, this is to create a presumption in favor of their conclusions—though presumptively acceptable conclusions are not conclusively, irrevocably established, they stand good until some objection is raised (Walton 2008).

Walton then supplied the argumentation schemes (Walton 1996; Walton, Reed, and Macagno 2008) as a catalogue of different presumption-raising argument types. Dialectically, the schemes are best understood as recipes for constructing and criticizing plausible arguments of the relevant sort. For example, if one of the "ingredients" of the schematic argument is missing, this may be pointed out to show that the proponent's burden of proof has not been met.

Importantly, among these argument schemes, are many of the so-called fallacies, like appeal to authority, appeal to popular opinion, etc. The idea here, recall, is that appeals to authority (for example) are not fallacious *per se*; rather, only some uses of such arguments are fallacious. *Accusations* of fallacy then come with a burden of their own, borne by those disinclined to accept the conclusion of putatively presumptive arguments.

Finally, Walton supplied a set of critical questions to accompany each scheme. The critical questions are best understood as designed to guide respondents to the stereotypical ways in which arguments of a given schematic type can fail to meet the burden of proof they are offered in an effort to discharge. Godden and Walton (2007) sought to tie these critical questions to the R.S.A. cogency criteria by showing how each is usefully understood as questioning whether one or other of the cogency conditions has indeed been met.

Fallacies, on this dialectical approach, take on a different character than that proposed on a product-centric account. While it is true that fallacious arguments fail at least one of the cogency conditions, the dialectical effect of this is that they fail to discharge a proponent's burden of proof. Yet, since he held that burdens of proof are set internally to argumentative dialogues of different types, Walton came to conceive of fallacies as illicit dialogue shifts. Here it is worth quoting Walton at some length:

> The argument techniques we have referred to [as "fallacies"] can be used reasonably to support goals of dialogue in some cases, and used fallaciously as sophistical tactics to block or subvert legitimate goals of dialogue in other cases. … What often makes fallacious arguments "seem valid"—that is, what makes the use of such argument techniques effective in a dialogue, even when they are used incorrectly are two factors. One is that in many cases, perhaps similar cases in many respects, these argumentation techniques are used correctly to support legitimate goals of dialogue. The other factor is that there is often a dialectical shift involved. The use of this particular technique might be quite inappropriate and incorrect in one type of dialogue, running quite contrary to the goals of the dialogue, but if the context has shifted to another type of dialogue, the use of this same technique may now be quite appropriate. But if the shift has not been perceived, if it was a covert or unilateral shift, not made out in the open, or agreed to by both parties, the incorrect argument may have a surface appearance of correctness to the uncritical respondent or observer. (Walton 1992: 145-46)

Such an account has the advantage of explaining both elements of the *deceptive appeal* of fallacious argumentation. The *appeal* of fallacious argument is explained by the fact that sometimes, in some dialectical contexts, argumentation of a similar sort is permissible as a burden-shifting move. Yet, the *deceptive* aspect of such fallacious argument is that, in the current dialectical context, such moves are not permissible. What the fallacious arguer attempts to do is to illicitly shift a context of dialogue *to* one where their move is permissible *from* one in which it isn't.

This account marks a significant development from Walton's earlier thinking on fallacies immediately following the years of the Woods-Walton collaboration. Far removed from Walton's earlier view, on which "the so-called "fallacies" turn out to be reasonable criticisms in some cases, poor or mistaken refutations in other cases, violations of procedural dialogue-rules in still other cases, and merely simple lapses of strategy that are no transgression against the opponent's argument in some cases" (1985b: 273), this mature view uses a dialectical framework to provide a unified theory of the fallacies.

By way of this rough outline, we can begin to survey the comprehensive vision offered by Walton's overall dialectical approach to informal logic. It brings into a single, unified account: (1) a view of argument-as-dialogue; (2) the procedural, dialectical nature of argumentative norms; (3) the variety of argumentative dialogue types, each understood as normative spaces unto themselves; (4) the probative force of making an argument as shifting a burden of proof; (5) the variety of plausibilistic, presumptive argument, and their attendant critical questions; (6) the dialectical operation of fallacious reasoning; and lastly, (7) the utility of formal models of dialogue. Importantly, each of these respects, Walton can be seen to have built a self-standing theoretical edifice on ground initially tilled by Hamblin. And, equally importantly, the major compo-

nents of Walton's overarching framework were set out within the first two decades following his initial collaboration with Woods.[9]

Windsor's Reception of the Waltonian Approach

Walton's sheer productivity made his work impossible to ignore. Yet, a separate matter is whether his dialogical approach was taken up by those working within a product-centric approach. How was the Winnipeg approach received in Windsor?

The answer, in brief, is that the response was mixed. Whereas for Walton the dialectical and the dialogical were inseparable, those working within the Windsor approach seemed to want to take the dialectical without the dialogical.

By 1987 Blair and Johnson had come endorse a broadly dialectical conception of the nature of argumentation.

> We have come to see in hindsight how the understanding of argumentation as dialectical in nature was a centripetal force which held together the debris created by the collision of two vectors—the logic we were taught and the logic we found ourselves wanting to teach. … [Yet] it is only in the last few years that we have been explicitly guided by the conception that argumentation is dialectical. (1987a: 41)

In what respects did their approach come to be guided by a dialectical conception of argumentation? Blair and Johnson identified four central dialectical features of argument which they worked in to their overall account.

9. Among the significant elements of Walton's mature program omitted from this story is any mention of his extensive contributions to the burgeoning fields of argumentation and computing. While I am not the person to tell this story, I will note that in this respect as well Walton is readily seen as following Hamblin's lead. It should also be noted that by at least the late 1990s Walton was already seeking out collaborators among computer scientists with an interest in argumentation. To interested readers I recommend Atkinson et. al's 2020 paper.

1. *A product / process link*: "An argument understood as *product*—a set of propositions with certain characteristics—cannot be properly understood except against the background of the process which produced it—the process of argumentation."
2. *The roles of arguers*: "The process of argumentation presupposes a minimum of two roles."
3. *The beginning of argumentation*: "The process of argumentation is initiated … by a question or doubt—some challenge—to a proposition."
4. *The purposive nature of the activity of argumentation*: "Argumentation is a purposive activity. Each participant has it as his or her goal to change or reinforce the propositional attitude of the interlocutor or of himself or herself." (1987a: 45-46).

