INQUIRY: A NEW PARADIGM FOR CRITICAL THINKING

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*All papers are jointly authored unless otherwise indicated.

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INTRODUCTION

INQUIRY: A NEW PARADIGM FOR CRITICAL THINKING

THE PROJECT

This volume reflects the development and theoretical foundation of a new paradigm for critical thinking based on inquiry. The field of critical thinking, as manifested in the Informal Logic movement, developed primarily as a response to the inadequacies of formalism to represent actual argumentative practice and to provide useful argumentative skills to students. Because of this, the primary focus of the field has been on informal arguments rather than formal reasoning. Yet the formalist history of the field is still evident in its emphasis, with respect to both theory and pedagogy, on the structure and evaluation of individual, de-contextualized arguments. It is our view that such a view of critical thinking is excessively narrow and limited, failing to provide an understanding of argumentation as largely a matter of comparative evaluation of a variety of contending positions and arguments with the goal of reaching a reasoned judgment on an issue. As a consequence, traditional critical thinking instruction is problematic in failing to provide the reasoning skills that students need in order to accomplish this goal. Instead, the goal of critical thinking instruction has been seen largely as a defensive one: of learning to not fall prey to invalid, inadequate, or fallacious arguments.

While acknowledging the value of "logical self-defense," we see the critical thinking project as having a much more expansive educational goal – that of critical inquiry. Students need to be equipped to critically investigate issues of significance, actively seek and identify credible information, and make judgments based on a critical evaluation of reasons and evidence. Thus the alternative conception of critical thinking which we have been developing, while including fallacy identification and argument critique, focuses primarily on inquiry, which we view in terms of arriving at reasoned judgments on issues, frequently of a complex nature.

We believe that this approach offers a new paradigm for critical thinking because it differs from more traditional conceptions in a number of fundamental ways. First, it is primarily epistemological rather than logical. The traditional approach focuses on the evaluation of arguments according to the norms of logic, informal as well as formal, examining, for example, whether the conclusion of an argument follows from its premises or whether logical fallacies have been committed. The inquiry approach, on the other hand, appeals to the range of epistemological norms used to justify and critique claims in a variety of areas, including, for example, criteria for evaluating sources, judging causal claims, or evaluating statistical arguments.

Second, the inquiry approach differs from the traditional approach in being dialectical. It does not focus simply on individual arguments but rather on the comparative evaluation of a variety of contending positions and arguments necessary for coming to a reasoned judgment.

Finally the inquiry approach is contextual. The consideration of context has traditionally been viewed as irrelevant to the evaluation of an argument. In contrast, the inquiry approach, focusing as it does on issues rather than individual arguments, takes as an important aspect of evaluation the consideration of the context in which the issue has been devel-

oped, including its dialectical, intellectual, and historical contexts.

We have implemented this inquiry approach in our textbook, *Reason in the Balance: An Inquiry Approach to Critical Thinking* (Hackett 2016; McGraw-Hill Ryerson 2010). The text uses dialogues among an ongoing cast of characters involved in realistic situations as a context for discussing the various aspects that go into the practice of inquiry, including identifying issues, identifying the relevant contexts, understanding the competing cases, and making a comparative judgment among them. These aspects are instantiated in inquiries on topics such as vegetarianism, vaccination, prostitution, conspiracy theories, the evaluation of a film, the legalization of marijuana, and the right of hate groups to speak. These various aspects are also applied to inquiry in specific contexts, including science, social science, philosophy, and the arts. There is also considerable emphasis placed throughout on the habits of mind which are essential for inquiry, including (among others) open-mindedness, fair-mindedness, the desire to act on the basis of reasons, the acceptance of uncertainty, and respect for others in dialogue – habits of mind which we characterize as the spirit of inquiry.

The present volume can be seen as a theoretical companion piece to the textbook. What we have done here is to collect the various papers that reflect the development of our approach, highlighting its foundation, theoretical elaboration, and diverse applications. These papers were written over a period of time and reflect the development of this approach historically as well as conceptually. The papers have all been published previously and are presented, for the most part, in their original form. As such, they draw on the research and literature available at the time of their creation or publication and reflect the dialectical context in which the ideas were initially developed. Our ideas have, to be sure, developed over time in response to a changing dialectical context. We have revisited

issues, developing them in what we hope is a more robust and nuanced way, and explored implications and applications of the approach. While we have added some more contemporary references to several of the earliest papers (chapter 1, 2, 3, and 11), we have endeavoured to remain faithful to the original purpose and context of each paper and to the developmental nature of the project as a whole.

THE PAPERS

The issues reflected here are ones which we have been thinking about and writing about for many years. We were each, independently, over the years, coming to the view that there were problems in basing critical thinking instruction strictly on the evaluation of individual arguments and in the fallacy approach; and we were both developing alternative ways to conceptualize critical thinking.

Mark's 1989 paper, "Critical Thinking as Applied Epistemology: Relocating Critical Thinking in the Philosophical Landscape," is an early elaboration of such an alternative conception. The paper argues that the appropriate philosophical heritage of critical thinking is not in logic, as is implied by the term 'Informal logic,' but rather in epistemology, involving as it does the application of epistemological norms to common problems. It also argues that, just as applied ethics contributes to the enhancement of normative ethics, so also should applied epistemology contribute to the enhancement of traditional epistemic norms.

Sharon's 1992 "Argumentation as Inquiry" also addresses the issue of how argumentation should be conceived. The paper contests Blair's contention that all argumentation can be construed as instances of two person dispute-resolving argumentation and argues that, from both an epistemological and a pedagogical perspective, argumentation is best conceived as inquiry.

Sharon's 1999 paper, "The Problem with Percy: Epistemol-

ogy, Understanding, and Critical Thinking," further develops the argument for the centrality of epistemology for critical thinking. The paper argues that the requisites for critical thinking cannot be fully encompassed by the notions of skills and dispositions and that the additional dimension is an epistemological one: an understanding of the nature of inquiry.

The ideas regarding the centrality of epistemology and of inquiry for critical thinking initially proposed in these three early papers have been foundational for the conception of critical thinking which we subsequently jointly developed and elaborated.

"Reason Appreciation," an early joint paper, explicates the notion of reason appreciation, which involves a respect for reasoning based on an understanding of its nature, role and significance. Appreciating reason involves, centrally, valuing its processes and outcomes, honouring its normative demands, and thus being committed to acting according to its dictates. This notion is at the heart of our subsequent idea of the critical spirit, which we argue is central to the process of inquiry.

It is in our paper, "Inquiry: A Dialectical Approach to Critical Thinking," where we lay out our basic approach and its rationale. In this paper, we argue that the central goal of critical thinking is the making of reasoned judgments and that arriving at reasoned judgments is, in most cases, a dialectical process involving the comparative weighing of a variety of contending positions and arguments. Recognizing this dialectical dimension means that critical thinking pedagogy should focus on the kind of comparative evaluation and weighing of reasons which we make in actual contexts of disagreement and debate.

Scholarly interest in the kind of dialectical or pro and con reasoning which is at the heart of the inquiry approach has grown considerably in recent years with the renewed interest in conductive reasoning. As a contribution to this discussion, our paper, "Guidelines for Reaching a Reasoned Judgment,"

addresses the contentious issue of the evaluation of conductive arguments by offering some general guidelines for reaching a well-reasoned judgment through conductive reasoning and a set of criteria which arise from these guidelines for identifying inadequate conductive argumentation.

One of the guidelines proposed in "Guidelines for Reaching a Reasoned Judgment" is that arguers should make a judgment at the appropriate level of confidence, apportioning their judgment to the strength of the reasons. Our paper, "Conductive Argumentation, Degrees of Confidence, and the Communication of Uncertainty," takes this line of reasoning further by arguing that arguers also have an obligation to communicate their judgments with the appropriate level of confidence, expressing the degree of certainty or uncertainty warranted by the strength of the evidence and arguments.

A number of the papers develop various aspects of our approach and examine its implications for a variety of issues in critical thinking and argumentation theory. An early paper of Mark's, "Assessing Expert Claims: Critical Thinking and the Appeal to Authority," argues that the evaluation of authoritative information has been given insufficient attention in critical thinking instruction. The paper goes on to offer a revised set of criteria for assessing appeals to authority which recognize the role of expert consensus and of the explanation and justification of claims offered by experts. These criteria, aimed at fostering an appropriate balance between rational trust and appropriate skepticism, play an important role in the critical evaluation which is integral to the inquiry approach.

The role, in inquiry, of identifying fallacies is another subject of investigation. In "Fallacy Identification in a Dialectical Approach to Teaching Critical Thinking," we put forward a conception of a fallacy that departs from many standard accounts, characterizing a fallacy as an argument pattern whose persuasive power greatly exceeds its probative value. We go on to argue, however, that the identification of fallacies

in individual arguments usually cannot, in itself, constitute an adequate evaluation of the strength of the argumentative support for a claim and that such an assessment must be based on the completion of the inquiry and a comparative evaluation of the arguments. Thus, given the dialectical nature of inquiry, fallacy identification can play only a preliminary, *prima facie* role in argument assessment.

The significance of considering the context surrounding an issue is underestimated and often overlooked in approaches to critical thinking theory and instruction based on informal logic. Our paper, "Critical Inquiry: Considering the Context," argues, in contrast, that considering the context of an issue is an important component of the inquiry process. The paper elaborates on our view about the importance of considering context by examining in detail the role of a number of different aspects of context for inquiry: dialectical context, the current state of belief or practice, intellectual, political, historical and social contexts, disciplinary context, sources, and self.

The implications for critical thinking theory and instruction of the research on cognitive biases is the subject of "Critical Thinking and Cognitive Biases." The paper details what this psychological work can add to the philosophical understanding of reasoning errors and also highlights how some aspects of the inquiry approach can help to counter some of these biases. These include: 1) the identification of the persuasive power of fallacies; 2) the use of strategies such as a set of guiding questions and the conscious monitoring of our thinking processes to slow down our thinking and make it more deliberate; 3) the deliberate seeking out of counter-evidence and alternative views to counter myside bias; and 4) the requirement to examine the full range of arguments on all sides of an issue in order to make a judgment with the appropriate degree of confidence, which can act as a counter to the bias of overconfidence.

Our paper, "DAMed If You Do; DAMed If You Don't:

Cohen's 'Missed Opportunities'," is written in response to a paper by Cohen in which he highlights an apparent tension between a collegial practice of argumentation in which arguers help each other and the Dominant Adversarial Model in which the specification of roles precludes such mutual assistance. Our paper, developing a theme initially raised in "Argumentation as Inquiry," argues that the tension is resolved by rejecting the characterization of roles inherent in the DAM account and recognizing that the epistemological structure of argumentation necessitates inquiry, which is a collegial, non-adversarial enterprise.

Several of our papers examine the application of our approach in various contexts. "Beyond the Boundaries: The Epistemological Significance of Differing Cultural Perspectives" focuses on an aspect of critical thinking which is central to our dialectical conception, the consideration of alternatives, addressing the question of whether and to what extent the requirement to consider alternatives extends to the beliefs and practices of other cultures. The paper explores this question in the context of a number of examples, including conceptions and practices of art in other cultures, aboriginal justice, traditional Chinese medicine, and religion and hydrology, and offers some guidelines for delineating the appropriate realm for serious considerations.

"Teaching Critical Inquiry in Science: The Role of Dialectical Context in Scientific Reasoning" explores the role of dialectical context in scientific inquiry and science pedagogy. Building on the conception of dialectical context explicated in "Critical Inquiry: Considering the Context," the paper details several examples from the history of science which show how the history and the state of the controversy in which a scientific theory is put forward play a crucial role in the evaluation of a theory. The paper also argues that having students conduct inquiries using such historical cases, as well as contem-

porary debates, can give students a sense of the dialectical and evolving nature of scientific inquiry.

The teaching of critical thinking is the subject of our textbook and is never very far from our sights in our theoretical papers. But there are also several of our papers where it is the explicit focus. Mark's early paper, "The Competent Layperson: Re-envisioning the Ideal of the Educated Person," argues that educating the competent layperson should be the central goal of undergraduate education. The paper explicates this notion, detailing the kind of breadth of understanding, ability to evaluate claims and explore specialized areas, and appreciation of the natural, social and artistic worlds that comprise this ideal. The paper goes on to show how engaging students in the process of critical inquiry is the best way to achieve this goal.

"Critical Thinking as Inquiry in Higher Education" outlines the shortcomings of both conventional critical thinking courses and traditional disciplinary teaching for developing critical thinking in higher education and argues that an inquiry approach is a more effective means for achieving this goal. The paper shows how the process of comparatively evaluating competing arguments is central for arriving at reasoned judgments in disciplinary as well as in everyday contexts. In emphasizing both the aspects common to inquiry across a range of areas and the modes of argumentation that are specific to an area, the inquiry approach can be used to foster critical thinking both in separate course and within disciplinary instruction.

Our paper, "Fostering the Virtues of Inquiry," expands on our notion of the critical spirit, elucidating the virtues necessary for inquiry, which include an overarching commitment to rational belief and action and a set of sub-virtues such as open-mindedness, fair-mindedness, concern for truth and accuracy, which are grounded in that commitment. The paper argues, further, that these virtues are best acquired through an immersion in the practice of inquiry within the context of a com-

munity which instantiates the norms and virtues of rational inquiry.

The relationship between critical thinking and creative thinking is the topic of Sharon's paper, "Is Argument for Conservatives? or, Where Do Sparkling New Ideas Come From?" In it, she addresses Rorty's claim that argument can only be a means for criticizing existing ideas and so cannot result in innovation whereas an imaginative envisioning of new ideas is necessary for intellectual progress. The paper argues, on the contrary, that intellectual progress proceeds through the process of inquiry which involves a dynamic interplay between the generation and the criticism of ideas. Argument is thus crucial to the development of new ideas.

The last paper in the volume, Mark's "Enhancing Rationality: Heuristics, Biases, and The Critical Thinking Project," revisits some of the ideas in our paper, "Critical Thinking and Cognitive Biases" but takes them in a new direction. This paper critiques the narrow conception of rationality as rational self-interest embedded in the standard economic interpretation of the heuristics and biases research. It further argues for the reclaiming for the critical thinking project of the area of applied rational decision-making but in a form which includes a focus on collective rationality and which takes into account factual, moral, political and personal considerations as well as utility maximization.

I. FOUNDATIONAL PAPERS

CHAPTER 1

CRITICAL THINKING AS APPLIED EPISTEMOLOGY: RELOCATING CRITICAL THINKING IN THE PHILOSOPHICAL LANDSCAPE[1]

Mark Battersby

1. INTRODUCTION

One of the most important developments in contemporary philosophy has been the interest in applying philosophy to contemporary issues. This occurred first on an *ad hoc* basis as philosophical reasoning was brought to bear on various moral problems such as abortion and triage. But more significantly, it has involved the creation of applied disciplines such as applied ethics (and sub-disciplines such as professional ethics) and Critical Thinking or informal logic.[2] While most

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1. I wish to thank the following helpful readers and commentators: Diana Davidson, Harvey Siegel, Earl Winkler, Hans Hansen, and Reid Gilbert.

2. "Critical thinking" is a more generally used term for the subject I wish to discuss, but "informal logic" is the term more widely used in philosophical circles—indeed, as the name of this journal. While the terms are often used interchangeably, I think it should be noted that for most educators, informal logic (the analysis and evaluation of arguments in ordinary discourse) is a subset of critical thinking. Critical thinking is often taken to involve not only argument analysis and evaluation, but also creative thinking and problem solving skills and a positive attitude towards open-mindedness and the application of informal logic and problem solving skills in everyday life. In its most full-blown articulation, critical thinking can be viewed as an educational ideal very similar to the traditional liberal arts ideal of the thoughtful citizen. In this paper, I am concerned to focus on that aspect of Critical Thinking that is of central interest to philosophers—i.e. informal logic, not only because it is of interest to philosophers, but because it is the central concept on which the notion of Critical

philosophers would probably not question my claim concerning the importance of developments in applied ethics, they might well question the claim as it applies to informal logic.

But I think that this would be a mistake. In this paper I will argue that critical thinking's relationship to philosophy could well be as productive of philosophical insight as is applied ethics, and, as a result, critical thinking deserves the same philosophical attention as that accorded applied ethics.

"Informal logic" is the name commonly used in philosophical circles to describe critical thinking, but it tends to obscure the relationship of critical thinking to philosophy; critical thinking is not a "casual" relative of logic, as the name suggests, but, rather, it is a significant effort to apply many of the insights of philosophy and particularly of epistemology to common questions about what we should believe. What makes critical thinking "critical" is the often negative impact on belief that results from the application of epistemological norms to common problems and judgments. Because it is epistemological norms and not rules of logic that constitute the philosophical core of critical thinking, it is unfortunate that this activity has been called and, therefore, misunderstood as informal logic. A better nomenclature would be "applied epistemology," suggesting as it does the right philosophical heritage and the parallel with applied ethics. Indeed, it is reasonable to expect that critical thinking will generate as many interesting problems for epistemology as applied ethics has done for ethics.

There is no novelty in the claim that the theoretical core of critical thinking should be thought of as epistemology; an excellent paper by Harvey Siegel (1985) makes this case quite

Thinking depends. Because I am recommending a change of terminology, the terminological problem becomes complex. For this reason, I will use "Critical Thinking" (capital 'C', capital 'T') to refer to Critical Thinking in its broadest ambit and "critical thinking'" without capitals as synonymous with "informal logic." In the long run I would recommend replacing "informal logic" with "applied epistemology," and keep "critical thinking" (with or without capitals) to include the broader range of concerns.

eloquently, and McPeck (1981) has made a similar point. The argument is very simple. Most of the claims that critical thinkers wish to examine are not deductively supported by their evidence, but are supported by evidence that "warrants" or justifies the belief. The crucial challenge for critical thinkers is to articulate the norms which can be used to justify well supported beliefs and criticize those that are not. While I elaborate this argument slightly, I am primarily concerned to bring to the attention of philosophers the value that the study of critical thinking has for epistemology. I do this by pressing the analogy of applied ethics, and illustrating the significant epistemological difficulties that critical thinking has already revealed, as, for example, the problems surrounding the appeal to authority.

Critical thinking's failure to attract appropriate attention from the discipline of philosophy is due I think partly to its history and partly to its novelty. Let me deal first with its history.

Critical thinking began primarily as a "teaching discipline." Howard Kahane, who can be given large credit for initiating this effort, has explained how he was pushed by student demands for relevance that characterized the sixties to create an informal logic course. To many in philosophy, informal logic remains something either to be celebrated or endured in the curriculum, as a holdover from the sixties and as a boost to student enrollment in the eighties. Because of the history and role that introductory critical thinking courses play, philosophers view the course as a service course, as essentially remedial, yet rarely as a subject with interesting problems worthy of study and research.

I think this is the wrong attitude. Applied ethics had the same "sixties" origins, but has now grown into a discipline with numerous journals and sub-disciplines. It has done so because those who began seriously to "apply" such ethical understanding as they thought philosophy possessed discov-

ered that their theoretical understanding was not up to the complexity of many real life situations. As a result, there was a need for theoretical development which gave central place to the processes and problems of application, the study of which gradually took on a life of its own.

Important effects of this awareness have been the renewed emphasis on rights in ethical and political literature, increased skepticism about the value of utilitarianism to solve ethical problems despite its self-proclaimed practicality, and a general awareness that much of the difficulty in applying ethical norms comes in interpretation of the norms during application. More generally, the actual effort to resolve pressing moral dilemmas, or at least to provide guidance for approaching moral problems, has led to a deeper understanding of moral reasoning and a revitalization of ethical theory as exemplified in such journals as *Philosophy and Public Affairs.*

Much the same may be expected from critical thinking. Not only do striking parallels exist between the relationship that critical thinking bears to epistemology and that which applied ethics bears to traditional ethical theory, but there are already problems that have been encountered by critical thinking instructors that could have a profound impact on epistemology. The discussion of these problems will provide the second ground for my claim.

To develop my claims about the parallels between applied ethics and critical thinking, I must first give a more detailed account of what I see as the situation in ethics. Subsequently, I will show how this categorization of ethics can be applied to epistemology to illuminate the relationship between critical thinking and traditional epistemology.