Yet, despite this receptivity to viewing argumentation as inherently dialectical in nature, neither Blair nor Johnson were willing to change their methodological perspective. Each remained resistant to adopting a dialogical approach to the dialectical. Informal logic was to remain categorically distinct from dialogue logic.

Blair (1998), for example, challenged the view that "dialogue is a necessary condition for argument, [and] that arguments always occur in a context of dialogue" (326).[10] Consequently, he held, "dialogue is not an adequate model for all types of argument" (325). When arguments are the product of rational engagement with a distant, passive, imagined, or heterogenous audience, different—non-dialogical—approaches are called for, even though the argument itself may still be conceived of as a dialectical artifact.

> Rules which may make sense for engaged dialogues do not necessarily apply to solo arguments. Yet, no one proposes that there are

10. Importantly, the concerns Blair here raises with dialogue-based approaches are similar to those raised by Govier (1998).

> no norms that apply to solo arguments. Other norms are needed, as are other grounds of those norms than the need to maintain a fruitful engaged dialogical interaction between or among the participants. (336)

For Blair, it would seem, regulative norms for dialogic arguments may not properly apply to, or be effective in evaluating, "solo" arguments.

Here we see precisely how taking the detached attitude encouraged by "defensive logic"—namely that of an assessor or rational judge, rather than the engaged attitude of another arguer—encourages the view that the soundness of one's appraisals of the cogency of argument is somehow disconnected from the activity of argumentation. Not only, Blair claims, are different norms called for, but different *grounds* for those norms are also required.

While Blair took a pluralistic response to dialogic approaches to the dialectical (sometimes we need dialogue logic, other times we need informal logic), Johnson sought a pragmatic response. By 1993, Johnson began counting the features of argumentation he had once called dialectical (1987a), as pragmatic (1993; cf. 1996a: 103-114).

Johnson maintained that his preferred approach, articulated in full (save for the dialectical tier!)[11] in his (2000) *Manifest Rationality*, shares with dialogic approaches the central tenets that the activity of argumentation is goal-directed and dialectical (1995: 242). "However," Johnson contended, "my theory of argumentation includes a third characteristic not shared by [dialogic approaches like Pragma-Dialectics]: argumentation is manifestly rational." (1995: 242; cf. 1993: 207; 2000: 316-317). Just what manifest rationality amounts to, and whether it is best understood as something other than a dialogical feature of argumentation, is beyond the scope of the present project. What is important for our purposes is the way in which Johnson sought to incorporate the dialogical

11. This is not intended as a merely idle gibe.

elements of argumentation into his normative theory. In brief, the answer is roughly this: argument has not only an illative core (where the central reasons supporting a claim are set forth), but also a dialectal tier (where known or anticipated objections are addressed) (2000: 164-173 and passim). According to Johnson, unless all reasonably anticipated (not merely actual) objections are addressed in making the case for one's position, the rational acceptability of the position itself will not be transparent to all concerned, and the manifest rationality of the process of arriving at that position will be undermined.

An Opinionated Conclusion

Despite these important concessions to dialogic approaches to the dialectical, Johnson and Blair maintained their view that the tasks of the dialogue logician and the informal logician are categorically different.

> The dialogue logician assigns to logic the task of prescribing rights and duties in the transaction of a rational dialogue. The informal logician assigns to logic the task of developing the criteria or standards for use in the evaluation of arguments. (Johnson and Blair 1994: 13; cf. Johnson 2000: 291)

The difference here *seems* to be that, while the norms of dialogue logic are procedural, the norms of informal logic relate to the product.[12] Whereas dialogue logic provides *guidance* norms, informal logic supplies *appraisal* norms. Dialogue logic provides guidelines for arguers so they may conduct themselves rationally and responsibly in reasoned discourse. By contrast, the "defensive logic" supplied by the informal logician offers the assessor, or rational judge,

12. Yet, even on this point the matter is not entirely clear. In 1993, Johnson held that "The task of informal logic, as I understand it, is to develop the normative theory which will allow us to assign rights and duties in the practice of argumentation" (1993: 204). This deontic approach to argumentative norms is clearly dialogical.

a set of analytical and evaluative tools allowing them to make sound appraisals of the rationality of argument.

Yet, what is meant by "sound" here? In casting the role of the assessor as detached from the activity of argumentation, the Windsor approach gives the impression that the standards of appraisal, and thereby the meritoriousness of an assessor's appraisals, are somehow determined independently of the activity of argumentation. The soundness of our assessments of argument cogency is taken to be discourse-independent feature of them—something disconnected from the activity or argumentation. There are objective answers to questions of argument assessment, and the tools of informal logic somehow give us reliable access to this realm of objective norms.

Against this view, Hamblin contends in *Fallacies*, that the assessor's detachment from the process of argumentation is illusory.

> The logician does not stand above and outside practical argumentation or, necessarily, pass judgement on it. He is not a judge or a court of appeal, and there is no such judge or court: he is, at best, a trained advocate. It follows that it is not the logician's particular job to declare the truth of any statement, *or the validity of any argument*. (244)

And, as one rids oneself of that illusion, one gains a clearer picture of the relationship between the merits of our appraisals and their dialectical standing. If it is not the job of the logician to *declare* the validity of arguments, what then could it be? Appraisals of arguments are not *declared*—as if the matter were to be settled by logical decree—they are *contended*.

Look at it this way: To *contend* an assessment of some argumentative episode is to *become* a proponent—a proponent of that very verdict. As such, *it* comes with an attendant burden of proof—a burden which must be discharged argumentatively. My *taking* my appraisal to be correct, my asserting it (even so quietly as to just *think* it to myself), *doesn't make it* so; our *acceptance* of our own

judgements of argument appraisal is not a standard of their *acceptability*. This remains so no matter how responsible we (take ourselves to) have been in reaching our judgements—no matter how carefully and judiciously we used the "defensive logic" of the informal logician. Acceptability is just not something to be had in the claiming; rather it must be *earned*. And, it is earned by having the acceptability of our judgements *recognized* by others. Those others—those whose recognition we seek in offering our assessments—, become *our* assessors. When they concur with our assessment, its acceptability is typically conferred by default. But, when there is disagreement, our gaining the recognition of others that our assessments are acceptable is something that we must earn by engaging with them in rational argumentation. We must, at that point, satisfy to their satisfaction a burden of proof we bear—the obligation to defend our appraisals of argument cogency.

What now could we mean by the "soundness" of our judgements of appraisal? The best we should hope for—the only thing actually within our grasp—I contend, is their *defensibility*. In practice, the soundness of our judgements—including our judgements of the cogency of arguments—is determined by other's judgements of how well we acquit ourselves of the discursive and probative burdens we incur by making those judgements.

"Where," Hamblin asked, "do dialectical rules derive their authority, and who enforces them?" "The answer," he contends, "… is simple, if a little disquieting in its ultimate implications":

> Although there are special circumstances in which there may be a … Judge … whose job it is to control the proceedings, in ordinary discourse there is no such person. The control of each dialogue is in the hands of the participants themselves. (1970: 283)

The point is not whether our argumentative norms take the form of guidance or appraisal norms. The point is that the determination and application of those norms is itself a dialectical, argumentative process. Argument is not merely dialectical in its subject matter—it is shot through with dialecticality. This, I claim, is the

real—the deep—difference between the Waltonian and Windsor approaches to informal logic. Not only are the *objects* of argumentative appraisal products of the process of argumentation, but so too are the *standards* by which these argumentative products and performances are to be appraised, and the *meritoriousness* of our appraisals of those products and performances. It's dialectical all the way down. And, the way the dialectical "plays out" is through dialogue.

References

Atkinson, K., T. Bench-Capon, F. Bex, T. Gordon, H. Prakken, G. Sartor, and B. Verheij. 2020. In memoriam Douglas N. Walton: the influence of Doug Walton on AI and law. *Artificial Intelligence and Law* 28: 281–326.

Blair, J.A. 1998. The limits of the dialogue model of argument. *Argumentation* 12: 325-339.

Blair, J.A. 2009. Informal logic and logic. *Studies in Logic, Grammar and Rhetoric* 16(29): 47-67.

Blair, J.A. 2015. What is informal logic? In *Reflections on Theoretical Issues in Argumentation Theory*, eds. F.H. van Eemeren and B. Garssen, 27-42. Chaim: Springer.

Blair, J.A. 2019. Pioneering informal logic and argumentation studies. In *Informal Logic: A 'Canadian' Approach to Argument*, ed. F. Puppo, 35-60. Windsor: Windsor Studies in Argumentation.

Blair, J.A. and R. Johnson. 1987a. Argumentation as dialectical. *Argumentation* 1: 41-56.

Blair, J.A. and R. Johnson. 1987b. The current state of informal logic. *Informal Logic* 9: 147-151.

Brockriede, W. 1975. Where is argument? Jo*urnal of the American Forensic Association* 11: 179-182.

Godden, D., L. Groarke, and H. Hansen. 2011. Informal logic and argumentation: An Alta conversation. In *Reasoned Argument and Social Change: Selected Papers from the 17th Biennial Conference on Argumentation*, ed. R. Roland, 48-62. Washington, DC: National Communication Association.

Godden, D. and D. Walton. 2007. Advances in the theory of argumentation schemes and critical questions. *Informal Logic* 27: 267-292.

Godden, D. and S. Wells. 2022. Burdens of proposing: On the burden of proof in deliberation dialogues. *Informal Logic* 42(1): 291–342.

Govier, T. 1998. When they can't talk back: The non-interactive audience and the theory of argument. In *The Philosophy of Argument*, ed. J. Hoaglund, 183-201. Newport News: Vale Press.

Hamblin, C. 1970. *Fallacies*. London: Methuen.

Johnson, R. 1990a. Hamblin on the standard treatment. *Philosophy and Rhetoric*: 23: 153-167.

Johnson, R. 1990b. Acceptance is not enough. A critique of Hamblin. *Philosophy and Rhetoric*: 23: 271-287.

Johnson, R. 1993. Dialectical fields and manifest rationality. In *Empirical Logic and Public Debate: Essays in Honour of Else M. Barth*, ed. E.C.W. Krabbe, R. Dalitz and P. Smit, 201-201. Amsterdam: Rodopi.

Johnson, R. 1995. Informal logic and pragma-dialectics: Some differences. In *Proceedings of the Third ISSA Conference on Argumentation, Volume I: Perspectives and Approaches*, ed. F.H. van

Eemeren, R. Grootendorst, J.A. Blair and C. Willard, 237-245. Amsterdam: SicSat.

Johnson, R. 1996. *The Rise of Informal Logic: Essays on Argumentation, Critical Thinking, Reasoning and Politics*, ed. J. Hoaglund. Newport News: Vale Press. (Reprinted in 2014 by Windsor Studies in Argumentation.)

Johnson, R. 1996a. Argumentation: A pragmatic perspective. In *The Rise of Informal Logic: Essays on Argumentation, Critical Thinking, Reasoning and Politics*, ed. J. Hoaglund, 103-114. Newport News, VA: Vale Press.

Johnson, R. 2000. *Manifest Rationality: A Pragmatic Theory of Argument*. Mahwah, NJ: Lawrence Earlbaum. (Reprinted in 2012 by Routledge.)

Johnson, R. 2006. Making sense of 'informal logic.' *Informal Logic* 26(3): 231-258.

Johnson, R. 2009. Some reflections on informal logic initiatives. *Studies in Logic, Grammar, and Rhetoric* 16(29): 17-46.

Johnson, R. 2011. The coherence of Hamblin's *Fallacies*. *Informal Logic* 31(4): 305- 317.

Johnson, R. and J.A. Blair. 1977. *Logical Self-Defense*, 1st ed. Toronto: McGraw-Hill Ryerson. (1983, 2nd ed.; 1993, 3rd ed.; 1994, 1st U.S. ed. New York: McGraw-Hill; 2006 reprint of 1st U.S. ed. New York: IDEA Press.)

Johnson, R. and J.A. Blair. 1980. The recent development of informal logic. In *Informal Logic: The First International Symposium*, eds. J.A. Blair and R. Johnson, 3-28. Inverness: Edgepress. [Reprinted in Johnson (1996).]