2. THE PARALLEL AND ITS IMPLICATION FOR CRITICAL THINKING

2.1. Ethics

Ethics can be divided into three subareas (exhibiting the traditional philosophical enthusiasm for tripartite distinctions): meta-ethics, normative or theoretical ethics, and applied ethics. Courses and texts are often divided up this way: such a subdivision of ethics is relatively uncontroversial.

2.1.1. Meta-ethics

Beyond the analysis of basic ethical concepts, meta-ethics is concerned with the nature and foundation of ethical knowledge, particularly with the question of whether there is any ethical knowledge.[3] The difficulties in establishing a secure basis for ethical claims has led many philosophers and even more first year students to conclude that some kind of skepticism or relativism is the only reasonable position. The arguments for and against skepticism and relativism, Naturalism and Intuitionism, and arguments generally about the nature of ethical discourse fall under meta-ethics.

2.1.2. Normative or Theoretical Ethics

Normative ethics, in contrast to meta-ethics, assumes that there is some ethical knowledge to be acquired (or at least that there are better and worse answers to ethical questions) and that this knowledge is usually articulated in a principle or fundamental set of principles or norms. The job of the philoso-

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3. I thought this claim was unproblematic, but a commentator on my paper objected. In support, I quote the following statement from William Frankena's classic introduction to ethics:[Meta-ethics] asks and tries to answer logical, epistemological, or semantical questions like the following: What is the meaning or use of the expressions "(morally) right" or "good"? How can ethical and value judgments be established or justified? Can they be justified at all? What is the nature of morality? What is the distinction between the moral and the nonmoral? (Frankena 1973, pp.5, 96; see also Brandt 1967, p.7).

pher in this area is to find these principles, articulate them, and show that these are the principles that any ethically thoughtful person should accept.

Normative ethics has tended to bifurcate into two major approaches: consequentialism and the deontologism. Consequentialism, as its name implies, holds that the rightness or wrongness of acts is wholly a function of their consequences. Deontologism (*deon* (Gr.) = duty) denies this claim insisting that some acts are right or wrong independent of their consequences. The principle representatives of each approach are Utilitarianism and Kantianism. Both schools have tried to show that this approach to ethical reasoning yields the correct outcome in actual moral situations. However, their main emphasis has been to argue about imaginary problems and thought experiments—some of them thoroughly bizarre. A more practical approach has been taken by John Rawls (1971). His effort to ground ethical norms in a decision procedure using the "veil of ignorance" is an excellent example of normative ethics.[4]

2.1.3. Applied Ethics

While philosophers have obviously been concerned over the centuries with applying ethical theories to practical issues, the appearance of a sub-discipline devoted to this endeavor is of recent vintage.

The original goal of applied ethics was to use the insights and principles of normative ethics to illuminate or even resolve issues of contemporary moral debate such as abortion and the allocation of scarce medical resources. But while this was the intent of applied ethics, in practice the inadequacy of many traditional moral theories and the difficulties in their interpretation have resulted in the development of new approaches which are grounded in the problems being studied.

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4. Rawls also does quite a bit of applied ethics in this text.

Therefore, the distinction between applied ethics and normative ethics is not so much a conceptual one as is the distinction between meta-ethics and normative ethics, but rather one of focus. Applied ethics focuses first on the ethical problem and only then on the ethical theory. The question for applied ethics is, first, what is the morally correct action in response to this sort of situation? and then, what are the correct principles of ethical theory?

Of course many great ethicists have written about everyday problems, for example, Kant in his *Lectures,* or Mill in his chapter on "Applications" in *On Liberty.* In doing so, they were engaged in applied ethics, but they differed from contemporary applied ethicists in that these efforts were afterthoughts, rather than their central concern.

Take the problem of abortion. One could start out with a theory about the universal right to life and then puzzle over how to apply it to a fetus. Or one could start, as various thinkers have, with the problem of trying to discern what the morally relevant differences are (if any) between a fetus, a dying violinist (Thomson 1971), a human vegetable, and a zygote. This "problem first" approach is both exciting and illuminating. One of the consequences of this approach has been an increased awareness of the problem of interpretation of ethical norms in actual application. One may expect that new normative theories might emerge from this effort; although they may fall roughly into one of the normative camps, the emphasis on real problems assures that the theories will be tied to the rich factual base of ordinary and extraordinary problems of everyday life.

It is not so much the move to apply philosophy that is exciting about applied ethics, but rather the feedback that these attempted applications generate. By sensitizing us to the difficulty of interpretation and the inadequacy of existing normative theories, and by placing philosophers in positions where

decisions must be made, applied ethics has inspired a renaissance in ethical reflection.

One further distinction should be mentioned. There is ethics even beyond applied ethical theory, that is, there is *being* ethical. I do not see the making of individual ethical judgments about, for example, whether to have an abortion in a particular case, as being applied ethics. These are cases of applying ethics, yes, but not an event in the field of applied ethics. On the other hand, to the extent that someone criticizes an ethical decision on the basis of the misapplication of ethical norms (as opposed to factual and logical error), this seems to me an activity inside, though near the border of, applied ethics. This distinction will become important when I go on to discuss applied epistemology.

How does the above division of ethics compare to an appropriate division in epistemology?

2.2. Epistemology

There is not a parallel, well-established trichotomy in epistemology, but I have one to propose, one directly analogous to that of ethics.[5]

2.2.1. Meta-Epistemology

First, there is meta-epistemology. This is what most philosophers think of under the general term of "epistemology": the study of the central concepts of knowledge and the foundations of the theory of knowledge.[6] Meta-epistemology

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5. A commentator on an earlier version of my paper brought to my attention an article by Richard Brandt (1967) in the Encyclopedia of Philosophy that draws similar parallels between meta-ethics and what he, too, calls meta-epistemology, and normative ethics and epistemology, though he makes no mention of applied ethics and, needless-to-say, no mention of applied epistemology.

6. Hans Hansen has brought to my attention a 1982 paper by William P. Alston which makes the same point:Recent epistemology has been heavily concerned with the conceptual and methodological foundations of the subject—in particular with the concepts of knowledge, certainty, basic knowledge, justification, and so on. In other words, to a considerable extent

attends primarily to epistemic discourse and it, too, can lead to skepticism about the possibility of knowledge. It has as its goal the analysis of epistemological discourse as illustrated by the continuing efforts to discover the missing ingredients in the traditional analysis of knowledge as justified, true belief (illustrated in the puzzles of Gettier). Why it has not been called meta-epistemology is not clear to me. This failure has tended to create the illusion that meta-epistemological concerns are the central issues in the discipline of epistemology.

2.2.2. Normative Epistemology

Normative epistemology[7] is a less distinct area, but there are a number of items that are specific to it. Like the normative ethicist, the normative epistemologist assumes that there is a solution to skeptical objections and proceeds to articulate what constitutes the correct basis of knowledge. As Brandt puts it:

> [Normative epistemologists] . . . have attempted to arrive at acceptable universal epistemological statements to be used as standards in appraising particular statements (Brant 1967, p.6).

While meta-epistemology is concerned with the role that "justified belief" plays in the analysis of the concept of knowledge, normative epistemology is concerned to articulate the epistemological norms which delineate what kind and quantity of evidence one needs to have a "justified belief."

Here one finds the traditional debate — between the rationalists and intuitionists on one side, and the empiricists and

it has been taken up with meta-epistemology, in contrast with substantive epistemology, in contrast with questions about what we know, how we know it, and how various parts of our knowledge are interrelated. Just as with ethics, meta-inquiries have been pursued throughout the history of the subject..., but also as in ethics, meta concerns have been more prominent in twentieth century Anglo-American philosophy than ever before (Alston 1982, p.275).

7. Alston characterizes this as "substantive epistemology," while Brandt describes it as "epistemology proper" (Brant 1967, p.6).

naturalists on the other side. It is a debate which very much parallels the one between the Kantians and the Utilitarians. These various epistemological views have even had the same geographic orientation as we saw in the ethical debate, in which Europeans prefer rationalism and intuitionism (and Kantianism) and the Anglo/Americans prefer empiricism and naturalism (and Utilitarianism).

Work in the philosophy of science (and its sub-areas) seems to occupy a middle-ground: partly normative epistemology, partly applied epistemology. Grounded as it currently is in the actual practice of scientists, it seems to reside naturally in applied epistemology, but its origins are in the efforts of both rationalists and empiricists to discover a basis for science without trying to ground it in the actual methods used by scientists. There is, for example something wonderfully rationalistic about Mill's methods which is little troubled by actual scientific activity. Recently the philosophy of science has given greater emphasis to the actual way scientists assess claims which is more analogous to what goes on in applied ethics and, thus, closer to applied epistemology.

2.2.3. Applied Epistemology

I see applied epistemology as, first, attempting to apply the insights of normative epistemology to the everyday pursuit of knowledge. This activity involves using normative epistemological views (for example, the role that the elimination of competing hypotheses plays in defending a causal claim) much more than "logical principles." In teaching critical thinking, we are, among other things, promulgating epistemological norms. And I think we find ourselves in a somewhat happier situation than those who first set out to apply normative ethics.

By describing, for example, the role that the elimination of competing hypotheses plays, we can illuminate for our students important facts about the way scientists acquire knowledge and give them useful rules of thumb for assessing every-

day causal claims. The well-established distinction between questions of how scientific discoveries are made and how they are established has many useful parallels in everyday life.

As indicated, much of the progress in philosophy of science has resulted from actually attending to how scientists arrive at their knowledge of the world. It has produced support for relativism (the recognition that scientific world views are grounded in the culture(s) of science), but at the same time, has yielded insights which have influenced working scientist (cf. those scientist influenced by Karl Popper). These later insights are on the border line between normative and applied epistemology.

Hume's attempt to show that miracle claims can be dismissed *a priori* is a nice, though controversial, example of trying to do applied epistemology. Similar efforts to apply epistemology are often made in the magazine, *The Skeptical Inquirer.* This magazine, while often concerned with the straightforward factual refutation of paranormal claims, also focuses on epistemological considerations such as the question of whether the claim is falsifiable. These are examples of applying our epistemological understanding to illuminate and criticize dubious, everyday knowledge claims, and they are parallel to the attempt to apply ethical principles to contemporary issues in applied ethics. [8]

Finally, I wish to emphasize the parallel between doing applied epistemology versus applying epistemology, and doing applied ethics versus applying ethics. In *applied* ethics, for example, we deal with abortion in general; in *applying* ethics we decide on the rightness of a particular abortion. By analogy in *applied* epistemology we might deal with questions concerning the role that the elimination of competing hypotheses plays in establishing a causal claim, but not the question of whether this or that particular hypothesis should be, or has been, elim-

8. An excellent recent example of doing applied epistemology (and also applied ethics) is Coady and Corry's The Climate Debate: An Epistemic and Ethical Enquiry (2013).

inated. On the other hand, as with applied ethics, the criticism of a particular view on an epistemological as opposed to factual basis is a legitimate activity within applied epistemology.[9]

But my concern is not simply to draw the parallel between critical thinking and applied epistemology, but to use this analogy to support the claim that the concerns of critical thinkers have significant philosophical import. In particular, the efforts to apply epistemological understanding to practical problems uncovers a number of difficulties within epistemology.

3. SOME IMPLICATIONS FOR NORMATIVE EPISTEMOLOGY

One of the most obvious facts about how knowledge is actually acquired is the heavy reliance on authority. Most of what we know, we know because someone told us. This is out of line with the traditional emphasis on either reason or experience as the basis of knowledge. What is the state of the theory of appeal to authority? It hardly exists.[10] But there other even deeper problems. While great effort is expended on trying to decide what else there is to knowledge besides justified true belief, little time is spent on what would count as sufficient justification for a belief to be the basis of a knowledge claim. The

9. Harvey Siegel, in criticizing an earlier draft of this paper, argued that ethical questions such as "What should I do?" are answered by normative ethics, but that questions of "What should we believe?" are not answered by normative epistemology—hence my analogy was problematic. This seems to me to miss the complexity of both kinds of questions. Obviously, factual considerations play a part in most ethical decisions and these are not the objects of ethical inquiry. Obviously also, observation, mathematics, and formal logical inference play a role in scientific investigation, and these are not the objects of epistemological reflection. But to the extent that a doctor is misapplying ethical norms or concepts (perhaps through inadequate justification), she is subject to ethical criticism and this could be justly done in a paper in applied ethics. Concomitantly, to the extent that a scientist is employing epistemological norms in supporting her claims, both the application and content of these norms could justly be questioned by epistemologists—applied or otherwise.

10. After I wrote this, I read the article by John Hardwig (1985), which is an excellent first step to explicating the role that authority plays in scientific knowledge. Subsequently, I have written a paper, "Assessing Expert Claims: Critical thinking and the Appeal to Authority" (included in this volume), which attempts to develop a theory of appeals to authority. More current work on appeals to authority can be found in Walton 2010.

assumption may be that there is little in general that can be said about the rules which would specify what evidence would constitute sufficient justification for a belief to be the basis of a knowledge claim: that this question must be answered by probability theory or intra-discipline norms. But, of course, it is just such a question that presents itself to us every day, and such questions do not always fall into some discipline's "jurisdiction." "Do I have enough evidence to proceed with this injunction, business decision, complaint, and so on?" "Can I say "I know" he did it on the basis of the evidence that I have?"

A related issue arises when considering people's actual willingness to make knowledge claims. Our willingness to claim we know something seems to be, at least partly, a function of what is at stake, weaker justification being sufficient for issues of lesser importance. I may say that "I know you are coming at five" simply on the basis of overhearing you say so, until I discover that my life depends on my being right. This point is related to Austin's insight that claiming to know is a kind of performative (Austin 1979). But Austin's claim is a descriptive claim, a meta-epistemological claim. The question applied epistemology would treat would be: when is it reasonable to stake yourself behind your claim, to claim that you know?

These are crucial epistemological questions, questions that should be addressed by philosophers, and questions that get much impetus when one attempts to apply epistemology to issues of everyday concern. These problems seem to me rich enough to justify the creation of a new field. Before we can advance the teaching of critical thinking beyond the largely introductory nature of current courses, these questions require deep, theoretical study.

4. EXAMPLES OF APPLIED EPISTEMOLOGY

There may not appear to be as many clear examples of the need for applied epistemology as there are examples of the kind of practical problems that requires applied ethics: med-

icine, in particular, seems to supply enough moral problems to keep a legion of applied philosophers employed. But we really need not look far to find analogues for the applied epistemologist. Law is one obvious context where putative factual claims are made and assessed in light of implicit and explicit epistemological norms. Much use is made, for example, of the fact/opinion distinction which Weddle (1985) has shown to be fraught with difficulty.

Decision theory too, to the extent that it involves considerations of rational belief as a basis for action, also involves issues in applied epistemology. For example, the issue of the appropriate 2nd order decision principle to apply (Type I or Type II) to the question of whether to believe a claim on the basis of evidence that is too weak to support a knowledge claim is a question for applied epistemology. A lovely example of the application of just such principals can be found in William James' famous article "The Will to Believe" (1896).

An excellent example of a text that takes critical thinking beyond basic instruction is Giere's book, *Understanding Scientific Reasoning* (1984). He elaborates a fairly sophisticated view of the basis of scientific knowledge, and attempts, in a simplified but theoretical way, to explain to people how to apply this approach to (1) theories in the natural sciences such as physics, (2) theories in the more statistically-based sciences such as epidemiology and sociology, and (3) popular theories such as Danekin's *Chariot of the Gods.* This is a highly commendable enterprise and because of its explicit theoretical base, his work is superior to other works such as *Science and Unreason* (Radner and Radner 1982), which are more superficial.

In my view, and perhaps in Giere's current view, there is too little emphasis on the role that the scientific community plays in assessing and establishing scientific knowledge. But whatever the difficulties with his particular approach, the students do learn a great deal from this careful and largely non-mathematical approach to science.[11] They develop quite clear pro-

cedures for assessing statistical information and good reasons to dismiss popular mythology like Danekin's. The difficulties and problems are grist for the applied epistemologist.

Another good example of applied epistemology is one I have already alluded to: Hume's attack on miracles (1748, Sections VIII-XI.) Hume argues that no empirical evidence or testimony could be sufficient to overwhelm the essential improbability of any claimed miracle. He also offers much historical evidence about people's misguided enthusiasms for the miraculous and extraordinary. But his argument against the possibility of justifying claims of the miraculous on the basis of fundamental epistemological considerations is an exemplary instance of applied epistemology. This is not to say that his argument is uncontroversial; it is not an algorithmic application of well-established epistemological norms, but rather an argument which focuses on a particular set of judgments and, using epistemological reflections, supports a skeptical position on claims of this type.

Another instance of applying epistemological reflections would be the use of the standards of statistical significance, especially in the various social sciences. One example would the use of ssd .05, which statisticians have fixed on as the minimal standard for a "scientific'" knowledge claim. The basic issue is how to decide the significance of statistics gathered by sampling. We have all read that Gallup polls typically allow for a confidence interval of ±3% (19 times out of 20). This means that Gallup is claiming that the percentage of the whole population holding a certain view will be within ±3% of whatever percentage Gallup's poll yield, 19 times out of 20 (i.e., 95% of the time). We can then say that we know (or at least that we are justified in believing) that the range in the population is X ±3%. We can say this because the 95% rule has been adopted

11. My own text, Is that a Fact? (Battersby 2016), also provides a non-mathematical introduction to scientific reasoning that emphasizes the role of consensus in establishing scientific claims.

as the norm of statistical significance for most statistical purposes. Introductory statistics students, for example, are taught that in the typical Gallup poll, changes in a politician's popularity are (statistically) significant only if they exceed ±3 %. But is this the appropriate criterion? Why are we not prepared to say that, while there is a 95% chance of the population being distributed within ±3% of Gallup's results, there is, say, a 75% chance of it being within 1%. After all, how many things in life are 95% certain? Must all our knowledge claims (significance claims) meet a 95% certainty criteria? My goal is not to answer this question but to offer it as another illustration of the kind of epistemological claims that are not necessarily addressed in any discipline and deserve philosophical reflection.

5. APPLIED EPISTEMOLOGY AND OTHER ASPECTS OF CRITICAL THINKING

It must be admitted that much of what we typically teach in Critical Thinking classes is preliminary to the teaching of applied epistemology, and as a result the concept and curriculum of Critical Thinking embraces a much broader range of skills and norms than are involved in applied epistemology. We must, of course, teach analysis of argument before we teach assessment and, with some students, this is a significant task. If students cannot recognize deductive inferences and their significance, then this, too, must be taught. But we teach analysis in order to teach assessment, so it seems fair to treat applied epistemology as the core discipline of Critical Thinking instruction.[12]

In addition, there are activities associated with Critical Thinking that are neither evaluation nor analysis, such as problem-solving, creative thinking, argumentation theory, and for some, even ethical analysis. Almost all practitioners also

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12. Our textbook, Reason in the Balance (Bailin & Battersby 2016), represents our effort to provide a text that uses an "applied epistemology" approach as a central aspect of critical thinking instruction.

consider the inculcation of the disposition to be reasonable as an important component of any Critical Thinking course. None of these topics is obviously epistemology, applied or otherwise, though it seems to me again that they are all directed at teaching students to apply appropriate epistemological norms in their lives. The purpose of creative thinking (lateral thinking, etc.) is surely to help people out of habitual and incorrect beliefs into true or at least better justified beliefs.

On the other hand, the temptation in many public schools to implement "creative thinking" as the central focus of Critical Thinking teaching seems, therefore, significantly wrong. And while this issue has been well treated (cf. Bailin 1987), arguing for the centrality of applied epistemology is a healthy correction to those tendencies.

6. SUMMARY

These remarks are somewhat speculative, but they suggest some of the possibilities that flow from a study of applied epistemology—even the possibilities of theoretical developments in normative epistemology. The view of critical thinking as applied epistemology ties it to its proper theoretical discipline, and encourages the possibilities of a two-way relationship between the theoretical and practical sides of the discipline, an approach which will be of benefit to both. If this is true, we have much fascinating and exciting work ahead. And, (almost) needless to say, a great deal of teaching to do. We must not only help our students to improve their Critical Thinking, but also help our colleagues see the significance of critical thinking/applied epistemology as a philosophical discipline.[13]

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CHAPTER 2

ARGUMENTATION AS INQUIRY

Sharon Bailin

1. INTRODUCTION

Blair and Johnson (1987b) have stated that an outstanding issue in the area of argumentation is how argument should be conceived and further, whether there is one central notion of argument. In this paper it will be argued that from both an epistemological and a pedagogical perspective, argumentation is most usefully conceived as inquiry.