Johnson, R. and J.A. Blair. 1985. Informal logic: The past five years: 1978-1983. *American Philosophical Quarterly* 22: 181-196.

Johnson, R. and J.A. Blair. 1994. Informal logic: Past and present. In *New Essays in Informal Logic*, eds. R. Johnson and J.A. Blair, 1-19. Windsor: Informal Logic.

Johnson, R. and J.A. Blair. 1996. Informal logic and critical thinking. In *Fundamentals of Argumentation Theory*, eds. F.H. van Eemeren, et al., 163-188. New York: Routledge.

Johnson, R. and J.A. Blair. 2000. Informal logic: An overview. *Informal Logic* 20: 94-108.

Johnson, R. and J.A. Blair. 2002. Informal logic and the reconfiguration of logic. In *Handbook of the Logic of Argument and Inference: Turn Towards the Practical*, eds. D. Gabbay, R. Johnson, H. Ohlbach, and J. Woods, 340-396. Amsterdam: Elsevier.

Johnson, R. and J.A. Blair. 2009. Teaching the dog's breakfast: Some dangers and how to deal with them. *[American Philosophical Association] APA Newsletter on Teaching Philosophy* 9(1): 2-5.

Konishi, T. 2009. Toward a history of argumentation: Canadian informal logic. In *Argument Cultures: Proceedings of the 9th International Conference of the Ontario Society for the Study of Argumentation*, ed. J. Ritola, pp. 1-26. Windsor: OSSA.

Konishi, T. 2011. Logically defending for publication: An analysis of the review process of *Logical Self-Defense*. In *Proceedings of the Seventh International Conference on Argumentation*, eds. F.H. van Eemeren, B. Garssen, D. Godden, and G. Mitchell, 998-1009. Amsterdam: SicSat.

Konishi, T. 2016a. Where practical activity meets theoretical excitement: A rhetorical history of Trudy Govier's contribution

to the informal logic movement. In *Reasonable Responses: The thought of Trudy Govier*, ed. C. Hundleby, 27-51. Windsor: Windsor Studies in Argumentation.

Konishi, T. 2016b. When different perspectives interact: A historical account of informal logic between 1983 and 1987. In *Argumentation, Objectivity, and Bias: Proceedings of the 11th International Conference of the Ontario Society for the Study of Argumentation*, eds. P. Bondy and L. Benacquista, 1-20. Windsor: OSSA.

Konishi, T. 2019. Informal logic and the first international conference on argumentation. In *Proceedings of the Nineth International Conference on Argumentation*, eds. B. Garssen, D. Godden, G. Mitchell, and J. Wegemans, 675-685. Amsterdam: SicSat.

Konishi, T. 2020. Canadian infrastructure for a "Canadian school" of informal logic and argumentation. In *Evidence, Persuasion, and Diversity: Proceedings of the 12th Ontario Society for the Study of Argumentation Conference*, ed. J. Cook, 1-13. Windsor: OSSA.

Krabbe, E. and B. Verheij. 2021. Douglas Neil Walton (1942–2020). *Argumentation* 35: 513–518.

McBurney, P., and S. Parsons. 2001. Chance discovery using dialectical argumentation. In *New Frontiers in Artificial Intelligence. Lecture notes in Artificial Intelligence 2253*, eds. T. Terano, T. Nishida, A. Namatame, S. Tsumoto, Y. Oshawa, and T. Washio, 414–424. Berlin: Springer Verlag.

O'Keefe, D.J. 1977. Two concepts of argument. *Journal of the American Forensic Association* 13: 121-128.

Puppo, F. 2019. Introduction. In *Informal Logic: A 'Canadian' Approach to Argument*, ed. F. Puppo, 1-34. Windsor: Windsor Studies in Argumentation.

Puppo, F. 2020. Harmony in diversity. On the (possible) existence of 'the Canadian school of argumentation'. In *Evidence, Persuasion, and Diversity: Proceedings of the 12th Ontario Society for the Study of Argumentation Conference*, ed. J. Cook, 1-17. Windsor: OSSA.

Tindale, C. 2020. In Memoriam Douglas Neal Walton 1942-2020. *Informal Logic* 40(1): 1-2.

Walton, D. 1984. *Logical Dialogue-Games and Fallacies*. Washington DC: University Press of America.

Walton, D. 1985a. Are circular arguments necessarily vicious? *American Philosophy Quarterly* 22(4): 263-274.

Walton, D. 1985b. New directions in the logic of dialogue. *Synthese* 63: 259-274.

Walton, D. 1988. Burden of proof. *Argumentation* 2: 233–254.

Walton, D. 1990. What is reasoning? What is an argument? *Journal of Philosophy* 87: 399-419.

Walton, D. 1991. Hamblin on the standard treatment of the fallacies. *Philosophy and Rhetoric* 24(4): 353-361.

Walton, D. 1992. Types of dialogue, dialectical shifts and fallacies. In *Argumentation Illuminated*, eds. F.H. van Eemeren, R. Grootendorst, J.A. Blair and C. Willard, 133-147. Amsterdam: SICSAT.

Walton, D. 1996. *Argumentation Schemes for Presumptive Reasoning*. Mahwah NJ: Lawrence Earlbaum.

Walton, D. 1999. *Informal Logic: A Handbook for Critical Argumentation*. Cambridge: Cambridge UP.

Walton, D. 2008. A dialogical theory of presumption. *Artificial Intelligence and Law* 16: 209-243.

Walton, D. 2011. Burden of proof in a modified Hamblin dialogue system. *Informal Logic* 31(4): 279-304.

Walton, D. 2019. How the context of dialogue of an argument influences its evaluation. In *Informal Logic a Canadian approach to Argument*, ed. F. Puppo, 196-233. Windsor: Windsor Studies in Argumentation.

Walton, D. and D. Godden. 2007. Informal logic and the dialectical approach to argument. In *Reason Reclaimed*, ed. H.V. Hansen and R.C. Pinto, 3-17. Newport News, VA: Vale Press.

Walton, D. and R. Johnson. 2011. Editors' introduction to special issue on Charles Hamblin. *Informal Logic* 31(4): i-iv.

Walton, D. and E.C.W. Krabbe. 1995. *Commitment in dialogue: Basic concepts of interpersonal reasoning*. Albany, NY: SUNY Press.

Walton, D., C. Reed, and F. Macagno. 2008. *Argumentation schemes*. Cambridge: Cambridge UP.

Woods, J. 2021. Douglas Walton: The early years. *Journal of Applied Logic* 8(1): 3-30.

Woods, J. and D. Walton. 1989. *Fallacies: Selected papers 1972-1982*. Dordrecht: Foris. (Reprinted in 2007 by College Publications, London.)

3.

Walton's contribution to evaluating the ad baculum argument

Shiyang Yu and Frank Zenker

Abstract: Douglas Walton's main contribution to evaluating the *ad baculum* argument (aka the argument from threat) within a dialectical framework is to have connected the argument scheme approach to speech act theory. To advance this contribution, we clarify the relations between three analytical levels (the *inferential* or *logical* level, the *speech act* level, and the *dialectical* level) at which *ad baculum* arguments can be evaluated. Our focus rests on the speech act level. The felicity conditions of the speech act of threatening not only distinguish acts of threatening from similar types of speech acts (e.g., *advising* or *warning*). The felicity conditions are also crucial to constructing a scheme and critical questions for the *ad baculum* argument. For Walton's dialectical analysis, then, the speech act level turns out to be fundamental.

1. Introduction[1]

The *argumentum ad baculum*—literally: the *argument to the stick* (Woods, 1998, p. 493; see Woods, 2013)—is also known as the argument appeal to/from force (Creighton, 1910; Mellone, 1913; Schiller, 1912), the argument appeal to/from threat (Copi, 1961; Fearnside, 1980), or the argument appeal to fear (Blyth, 1957; Chase, 1956). Although *ad*-terms are sometimes used to denote fallacious instances of an argument form, whereas the English glosses denote its non-fallacious instances (e.g., in Pragma-dialec-

1. Parts of this manuscript draw on material presented in Yu and Zenker (2023).

tics), we will in both cases use '*argumentum ad baculum*' or '*ad baculum* argument' to refer to an argument from threat.

While the tradition of prefixing *ad* to the names of argument forms originates with John Locke (1975 [1690]), the term '*argumentum ad baculum*' was coined only much later, by Hibben (1906) (see Walton, 2000, p. 34). Henceforth, logic textbooks would typically treat the *ad baculum* as a fallacy, indicating that the issuing of a threat was evaluated as a categorically bad act of arguing (e.g., Copi & Cohen, 1998; Jason, 1987; Kelley, 1988; Pirie, 1985; Wilson, 1986). Today, by contrast, many argumentation scholars recognize the *ad baculum* argument as a contingently fallacious argument form, one that requires a context-sensitive evaluation (e.g., Woods, 2004, pp. 65–94).

In his *Scare Tactics* (Walton, 2000) and a subsequent article in *Informal Logic* (Walton, 2014), Douglas Walton has advanced the evaluation of the *ad baculum* argument in a dialogical context by connecting this argument form to the speech act of threatening. Walton's approach, we claim, can be further developed into a well-motivated scheme and critical questions (CQs) for the *ad baculum* argument, as well as an improved list of felicity conditions of the speech act of threatening. In this development, the speech act level proves to be fundamental. After briefly introducing Walton's approach, we show why the *ad baculum* need not be treated as a categorically fallacious argument form (Sect. 2.). In the remainder, we show how Walton's approach to evaluating the *ad baculum* may be strengthened (Sect. 3). We conclude in Sect. 4.

2. Can an *ad baculum* be a good argument?

2.1 The ad baculum as a non-argument or a fallacy

The rich discussion on how the premise(s) and conclusion of an *ad baculum* argument scheme should be formulated presupposes that a threat can be meaningfully treated as an argument in the first place (Brinton, 1992; Copi & Cohen, 1998; Walton, 2000; 2014;

Woods, 2004; Wreen, 1987; 1988; 1995). As someone who threatens their interlocutors can be said to trade the open exchange of reasons for coercion (Zenker *et al*., 2023; cf. Woods, 2004, p. 80), many contend that "the *ad baculum* is really a rhetorical tactic used to put an end to further argument" (Levi, 1999, p. 148). This evaluation would also apply if the addressee of an *ad baculum* argument fails to *recognize* that they are being coerced.

According to the Pragma-dialectical model (van Eemeren & Grootendorst, 1992; 2004), an overt (or undisguised) threat is *always* fallacious in the confrontational stage of a critical discussion, where it violates the *Freedom Rule*: 'to reasonably resolve a difference of opinion, discussants should not prevent each other to put forward a standpoint or cast doubt on themselves' (cf. Woods, 2004, p. 82). Yet a threat can also surface in the disguise of the speech acts of *warning* or *advising*, both of which seem to comply with the Freedom Rule. A disguised *ad baculum* argument may thus appear less unreasonable than an undisguised one (van Eemeren *et al*., 2015), particularly to an overhearing but non-addressed audience. Disguised or not, speakers using an *ad baculum* argument in the confrontational stage would nevertheless be said to commit a fallacy.

Let us turn to two intuitively *non*-fallacious instances of the *ad baculum*.

2.2 Examples of non-fallacious ad baculum *instances*

A typical illustration of the fallaciousness of the *ad baculum* argument is provided by the following "Gangster example":

> "A known gangster says to the owner of a small business: 'You should pay us protection money, because this is a very dangerous neighborhood. The last guy who didn't pay had his store looted and destroyed, right after he failed to pay'" (Walton, 2000, p. 123).

As Walton observes, the example's alleged fallaciousness is hard to explain (Walton, 2014, p. 284). Compared to the store's destruc-

tion, the more reasonable choice seems to consist in paying protection money.

To analyze the *ad baculum* argument embedded in this example, analysts must first construct an argument along the following lines: if you do not pay protection money, then your store will be looted and destroyed; therefore, you should pay. A yet more complex argument can be constructed by adding a premise such as 'I [the speaker] am a gangster who can loot and destroy your store'.

As for evaluating the *ad baculum* argument embedded in this example, for the argument's premise ('if you do not pay us protection money, then your store will be looted and destroyed') and its conclusion ('you should pay us') to be acceptable requires that specific conditions are fulfilled. For instance, the speaker must be *able* to loot and destroy the store, and the speaker must be *expected* to do so if the addressee fails to pay). If these conditions are satisfied, then pragmatic considerations arguably make it unreasonable for the addressee to reject the argument's conclusion. In this sense, the Gangster example is non-fallacious.