2. EPISTEMOLOGY

When viewed from the point of view of epistemology, the process of argumentation is, essentially, the process of inquiry, which I shall define, with Blair, as "an investigation into whether a questioned or problematic point of view is acceptable" (1987, p.193).[1][2] There is a tendency in argumentation theory and pedagogy to emphasize the assessment of arguments but it must be remembered that argumentation also involves the construction of arguments and ultimately of entire belief sets or views. It is the process whereby knowl-

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1. We subsequently define inquiry as "the process of carefully examining an issue in order to come to a reasoned judgment" (Bailin and Battersby 2016).

2. In a later paper (2016), Blair suggests the terms "investigation" or "exploration" as an alternative to the term "inquiry."

edge is assessed, but it is also the process whereby knowledge is constructed, and the evaluative and constructive dimensions are closely intertwined (Bailin 1987, 1988).[3] In the process of argumentation, claims are put forth on the basis of reasons, the claims and reasons are challenged and tested, they may be reformulated, alternative arguments may be proposed, these will be tested and perhaps reformulated, and in the end a view is arrived at which takes into account the strengths and weaknesses of the various arguments and synthesizes the strongest elements into a coherent whole (Bailin 1990). This process may also involve some alteration in existing beliefs and is best viewed in the context of the larger dialectical process of belief formation and testing, as a moment in that ongoing process (Blair and Johnson 1987a).

This dialectical process can have a variety of forms in actual practice depending on the context. It may involve two or more individuals engaged in a genuine attempt to resolve a dispute, one individual engaged in attempting to resolve a puzzlement, or two or more individuals arguing different sides of an issue without any intention to co-operate.

The speech act model of argumentation as put forth by van Eemeren and Grootendorst (1983, 1992, 2004) takes as fundamental the first of these, that is the two party argumentative discussion aimed at resolving a disagreement, and Blair (1987) argues that the other forms of argumentation can be assimilated to this model as well. Although it may appear that individual inquiry would not fit the model since it does not necessarily involve dialogue or dispute, Blair argues that it does, in fact, exhibit the requisite features. That this form of argumentation is conducted by one person does not alter the fact that it is a dual-role activity, although in this case both roles are occupied by a single person. Similarly, individual inquiry does involve disagreement, although the disagreement

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3. See also "Is Argument for Conservatives? or Where Do Sparkling New Ideas Come From?" in this volume.

in such cases arises from an incompatible view rather than from another individual. Blair further argues that the lack of public performance of the speech acts involved in argumentation is irrelevant since one would expect the inquirer to be able to reconstruct the various moves in the argumentative inquiry. Finally, Blair argues that argumentation conducted with no intention to co-operate can fit van Eemeren and Grootendorst's model since the object of such argumentation may be to convince a third party rather than to resolve a disagreement between the disputants. Thus Blair concludes that a speech act analysis is applicable to all these cases of argumentation, and that, from this perspective, all can be seen as instances of co-operative dispute-resolving argumentation.

I find this reasoning compelling with respect to viewing argumentation from a discourse analysis perspective. I would argue, however, that from an epistemological perspective, the process in all these cases can be viewed as one of inquiry. The inquiry may be undertaken by one person or several, with the possibility of people sharing roles or even exchanging roles; the division of labour within the argument situation is irrelevant. What is relevant is the epistemological structure, which is one in which knowledge claims are formulated, tested and adjusted in order to arrive at the best justified position.[4]

It may appear initially that the case of individuals involved in a disagreement would not conform to the inquiry model since the aim of each might be to persuade the other of the correctness of his or her position rather than to inquire. Nonetheless there are normative constraints on arguers in rational arguments (van Eemeren and Grootendorst 1983, 1992, 2004), for example openness to the possibility that one's own position might not deserve acceptance or willingness to concede to the most defensible position, which require that claims be put to the test of reason and that those which are

4. For more on the role of roles, see "DAMed If You Do; DAMed If You Don't: Cohen's "Missed opportunities'" in this volume.

to be accepted be the ones which have the strongest warrant. Thus, even if the psychological aim of the participants might be to win, provided that they are willing to abide by the rules of co-operative argument, the epistemological structure of the enterprise necessitates inquiry. Van Eemeran and Grootendorst's model, in viewing dispute-resolving argumentation as co-operative, recognizes this dimension, and as Blair states in referring to this model: "The parties resolve their disagreements only if they are prepared to inquire together into the implications of their different commitment stores" (1987, p.194). Indeed, the rules of dialectical interchange which van Eemeren and Grootendorst propose are really rules which ensure that the disputants, whatever their predisposition at the commencement of the discussion, do in fact inquire. These rules make explicit the inquiry dimension.

Moreover, many of the points which Blair raises in the course of his discussion seem to reinforce this point regarding the primacy of inquiry. For example, in discussing a proposed revision to van Eemeren and Grootendorst's rules, he states:

> This similarity between solo inquiry and the revised model I am suggesting for multi-purpose dispute-resolving argumentation is a point in favour of that revision, for it seems clear that dispute-resolving argumentation is possible only to the extent that the disputing parties co-operate with a view to reaching agreement – that is, function the way a solo inquirer does (1987, p.196).

At one point Blair is willing to view as a form of inquiry argumentative discussion in which the parties test beliefs by seeing how far they can be defended. He further states that disputes in which each side aims to win ought ideally to be preceded by argumentative inquiry and are unjustified if not so conducted (1987, pp.191-2). Yet surely the latter are also unjustified if the participants do not abide by the rules of argumentative exchange, if they are not willing to concede to a stronger argument for example, and so ideally dispute-

resolving argumentation is also a form of inquiry. Blair also draws a comparison between inquiry and the type of argumentation undertaken to convince a third party or parties by stating that the judge or jury in the latter type of exchange does not play an adversarial role in the proceedings but rather plays the role of an inquirer (1987, p.197).

3. PEDAGOGY

I have argued that, from an epistemological perspective, argumentation is best seen as inquiry. I also believe that a conception of argumentation as inquiry is helpful from a pedagogical perspective and that there are good reasons for stressing the notion of inquiry in pedagogy related to argumentation skills. Our goals, in teaching argumentative skills, are to have students "manage their belief systems" (Blair and Johnson 1988) in a logical and intelligent manner,[5] to engage in intellectual inquiry with skill and judgment, and to resolve disputes in a co-operative and fair-minded way. Yet as teachers of argumentation we realize what an exceedingly difficult task this turns out to be. Students display strong tendencies to avoid challenge to their own beliefs, to ignore contrary evidence, to straw-person the beliefs of others, to refuse to concede points, to start with conclusions and then look for arguments to support them, to want to win at all costs.[6] And perhaps these tendencies are not all that surprising given the images which tend to be associated with arguments. Numerous theorists have pointed out that the dominant metaphor for argument in our culture is that of struggle, usually violent (Cohen 2014; Hundleby 2013; Rooney 2010).[7] Thus Ayim

5. Cf. Cohen's (2014) formulation of the goal as "the bettering of our cognitive systems" and van Radziewsky's (2013) as "the bettering of our belief systems."

6. There is considerable contemporary research in cognitive science which confirms the existence of these tendencies. See, for example, Kahneman 2011; Mercier and Sperber 2017. See also our paper "Critical Thinking and Cognitive Biases" in this volume.

7. See also "DAMed If You Do; DAMed If You Don't: Cohen's "Missed opportunities'" in this volume.

(1988) notes the ubiquity in academic argumentation of the language of the battlefield, including talk of attack and defense, of tearing apart opposing arguments, of having the upper hand, of winning thumbs down. And Blair describes the situation thus:

> We speak of 'winning' and 'losing' the argument, 'winning someone over,' 'knock down arguments', and 'protagonists' and 'opponents'. We regard it as something to be proud of to have 'won' an argument, and conversely, something undesirable to have to 'concede a point' or 'admit defeat' (1987, p.193).

Moreover, Lakoff and Johnson argue that such language use is not incidental but actually shapes the practice:

> It is important to see that we don't just *talk* about arguments in terms of war. We can actually win or lose arguments. We see the person we are arguing with as an opponent. We attack his positions and we defend our own. We gain and lose ground. We plan and use strategies. If we find a position indefensible, we can abandon it and take a new line of attack. Many of the things we *do* in arguing are partially structured by the concept of war. Though there is no physical battle, there is a verbal battle, and the structure of an argument – attack, defense, counterattack, etc. – reflects this. It is in this sense that the ARGUMENT IS WAR metaphor is one that we live by in this culture; it structures the actions we perform in arguing (1980, p.4).

Granted that we, as theorists of argumentation, understand that what we mean when we talk of argumentation entails co-operation, open-mindedness and a willingness to concede to the strongest reasons; nonetheless our students are very likely in the grip of the conception of argument as battle, a conception which undermines open-mindedness and which may be exceedingly difficult to overcome. Thus I would argue that there are pragmatic reasons for stressing that argumentation, even when it is conducted by two individuals disagreeing, is really a process of joint inquiry into what the best position is and is a constructive enterprise.

I would also argue that the concept of inquiry is preferable to that of argument with respect to the development and presentation of argumentation, an activity which is central to virtually all academic enterprises. A common tendency among students writing argumentative papers is to conceive of the task as that of arguing for a position and so to decide first on a conclusion and then look for arguments to support that conclusion and ignore or downplay contrary evidence. The tenacity of this tendency despite our best pedagogical efforts is, I suggest, connected with the fact that the students generally do not understand the nature of the process in which they are engaged. They fail to understand it as a process of inquiry in which they are trying find something out. The rules of good argument and of appropriate dialectical interchange are helpful in providing guidance as to what moves are appropriate, but without an understanding of the epistemological grounding for these rules, the entire enterprise likely strikes many students as an arcane academic game for which they must learn the rules in order to succeed.

It may also be the case that some aspects of the way argument construction is taught are not very conducive to the development of this type of understanding. For example, in the section of the text *Logical Self-Defense* devoted to argument construction, a distinction is made between those arguments in which one begins with a settled position and those arguments which are forms of inquiry, meaning one has not made up one's mind on a position. Yet to what extent is this really a helpful distinction? Even in the former case, one cannot simply look for arguments to support one's conclusion and ignore contrary arguments, as Johnson and Blair (1983) fully acknowledge. Rather, one must assess the arguments for and against one's conclusion in a fair-minded manner, and must be willing to modify or even abandon one's initial position in the face of cogent counter-arguments. Thus even in the case when one begins the process with a position in mind, one

can hold this position only provisionally, as a hypothesis to be tested. In the case of argumentative inquiry, the text enjoins one to begin with a position which seems to one to deserve serious consideration and to treat it as a hypothesis. I submit that this is not significantly different from the process in the first case. The primary difference is with respect to the degree of conviction with which the initial position is held, but this is a psychological difference and is not one which has any bearing on the structure of the argumentation. In the final analysis, both are instances of inquiry.

In terms of pedagogy, I believe that there are problems separating these out as two distinct kinds of arguments and not indicating that both are instances of inquiry. Giving students a sense that a central type of argument involves making a case for a position one already holds will very likely reinforce their distorted beliefs about the nature of argumentation. Johnson and Blair do eventually inform students that they may have to qualify or even reject their initial position in light of compelling objections, and, in a subsequent section outline the problems of commitment to a view and post facto justification inherent in beginning with a position already set. I suggest that it might be preferable to begin with discussion of these issues, which are central to the epistemological structure of argumentation, and then go on to frame the task not in terms of constructing an argument to make a case for a pre-existing position, but rather in terms of inquiry, to find out what the best position is.

It might be objected that inquiry is an inappropriate metaphor to guide the construction of an argumentative paper since what we want to see in a paper is the product of the student's deliberation, not some reflection of the process. How the ideas were arrived at is irrelevant; what we want to see is the justification of the ideas. I would argue, however, that such a separation between the process of inquiry and the product of deliberation is highly artificial. We are interested

not simply in the conclusions of deliberation, but in the reasoning which leads to these conclusions. Thus the product that we want to see is a reflection of the deliberative process. Blair makes a point which lends support to this position when discussing whether someone engaged in individual inquiry could be viewed as performing the speech acts constitutive of argumentation. He states:

> clearly, the solitary inquirer who neither speaks nor writes cannot literally perform these or any other speech act. However, she does carry out mental operations strictly corresponding to the speech acts performed in verbally explicit argumentative disputes. Whatever 'goes on in her mind', we would not be satisfied that she has carried out an argumentative inquiry unless she could produce in words the challenge, the asserted point of view, the arguments, the clarifications and definitions, and the final concession or reaffirmation that we would expect to find at the various stages of a spoken or written argumentative discussion (1987, pp.193-4).

Nor does the product of deliberation refer only to justification if that means simply the testing of already held views. We do sometimes hold beliefs unreflectively, and such beliefs need to be tested. But inquiry also involves adding, deleting, modifying, and integrating beliefs. It is the process involved in the rational management of one's belief system (Blair and Johnson 1988). And it is a reflection of this process which we want to see in students' papers (or at least a rational reconstruction thereof).

Inquiry is the process we want students to use in arriving at their beliefs. Thus viewing argumentation as inquiry may be of help in conveying to students a sense that constructing arguments is not simply an academic exercise which is irrelevant to everyday life but that argumentation is a way of constructing knowledge, a way of inquiring into and deciding what to believe and do both in the disciplines and in real-life situations.

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CHAPTER 3

THE PROBLEM WITH PERCY: EPISTEMOLOGY, UNDERSTANDING AND CRITICAL THINKING

Sharon Bailin

1. INTRODUCTION

I would like to begin by recounting to you the story of Percy. Percy was a student in a philosophy of education class I taught one year. He was, in fact, a graduate student and had thus managed to successfully negotiate the shoals of academe to that point. But Percy was having problems with his paper for the class. His first effort was a literature review, a complete compendium of anything anyone had ever said about the topic at issue (and thorough it was, too). Alas, Percy's own musings and reflections on the issue were nowhere in evidence. Much discussion ensued about the necessity of coming to his own conclusion on the issue. "Oh, so you want our opinion!" His next attempt involved a compendium of various theorists' views on the issue, largely done without benefit of quotation marks and references, and his own conclusion tacked on the end, dangling and disconnected. More discussion. The inappropriateness of using other people's words without referencing them came as quite a shock to him. "But they said it so much better than I could." But the idea that there ought to be some sort of connection between the points made in the body of the piece and the conclusion drawn at the end was gradu-

ally beginning to take hold. I could see the light bulb flashing in great, bright bursts. "OH! So you want us to base our conclusions on reasons and evidence!!!" Yes, Percy, yes! I sat back and smiled, congratulating myself at my pedagogical prowess. But too soon. "OH! So in THIS class, YOU want us to base our conclusions on reasons and evidence." I had met Percy before, in various guises, and I have met Percy since. I'm sure that you have all met Percy. What is the problem with Percy?

Most current conceptions of critical thinking conceive of critical thinking in terms of abilities and dispositions. I believe that such conceptions do not provide a way to understand what the problem is with Percy. I shall argue that a useful way to think about the problem is in terms of epistemological understanding, and that this way of thinking about the issue can provide both pedagogical and conceptual grounding to efforts to foster critical thinking.

2. CONCEPTUALIZING CRITICAL THINKING

Two conceptions of critical thinking which have been seminal for the field are those of Robert Ennis and of Harvey Siegel. Both Ennis and Siegel place good reasons at the centre of their conceptions. Ennis, for example, highlights the assessment of reasons in his conception of critical thinking which has been highly influential in the field. In his 1962 paper, Ennis defined critical thinking as "the correct assessing of statements" (Ennis 1962). Ennis subsequently broadened the scope of critical thinking with the following definition: "reasonable reflective thinking that is focused on deciding what to believe or do" (Ennis 1985, 1991, 2011, p.10). Harvey Siegel also puts reason at the centre of his account of critical thinking. For Siegel the critical thinker is one who is appropriately moved by reasons and one of the main aspects of critical thinking for Siegel involves the assessing of reasons (Siegel 1988, 1997).

When actually detailing what precisely constitutes such

critical thinking, both Siegel's and Ennis's analyses are framed in terms of an ability component and a dispositional component. Siegel terms these two dimensions the reason assessment component and the critical spirit. For Siegel the reason assessment component is central to critical thinking and involves the ability properly to assess reasons and their ability to warrant beliefs, claims and actions. The critical spirit, which Siegel views as being of equal importance with the reason assessment component, indicates that the thinker values good reasons and is disposed to assess reasons and to govern beliefs and actions on the basis of such assessment (Siegel 1988). Ennis elaborates on the reason assessment dimension with a list of specific abilities which is categorized under the headings *elementary clarification*, *basic support*, *inference*, *advanced clarification*, and *strategies and tactics*, and includes the following: 1) focusing on a question; 2) analyzing arguments; 3) asking and answering questions of clarification and challenge; 4) judging the credibility of a source; 5) observing and judging observation reports; 6) deducing and judging deductions; 7) inducing and judging inductions; 8) making and judging value judgments; 9) defining terms and judging definitions; 10) identifying assumptions; 11) deciding on an action; and 12) interacting with others (Ennis 1985). Ennis also includes a list of tendencies or dispositions in his conception of critical thinking which includes: the disposition to seek a clear statement of the statement or question, to seek reasons, to try to be well-informed, to use credible sources and mention them, to take into account the total situation, to try to remain relevant to the main point, to keep in mind the original or basic concern, to look for alternatives, to be open-minded, to take a position when the evidence and reasons are sufficient, to seek as much precision as the subject permits, to deal in an orderly manner with the parts of a complex whole, and to be sensitive to the feelings, level of knowledge, and degree of sophistication of others (Ennis 1994).

Both Siegel's and Ennis's accounts are prototypical in analyzing critical thinking in term of abilities and dispositions. Can the problem with Percy be accounted for in terms of a deficit in such abilities or dispositions?

2.1. Abilities

Let us consider first the possibility that the problem with Percy lies in the area of abilities. Are there specific abilities which Percy is lacking which account for his problem with critical thinking? We have no way of knowing whether Percy is able to handle equivocation appropriately, judge the credibility of a source, or deduce, and judge deductions, to draw from Ennis's list (Ennis 1994, 2013). It may be that he is able to accomplish these and similar tasks in particular contexts. Even if he cannot, it does not seem to be a lack of these particular kinds of abilities which would account for the type of problem which Percy exhibits.

Might his problem be that he is unable to analyse arguments, that he cannot identify premises and conclusions? Yet he might be able to make such an identification in particular contexts, for example in a textbook exercise. In fact, he may even in the end be successful, in his paper for MY class, at basing his conclusions on reasons and evidence. His problem with argument goes deeper than an inability to analyse and to identify the parts. He does not understand the role of premises and conclusions within an argument nor the conceptual connection between them. In fact, he does not really understand what an argument is.

Perhaps Percy's problem can be captured in terms of an inability to "integrate the other abilities and dispositions in making and defending a position" (Ennis 1994, p.2) or, more broadly, as a failure in the reason assessment component. Yet, as mentioned above, he may be able to pull it off in particular contexts. Moreover, this diagnosis of the problem would be so broad and general as to be unhelpful. It would not pinpoint

the source of the problem. We would still want to know **why** he could not effect such an integration. It would have little explanatory power and provide little guidance in terms of pedagogical remedy.

2.2. Dispositions

Let us consider the possibility that the problem with Percy stems from a dispositional deficiency. Perhaps his problem is that he is not disposed to assess reasons and to govern his beliefs and actions on the basis of such assessment. Now he might be disposed to apply the relevant criteria of reason-assessment in certain contexts. For example, if he comes across and recognizes a deductive argument, he might be inclined to evaluate it appropriately. If he encounters an observational report, he might be disposed to judge it according to relevant criteria. And if he discovers that another professor has a similar idiosyncrasy to mine and also wants students to base their conclusions on reasons and evidence, then he may well be inclined to do so. We don't know if, indeed, he would, but nothing we know about his story would preclude such possibilities. Nor do we know to what extent he applies relevant criteria in his daily life, e.g., when buying a stereo. What we do know, however, is that basing a conclusion on reasons and evidence is not, for Percy, a generalized disposition.