Ad baculum arguments are rather common. As a second example, consider the headline "In endeavor to lower gas prices, Joe Biden threatens to raise taxes on oil companies" (Kinery (2022), CNBC, October 31, 2022). We refer to this as the "Biden-example." We may assume that Joe Biden *can* raise taxes and, if oil companies failed to lower the gas prices, probably *would do so*. Hence, if paying increased taxes is *more harmful* to oil companies than lowering the gas prices, and if oil companies *can* lower them, then one would expect them to do so.

Insofar as this expectation is *reasonable*—in the sense of the argument sufficing to persuade oil companies to lower gas prices—the *ad baculum* argument embedded in the Biden-example appears to be a *non-fallacious ad baculum* instance. The perhaps shortest version of this argument can be stated as: On pains of their profits

being consumed by increased taxes, oil companies should lower their gas prices.

The *ad baculum* arguments embedded in the Gangster- and the Biden- examples can thus be evaluated as reasonable if specific conditions are fulfilled, conditions that vary with the context. To identify the conditions that matter, let us turn to Walton's three-level approach.

3. Evaluating *ad baculum* arguments

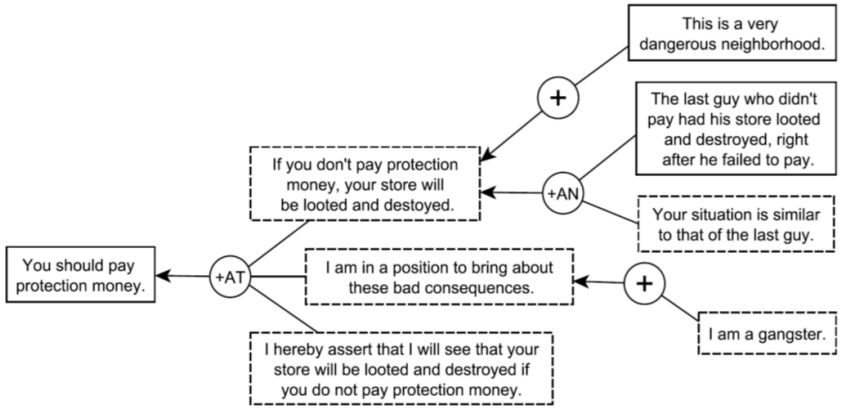
3.1 A three-level evaluation of the ad baculum *argument*

To evaluate an *ad baculum* argument in ways that are sensitive to context, Walton (2014) has proposed a three-level analysis. On the *inferential* (or *logical*) level, Walton (2014, p. 287) constructs the *ad baculum* argument scheme as a sub-scheme of the *argument from negative consequences*:

> *Premise 1*: If you do not bring about *A*, some cited bad consequences, *B*, will follow.
> *Premise 2*: I am in a position to bring about *B*.
> *Premise 3*: I hereby assert that I will see to it that *B* occurs if you do not bring about *A*.
> *Conclusion*: You had better bring about *A*.

Since the components of an argument type are what an argument scheme identifies, analysts can always employ the *ad baculum* scheme to determine whether a specific argument in fact instantiates this scheme. If not, then on the presupposition that a speaker did intend to utter an argument from threat, the *ad baculum* argument scheme remains useful to identify any implicit premises. In the Gangster-example, for instance, although all three of the above premises are implicit, one nevertheless readily suspects that what the gangster is directing at the store owner is an argument from threat.

To illustrate how a potential *ad baculum* argument can be identified as such, Walton (2014, p. 288) provides the following diagram (Fig. 1). Here, a dashed box marks an implicit premise, '+' denotes a supporting relation (i.e., a pro-argument), 'AT' refers to an *argument from threat*, and 'AN' to an *argument from analogy*.



In the Gangster-example, two of the missing premises of Walton's *ad baculum* argument scheme can plausibly be inferred. Yet the third premise—'I hereby assert that I will see that your store will be looted and destroyed if you do not pay protection money'—arguably remains missing. Without this third premise being overt, however, it is not obvious how the above argument can be identified as instantiating an *ad baculum* argument. To identify the argument type, Walton (2014, p. 289) claims that analysts must examine the *function* of the statement 'this is a very dangerous neighborhood'. Specifically, they must evaluate whether this statement can be transformed into the missing third premise (of the form: 'I hereby assert that I will see to it that *B* occurs if you do not bring about *A*').

Absent contextual information, 'this is a very dangerous neighborhood' can be interpreted as conveying a *piece of advice*, a *threat*, or a *warning*. To tease *advising* apart from *threatening*, and *warning*, Walton suggests that the evaluation of an *ad baculum* argument requires an additional *speech act level*. At this level, ana-

lysts can leverage a speech act's felicity conditions to identify the speech act type and to evaluate its goodness.

For the speech act of threatening, Walton (1992, p. 163; 2000, pp. 113f.; numbers for sub-conditions added) formulates the following felicity conditions:

Felicity conditions of threatening (Walton, 1992, p. 163; 2000, pp. 113f.)

1. *Preparatory Conditions*

    a. The hearer has reasons to believe that the speaker can bring about the event in question;

    b. without the intervention of the speaker, it is presumed by both the speaker and the hearer that the event will not occur.

2. *Sincerity Conditions*

Both the speaker and the hearer presume

    a. that the occurrence of the event will not be in the hearer's interests;

    b. that the hearer would want to avoid its occurrence if possible;

    c. and that the hearer would take steps to do so if necessary.

3. *Essential Condition*

    a. The speaker is making a commitment to see to it that the event will occur unless the hearer carries out the participant action designated by the speaker.

To the above felicity conditions, Walton (2014, pp. 291f., numbering added) adds a propositional condition and makes several changes:

1. *Propositional Condition*

a. The hearer has to have reasons to believe that the speaker can bring about the negative consequences in question.

2. *Preparatory Condition*

a. It is presumed by both the speaker and the hearer that the negative consequences will not occur without the intervention of the speaker.

3. *Sincerity Condition*

a. The negative consequences will not be in the hearer's interests;

b. the hearer would want to avoid them if possible.