Is Percy's problem that he lacks such critical thinking dispositions as open-mindedness, fair-mindedness, or intellectual honesty? It is true that his work was not marked by a fair and open appraisal of opposing views. But this does not appear to be a failing in terms of openness, fairness or honesty. It seems, rather, to be a lack of understanding that such a weighing is what is called for. Percy did not get far enough into the practice for such dispositions to be at issue.

It does seem correct to say that Percy lacks a critical spirit. One could not describe him as committed to critical thinking,

as valuing good reasons, as caring to get it right. Yet such a diagnosis is only marginally helpful. It still does not get at the heart of Percy's problem. It does not tell us why he does not value critical thinking. Indeed, Percy's case seems to be quite different from some others which might be similarly diagnosed, e.g., individuals who fail to think critically out of self-interest, or individuals whose biases blind them from being open-minded. It is not so much that Percy does not care about good reasons. Rather, it is that Percy does not appreciate the role of reasons in inquiry and knowledge.[1]

3. EPISTEMOLOGICAL UNDERSTANDING

I would argue that the problem with Percy is essentially an epistemological one. He does not understand the enterprise of knowledge creation and evaluation, an enterprise which is constituted by the offering and assessing of reasons. He may have some basic grasp of concepts such as reason, evidence, argument and conclusion, but he does not fully understand their meaning, grasp the conceptual connection between them, nor appreciate the role they play in the larger process of inquiry. Thus, for example, he does not fully understand what constitutes a conclusion, failing to appreciate that it is not just a statement which comes at the end of an argument, but that it is conceptually tied to notions such as reasons and evidence. He cannot distinguish between opinion and reasoned judgment because he does not have a developed concept of justification and its relationship to knowledge. He does not know how to use sources because he does not understand the epistemological status of the claims made by others. Without some appreciation of the nature of inquiry, without a larger epistemological picture in which to situate these practices, what I ask of him must seem like an arcane game with arbitrary rules.

It might be objected that Percy must, in fact, have some

1. See our paper, "Reason Appreciation" in this volume.

understanding of concepts such as conclusion, argument, and justification. He doubtless engages in arguments in many aspects of his life, for example arguments regarding the merits of various stereo systems or the strengths and weaknesses of various hockey players. And he doubtless offers reasons justifying his preferences and evaluates conflicting reasons in the process. The problem with Percy, it might be argued, is simply that he does not apply critical thinking in the context of schooling.

Now this is certainly to some extent the case. It would be going too far to claim that Percy has no concept of argument or justification. He would be unable to function in his daily life without such concepts. Nonetheless, his understanding of these concepts appears very limited. He seems to have only a superficial grasp of what it means to justify a claim and his understanding does not generalize to a wide variety of contexts.

Moreover, the problem does not reside simply in a failure to grasp some particular concept such as justification. Rather, the enterprise of critical thinking is constituted by an entire web of interconnected concepts (e.g., reasons, evidence, argument, justification, warrant, premise, conclusion, opinion). These concepts are connected, in turn, to certain principles and procedures, and all the preceding are connected to certain purposes. It is this whole interconnected network of concepts, principles, procedures and purposes which have eluded Percy's grasp.

Let us return, however, to the objection cited earlier that the problem with Percy is not so much an epistemological one having to do with his conceptual understanding, but rather has to do with his failure to apply critical thinking in an academic context. On this interpretation, Percy is able to engage, at least to some extent, in the practice of critical thinking in his daily life, but has failed to see the academic context as an appropriate venue for critical thinking. It is likely that

his previous schooling experience did not promote or expect much critical thinking nor engage him to any extent in rational inquiry. Thus Percy has not been properly initiated into the practice of thinking critically in an academic setting. One might wonder, however, to what extent he actually engages in sustained reason-giving, evaluation and challenge even in his daily decisions (e.g., in voting). The kind of evaluation of competing claims and opposing arguments which is required in academic writing is not all that different from the kind of evaluation required in assessing complex issues in daily life. Thus one might be justified in suspecting that Percy has a problem with critical thinking even in these contexts. Percy has likely not been properly inducted into the practice of critical thinking even in everyday contexts.

On this reading, then, critical thinking is viewed primarily as a practice which one learns through being inducted into the practice (Selman 1993). The kind of failure to understand which seems to characterize Percy's performance would be viewed as a failure to see the point of the practice. Moreover, on this view, the practice can only be appreciated from within. Thus the problem with Percy would be seen not so much as a lack of prior epistemological understanding, but rather as a failure to get on the inside of the practice of critical thinking in order to appreciate the goods internal to it (MacIntyre 1984).[2]

I believe that it is very plausible to view critical thinking as a practice, and as such it is a practice constituted by the network of concepts, principles, procedures, and purposes described earlier. And Percy has clearly failed to get the point of the practice. Yet it is important to recognize that the practice is essentially epistemological in nature, involving as it does the evaluation of claims to knowledge. Thus getting the point of

2. Critical thinking encompasses goods which are external to the practice as well as internal, as Kvernbekk (2008) points out. See "Fostering the Virtues of Inquiry" in this volume.

the practice means understanding something about epistemology.

It might be objected that framing the issue in terms of epistemology is too narrow. It can be argued that critical thinking takes place in a variety of contexts, e.g., morality, science, law, and that what is required is initiation into this variety of practices and understanding the point of each, not simply understanding epistemology. Now it is certainly the case that the practices which instantiate critical thinking are many and varied and involve a diversity of concepts, principles, procedures and purposes which students must come to understand and appreciate. But what these practices have in common is that they are all critical practices. Whatever else they may involve, they also importantly involve the evaluating of reasons, the justifying of claims, and the making of judgments. And to the extent that they do so, they all have a major epistemological dimension.

It is important to be clear at this point that I am not arguing that what is required in order to think critically is some prior understanding of epistemology. I am not claiming that one needs a course in epistemology before ever engaging in the activity of critical thinking nor that simply teaching students about epistemology will enable them to understand the nature of the enterprise. Certainly an immersion in the practice is fundamental to the acquisition of the kind of understanding which is at issue. However that immersion must consist in more than an acquisition of abilities. It must focus, as well, on the development of this understanding. One might fruitfully draw a parallel here with Aristotle's contention that one becomes just by performing just actions, but that one must perform them in the way in which the just person would, that is, with an understanding of their justification (*Nicomachean Ethics,* Bk. 11, Chpts. 3 & 4*).* Analogously, it may be the case that one becomes a critical thinker by engaging in the practice of thinking critically, but one must do this in the way in which

the critical thinker would, that is, with an understanding of the nature of and justification for the practice, and this would entail some sort of explicit awareness of its epistemological underpinnings.

It may be relevant, at this juncture, to highlight how the view which I am developing differs from some of the standard views of critical thinking. It differs substantially from that of Ennis in that the notion of epistemological understanding is not explicitly present in his account. Siegel, however, does argue for the importance of epistemology, and our views are thus compatible. Nonetheless, there is a difference in focus which is of consequence both conceptually and pedagogically. Siegel's analysis is framed in terms of a reason assessment component and a dispositional component. Knowing about epistemology, conceived of in terms of "a theoretical grasp of the nature of reasons, warrant, and justification" is part of the reason assessment component (Siegel 1988, p.35). In my analysis, epistemological understanding is not simply a sub-component. Rather it is the central concept through which critical thinking is conceptualized. It is that which underpins, justifies, and makes sense of the activities and dispositions related to reason assessment. These activities and dispositions are grounded in the understanding. Thus the critical thinker is one who understands about the evolution and evaluation of knowledge and who believes and acts according to this understanding. The latter involves possessing certain kinds of knowledge and being able to and disposed to do certain sorts of things, but it is understanding, rather than skill, which is the central explanatory concept.[3]

Such a difference in conceptualization may also have educational consequences. Siegel states that "education aimed at the development of critical thinking … must seek to foster a host of attitudes, emotions, dispositions, habits and charac-

3. For a critique of skills-focused conceptions of critical thinking, see Bailin 1998.

ter traits as well as a wide variety of reasoning skills" (Siegel 1988, p.41). I believe, however, that a pedagogical focus on these as the constitutive components might serve to obscure some important aspects of critical thinking. It could result in a failure to give sufficient attention to the conceptual network which underpins critical thinking, a failure to connect the activities and abilities of critical thinking to the purposes of the endeavour, and, more generally, a failure to situate these activities and abilities within the context of the wider enterprise of knowledge creation and evaluation. Thus, students may fail to gain an understanding of the sort of larger epistemological picture in which to situate the particular practices, and this is precisely the problem which Percy exhibits.

To say this is to acknowledge that there is an epistemological picture (or range of pictures) in which the activities of critical thinking are situated, a number of epistemological assumptions which are implicit in the practice. These include a belief in reason, a belief in the possibility of rational justification in terms of the criteria and standards inherent in our critical practices, a belief in the desirability of acting on the basis of rationally justified beliefs, and a belief that any of our particular beliefs or criteria could be mistaken or inappropriate.

There are, similarly, certain epistemological beliefs which are incompatible with the enterprise of critical thinking. One of these is the belief that knowledge is certain and comes from authority.[4] This belief leaves no room for a rational assessment of claims and thus precludes critical thinking. Another type of position which is incompatible with critical thinking is radical relativism, in its various guises. The naive relativist

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4. I take the point made by Battersby (1993) that we do, in fact, rely on authority for much of our knowledge, but authority is here relied on as an intermediary source of knowledge when the means for rationally assessing the knowledge claims themselves is beyond our reach. The assumption is that the experts have themselves reached their conclusions based on reasoned assessment and that there are criteria for critically assessing their expertise and basis for judgment.

views all opinions as subjective expressions of preference which are equally valid. The enterprise of critical thinking makes no sense in this context (Siegel 2011). An interesting variation on the above is the view that there is a domain of certain knowledge which is ascertained through authority and that everything else is a matter of subjective opinion. This, in fact, seems to be the position implicit in Percy's faltering attempts at writing his philosophy of education paper. There are, of course, more sophisticated versions of the radical relativist position, for example the kind of postmodern view which totally rejects reason. Someone holding this position might well utter the same statement as Percy: "Oh! So in THIS class, YOU want us to base our conclusions on reasons and evidence." But this statement would not represent a lack of comprehension of the nature of the enterprise as it did for Percy, but rather a rejection of its legitimacy.

This connection between critical thinking and epistemological beliefs is supported by some of Kuhn's empirical investigations of argument skills (Kuhn 1991, 1999). Kuhn discovered a correlation between what she terms an evaluative epistemology — one which "denies the possibility of certain knowledge" (1991, p.187) but which "reflects the understanding that viewpoints can be compared with one another and *evaluated* with respect to their adequacy or merit" (1991, p.188) — and argumentative skill development. The explanation she suggests for this correlation parallels the argument offered above:

> If knowledge is entirely objective, certain, and simply accumulates, as the absolutist believes, or if knowledge is entirely subjective and subject only to the tastes and wishes of the knower, as the multiplist believes, argument is superfluous. There is no need or place for the comparative weighing and evaluation of alternative claims that is at the heart of skilled argument . . . Only if knowledge is seen as the product of a continuing process of examination, comparison, evaluation, and judgment of different, sometimes competing, explanations and perspectives does argu-

ment become the foundation upon which knowing rests (Kuhn 1991, pp.201-202).

4. JUSTIFICATION

I would want to claim, then, that there are certain assumptions which underpin our practice of critical thinking and give coherence to the particular elements, and that discussion of this epistemological dimension has tended to be neglected in the way critical thinking has been thought about and taught. And I have outlined above some of the reasons why I believe it makes pedagogical sense to communicate these assumptions to our students. But I also believe that there is a moral reason for engaging these epistemological issues with our students. In teaching critical thinking, we are attempting to promote certain behaviours and attitudes. We are trying to get students to evaluate claims on the basis of certain criteria, and, more generally, to act from such an assessment rather than from various alternatives such as image, intuition or authority. We are also trying to get students to adopt certain values, for example to value open-mindedness, accuracy, truth, and reason. We further believe that we have good reasons for so doing, and these reasons are connected with the way we view the nature of the enterprise and with the kinds of epistemological assumptions outlined above, for example a belief in reason and a belief in the desirability of acting on rationally justified beliefs. Now as Siegel has pointed out, one of the obligations incumbent upon us as teachers attempting to promote critical thinking is the obligation to provide students with our reasons for what we do in class and what we require of them (Siegel 1988, p.45; 1995). This would imply that we have an obligation to provide students with our reasons for promoting critical thinking.

It has been argued by some, however, that critical thinking is not the kind of thing which requires a justification. Selman, for example, asks if anyone could seriously dispute the desir-

ability of being able to reason well and further states that the value of critical thinking does not need to be justified to someone who is genuinely taking part in the practice (Selman 1993, pp.63-64). Yet the value of critical thinking does seem to be an issue of dispute in contemporary society. Indeed, a flight from reason is evident in many ways, from the spread of religious fundamentalism to the proliferation of new age philosophy. Moreover, the kind of postmodernist view which rejects rationality seems to be precisely a case of those who have genuinely taken part in the practice of critical thinking then rejecting the practice. In any case, in recommending that we discuss with our students our reasons for promoting critical thinking, I do not necessarily mean offering a meta-level justification of rationality (although engaging in that discussion may be worthwhile as well). Rather, I mean giving students a sense of why we want them to do particular sorts of things and how we see what we want them to do as related to the nature and purposes of the enterprise. This means, I think, engaging with the epistemological issues.

5. CONCLUSION

What, then, is the problem with Percy? It is, essentially, that the nature of the enterprise of critical thinking has escaped him. He has not understood the practice in any deep or coherent way, and this is despite the fact that he may be able to and even disposed to engage in reason assessment in particular contexts. This seems to me to indicate that abilities and dispositions are not the appropriate units of focus when conceptualizing critical thinking.[5] Although there is certainly merit in detailing particular elements or attributes which are involved in thinking critically,[6] more fundamental is an appreciation of

5. For a further elaboration of some of the problems with "skills and dispositions" accounts, see Bailin et al. 1999a.

6. For an alternative approach to detailing the aspects involved in critical thinking, see Bailin et al. 1999b; Bailin and Battersby 2016.

the nature of the enterprise. Perhaps this should be the point of focus when attempting to conceptualize and to promote critical thinking.

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CHAPTER 4

REASON APPRECIATION

Sharon Bailin and Mark Battersby

1. INTRODUCTION

The pioneering work of Blair and Johnson has made an extremely significant contribution to both research and pedagogy by making reasoning and argumentation a central concern. Their ideas have generated and inspired a great deal of research focusing on both the conceptualization of argument and the teaching of argumentation. In this paper, we would like to extend that work by developing a dimension of reasoning which is seldom made explicit – that of the appreciation of reason. Reason appreciation involves a respect for reasoning based on an understanding of its nature, role and significance, and a recognition of its subtleties and aesthetic aspects. A full appreciation of reason has both cognitive and affective dimensions. Reason appreciation should be one of the goals of critical thinking instruction.

2. WHY A NEW CONCEPT IS NEEDED

The reason we think that the idea of reason appreciation is important might best be demonstrated by a pedagogical example. Elsewhere, one of the authors has described the problem of a student who is having difficulty constructing an argumentative essay (Bailin 1999). He has trouble understanding that

such an essay can be anything other than a summary of other authors' views, or the same with his own unsupported opinion tacked on the end. But the realization does finally come that there ought to be some sort of connection between the points made in the body of the piece and the conclusion drawn at the end: "Oh! So you want us to base our conclusions on reasons and evidence!!!" Any feeling of pedagogical success on the part of the instructor was, however, premature. "OH! So in THIS class, YOU want us to base our conclusions on reasons and evidence."

Now the problem with this student does not seem to be captured in terms of an inability properly to assess reasons. The student might, indeed, have the ability to identify fallacies or evaluate inferences given the right circumstances (e.g., if instructed to that end and then asked to do so in particular examples). It does not seem to be a lack of these types of abilities that is the problem here. Such an example seems to us, rather, to be a case of someone who does not appreciate reason. As a consequence, he does not respect its normative demands nor is he appropriately motivated to adopt its practice. He fails to appreciate what reasoning is all about.

3. DIFFERENCES FROM OTHER CONCEPTS

Numerous critical thinking theorists have argued that there is more to being a competent reasoner than having the ability to evaluate arguments, and most have attempted to characterize this aspect in terms of a dispositional component. This dispositional component has several dimensions. One is an overarching commitment to reason, well captured by Siegel's notion of critical spirit (Siegel 1988). The second dimension is behavioural: the critical thinker is inclined to act in accordance with norms of reason (Ennis 1996a; Siegel 1988). In addition, some of the dispositions proposed by theorists seem to point to an attitudinal and even ethical aspect, for example open-

mindedness, fair-mindedness, a commitment to critical dialogue, and sensitivity to the feelings of others (Ennis 1996a).

The phenomenon which these theorists are pointing to through their use of the concept of disposition has some significant overlap with the phenomenon we are attempting to capture through our concept of reason appreciation. Nonetheless, we believe that referring to this dimension in terms of dispositions is not particularly helpful.

The notion of disposition is used to describe a behaviour, indicating that the person actually behaves in a certain way.[1] It can sometimes also be used to refer to some quality or property of an individual by virtue of which the person behaves in the manner indicated (Siegel 1999).

Neither formulation seems entirely satisfactory as a way to capture the dimension of reasoning which we have in mind. Positing a disposition does indicate that an individual actually does engage in the behaviour in question, in this case assessing reasons appropriately in a variety of contexts, and this is certainly part of what we are after. It tells us nothing, or very little, however, about why the person tends to behave in this way. The property sense does rule out explanations based on external causes, but it would not rule out cases in which the person has a tendency to engage in reason assessment because they have assimilated some external forces, for example, if they have been indoctrinated or if they want to live up to their teacher's expectations (even if teacher is no longer on the scene). These are significantly different from behaving in this way because they understand something about reason assessment and why it is important. And since it does not elaborate in any detail why the person has this tendency to act, its pedagogical usefulness is limited.

This notion of disposition gains its currency from Quine's conceptualization of dispositions in the physical realm (Siegel

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1. Ennis, for example, defines dispositions thus: "Roughly speaking, a disposition is a tendency to do something, given certain conditions" (Ennis 1996b).

1999). According to Quine, "a dispositional term is a promissory note for an eventual description in mechanical terms" (1973, p.14) and it is the eventual elaborated mechanical description which will do the explanatory work.[2] In the case of critical thinking, however, it is not a mechanical explanation in terms of neurons etc. which is at issue. A promissory note is not required because we know full well how to cash it out – in terms of understanding, beliefs, values, and attitudes. Moreover, such concepts are pedagogically useful. It is the particular set of such understandings, beliefs, values and attitudes required for reasoning well which we are trying to capture through the notion of appreciation.

4. THE CONCEPT OF APPRECIATION

Before indicating what the concept of appreciation would add to instructional goals in teaching reasoning, we need to elucidate the concept itself. "Appreciate" is etymologically derived from the word "to value" — to know the value of something. It has come to mean more than that, but still holds that basic meaning. Its secondary meaning is to be sensitive to subtleties and distinctions — what many dictionaries refer to as "delicate perception". This sensitivity to the underlying qualities of an object or enterprise is often the basis for the valuing or "appreciation" of it. To appreciate something requires knowing enough about a topic to understand (appreciate) what is valuable about it.

In explicating our concept of reason appreciation, we are drawing an explicit analogy to the realm of art as this is an area where the notion of appreciation plays a central role. Appreciating art involves understanding its value as an enterprise as well as understanding the value of particular works. Appreciation involves more than pure intellectual understanding,

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2. Siegel implies that the situation is similar for critical thinking dispositions, that a reference to such dispositions is a kind of place-holder until science tells us more about what constitutes such dispositions (Siegel, p.211).

however. It also means, importantly, "getting," at an emotional level, what a work has to offer.

The foundation for appreciating art lies in knowing what makes a piece of art actually work. In the case of visual art, this would include knowledge of the elements of art such as colour, line, and composition; some knowledge of materials and techniques; an understanding of the relevant artistic tradition and how the work fits into it; and some understanding of the nature of the enterprise. This type of knowledge directs the viewer's attention to relevant features of the work (delicate perception) and may enable the viewer to make discriminations and notice aspects that might escape the attention of an untutored viewer. It might also provide a basis for making the work meaningful. The viewer thereby gains access to the work's intricacies and subtleties and the possibility of a rich aesthetic response. A viewer who is able to experience works of art in this manner will likely also have an appreciation for the enterprise of art as a whole, seeing and respecting its value in human life and culture.

Let us illustrate with an example. A highly knowledgeable collector recently introduced one of the authors to her collection of (mostly aboriginal) woven baskets. As she explained the process of producing the baskets (including harvesting and treating the materials), the different materials involved, pointed out the different patterns, various means of achieving water tightness, the different styles of baskets produced by different cultures, etc., our author gained an enormous enhancement of his appreciation of basket weaving (contrary to the usage with which many of us are familiar of "basket weaving" as a term of derision to describe the learning of trivial, useless and too easy to learn skills). At the end of the introduction, he had both a much greater understanding of aspects of basket weaving and much more respect and admiration for the products – he had a much greater *appreciation* for woven baskets. He was learning not only to detect differences in appearance

and function, but also differences in finesse and design. He was gaining respect for the labour and artistry involved in basket production and as a result, his estimation of the value of these baskets increased.

As stated, appreciation has two aspects, highlighted in the preceding definition, which are relevant to reason appreciation. One relates to the recognition of the value, significance or magnitude of the activity and can be cashed out in terms of the concept of respect. The second relates to the aesthetic qualities of the activity, and is grounded in a valuing based on a deeper understanding of the subtleties of the activity.

5. APPRECIATING REASON

5.1. Respect

Perhaps the most fundamental constituent of reason appreciation is respect. Appreciating reason involves, centrally, valuing its processes and outcomes and honouring its normative demands. There are two main kinds of grounds for this respect. One is essentially epistemological, having to do with the role of reason in inquiry and truth-seeking. The other is essentially moral, having to do with the connection between reason and freedom, autonomy, and respect for persons. (There are, however, also ethical dimensions to the epistemological aspect.)

5.1.1. Epistemological aspect

One of the primary reasons that reason is deserving of respect is because it is intrinsically connected to the seeking of truth. Reasoning is our primary mechanism for inquiring into what to believe or do and thus our primary means for arriving at better justified beliefs. Thus, we would expect someone who appreciates reason to have an understanding of the nature of the enterprise of reason-giving and evaluation, and an appropriate respect for its role in inquiry and truth-seeking.

Having an understanding of the nature of the enterprise of reasoning involves, to begin with, having a grasp of particular concepts such as reason, argument, evidence, warrant, premise, and conclusion. Such concepts are not isolated, however, but form an interconnected network which is connected in turn with certain principles, and procedures which constitute the core of reasoning. The concept of conclusion, for example, is conceptually tied to concepts such as reasons and evidence, and all these are inextricably connected to that of justification. Thus understanding the enterprise of reasoning means having an understanding of this whole interconnected web of concepts, principles, and procedures which is at the heart of reasoning (Bailin 1999).

What gives this whole conceptual network its grounding and meaning is its goal or purpose, and one of its primary purposes is that of inquiry, which we would define, with Blair, as "an investigation into whether a questioned or problematic point of view is acceptable" (1987, p.193).[3] In the process of such an investigation, knowledge claims are formulated, tested and adjusted in order to arrive at the best justified position.

Having some understanding of the nature of inquiry and the role of arguments therein is a *sine qua non* of appreciating reasoning. This would include having a grasp of the epistemological assumptions which are implicit in the enterprise of inquiry and which give coherence to the particular elements, including a recognition of the value of reason, a belief in the possibility of rational justification in terms of the criteria and standards inherent in our critical practices, a belief in the desirability of acting on the basis of rationally justified beliefs, and a belief that any of our particular beliefs or criteria could be mistaken or inappropriate. Without some understanding of this larger epistemological picture in which to ground the particular practices of reasoning and argumentation, such practices

3. We subsequently define inquiry as "the process of carefully examining an issue in order to come to a reasoned judgment" (Bailin and Battersby 2016, p.6).

may seem like "an arcane game with arbitrary rules" (Bailin 1999).

One way to think about what we are after with our concept of reason appreciation might be in terms of MacIntyre's notion of seeing the point of a practice (MacIntyre 1984). The latter he characterizes thus:

> By a 'practice' I am going to mean any coherent and complex form of socially established cooperative human activity through which goods internal to that form of activity are realized in the course of trying to achieve those standards of excellence which are appropriate to, and partially definitive of, that form of activity (p.87).

On this account, reasoning could be thought of as a practice which one learns by being inducted into it (Selman 1993). One comes to see the point of the practice, which can only be appreciated from within, through such initiation, and one is then (and only then) in a position to appreciate the goods or virtues inherent in the practice (MacIntyre 1984). Several theorists, in particular Paul (1990) and Burbules (1995), in fact characterize the additional dimension of critical thinking in terms of intellectual virtues. Such a characterization comes considerably closer to our conceptualization than does the characterization in terms of dispositions, as virtues are not psychological reifications added on to the skills of reasoning, but are inherent to the practice of inquiry and come out of appreciation of the nature of the practice. MacIntyre (1984) illustrates this point in terms of a child learning chess who is initially motivated by external rewards:

> But, so we may hope, there will come a time when the child will find in those goods specific to chess, in the achievement of a certain highly particular kind of analytical skill, strategic imagination and competitive intensity, a new set of reasons, reasons now not just for winning on a particular occasion, but for trying to excel in whatever way the game of chess demands. Now if the

child cheats, he or she will be defeating not me, but himself or herself (p.188).

There is, then, a kind of normative force inherent in the rules of a practice and entering into a practice entails abiding by these rules and respecting their authority (p.190).

While the learning of games is one way in which MacIntyre elucidates the notion of practices and the goods inherent therein, the analogy between learning to reason and learning a game is helpful only to a point. There are significant limitations to the analogy between appreciating a game and appreciating reasoning. Whereas learning most games is an optional pastime and nothing of great importance hinges upon whether one learns to appreciate them, the practice of reasoning is not really optional. It is, rather, fundamental to human activities and ways of life because it is intrinsically connected to the seeking of truth and is constitutive of a number of key truth-seeking practices, including moral deliberation, autonomous decision-making, legal practice, and scientific inquiry. In virtue of this, it commands respect and carries with it normative force.

There are two ways in which the value of reasoning as a truth-seeking enterprise can be construed. The first of these is pragmatic. Reasoning has instrumental value in helping us arrive at the best justified beliefs according to which to lead our lives. It can be valued as a tool for getting us to the truth or, at least, giving us a reasonable basis for believing we have the truth.

Moreover, it can be argued, as Clifford did in his famous article, "The Ethics of Belief," that there is a positive obligation to seek truth through reason. Clifford argued that the acceptance of unsubstantiated claims was wrong if it might result in a decision that would cause harm, and that this would be the case whether or not the harm occurred because the acceptance of unreasonable belief would inevitably corrupt the individual or society. Clifford's argument is a consequentialist argument

that demonstrates that, even when truth is valued for instrumental reasons, there is an ethical obligation to hold justified beliefs (Clifford 1999).

An instrumental justification, based on consequentialist considerations, does not, however, provide sufficient grounds for the respect which reason is due. A person who does what reason dictates only for pragmatic reasons does not really appreciate it in a full sense. Reason must also be valued for its own sake, as a good in itself or virtue. As MacIntyre (1984) argues, a virtue pursued for instrumental purposes ceases to be a virtue.

… although the virtues are just those qualities which tend to lead to the achievement of a certain class of goods, nonetheless unless we practice them irrespective of whether in any particular set of contingent circumstances they will produce those goods or not, we cannot possess them at all (p.198).

An important dimension of an appropriate stance towards reason which is encompassed by the concept of appreciation is the affective dimension. Here the analogy to art appreciation is again instructive. Appreciating a work of art involves more than having a purely cognitive understanding of aspects of the work. It also has a central emotional component. To appreciate a work involves responding, at an affective level, to what the work has to offer. The situation is similar with respect to the appreciation of reason. Contrary to the popular notion that reason and emotion are opposed and in conflict, numerous theorists have pointed out that reason and emotion are inextricably intertwined. Cognition incorporates many emotional elements, and emotions are based in cognitive judgments (De Sousa 1987; Elgin 1996; Scheffler 1991). The image of a bloodless reason, set in perennial opposition to the passions, is far from the reality. Scheffler (1991), for example, argues that the life of reason demands certain rational passions, including "a love of truth and a contempt for lying, a concern for accuracy in observation and inference, and a corresponding repugnance

at error in logic or fact. It demands revulsion at distortion, disgust at evasion, admiration of theoretical achievement, and respect of the considered arguments of others" (p.4).

The person who appreciates reason will have an emotional impetus to act according to its dictates. The impetus to act according to reason is not, then, to be sought in some external motivation which must be attached to the act of reasoning. It is, rather founded in the obligation one feels to do so. Old-enquist (1982) eloquently sums up this sense of obligation in pointing out that rational dialogue with those with whom we disagree opens up "the possibility of being obligated to lose" (p.183). The appreciator of reason appraises opposing views in a fair and open-minded manner because she understands that such a weighing is what is called for by the practice of inquiry. She is willing to be corrected because she understands that her own view could be mistaken and that fallibilism is a necessary grounding for the practice. She can appreciate even the esoteric pleasure of savoring uncertainty because she knows that one can never be certain that one has knowledge. Moreover, our feelings about ourselves are tied up with such attitudes and actions, as Scheffler (1991) points out: "Failing such demands, we incur rational shame; fulfilling them makes for rational self-respect" (p.5).

5.1.2. Freedom, autonomy and discourse

As well as being the fundamental way to establish truth, reason plays a key role in issues of autonomy, respect for others, and conversational effectiveness. Having a full appreciation of the role of reason requires seeing its role in autonomy and freedom. When we use reason to direct our own activity, we are acting autonomously. Siegel's view of critical thinking as teaching people to be "appropriately moved by reason" (1988) argues, rightly, that it is a good thing to be moved by reason, rather than being torqued by manipulative marketing tricks or driven by compulsions and irrational fears. It constitutes

an act of freedom and an assertion of one's humanity. From our basic understanding of the concept of maturity (which involves at least being able to generally govern one's actions by rational considerations of future consequences) to the idea of informed consent, reason, and being a reasonable person, is central to our notion of a fully autonomous and responsible human being.

Appreciating reason's role in autonomy also involves recognizing reason's appropriate role in discourse – understanding why it deserves respect not only for its utility but also for its place in the fundament of human intercourse. Reasoning is a particular way of conducting a conversation. It is the least manipulative and most respectful way to motivate and change belief and behaviour. To give someone reasons rather than threats, to reason with, rather than cajole or manipulate, is to treat the person as an "end-in-themselves." When we reason together, we respect the autonomy of the other person. Students who come to have an appreciation of reason can conduct less fractious and more profitable discussions by avoiding the insults and manipulation involved in irrational and fallacious conversational gambits such as the *ad hominem*. As Socrates points out in the *Republic*, rational persuasion is a crucial replacement for savagery. [4]

5.2. Appreciating the aesthetics of reasoning

The goods internal to a practice are of many kinds, and one important kind is the aesthetic. Truly understanding a practice implies more than skill at executing its procedures. It also involves, importantly, appreciating its aesthetic dimensions. This appreciation has two aspects: appreciating and valuing the practice as a whole and appreciating a move within a practice. Appreciating a practice is partly the result of the sophisti-

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4. "Socrates: … a misologist … no longer makes any use of persuasion by speech but achieves all his ends like a beast by violence and savagery, …" From 412a of the Shorey translation.

cation involved in the more micro-appreciation of the specific activities within a practice. Using our basket weaving analogy: as our author learned to understand and appreciate specific baskets, he was learning to appreciate the whole enterprise. Appreciating reason, as with other human practices, also involves understanding the subtleties involved in the practice. This means understanding not only the basic rules of inference, but also what constitutes good argumentative strategies, e.g., insightful and imaginative counter-examples. This more subtle understanding of the practice goes beyond knowing the basic rules of inference and premise acceptability in the same way that understanding the quality of a play in a game, whether intellectual or physical (e.g., bridge or golf), goes beyond merely understanding that the play adhered to the rules: one can have an adequate knowledge of the rules of bridge and be able to play within these rules and still not appreciate the strategies of a bridge maven. Ultimately one would want a student to see not only that an argument is good because it supplies plausible and sufficient reasons for its claims, but also that an argument is exceptionally well done because it achieves its end creatively and insightfully.

A student who can recognize good argumentative moves has attained a fairly high level of sophistication and appreciation. This appreciation of the subtleties of the practice can now also provide a basis for appreciating the whole enterprise. In the case of reason, the route from appreciating particular argumentative moves to appreciating the enterprise seems somewhat indirect because a basic appreciation and understanding is required (is constitutive) before one can proceed to appreciate more subtle aspects of the practice. This is not unique to reason; having a reasonably good understanding of language is a prerequisite to appreciating poetry, while an appreciation of the poetic use of language can enhance one's appreciation of the beauty and power of language generally.

It is important not to confuse issues of rhetoric with issues

of argumentative excellence. While what we are calling the "aesthetics of reason" undoubtedly overlaps with the rhetoric of argument, it is not the same thing. Take J.J. Thompson's famous treatment of the abortion issue: creating an analogy between becoming pregnant and being captured and attached to a famous violinist (Thompson [1996] 1971). The violinist bit may well add a nice rhetorical flourish to her argument, but the imaginative use of an anatomically dependent adult to refocus the issue of abortion away from the right to life of the child was truly ingenious and an aesthetically pleasing element of her argument.

The appreciation of arguments like these involves more than understanding them, more than agreeing that they are persuasive, and more than appreciating whatever rhetorical force is involved. Arguments like these are elegant, often ground breaking moves in a long debate and demonstrate a kind of imaginative creativity that someone who appreciates reason can and should enjoy. These arguments are justly revered not because they brought us to the truth, but because of their effective use of the argumentative genre to stimulate the imagination and bring us to points of view that we did not initially see.

As argued above, a sophisticated practitioner of a practice such as someone who deeply appreciates art, science or bridge can distinguish merely legitimate or appropriate moves in the practice from superb and elegant ones. These distinctions often require a sophisticated understanding of the enterprise, but such an understanding is the basis of a more or less complete appreciation of the practice. It is also what motivates practitioners as they strive for excellence of practice. As Mac-Intyre (1984) points out:

> Someone who achieves excellence in a practice, who plays chess or football well or who carries through an enquiry in physics or an experimental mode in painting with success, characteristically enjoys his achievement and his activity in achieving. … As Aristotle says, the enjoyment of the activity and the enjoyment of the

achievement are not the ends at which the agent aims, but the enjoyment supervenes upon the successful activity in such a way that the activity achieved and the activity enjoyed are one and the same state (p.197).

Getting students to experience this unity of appreciation and motivation is much of what teaching is all about.

We have alluded to the way in which recognizing imaginative argumentative moves contributes to the appreciation of reason, but imagination plays an additional role in reasoning. Much of reasoning is about "what if"—about claims that may not be true. The focus of inference in an argument is not on the truth of the conclusion but on whether the conclusion follows from or is well supported by the premises. Notoriously many students have initial difficulty distinguishing between the validity of an argument and the truth of its conclusion. Being able to make the leap to a more abstract view of argument is an important part of appreciating reason. Arguments, especially but not only deductive ones, have an underlying form which is crucial to their epistemological worth. Moving from the details of a particular argument and in particular from the truth values of the claims, to reflection on the value of the argumentative form itself requires a kind of sophistication that is part of appreciating what reason is all about. While one can make appropriate use of argument without this abstract understanding, this lack would mean that one could not fully appreciate particular arguments. Imagine someone saying that Thompson's argument is poor because medicine has no way of hooking people up in the way that she imagines. This would constitute a failure to appreciate that particular argument resulting from a failure of the imagination.

6. FOSTERING REASON APPRECIATION

It may seem odd that one has to induct students into the practice of reasoning which should not, after all, be "alien" to everyday life in the way in which say, quantum physics or

basket weaving may be. Unlike in the case of games, students of reasoning are not being initiated into the practice, but are involved in it from a very early age. Evaluating reasons, justifying claims, and drawing inferences are all inevitable aspects of living (at least in modern societies) and children are introduced into these practices in so far as they learn to be language-using beings. It can be argued, however, that a large percentage of adults do not engage in this practice with a high degree of skill (Nisbett 1980). They are already practitioners to some degree, but usually not entirely competent ones and almost certainly not as competent as they could be. Even less do they possess the kind of appreciation which is at issue here.

Fostering such appreciation involves inducting students into the practice as contrasted with merely informing them about it, but this is a complex pedagogical process. This is not the place for a comprehensive review of this challenge. What we have tried to do is to outline the richness of the goal. Nonetheless, we shall conclude by suggesting some general pedagogical implications of our view.

The most fundamental and overarching implication of our view is that instructors of reasoning should have reason appreciation as an explicit goal of their teaching which suffuses all aspects of instruction. This means going beyond the mere basic competence and knowledge of the rules of inference and evidence to a more in-depth, comprehensive and nuanced understanding of the practice. This would include an explicit focus on the reasons, both epistemological and moral, why reason should be respected, and an emphasis on the centrality and non-arbitrary nature of the practice of reason, with its entailed moral obligation to adhere to the principles of reasoning. Another aspect would involve focusing on and illustrating the role that reason plays in everyday life and in successful discussion, with its potential for "civilizing the discourse." Pointing out the aesthetic and imaginative aspects of arguments, those aspects that make an argument more than non-fallacious

or sufficient, is another means for attempting to foster the appreciation of reasoning. Finally, an instructor can attempt to get students to "catch" the affective dimension through displaying her own enthusiasm for the enterprise of reasoning.

If we are successful in fostering an appreciation of reason in the full sense, the result should be students who are able to recognize excellence in reason and be motivated to strive for this excellence.

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II. THE APPROACH

CHAPTER 5

INQUIRY: A DIALECTICAL APPROACH TO TEACHING CRITICAL THINKING

Sharon Bailin and Mark Battersby

1. INTRODUCTION

The ultimate goal of this paper is to argue for a particular approach to critical thinking pedagogy. Our argument is aimed particularly at those courses taught at the post-secondary level which currently tend to focus on analyzing and evaluating individual arguments in the name of critical thinking instruction.

We shall argue that the underlying concern of critical thinking is the making of reasoned judgments. Arriving at reasoned judgments in actual cases is a dialectical process involving the comparative weighing of a variety of contending positions and arguments. Thus, taking seriously the dialectical dimension implies having as a central focus for both theory and pedagogy the kind of comparative evaluation which we make in actual contexts of disagreement and debate.

In order to make this case, we draw upon arguments concerning the nature of argumentation. Thus a note about how we view the relationship between critical thinking and argumentation is in order. Although we agree with theorists who argue that the two are not synonymous and that critical thinking may include aspects that do not focus on arguments (e.g.,

Govier 1989), nonetheless, we believe that argumentation constitutes a significant aspect of critical thinking. This is especially the case as we view argumentation quite broadly and would argue that much discipline-specific reasoning, including inference to the best explanation or the justification of interpretations of an artwork, constitute examples of argumentation (Bailin and Battersby 2016). Because of the centrality of argumentation in critical thinking, we shall draw implications from the dialectical nature of argumentation for critical thinking pedagogy.

2. ARGUMENTATION AS DIALECTICAL

Our discussion will take as its point of departure three points made by Ralph Johnson:

1. The theory of argumentation should develop out of an understanding of the practice of argumentation.
2. An important feature of the practice of argumentation is that it is dialectical.
3. The pedagogy of argumentation should include this dialectical dimension.

We shall begin by registering our agreement with Johnson's first point, that "the normative dimension of the theory of argument … must develop out of a proper understanding of the practice of argumentation"[1] (Johnson 2000, p.6). It was a very similar view, that argumentation theory and pedagogy should be more faithful to how arguments are actually conducted, that motivated the Informal Logic movement, and it is a view with which we concur. We also concur with Johnson's view that the aspect of the practice of argumentation which is missing from the theory is its dialectical dimension.

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1. "By 'the practice of argumentation,' I mean to refer to the social and cultural activity of constructing, presenting, interpreting, analyzing, criticizing and revising arguments" (Johnson 2007, p.8).