4. *Essential Condition*

a. The speaker is making a commitment to see to it that the bad consequences occur unless the hearer carries out the action recommended by the speaker.

The felicity conditions for *advising*, *threatening*, and *warning* suffice to distinguish threatening from the other two speech act types. For instance, a major difference between threatening and warning is that the focal negative consequence is brought about by *the speaker*, respectively by *someone else* (Walton, 2000; 2014). As a second difference, a speaker who threatens a hearer *requests* the hearer to avoid or undertake some action (see Yu & Zenker, 2023), whereas a speaker who offers a warning informs a hearer that a future state or event is not in the hearer's best interest (see Searle, 1969, p. 67). A speaker who offers a piece of advice, by contrast, *informs* a hearer of a future action that is in the hearer's best interest.

To identify instances of the speech act type of threatening, and hence instances of the *ad baculum* argument, it is no doubt helpful to recur to the felicity conditions of this and similar speech act

types. As a yet more precise method to this end, one that especially applies to borderline cases, Walton suggests defining different *dialogue types* to describe the dialectical circumstance of a specific speech act type (e.g., advising, threatening, warning). According to Walton's *new dialogical theory* (Walton, 2014), a dialogue type can be defined according to three parameters: the initial situation, the participants' goal(s), and the goal of the dialogue.

In conceiving of the *advising dialogue* as a dialogue in its own right, Walton specifies this dialogue's goal or purpose, its stages, as well as the goals of the proponent and the opponent (Walton, 2014, pp. 294-298). Although he avoids providing a dedicated term for a dialogue accommodating the speech act of threatening, a *threatening dialogue* can be understood as a combination of a negotiation, a persuasion, and a deliberation dialogue:

> "An interesting aspect of the [*ad baculum* argument] is that *negotiation* is involved in the model of argumentation, suggesting the scenario that in multi-agent reasoning if two agents are *deliberating* on what to do in a given case, it might be quite reasonable for one of them to try to negotiate with the other in order to move their joint deliberations forward" (Walton, 2014, p. 299).

In Walton's three-level analysis, the logical and the speech act levels are thus accommodated by the dialectical level, the latter being the most general level. On this analysis, *ad baculum* argument scheme instances are evaluated as (non-)fallacious according to whether the speech act of threatening is (in-)appropriate given the dialogue type at hand, i.e., whether the speech act facilitates or prevents the realization of the dialogue's goal.

Although this dialectical analysis already offers a somewhat precise analysis of *ad baculum* arguments, we now turn to three problems for this analysis and how they can be resolved.

3.2 Strengthening Walton's approach

3.2.1 The connection between the speech act level and the logical level

As to how the objects of speech act analysis and a logical analysis of the *ad baculum* argument are related, Walton (2000) initially equated them. "When one party to a dialogue puts forward a speech act of making a threat to another party […] this act [of threatening] *is* [an act of making] an argument, in virtue of it being used as an instance of practical reasoning" (2000, p. 164; *italics added*). Subsequently, Walton adopted a weaker view, treating the issuing of a threat as a way of *presenting* an *ad baculum* argument. "[T]he making of a threat by one party *is used to present* an argument designed to try to get another party to take some course of action" (Walton, 2014, p. 280; *italics added*). This seems right. After all, not only do threatening and arguing constitute distinct speech act types, but speech acts and arguments also belong to analytically distinct categories. In Walton's three-level analysis, for instance, speech acts are situated at the *speech act level*, whereas arguments are situated at the *logical level*. And although speakers can employ different speech acts to pursue distinct aims (as represented by a speech act's essential condition), speakers who raise arguments invariably pursue a single overarching aim, namely to justify, or support, a conclusion.

To connect the speech act and the logical levels, we propose that the conclusion of the *ad baculum* argument scheme be formulated as: 'the hearer will undertake the action (*A*) that the speaker requires of the hearer'. After all, if the conclusion 'the hearer will do *A*' is justified, then it is rationally expectable that 'the hearer does *A*'. This, in turn, indicates the fulfillment of the *essential condition* of threatening ('The threat counts as an attempt to make the hearer do *A*'; see Yu & Zenker, 2023). Furthermore, we propose using the *propositional condition* of threatening (i.e., an abstraction of the utterance the speaker uses to threaten the hearer) to formulate the premise of the *ad baculum* argument scheme: 'If the hearer omits *A*, then the speaker will do *B*'. Thus, the *ad bacu-*

lum argument scheme is formulated using nothing but the felicity conditions of the speech act of threatening. This explains why we equate the *ad baculum* argument with an argument from threat, highlighting the role of the speech act of threatening.

Although other ways of formulating the *ad baculum* argument scheme are possible, our proposed formulation connects the speech act and the logical levels of analyzing the *ad baculum* argument. Using this or another formulation, the key task is to clarify how both levels are connected.

3.2.2 Hierarchal arrangement and the fundamental role of the felicity conditions

In Walton's approach, the dialectical level may appear to be the most fundamental level of analysis because the other two levels are accommodated by it. But this appearance potentially misleads. For without having stated a speech act's felicity conditions, neither the goal of an associated dialogue type can be defined, nor can the goal of the participants in that dialogue be described. The goal of an *advising dialogue*, for instance, is what Walton (2014, p. 294) identifies as: "to help […] make a decision on what to do in a situation that requires choice […]." This goal, as Walton (2014, p. 291) himself observes, corresponds to the *essential condition* of the speech act of *advising*: "The action of telling the hearer how to proceed is taken to offer to the hearer a way to solve the problem or make the best choice" (Searle, 1969, p. 67). A precondition of describing an associated dialogue type, therefore, is to have appropriately stated a speech act's felicity conditions.

Given the tighter connection between the felicity conditions of threatening and the *ad baculum* argument scheme that can be achieved if this scheme is formulated using nothing but a speech act's felicity conditions (see Sect. 3.2.1), the role of the felicity conditions in constructing the *ad baculum* argument scheme and in describing the associated dialogue types thus reveal that the most fundamental level of analysis is not the dialectical level, but rather the speech act level.