It is important to clarify that Johnson uses the term "dialectical" to refer to a feature of the practice of argumentation and not to an approach to argumentation theory, as for example the Pragma-Dialectical approach. It is, in Finocchiaro's terms, dialectical as distinguished from monological and not dialectical as distinguished from rhetorical or logical (Finocchiaro 2003, p.19). We shall also use "dialectical" to refer to a feature of the practice of argumentation.

What might be meant by claiming that argumentation is dialectical? In their 1987 paper, "Argument as Dialectical," Blair and Johnson offer the following characterization of the dialectical features of argumentation, a characterization which seems to have been followed in subsequent work.

1. An argument as a product can only be understood against the background of the process of argumentation.
2. The process of argumentation presupposes at least two roles: questioner and answerer, although the roles may be exchanged at various stages of the process.
3. The process of argumentation is initiated by some question, doubt or challenge to a proposition.
4. Argumentation is a purposive activity (Blair and Johnson 1987, pp.45-46).

They summarize as follows: "To say that argumentation is dialectical, then, is to identify it as a human practice, an exchange between two or more individuals in which the process of interaction shapes the product"[2] (Blair and Johnson 1987, p.46).

In our view, these points capture some central aspects of the dialectical dimension of argumentation. To say that argumentation is dialectical means that it takes place in the context of some controversy or debate. This implies 1) that it is initiated

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2. Johnson continues to make a similar point in more recent work: "An exchange is dialectical when, as a result of the intervention of the Other, one's own logos (discourse, reasoning, or thinking) has the potential of being affected in some way" (Johnson 2000, p.161).

by some question, doubt, challenge, and 2) that there is a diversity of views on the issue, arguments both for and against (if the controversy is genuine, then it is likely that there will be at least some plausible arguments on both sides).[3] The dialectical aspect also means that there is an interaction between the arguers and between the arguments involving criticism, objections, responses, and, frequently, revisions to initial positions.

One implication of this view is that we seldom make and assess individual arguments in isolation. Rather, we make them in the context of a dialectic, of a historical and ongoing process of debate and critique, of competing views and the give-and-take among them. Thus, an individual argumentative exchange must be viewed in the context of this dialectic (Bailin 1992, p.64). The following reference by Blair and Johnson to Aristotelian dialectic captures the essence of this perspective:

> In Aristotelian dialectic, an interlocutor's contribution has to be seen against the background of the questions already asked and the answers already given. In understanding argumentation, this feature points in the direction of background beliefs shared, or debated, by the community of informed people for whom the key propositions of the argument arouse interest and attention (Blair and Johnson 1987, p.45).

3. REASONED JUDGMENT VERSUS RATIONAL PERSUASION

An implication of the recognition that argumentation is dialectical is that, in order to understand the nature of argumentation and its evaluation, one needs to focus on the whole process of argumentation. This involves a focus on the comparative evaluation of competing views rather than simply on the evaluation of particular arguments.

Argumentation is a purposive activity, as Blair and Johnson have pointed out. We engage in argumentation to some end,

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3. Johnson makes a similar point: typically "there are good arguments for and good arguments against a particular proposition or proposal" (Johnson 2003, p.42).

but what that end is has been the subject of some debate. Johnson holds that there are different goals of argumentation: rational persuasion, inquiry, decision-making and justification. For him rational persuasion is primary, with other goals being generated from it. We agree that arguers may have different purposes or intentions in arguing such as the ones he lists. Nonetheless, because of the rational and dialectical character of argumentation, we would argue that the primary goal should be seen as arriving at a reasoned judgment, a process we deem inquiry.[4] Whatever the original intentions of the arguer, because of the normative constraints on arguers to be open-minded, to put their arguments to the test of reason, and to be willing to concede to the most defensible position, the normative structure of the practice necessitates inquiry at some level or stage (Bailin 1992). We might think about this issue in terms of MacIntyre's notion of the point of a practice, which does not necessarily or always coincide with the psychological purposes of particular practitioners engaging in the practice (MacIntyre 1984). Yet, through participating in the practice and abiding by its normative constraints, one can learn to appreciate its underlying structure and share in its constitutive purposes.

In order to probe this point further, let us look at what Johnson has to say about his rationale for taking rational persuasion as primary:

> I cannot argue it here but I believe this purpose [rational persuasion] is the fundamental one and others (like justification, inquiry, reinforcement) can be generated from it. My strategy would be to mount an argument that parallels Wittgenstein's argument that first we learn to talk to others, then to ourselves. We justify to others, then to self (Johnson 2007, p.3: note 10).

We would, however, hesitate to equate justifying to others

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4. By inquiry, we mean critical inquiry, i.e., the process of arriving at a reasoned judgment, and not simply the gathering of information.

with rational persuasion. If you make an argument to some-one, but the interlocutor presents you with sound criticisms and a more cogent alternative argument, then you ought to change your mind. If one views the purpose of argumentation as rational persuasion, and you fail to persuade, then the argu-mentation has failed. This seems an unpalatable conclusion. If the outcome of the exchange has been to reach a reasoned judgment, then we would want to say that the argumentation has succeeded. It seems to us that the "rational" in "rational persuasion" is central and points to an underlying strata of inquiry.

It is not our intention to imply that the purposes or inten-tions of the arguer are irrelevant to the process of argument. These purposes may frame how we go about the inquiry and where we put our emphasis. When I sit down to make my case in an op-ed piece, I am doing something which is different in certain ways than when I am discussing an issue with a col-league. In the latter case, I am trying to decide what to believe, and in the former I am trying to (rationally) persuade some-one. The rational persuasion must, however, be preceded by inquiry in order to be rational – it involves, in effect, a presen-tation of the results of inquiry. And even when presenting my case, I have an obligation to be open to the objections, criti-cisms, and argument on the other side that may be offered in response. Thus I am still, in some sense, engaged in an inquiry process. We shall argue in due course that taking reasoned judgment as primary is also beneficial from a pedagogical per-spective.

4. REASONED JUDGMENT AND COMPARATIVE EVALUATION

Thus we are arguing that we should view as the central goal of argumentation the making of reasoned judgments. This process of arriving at a reasoned judgment is what we refer to as inquiry. By a reasoned judgment we mean not simply a

judgment for which one has reasons, but a judgment for which one has good reasons, reasons which meet relevant standards. Hitchcock's revision of Johnson's notion of argumentation in terms of argumentative discussion has considerable overlap with our notion of inquiry:

> An argumentative discussion is a sociocultural activity of constructing, presenting, interpreting, criticizing, and revising arguments for the purpose of reaching a shared rationally supported position on some issue (Hitchcock 2002, p.291).

An important difference is that Hitchcock frames his definition in terms of the purpose of the participants whereas we frame ours in terms of the point of the practice (a move which Hitchcock explicitly rejects). Nonetheless, his notion of the purpose as reaching a shared rationally supported position on some issue comes close to our notion of arriving at a reasoned judgment. In addition, his list of examples of the practice of argumentative discussion (p.288) would all qualify as well as examples of the practice of inquiry.

Given that argumentation is dialectical, the process of arriving at a reasoned judgment on an issue necessarily involves the comparative evaluation of contending positions and arguments. Kuhn makes the point thus:

> Only if knowledge is seen as the product of a continuing process of examination, comparison, evaluation, and judgment of different, sometimes competing, explanations and perspectives does argument become the foundation upon which knowledge rests (Kuhn 1991, pp.201f., cited in Govier 1999, p.212).

Such an evaluation requires knowledge of the details of the current debate, or what Johnson refers to as the dialectical environment. He defines the dialectical environment as "the dialectical material (objections, criticisms, alternative positions, etc.) that congregates around an *issue*" and goes on to describe what would be involved in mapping the dialectical environment surrounding an issue:

A mapping of the dialectical environment surrounding this issue [same sex marriage] would require us to lay out the various positions, the objections and criticisms of those positions, the responses to them" (Johnson 2007, p.10).

It also requires one to address alternative positions. Johnson views this process of mapping as necessary in order to be in a position to address objections to one's argument, but we view it as much more fundamental. If argumentation is dialectical and coming to a reasoned judgment on an issue involves a comparative evaluation of contending positions, then having knowledge of the dialectic is central to the enterprise of arriving at a reasoned judgment.[5]

An example of the importance of knowledge of the dialectical context can be found in the role of identifying alternative arguments. A number of authors have adduced evidence demonstrating how significant errors of reasoning can be attributed to a lack of understanding of other positions (Kuhn 1991) and the failure to pursue alternative lines of reasoning (Finocchiaro 1994).

In addition to the current debate around an issue, another aspect of the dialectical context is the history of the debate. If an issue is controversial, it is likely that the debate will have gone on over a period of time. Knowledge of the history of the argumentation which has led to the current debate, of "the questions already asked and the answers already given," can be helpful and is in some cases essential, to understanding the issue and the various positions which are contesting for acceptance. It is, for example, only possible to understand the ascendancy of certain scientific theories by understanding the nature of the problem which they were addressing and seeing what other theories they defeated and why. Only in this way we will understand why the dominant theory is seen as the best explanation and what issues still remain contested. Sim-

5. For a discussion of the difference between alternative positions, objections, criticisms, and counter-arguments, see Govier 1999, pp.223-232.

ilarly, we can really only understand contemporary political debates by knowing something about the historical situation and the historical disagreements in which the contemporary debate has its roots. And knowing the history of a debate is important in order to determine where the burden of proof lies (looking at the history of the capital punishment debate, for example, will reveal that the deterrence argument has largely been discredited and that, as a consequence, any deterrence-based arguments would now assume the burden of proof).

5. THE ROLE OF ARGUMENT ASSESSMENT

We have argued that coming to reasoned judgment involves a comparative evaluation of competing cases. But what is the role of the analysis and evaluation of individual arguments in this enterprise? Certainly, the evaluation of individual arguments has an important role to play as arguments are the building blocks of cases or positions. Thus an initial assessment of individual arguments is a necessary part of the process of arriving at a reasoned judgment. It is, however, not sufficient. A complete assessment usually requires a comparative assessment of the strengths and weaknesses of the cases in which the arguments are embedded.

We would, however, also question the extent to which one can actually evaluate individual arguments apart from the context in which the arguments are situated.[6] One may be able to make an initial, *prima facie* assessment of whether a particular argument is fallacious, but often, in order to know how good an argument really is, one has to evaluate it in its dialectical context. Judging how strongly a particular set of premises supports a conclusion frequently requires more information than that supplied in the particular argument. One might, for example, construct what seems like a strong argument for euthana-

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6. We discuss the role of other types of contexts (social, political, historical, disciplinary, and personal perspectival) in argument evaluation in Battersby and Bailin 2011.

sia on the basis of individual human rights, but this argument may not be strong enough to prevail against arguments regarding the possible abuses of legalization.

Moreover, this type of comparative contextual evaluation will call on criteria from the particular area as well as traditional argument evaluation criteria.[7] Thus, for example, evaluating a causal claim in social science may require criteria for evaluating statistical arguments; and evaluating a claim about the merit of a particular painting will call on criteria of artistic value.

6. LIMITATIONS OF THE DIALECTICAL TIER

As a way to recognize the dialectical dimension of argumentation, Johnson makes the move of adding a dialectical tier to the requirements for an adequate argument. In so doing, he maintains the focus on individual arguments but adds a requirement which enlarges the scope of what constitutes an argument. This move to have the dialectical dimension of argumentation reflected in the theory of argument is an extremely promising and important development. We would argue, however, that this approach does not go far enough in recognizing the implications of the dialectic dimension of argumentation. Taking rational persuasion as primary dictates a focus on particular arguments and how to improve them in order to achieve this goal. Dealing with criticisms, objections, and alternative arguments is a way to strengthen (or possibly amend) one's original argument(s). We would argue, however, that truly recognizing the dialectical dimension means more than simply discharging one's dialectical obligation to address criticisms and objections to particular arguments. Rather, taking seriously the dialectical dimension means focusing not on particular arguments, but instead on the debate and an evalua-

7. In their 1987 paper, Blair and Johnson state that "single arguments are normally parts of a larger process and need to be interpreted and evaluated in that context" (Blair and Johnson 1987, p.46).

tion of competing cases in order to make a reasoned judgment on an issue.

Johnson has the insight that argumentation is dialectical and that current theory and pedagogy do not take this into account. His solution is to augment the notion of what constitutes an argument and build more into the requirements for argument adequacy. Thus a knowledge of the dialectical environment is necessary in order to anticipate and deal with criticisms, objections etc. and to improve one's argument. He describes ways to go about anticipating objections as follows:

> Perhaps even more effective is the step of immersing oneself in the issue and the various positions that have been developed. That means becoming familiar with the dialectical environment of the argument …. The better one knows the dialectical environment …, the more successful one can be in anticipating various objections. Because one then knows what sorts of objections are around, what sorts of objections others have raised. One will be familiar with the alternative positions and possibly be able to immerse oneself in them in order to see how someone who holds that view might object. One can then make use of one's knowledge of similar argumentative situations to extrapolate to the current one…. Typically some of this thinking occurs in the construction of the argument – so it is likely the dialectical environment will influence the arguer in the very formation of the argument (Johnson 2007, p.4).

This process of becoming familiar with the dialectical environment around an issue (becoming knowledgeable about the various positions, objections, and alternative positions) sounds very similar to how we would describe a major component of the process of inquiry. For Johnson, this process in undertaken as a way to anticipate objections and thereby support one's argument. However, if one then evaluates these various positions, arguments, objections etc. in a rational and fair-minded way, with the intent of identifying the most reasonable position, then one is really engaging in the inquiry process.

One criticism which has been leveled against Johnson's

inclusion of the requirement of a dialectical tier is that this move would lead to an infinite regress in that supplementary arguments may themselves require further support, and so on (Govier 1999, p.218). We would argue, however, that such a result is only problematic if one tries to build a dialectical tier into the requirements for an individual argument. Otherwise it can be seen as a realistic reflection of the dialectical character of argumentation, as Govier points out:

> From a practical point of view, the fact that supplementary arguments may be questioned and may themselves require further support is only realistic, and quite plausible when we reflect on the history of actual controversies about important matters. Far from showing that there is a problematic infinite regress in the account, it could be alleged that this indefiniteness simply points to a feature of real debate, one that is mirrored in the intellectual and dialectical structure of the issues themselves (Govier 1999, p.236).

7. IMPLICATIONS FOR PEDAGOGY

The third point of Johnson's which we highlighted at the beginning, and with which we whole-heartedly agree, is that the pedagogy of argumentation should reflect how arguments are actually conducted and thus should include the dialectical dimension:

> If my view is correct, then it follows that a critical thinker must possess as part of his or her argumentative skills what I called *dialectical* skills: being familiar with the standard objections to his position and responding to them, facing off against alternatives (Johnson 2008, p.1).[8]

He believes, moreover, that these dialectical skills are absent from most texts and tests of critical thinking, which tend to presuppose a traditional account of argument. We concur with

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8. The dialectical skills which Johnson outlines include the following: dealing with objections and alternative positions (including seeking out criticism); knowing what would count against one's position as well as for it – knowing weaknesses in one's own position; changing one's mind when appropriate; taking time to reflect rather than rushing to judgments (Johnson 2009, p.7).

this diagnosis. In order to fill this lacuna, we would argue for an approach to critical thinking pedagogy focusing on inquiry.

7. 1. Teaching critical thinking as inquiry

What might such an approach look like and include? 1) It would have as its goal the making of reasoned judgments; and 2) it would emphasize the comparative evaluation of contending positions and arguments in actual contexts of disagreement and debate. The following are the aspects which we have included in the inquiry approach which we have developed (Bailin and Battersby 2016):

1. the nature and structure of arguments, the *prima facie* identification of fallacies, and the use and evaluation of central argument types such as analogical and causal reasoning;
2. identifying and clarifying issues, as well as determining the kinds of claims or judgments that are involved in different kinds of inquiry;
3. understanding the dialectical environment, including the current debate and history of the debate;
4. understanding the various aspects of context which may be relevant, including the social, political, historical, disciplinary, and personal perspectival contexts (Battersby and Bailin 2011);
5. making a reasoned judgment, including the comparative weighing of arguments, the evaluation of alternative positions, synthesizing the strengths of various views, and proportioning judgment to the weight of evidence;
6. making one's own case, including constructing arguments, creating analogies, generating alternative explanations, and anticipating objections.

In addition to addressing inquiry in general, we also look at inquiry in specific areas, including the physical sciences, the

social sciences, the arts, the humanities and interdisciplinary contexts. Considerable emphasis is placed throughout on the cultivation of the appropriate habits of mind in inquiry and dialogue.

We see a number of benefits in this type of approach. First, in focusing on argumentation as it is actually conducted, the approach should furnish students with some of the knowledge and skills necessary for making reasoned judgments in real contexts.

There are also dispositional benefits to an inquiry based approach. Inquiry is an active process. Students go beyond evaluating the arguments that may come their way or be put in their path to actively seek information and arguments in order to resolve an issue or puzzlement. Habits of mind such intellectual curiosity, truth-seeking, self-awareness, and intellectual perseverance may be fostered in the process.

An inquiry approach is also preferable to an approach based on rational persuasion because of the orientation to argumentation which it promotes. One of the challenges in teaching critical thinking is to counter students' tendencies to "avoid challenge to their own beliefs, to ignore contrary evidence, to straw-person the beliefs of others, to refuse to concede points, to start with conclusions and then look for arguments to support them, to want to win at all costs" (Bailin 1992). Thinking about argumentation in terms of rational persuasion may have the result of reinforcing students' tendencies to try to find support for and persuade others of positions they already hold (even though this is avowedly not the intention), and it may not provide sufficient conceptual antidote to closed-mindedness and a desire to win. Adding a dialectical tier is a move in the right direction in that it imposes a requirement to look beyond one's own arguments, as Govier points out:

> Thinking of argument as having a second dialectical tier links the practice of arguing with an open and flexible form of thinking in which we come to consider how other people think as

well as how we ourselves think, and we attempt explicitly to consider and address alternatives to our own beliefs about the world (Govier 1999, p.207).

Nonetheless, the focus on rational persuasion limits the extent to which such open and flexible thinking is likely to be encouraged. Lawyers do, after all, anticipate objections to their own arguments, but they do so in the service of the effectiveness of the case they are making for their client. It is unlikely that in so doing, they are seriously considering changing their commitment to their client's position. We would argue that an open-minded, fair-minded, and flexible attitude is much more likely to be encouraged by an approach which puts less emphasis on the persuasive function of argumentation (rational though it may be); which focuses on the evaluation of competing cases rather than on the evaluation of individual arguments; and which has as its explicit goal arriving at a reasoned judgment.

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III. CONDUCTIVE REASONING

CHAPTER 6

GUIDELINES FOR REACHING A REASONED JUDGMENT

Mark Battersby and Sharon Bailin

1. INTRODUCTION

When one begins to survey the work on conductive argument, two surprising facts emerge. One is that so little has been written on conductive arguments; the second is that much of what has been written has focused on establishing their existence. One would have thought that even a cursory observation of how arguments are conducted in all areas of life would bring to an observer's attention not only the existence of such arguments but their ubiquity. Making judgments based on both pro and con considerations is a common phenomenon in numerous domains, as Govier notes: "In my experience they [conductive arguments] naturally occur in law, philosophy, interpretive studies—and in fact in any area, including science, in which there are reasons for and against, or 'pros and cons' which we must consider in order to make a judgment on an issue" (Govier 1999b, p.160).

That the ubiquity and importance of conductive reasoning has not been sufficiently recognized may be a function of its "messiness." Conductive arguments do not fit traditional argument patterns. The premises neither entail the conclusion nor do they support the conclusion in an unambiguous way as some of the "premises" (or anti-premises, as some have called

them) actually adduce reasons that count against the conclusion. Indeed, Johnson makes the point that conductive arguments are not easily identified as arguments by either Formal Deductive Logic or positivism (Johnson 2000a, p.92).