3.2.3 A CQ-list for the ad baculum *argument scheme*

A simple but effective evaluative method is to apply a list of CQs associated with the *ad baculum* argument scheme. (Walton has presented the *ad baculum* argument scheme without a CQ-list.) Generally, only if all associated CQs are answered satisfactorily would an argument scheme instance be evaluated as a good argument. A CQ-list for the *ad baculum* argument has recently been proposed by Yu & Zenker (2023). This proposal exploits the relation between the logical level and the speech act level (see Sect. 3.2.1) in that the CQs are formulated by recourse to the *correctness* conditions of the speech act of threatening (comprising the preparatory and the sincerity conditions). This once again underscores the fundamental role of the speech act level.

4. Conclusion

We reviewed Walton's main contribution to evaluating the *ad baculum* argument (Walton, 2014) and identified ways of advancing Walton's three-level approach, itself comprising a logical, a speech act, and a dialectical level. The logical and the speech act levels house the *ad baculum* argument scheme, respectively the felicity conditions of threatening, whereas the dialogical level houses the dialogue types accommodating the speech act. On this approach, *ad baculum* argument scheme instances are evaluated as (non-)fallacious according to whether the speech act of threatening facilitates or prevents the realization of the goal associated with the dialogue type of threatening.

To advance Walton's approach, we clarified the connection between the speech act and the logical levels by highlighting the fundamental role of the felicity conditions of threatening. We indicated how these conditions can be used to construct the *ad baculum* argument scheme and an associated CQ-list. We invite scholars to apply this combination of argument scheme and speech act theoretic elements to other argument schemes that can be characterized using specific speech act types.

Acknowledgments

For critical comments that allowed us to develop an earlier version of this manuscript, we thank audience members at the "Douglas Walton Legacy Workshop" held 17-18 February 2023, at the University of Windsor, Ontario, Canada, especially Catherine Hundleby, Christopher Tindale, and Fabrizio Macagno. S.Y. acknowledges funding from the Nankai University Development Funds for the Humanities (No. ZB22BZ0314). F.Z. acknowledges funding from EU Cost Action CA 17132 (European Network for Argumentation and Public Policy Analysis) and the Polish National Science Center (No. 2019/35/B/HS1/03281).

References

Blyth, J. 1957. *A Modern Introduction to Logic*. Boston: Houghton Mifflin Company.

Brinton, A. 1992. The *ad baculum* re-clothed. *Informal Logic* 14: 87-92.

Chase, S. 1956. *Guides to Straight Thinking*. New York: Harper & Row Publishers.

Copi, I. M. 1961. *Introduction to Logic* (2nd edition). New York: Macmillan Company.

Copi, I. M., and Cohen, C. 1998. *Introduction to Logic* (10th edition). New Jersey: Prentice-Hall.

Creighton, J. 1910. *An Introductory Logic*. New York: The Macmillan Company.

Fearnside, W. 1980. *About Thinking*. New Jersey: Prentice-Hall.

Hibben, J. 1906. *Logic: Deductive and Inductive*. New York: Charles Scribner's Sons.

Jason, G. 1987. The nature of argumentum ad baculum. *Philosophia* 17: 491-499.

Kelley, D. 1988. *The Art of Reasoning*. New York: W. W. Norton & Company.

Kinery, E. 2022, October 31. Biden threatens higher taxes on oil companies if they do not work to lower gas prices. *CNBC*. Retrieved from https://www.cnbc.com/2022/10/31/joe-biden-threatens-higher-taxes-on-oil-companies-amid-high-gas-prices.html.

Levi, D. 1999. The fallacy of treating the *ad baculum* as a fallacy. *Informal Logic* 19: 145-159.

Locke, J. 1975. *An Essay Concerning Human Understanding* [1st ed. in 1690]. P.H. Nidditch (ed.). Oxford: Clarendon Press.

Mellone, S. 1913. *An Introductory Textbook of Logic*. Edinburgh: William Blackwood and Sons.

Pirie, M. 1985. *The Book of Fallacy*. *A Training Manual for the Intellectual Subversives*. London: Routledge & Kegan Paul.

Schiller, F. 1912. *Formal Logic: A Scientific and Social Problem*. London: Macmillan and Co., Limited.

van Eemeren, F. H., and Grootendorst, R. 1992. *Argumentation, Communication, and Fallacies*. Hillsdale: Lawrence Erlbaum.

van Eemeren, F. H., and Grootendorst, R. 2004. *A Systematic Theory of Argumentation. The Pragma-dialectical Approach*. Cambridge: Cambridge University Press.

van Eemeren, F. H., Garssen, B., and Meuffels, B. 2015. The disguised *ad baculum* fallacy empirically investigated. Strategic maneuvering with threats. In F.H. van Eemeren (ed.), *Reason-*

ableness and Effectiveness in Argumentative Discourse. Switzerland: Springer Cham.

Walton, D. 1992. *The Place of Emotion in Argument*. University Park: Penn State Press.

Walton, D. 2000. *Scare Tactics: Arguments that Appeal to Fear and Threat*. Dordrecht: Kluwer.

Walton, D. 2014. A dialectical analysis of the *ad baculum* fallacy. *Informal Logic* 34: 276-310.

Wilson, B. 1986. *The Anatomy of Argument*. New York: University Press of America.

Woods, J. 1998. Argumentum *ad baculum*. *Argumentation* 12: 493–504.

Woods, J. 2004. *The Death of Argument*. Dordrecht: Springer.

Woods, J. 2013. *Reasoning Errors: Naturalizing the Logic of Inference*. London: College Publications.

Wreen, M. 1987. Yes, Virginia, there is a Santa Claus. *Informal Logic* 9: 31-39.

Wreen, M. 1988. Admit no force but argument. *Informal Logic* 10: 89-95.

Wreen, M. 1995. Knockdown arguments. *Informal Logic* 17: 316-336.

Yu, S., and Zenker, F. 2023. A scheme and critical questions for the *argumentum ad baculum*. *Topoi* (online first). https://doi.org/10.1007/s11245-023-09904-7

Zenker, F., Laar, J. A., van, Cepollaro, B., Gata, A., Hinton, M., King, C. G., Larson, B., Lewiński, M., Lumer, C., Oswald, S., Pichlak, M., Scott, B.D., Urbański, M., and Wagemans, J.

H. M. 2023. Norms of public argumentation and the ideals of correctness and participation. *Argumentation* (online first). https://doi.org/10.1007/s10503-023-09598-6