Given their lack of conformity to traditional argument patterns, the appraisal of conductive arguments has become a central issue. As they are non-conclusive arguments, one cannot specify the criteria for their formal validity, as Wellman points out. And since they involve reasons against as well as for the conclusion, the problem arises as to how to weigh the various considerations and counter considerations, especially as such a weighing will be dependent on subject matter (Wellman 1971, pp.61–62; Govier 1985, p.261). For these reasons, some theorists have concluded that, "It is difficult to give any general guidelines about appraising conductive arguments" (Govier, p.260). Wellman argues, in fact that, although it is meaningful to refer to the validity of conductive arguments, the only way to establish such validity or lack thereof is by thinking the argument through and feeling its logical force (Wellman 1971, p.79).

It is our belief that there are some general guidelines which can be offered with respect to doing conductive reasoning well and that these guidelines give rise to a set of criteria for identifying inadequate conductive arguments. It is such guidelines and criteria that we elucidate in the remainder of the paper.

2. WHAT DO WE MEAN BY CONDUCTIVE REASONING?

Before proceeding with that task, it is necessary to clarify how we are using various terms and to delineate the focus and scope of our project. Our focus is not on the structure or assessment of particular conductive arguments per se but rather on the enterprise of conductive reasoning. By conductive reasoning we are referring to the process of comparative evaluation of a variety of contending positions and arguments

with the goal of reaching a reasoned judgment on an issue. We adopt this terminology and focus for a number of reasons.

The first is clarity. What are generally referred to as conductive arguments are most likely themselves constructed of competing arguments which may offer reasons in support of a particular claim, objections to and critiques of arguments offered, or responses to objections. We will call the collection of all arguments in a piece of conductive reasoning a *case*, and individual arguments, simply arguments. A case, then, is made up of a collection of arguments whose conclusion is intended to support a particular judgment on the issue in question. Let us illustrate with an example (taken from our textbook on inquiry). This dialogue takes place following an extensive evaluation by the two protagonists of the various arguments commonly offered for and against capital punishment.

> *Phil:* You know, Sophia, we've looked at a lot of arguments and information on capital punishment, but I think that the conclusion is becoming obvious to me. The weight of arguments clearly points against capital punishment.
>
> *Sophia:* What made you come to that conclusion?
>
> *Phil:* Well, it's pretty clear that there's little evidence to support the deterrence argument.
>
> *Sophia:* Agreed.
>
> *Phil:* And the incapacitation argument is really "overkill" (sorry about that) since the same result can be achieved by less drastic means.
>
> *Sophia:* Agreed again.
>
> *Phil:* The issue of cost actually supports the con side since it turns out that capital punishment is much more expensive than life imprisonment.
>
> *Sophia:* Right again.
>
> *Phil:* I think that there is something legitimate to the retribution argument in terms of the desire for justice. But retribution can be achieved with life imprisonment.

You've also convinced me that with capital punishment, we risk an even greater injustice, that of possibly executing an innocent person.

Sophia: I'm with you.

Phil: Then there's the fact that capital punishment is discriminatory.

Sophia: True.

Phil: And then we're left with all the moral problems of the state killing some of its citizens and, in particular, some of its citizens who are innocent. That's a very strong argument against capital punishment.

Sophia: Especially since there are alternatives.

Phil: And given the worldwide trend toward abolition, supported by important organizations like the United Nations, the arguments for capital punishment would have to be very strong to counter that.

Sophia: Which they're not.

Phil: So, all in all, I have to agree with the abolitionists—we should not have the death penalty (Bailin and Battersby 2016, pp.235-236).

This dialogue may be seen as exemplifying a conductive argument in the usual sense, offering as it does a number of independent reasons in support of a conclusion as well as addressing objections and counter considerations. As noted above, however, this presentation of the case is preceded by considerable reasoning in the form of an evaluation of individual arguments and a comparative weighing of considerations that leads to the making of this conductive "argument." Cases are often presented in this way—as summaries of conductive reasoning, using primary claims to support a judgment without an explicit statement of the arguments that provide support for these claims. But good conductive reasoning involves a deeper process of inquiry in which the credibility of primary claims is based on an assessment of the arguments that provide support for these claims and in which competing considera-

tions are explicitly weighed and balanced. This is the process in which Sophia and Phil have been engaged previous to this dialogue. It is this entire process of comparative evaluation and weighing which is the focus of our interest, and not simply the resulting "argument."

Conductive arguments, in the usual sense, can vary considerably in subject matter and complexity. Both the preceding argument regarding capital punishment and the argument: "I'm tired, but I should go to the store anyway because we need bread" have the structure of a conductive argument. Our focus, however, is on the former. We are interested in the pro and con reasoning which takes place in complex and controversial situations, the kind of comparative evaluation we make in actual contexts of disagreement and debate.

Another reason for focusing on conductive reasoning is our commitment to the view of argumentation as dialectical. According to Blair and Johnson, "To say that argumentation is dialectical … is to identify it as a human practice, an exchange between two or more individuals in which the process of interaction shapes the product" (Blair and Johnson 1987, p.46). Our primary focus is on what will make this process a successful one, thereby leading to an adequate product, i.e., a credible reasoned judgment.

3. FEATURES OF CONDUCTIVE REASONING

The guidelines and criteria we offer arise from the particular features of conductive reasoning.

The first characteristic of import here is that the appropriate goal of conductive reasoning is not the making of a conclusive argument but rather the making of a reasoned judgment. By a reasoned judgment we mean not simply a judgment for which one has reasons, but a judgment for which one has good reasons, reasons which meet relevant standards. A piece of conductive reasoning can, at best, offer good, but not decisive, reasons to support a conclusion over its competitors. Thus

arriving at a reasoned judgment will require an examination and weighing of the reasons offered on different sides of an issue and the balancing of various considerations.

No survey of arguments will be exhaustive, however. The possibility always exists that additional reasons and arguments will be put forward which might affect the outcome of the reasoning. Thus the judgment that is the outcome of the conductive reasoning process is always provisional and open to further examination. In addition, because this type of reasoning takes place in complex contexts with dimensions of uncertainty, there may be more than one judgment that is defensible given the context. For these reasons, conductive reasoning needs to be seen in the context of an ongoing process of critical inquiry.

Conductive reasoning takes place in many domains (as mentioned above). It is common in practical reasoning (Hitchcock 2000, pp.5–8) and in social theory and history (Govier 1985, p.260), but can also take place in virtually any domain, including art interpretation and criticism and scientific inquiry. In addition, reasoning about many contested issues will involve a range of types of considerations (for example, factual, ethical, practical). As a consequence, a variety of different types of considerations will often need to be taken into account in conductive reasoning and the criteria of specific domains of inquiry will often play an important role.

An important feature of conductive reasoning (of the kind which is of interest to us) is that it takes place in the context of a dialectic, of a historical and ongoing process of debate and critique, of competing views and the give-and-take among them. Reasons and arguments have been offered on various sides of the issue in question, objections have been raised to many of the arguments, responses have been offered to some of the objections, and alternative views have been put forth. This constellation of reasons, arguments, objections and responses constitutes what Johnson calls the dialectical envi-

ronment (Johnson 2007). Having knowledge of the dialectical environment surrounding an issue is central to the enterprise of arriving at a reasoned judgment (Bailin and Battersby 2009). In addition, knowledge of the history of the debate can be of assistance in determining which arguments are salient and should be considered, which are considered strong, and which are considered defeated and why.

In addition to this dialectical context, we have identified several additional aspects of context that we believe are relevant to conductive reasoning by playing a role in the determination of both the significance and the weight of reasons. One is the state of practice, which refers to the current situation with respect to the issue at hand (e.g., is there currently capital punishment in the jurisdiction under discussion, and if not, when was it defeated and why). Knowing where the force of current practice and opinion lie can help us to understand what alternative views are up against and whether (and to what extent) any of these views bears the burden of proof. Knowledge about the intellectual, social, political, and historical contexts that surround an issue can contribute to our understanding of the assumptions that lie behind various positions and why people might hold them. Hitchcock's observation that students' problems with conductive reasoning are due in part to a "lack of background knowledge to generate a full enough range and detail of competing considerations" (Hitchcock 2000, p.7) points precisely to the centrality of this kind of contextual knowledge.

The dialectical nature of conductive reasoning implies that the process will be dynamic. Particular arguments are often modified or reframed in response to criticism and objections, and these modifications may in turn result in a reframing of the objections, and so on. As Zenker points out, for example, "Typically, some premises appear only in response to and sometimes integrate an opponent's objections successfully" (Zenker 2007, p.2). In this spirit, Wohlrapp argues against a

view of (non-deductive) argumentation in terms of a sequence of isolated inference steps and for a view in which "premises and conclusions of an argumentation form a 'retroflexive' system of mutual support" (Wohlrapp 1998, p.342). One implication of this dynamism is that weighing arguments cannot be simply a matter of placing competing arguments on a metaphorical balance scale because arguments will often change in the process of reasoning. Conductive reasoning will need to give attention to the modification, reframing, and synthesizing of arguments.

Because conductive reasoning involves the comparative weighing of reasons on various sides of an issue and because there will often be good reasons supporting different judgments, how strong the prevailing case is in comparison to the other cases will vary. Thus the strength of the judgments warranted by particular instances of conductive reasoning will vary as well. This feature of conductive reasoning points to the need to apportion the confidence of one's judgment to the strength of the reasons.

4. GUIDELINES FOR CONDUCTIVE REASONING

In what follows we offer guidelines for conducting conductive reasoning, and then use these guidelines to identify various fallacies in conductive reasoning that one might see either in the process of reasoning or in a case instantiating such reasoning. These guidelines arise from the dialectical and contextual nature of conductive reasoning reviewed above.

4.1. Appropriately review the "dialectical space," i.e., identify the relevant arguments and the history of the debate

As noted above, in coming to a reasoned judgment, the first task is to conduct an appropriate inquiry into the relevant arguments, including a review of the history of the debate. In addition to providing information regarding the salience and strength of various arguments, the history of the debate pro-

vides a context without which it may be extremely difficult to understand some arguments. For example, the problematic nature of the debate in British Columbia and then across Canada about the wisdom of a carbon tax was largely the result of the fact that most citizens were unaware of the dialectical context of the debate. For many, it was just another "tax grab" by the government with the puzzling and suspicious feature that the money was being returned to the taxpayer. Most simply did not understand the economic argument about carbon being an externality (a cost that was not fed through the market) that needed to be woven into the price structure of goods if there was to be an economically rational revision of the use of carbon fuels. The context was not simply global warming, but an extensive debate that had occurred among policy theorist about how best to implement incentives for reduction of carbon use.

4.2. Consider the full variety of objections to the various arguments and responses to the objections

The arguments pro and con about an issue which are the substance of conductive reasoning need to be identified and evaluated along with their associated objections. It is worth noting that there are at least two kinds of objections to individual arguments that provide the support for the primary claims. We suggest using the following terminology. An *under cutter* is a critique of an argument offered in support of a primary claim. This critique could attack the premises of the argument or the inference to its conclusion. The goal of an under cutter is to show that the conclusion of the argument is poorly supported so that the argument's conclusion cannot serve as a credible primary claim in support of the case's judgment. For example, an under cutter for the argument that capital punishment deters would be evidence showing that jurisdictions which eliminated capital punishment did not experience an increase in murder. Another kind of objection to

an argument in a case is a *specific counter*—a countervailing argument or claim meant to provide a countervailing consideration to a particular primary claim. The claim that capital punishment will inevitably result in the execution of people who are innocent is directly countered by the argument that all socially useful practices have downsides which must be accepted; on this view the execution of innocents is just something that society needs to accept in order to have appropriate punishments for first degree murders. These two kinds of objections directed at particular primary claims differ from general counter arguments or *con arguments*. *Con arguments* provide a different kind of objection. For example, the argument that capital punishment is a barbaric practice inappropriate to civilized countries is not an argument directed at any particular argument for capital punishment. Rather, it is a general countervailing consideration or *con argument*.

4.3. Evaluate individual arguments according to relevant criteria

Since the very concept of conductive reasoning involves marshalling both pro and con arguments and relevant objections, one of the primary requirements for reaching a reasoned judgment is that relevant pro and con arguments must be evaluated (just as one would do with any argument). This is not an assessment of the "weight" to be given to a certain claim in the case, but rather an assessment of credibility of the primary claim given the review of the supportive arguments and objections. For example, one could evaluate the arguments for the claim that capital punishment does not deter using the usual criteria for causal claims in the social sciences. Alternatively, one could point out that the appeal to a police chief's opinion is a fallacious appeal to authority. One could evaluate the evidence for the claim that historically, innocent individuals have been executed and for the claim that it is unlikely that this problem could be eliminated (the latter by appealing to histor-

ical evidence, legal scholars, etc.). Finally, one could evaluate the moral argument that capital punishment is the only appropriate punishment for certain kinds of murder—this would require a largely philosophical inquiry.

4.4. Establish the burden of proof and standard of proof required

One role that the consideration of context plays is to help identify, where appropriate, which side bears the burden of proof and the relevant standard of proof required. In scientific inquiry, the burden of proof bears on any novel theory or on claims counter to well established views. Science is inherently conservative in this way. In the political situation, those who argue for change in statutes or other political arrangements inevitably bear the burden of proof. But the standard here can clearly and reasonably evolve. After fifty years of widespread usage of marijuana and at least some scientific studies, the claim that it is relatively harmless (not harmless, but compared to alcohol…) is widely accepted and therefore claims of relative harmlessness would not bear the same burden of proof as they might have in 1960. Even more decisively, the argument that prohibition would not stop usage seems so obvious that it could almost be assumed in the argument. Returning to the capital punishment debate, the claim that capital punishment is not an effective deterrent against murder is now the accepted view of criminologists and anyone arguing for a deterrence effect would bear the burden of proof.

4.5. Assess possibilities in light of alternatives

Part of the assessment of particular arguments should involve consideration of whether there are better alternatives to the position being advocated. For example, with respect to the claims that capital punishment is necessary for both incapacitation and retribution, the existence of the less morally

troubling alternative of life imprisonment provides an alternative that weakens the force of those claims. In addition, since the goal of conductive reasoning is reasoned judgment, an inquirer should not be restricted to only considering alternatives that have been put forward in the past. Part of the resolution of a longstanding controversy may well be to consider totally different alternatives rather than trying to decide which of given alternatives is worthy of support. On the question of the legalization of marijuana, for example, there is a wide range of alternatives to consider. While California contemplates legalization of marijuana, many other jurisdictions are considering just decriminalization for possession, or as in The Netherlands, its sale in only certain "coffee bistros."

4.6. Take into account the relevant range of considerations

Because reasoning about many contested issues will involve a range of types of considerations (for example, factual, ethical, practical), it is important to ensure that one has taken into account the appropriate range of considerations when attempting to make a reasoned judgment. So, for example, in examining the issue of whether we should eat meat that comes from factory farms, it would be important to take into account both factual considerations about the conditions of animals kept on these farms and ethical considerations regarding whether humans have a moral obligation to animals. In inquiring into the debate over the raising of the minimum wage, it would be important to consider not only statistical information, but also the differing assumptions about equity and merit which are inherent in different positions in the debate. In dealing with public policy issues, it would be important to consider ethical as well as instrumental considerations, ends as well as means, costs as well as benefits, and long term as well as short term consequences.

4.7. Take into account and consider a variety of perspectives

The goal of reasoned judgment involves the attempt to make a decision or assessment from an ideal observer's or "objective" point of view, striving for the "view from nowhere" as the regulative ideal. Striving for this ideal involves attempting to look at an issue from many relevant perspectives—e.g., in a moral dilemma trying to see the perspective of both the moral actor and those of the victims or beneficiaries of the action. One might consider, for example, the controversy surrounding Peter Singer's advocacy of the euthanasia of disabled babies. Many disabled groups argued that he had failed to consider their perspective (McBryde Johnson 2003).

4.8. Consider differences in how issues, arguments, and reasons are framed

Opposing arguments are frequently characterized by different ways of framing or setting up the issue. Particular ways of framing may slant an inquiry in a particular direction and reframing may affect the outcome of the reasoning. Kahneman and Tversky (1982) have shown, for example, that the question of whether a decision is framed in terms of losing lives versus saving lives has significant impact on the way most people make the decision. As another example, a deontological approach to moral issues would frame a moral dispute quite differently than would a consequentialist perspective. The debate over carbon tax provides yet another illustration of the significance of framing. After the public outrage in British Columbia about the carbon tax, a PR person suggested that what the government should have done was to reframe the issue from a proposal for a tax increase to a proposal for "tax shifting," i.e., shifting taxes from income tax to carbon producing activities. The carbon tax would not be a tax increase but a tax shift, which would be more acceptable and intelligible to the average citizen, a claim supported by poll results (Bar-

rett 2008). Recognizing differences in framing can often help one to understand the assumptions underlying opposing arguments and thus to be in a better position to comparatively evaluate them. It also opens up the possibility for a mediation of frames that may lead to a judgment that incorporates the strong points of the opposing views.

4.9. Recognize and attempt to incorporate/synthesize strong points from different positions

Good reasons often do not reside entirely in one or other of the conflicting views. Thus it is important, in arriving at a reasoned judgment, to recognize the valid points in each view. The best-justified judgment is often one that incorporates the strong points in opposing views. In the dialogue, for example, our participants acknowledge that the need for deterrence, incapacitation and retribution are legitimate concerns, but they argue that they can all be addressed through life imprisonment.

4.10. Appropriately weigh and balance different considerations, values, and arguments

A central aspect of arriving at a reasoned judgment involves weighing the various reasons pro and con. Although there will likely be some differences in views about comparative weight, it is possible to justify one's assignment of weight and to criticize reasoning for inappropriate weighting (see below for a detailed discussion of weighing).

4.11. Consider whether one's own personal convictions and experiences may be coloring one's judgment

Since we are focused on the process of arriving at a reasoned judgment, there is a requirement for the participant(s) in this process to be aware of their own biases and prejudices. Increasingly convincing research has demonstrated the dif-

ficulty people have in making reliably rational judgments. Efforts, including the sharing of discussion with others, identifying one's perspectives and biases, and avoiding the more common generic biases such as representativeness (thinking individual events or experiences are representative of what generally happens) and confirmation bias (seeking only instances that provide support for one's view) can all serve to make it more likely that one comes to a judgment which is truly reasoned. One key strategy to avoid bias in one's judgment is to give due attention to evidence and arguments that counter one's own point of view. As noted above, we have built such considerations into the process of inquiry, so there is already an important check on confirmation bias, although other biases may need to be addressed with different strategies. An awareness of the historical basis of one's views and those of others can also help to undermine an inappropriate confidence in one's views.

4.12. Make a judgment at the appropriate level of confidence—apportion one's judgment to the strength of the reasons

Part of rational self-awareness involves assessing how much confidence one should have in one's judgments given the arguments that one has reviewed. It may be that one can conclude with considerable confidence that capital punishment should not be used by a state, but as current debate about what to do about global warming or the debate about the causes of obesity show, not all judgments can be made with the same degree of confidence, even though there may be an urgent need to act on such judgments. Judgments of the likelihood of descriptive factual claims present one sort of problem, but any judgment about what to do must also take into account future states of affairs that are usually less certain than judgments about current states of affairs. And finally, while there are some accepted general moral principles, their application

in particular cases, especially ones where accepted principles conflict, inevitably creates significant uncertainty. The unpredictability of the future means that almost all significant actions need to be based on judgments that are at best less than fully confident. In our text we suggest the following table as a guide.

Judgment and Confidence

A *very confident judgment* is warranted when the weight of reasons clearly supports the judgment.

A *reasonably confident judgment* is warranted when the weight of reasons strongly supports the judgment but there are still strong countervailing considerations.

A *tentative judgment* is warranted when the weight of reasons is not overwhelming but is supportive of one position, and we can make a judgment *on balance.*

A *suspended judgment* is warranted when the reasons for different positions are closely balanced or when there is insufficient evidence to make a judgment (Bailin and Battersby 2016, p.243).

5. FAILURES OF JUDGMENT

Our focus to this point has been on offering guidelines for reaching reasoned judgments. We also believe that these guidelines can furnish the basis for identifying certain kinds of problems in particular pieces of conductive reasoning, or cases. A given case can be evaluated in terms of the extent to which it deals with, or fails to deal with, the relevant considerations for reaching a reasoned judgment. We have termed the failures "failures of judgment." As is the case with traditional informal fallacies, failures of judgment are most useful in identifying bad arguments rather than in specifying good ones. We propose that proffered cases are inadequate to the degree to which they fail to take into account the various relevant considerations. The following is a description of the failures of judgment which we have identified.

- *Failure to undertake a comprehensive examination of the various competing arguments*

Since reaching a reasoned judgment involves a comparative evaluation of the various reasons and arguments on an issue, the failure to take into account any of the significant arguments on the issue constitutes a serious defect in a case.

- *Failure to give appropriate consideration to the burden of proof*

Failing to determine where the burden of proof lies or misplacing the burden of proof may result in an inappropriate determination of how much evidence is needed to make a case or of when a case has been made successfully.

- *Failure to consider the uncertainty of claims*

Taking claims as certain where the evidence in support of the claim is not, in fact, compelling may result in making an unjustified judgment or making a judgment with a greater degree of confidence than is warranted.

- *Failure to consider alternative solutions or possibilities*

The strength of a case can only be evaluated in light of the alternatives available. Ignoring possible and plausible alternatives would be a ground for criticism of a given case.

- *Failure to consider objections*

Because argumentation is dialectical, any reasoned case, in addition to offering arguments, must also respond to any known and important objections. Failure to do so significantly weakens the case.

- *Failure to consider implications*

Many cases concern decisions about what to do. However cor-

rect an action may appear on the basis of the arguments pro-
vided, failure to consider consequences (typically unintended
consequences) significantly weakens the case.

• *Failure to consider a range of considerations*

Judgments which fail to take into account relevant considera-
tions are faulty for that reason.

• *Biased framing*

Too narrow framing of an issue or argument, or framing in
a way that slants the discussion toward a particular perspective
may exclude the consideration of other possibilities and thus bias
the judgment.

• *"Either-Or" framing*

Given that many issues have more than two sides, and that
there are often intermediate possibilities between two opposing
positions, viewing all issues in terms of 'either-or' – as a choice
between two opposing positions, can oversimplify issues and
result in a failure to recognize other, possibly more reasonable
possibilities.

• *Inappropriate weighting*

This problem consists in giving undue weight to certain
aspects of an issue when making a judgment.

• *Making a judgment at an inappropriate level of confidence*

Asserting a judgment with more or less confidence than war-
ranted by the strength of the reasons constitutes another fallacy
of judgment.

6. WEIGHING AND BALANCING CONSIDERATIONS

A central notion in discussions of the evaluation of conduc-

tive reasoning, including our own, is that of weighing. Whatever guidelines may be offered, in the final analysis, reasons pro and con must be weighed in order to reach a reasoned judgment. Yet weighing is a metaphor that is difficult to cash out in the context of arguments, as numerous theorists have pointed out. Is it possible to quantify the weight or strength of various reasons or arguments? And if it is not, then does the notion become so vague as to be of little use or so subjective as to be devoid of evaluative purchase (Koch 2007c).

It is our view that weighing (which we take as the process) is a meaningful, if imperfect, metaphor, and that although weightings (which we take as the products of weighing) are not quantifiable and will sometimes be the object of disagreement, they are nonetheless not (or not primarily) subjective. Weightings can be justified (or criticized) by appeal to objective factors and considerations, for example by appeal to certain widely shared values and principles. Moreover, arguments can be evaluated in terms of both the likelihood that they are true and the support or weight that they give to the judgment. An argument which, if its conclusion is credible, gives considerable weight to a judgment will add little or no weight if it is doubtful. In the court context, for example, an argument that shows that the accused had a good alibi will largely exclude a conviction, whereas if the alibi is in question, the weight it provides is greatly diminished. On the other hand, the fact that an individual has a credible motive adds relatively little weight given that many people may have motives for committing a certain crime.

The excerpt of the dialogue on capital punishment quoted earlier can be used to illustrate some of these aspects of weighing. It is important to bear in mind, however, that a considerable amount of discussion regarding the relative weight of various arguments has already taken place before this dialogue occurs (e.g., **Phil:** *But you've convinced me that with capital punishment, we risk an even greater injustice...*) and that this discussion

process has been a dynamic one, with some of the arguments being modified or reframed in the course of the reasoning that has led to the presentation of the case that we see in the dialogue excerpt.

When reviewing their previous evaluation of individual arguments, Phil and Sophia agree that two of the pro capital punishment arguments, the deterrence and cost arguments, do not hold up—their conclusions are not justified. They are refuted by under cutter arguments and thus are given no weight. However, in addition to the likelihood that the conclusion is true or credible, the arguments can also be assessed with respect to the amount of support (positive or negative) they provide for the case for capital punishment. And each of the deterrence and cost arguments, if they had been credible, would have added different amounts of weight to the case for capital punishment. If capital punishment really did serve as a significant deterrent to murder, that would be a strong argument in its favor, grounded as it is in the widely shared value of saving the lives of innocent people. Even if it were true, however, that the costs are greater to incarcerate for life than to execute, that would not constitute a strong argument in light of the moral objections to capital punishment because of the *prima facie* presumption that moral issues should generally trump instrumental issues such as cost.

Another of the pro capital punishment arguments, the incapacitation argument, is recognized as sound in the sense that it is true that dead murderers cannot murder again. Nonetheless it is seen as a rather drastic way of removing murderers from circulation given there are other possibilities and so is not a very strong argument for capital punishment. Thus this argument is weakened by a specific counter argument that there is a less morally troubling alternative, life imprisonment, that can achieve the same goal. The retribution argument, on the other hand, is seen as based on strong grounds—an appeal to justice, which is a widely shared value and one that is inherent

to any legal system. Nonetheless, although the legitimacy of the appeal to justice is recognized, the weight of the argument as a justification for capital punishment is lessened because life imprisonment can be seen as an alternative which also meets the demand for justice. For both the incapacitation and retribution arguments, then, their weight in the debate is reduced because of the existence of less problematic alternatives.

The likelihood of executing innocent people is viewed by our two inquirers as a very strong argument against capital punishment, indeed as a consideration which overrides most other considerations, appealing as it does to a very strongly held value (not to kill innocent people) and a basic principle of the law (not to punish the innocent). It is true that any system of punishment will have errors no matter how good a job the system does in trying to avoid them. It is, however, crucial to the strength of the argument that some executions (and other long-term incarcerations) have been shown to have been erroneous. So the execution of innocent people is not just a theoretical possibility or an exceedingly rare occurrence. The frequency of such occurrences and the racial bias evident in many cases, in at least some locations, add to the strength of the argument. The weight given to this argument must still be seen as comparative, however, in that, if it could be shown that capital punishment were a significant deterrent and that it would thereby prevent many more innocents from being murdered than would be victims of system error, a much stronger case could be made for the practice. Because of the comparative nature of these evaluations, numbers, if credible and appropriate, may be significant.

We can also see how an appeal to the question of burden of proof is used to help determine how strong the arguments on various sides would need to be in order to prevail. In this case, the worldwide trend toward abolition sets up a burden of proof on the retentionist side. The determination of burden of proof is less pivotal in this case as the anti- capital punishment

arguments have been judged to be considerably stronger, but it can be decisive with respect to issues where the reasons on each side are judged to be more evenly balanced. Consider the criminal trial situation where the burden of proof is clearly on the prosecution. The failure of the defense to decisively undermine the prosecutor's argument should not result in the defendant being convicted since all the defense needs to do is show that there is a reasonable doubt about the guilt of the accused.

One aspect of weighing that is illustrated in the proceeding is that an important ground for justifying weightings is an appeal to widely shared values and principles. The extent of agreement in this regard should not be underestimated. There would, for example, be widespread agreement that the legal system should instantiate principles of justice; that moral considerations should generally take priority over cost considerations; that the state executing innocent people is extremely ethically problematic. Some of these values and principles are built into various domains and related to the "point of the practice." It is, for example, a basic principle in law not to convict or punish an innocent person. The alleviation of suffering is a foundational value in medicine. Education is grounded in the learning of the child. Weightings can be legitimately justified in terms of such values and principles, and judgments can be rationally criticized which exhibit inappropriate weightings. We would, for example, be justified in criticizing an educational policy if it was seen to value administrative efficiency over the learning of the child.

An excellent example of this aspect of weighing is provided by Allen in his paper discussing Canada's Rape Shield decision (Allen 1993) where he cites an excerpt from the opinion of one of the judges regarding the exclusion of possibly prejudicial evidence in rape cases:

> When, however, prejudicial evidence is for the defence, the prejudicial effect it would have if admitted must *substantially* outweigh its probative value before a judge can exclude it. This is

because a free and democratic society attaches great importance
to the principle that an innocent person must not be convicted
(p.106).

Here we have both an explicit statement of a central princi-
ple that ought to be appealed to in legal decisions and a judg-
ment about the appropriate weighting of considerations in a
particular case based on this principle.

There can, of course, be disagreement, even at times deep
disagreement, about the relevant or primary considerations, as
seems to be the case, for example, in the abortion debate. It is
often the case, however, that there will be agreement on the
considerations but disagreement over how to prioritize them
or how they play out in particular instances. In the rape shield
decision cited by Allen, for example, a dissenting opinion by
another of the judges argued that the excluded sexual history
evidence "is either irrelevant or so prejudicial that its mini-
mal probative value is overwhelmed by its distorting effect"
(Allen 1993, p.107). In this case there is agreement regarding
the principles that are relevant, i.e., prejudicial effect vs. pro-
bative value, but disagreement about their relative weighting
in this particular context. As another example, amongst people
toward the left of the political spectrum, there are those who
support a carbon tax because they believe that it would have
a positive impact on the environment while there are others
who oppose it because they believe that it would have a neg-
ative impact on economically disadvantaged individuals.
Although both groups value both the environment and eco-
nomic equality, they prioritize these values differently with
respect to this particular issue. These differences in judgment
may be based to some extent on differences in how the like-
lihood or the severity of the various possible outcomes is
assessed or how the short term versus the long term costs and
benefits of the different policies are calculated. But these are
differences for which one can offer justifications and about
which one can reason.

Another example of an explicit discussion of weighing can be seen in a groundbreaking paper by Cornfield (1959) in the context of the early debate about whether smoking caused lung cancer. Cornfield argued that despite the fact that researchers could not provide a good biological model (i.e., animal experiments) to demonstrate the link between smoking and lung cancer, in this case that criterion should not be given the weight it usually receives in epidemiological reasoning. His argument was that, since smoking exhibited very strong correlations and a strong "dose relationship" with lung cancer, these facts and the fact of the lack of credible alternative explanations for the data should be taken as adequate to establish a causal link between smoking and lung cancer. This was one of the first successful arguments in epidemiology since the late 19th century to subordinate the biological account to the results of large-scale statistical results.

We take these examples to show that there is a role for a rational examination of weightings and the considerations that lie behind them. In this regard, the two opinions cited in the rape shield case (or the argument by Cornfield) can be seen as models for the role of the justification of weightings. Such an explicit justification of weightings puts them forward for scrutiny in the arena of public reason where they can be the basis for deliberation by others and for ongoing inquiry. Since weighing is a dynamic process, there is always the possibility that arguments and even issues may be reframed, resulting in the dissolution of a disagreement over how values or considerations have been weighed. An example would be a public policy debate, initially framed in terms of the competing rights of various parties being reframed in terms of the welfare of the community. Such a process will not necessarily lead to agreement among the interlocutors, however. But unless and until the issue is considered settled, any evaluation made can be seen as a moment in and contribution to on ongoing public

process of reasoning about the issue by others as well as ourselves.

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CHAPTER 7

CONDUCTIVE ARGUMENTATION, DEGREES OF CONFIDENCE, AND THE COMMUNICATION OF UNCERTAINTY

Sharon Bailin and Mark Battersby

1. PROLOGUE

On April 6, 2009, a magnitude 6.3 earthquake struck L'Aquila, Abruzzo, resulting in considerable devastation and the death of 300 people. Seven Italian officials and scientists were subsequently put on trial for manslaughter. The accusation was that scientists presented incomplete, inconsistent information which falsely assured the public and caused the deaths of 30 residents. The usual practice when an earthquake was likely was for residents to sleep outside, but it was alleged that because of the assurance, these individuals remained in their houses and were killed in the quake (Ashcroft 2012). The prosecution argued that the assessment of risk communicated to the public was unjustifiably optimistic and that lives could have been saved had people not been persuaded by the assurances to remain in their houses (Hooper 2012). In 2012, the scientists were found guilty of manslaughter and sentenced to six years in prison. (Six of the convictions were overturned on appeal in 2014).

We will return to this case later. We have no intention to try to evaluate its merits, but we shall examine the issues it

raises regarding the obligation to communicate an appropriate degree of certainty or uncertainty in one's judgments.

2. INTRODUCTION

This paper begins by making the argument that a degree of uncertainty is an unavoidable aspect of conductive argumentation. The arguments which comprise instances of conductive argumentation vary in terms of the degree of support that they provide for their conclusions; for this reason, the strength of the judgments warranted by particular instances of conductive argumentation will vary as well. We argue, further, that this variability imposes an epistemic requirement on arguers to apportion the confidence of their judgment to the strength of the reasons. Moreover, because of the dialectical nature of argumentation, there is the additional requirement for arguers to communicate the appropriate degree of certainty or uncertainty when making judgments in the context of an argumentative exchange.

3. ARGUMENTATION AND UNCERTAINTY

The traditional focus for the philosophical study of argumentation has been individual arguments, in terms of both their structure and their evaluation. The model of argument which has been dominant has been deductive argument, i.e., an argument whose premises entail the conclusion. Provided that the premises are true, the conclusion follows with certainty. Uncertainty may, of course, still arise with respect to the truth of the premises.

This requirement of inference certainty does not, however, fit a great deal of actual argumentation, as has been pointed out by theorists since the inception of the Informal Logic movement. In probable reasoning, for example, the conclusion does not follow necessarily but only with some degree of probability (Blair and Johnson 1987, p.42). The situation is similar for inductive reasoning: "Inductive inferences vary from weak

to strong; there is no all-or-nothing critique such as 'valid-or invalid' available" (Blair and Johnson 1987, p.42).

Theorists have, however, been increasingly broadening their focus from exclusively individual arguments to the entire enterprise of argumentation. Argumentation can be conceptualized as a socio-cultural activity (Hitchcock 2002, p.291) which is dialectical in the sense that it involves an interaction between the arguers and between the arguments (Blair and Johnson 1987). This focus is much broader than the making of individual arguments. Rather, arguments are put forward, criticisms and objections offered, responses proposed, and, frequently, revisions made to initial positions (Bailin and Battersby 2009). It is this practice of argumentation that is our focus here, and in particular the practice of conductive argumentation (or conductive reasoning). By conductive reasoning we are referring to the process of comparative evaluation of a variety of contending positions and arguments with the goal of reaching a reasoned judgment on an issue (Battersby and Bailin 2011). Such judgments are generally based on the weighing of both pro and con considerations.

The focus of many theorists working in the area is, however, on individual conductive arguments rather than on conductive reasoning. Conductive arguments are, as Govier puts it, "arguments in which premises are put forward as separately and non-conclusively relevant to support a conclusion, against which negatively relevant considerations may also be acknowledged" (Govier 2011, p.262). In our view, however, viewing conductive reasoning in terms of individual arguments fails to do justice to the dialectical nature of argumentation (Battersby and Bailin 2011). In addition, attempting to make conductive reasoning fit into the traditional model of argument structure has resulted in unnecessary conundrums, for example how to analyze counter-considerations (are they premises? counter-premises?) or how to diagram these anomalous types of arguments. Our focus, in contrast, is on conduc-

tive reasoning more broadly. According to this perspective, the structure of conductive argumentation is viewed in terms of a balancing of competing arguments and claims rather than as a single argument.

4. UNCERTAINTY IN CONDUCTIVE ARGUMENTATION

There are a number of reasons why conductive argumentation does not lead to conclusions which can be asserted with epistemic certainty. These include inferential uncertainty, the inherent uncertainty of particular claims and judgments, the open-endedness of the reason-giving process, and variability in the weighing of pro and con considerations. Because of these factors, the degree of certainty with which conclusions of conductive argumentation can justifiably be held will vary.

Inferential uncertainty is a feature of conductive reasoning just as it is with inductive reasoning. Given that particular claims are true, there is still the question of how much support they give to the conclusion.

The uncertainty has also to do with the inherent uncertainty of particular claims and judgments which go into the reasoning process. The likelihood of factual claims is an important factor in evaluating their weight as the greater the likelihood of the claim, the more weight it can add to the conclusion. Likelihood is, however, often difficult to determine. To compound the difficulty, any argument leading to a judgment about what to do must also take into account future states of affairs which are usually even less certain than judgments about current states of affairs. What one can do in both these cases is to use the available information, history, contextual factors, and statistical tools to make reasoned judgments. And in the area of moral issues, while there are some widely accepted general moral principles, their application in particular cases inevitably creates some degree of uncertainty, the degree depending on the strength of the supporting arguments (Battersby and Bailin 2011).

The uncertainty arises also from the nature of conductive reasoning itself. One important factor is the open-endedness of the reason-giving process. Competent conductive reasoning requires laying out the dialectic – the arguments on various sides of the debate, as well as objections to the arguments and responses to the objections. No survey of arguments will be exhaustive, however. The possibility always exists that additional reasons and arguments will be put forward which might affect the outcome of the reasoning (Battersby and Bailin 2011). This being said, the more extensive the review of the available evidence and argumentation, the stronger the support for the resultant judgment.

Uncertainty also comes in due to the process of weighing the various reasons pro and con. There is sometimes variability amongst arguers in the evaluation of the comparative strength of evidence and arguments on different sides of an issue and disagreement about the appropriate weight to be apportioned to various considerations. This is not to say that weightings are (primarily) subjective. Weightings can be justified (or criticized) by appeal to objective factors and considerations (e.g., the likelihood of claims, appeal to widely shared values and principles). Nonetheless, there may not be consensus on how some considerations should be weighted and there may be more than one judgment which is defensible given the context (Battersby and Bailin 2011).

Because of the uncertainty of particular claims, the variability in the evaluation of the comparative strength of evidence and arguments, the different weightings given to various considerations, and the open-endedness of the reason-giving process, an instance of conductive reasoning can, at best, offer good reasons and strong support for a conclusion but not certainty.

This does not mean, however, that it is not possible to make warranted judgments in instances of conductive reasoning. Guidelines exist for making reasoned judgments and criteria

exist for their evaluation (Battersby and Bailin 2011). What it does mean is that there will always be some uncertainty with respect to the judgments emerging from the process of conductive argumentation and that the strength of the judgments warranted by particular instances of conductive argumentation will vary.

5. CONFIDENCE IN JUDGMENT

The strength of the evidence and argumentation in support of conclusions in conductive argumentation will vary from case to case (Battersby and Bailin 2011). In some cases, the evidence for a particular judgment may be overwhelming. There are, for example, very strong reasons to believe that smoking causes cancer or that the enslavement of human beings is morally unjustifiable. In other cases, the weight of reasons may favour a particular judgment but not without significant opposing reasons or counter considerations. Claims about the causes of the increasing incidence of obesity might fall into this category. In still other cases, the reasons may be insufficient for reaching a judgment, for example in debates about life on other planets. Thus, in robust argumentation, warrant is usually a matter of degree.

Engaging in the process of argumentation imposes certain epistemic requirements on arguers: that they present arguments justified by the available evidence, address appropriate objections and provide reasonable responses, and revise their initial position when warranted. But the variability in the degree of support for different judgments also imposes an additional requirement on arguers: that they apportion the confidence of their judgment to the strength of the reasons. Not all judgments warrant an equal level of confidence. It is important to be clear that we are not referring to subjective confidence – how confident an individual may happen to feel about a judgment, but rather rational or warranted confidence

– the level of confidence that is justified by the reasons and evidence.

The following is a schema which we have developed to represent the level of confidence warranted by different weights of reasons:

- A *very confident judgment* is warranted when the weight of reasons clearly supports the judgment.

- A *reasonably confident judgment* is warranted when the weight of reasons strongly supports the judgment but there are still strong countervailing considerations.

- A *tentative judgment* is warranted when the weight of reasons is not overwhelming but is supportive of one position, and we can make a judgment *on balance.*

- A *suspended judgment* is warranted when the reasons for different positions are closely balanced or when there is insufficient evidence to make a judgment (Bailin and Battersby 2016, p.243).

This schema has similarities to the categorization used for classifying the strength of causal inferences in science (US Department of Health, 2006).

These four levels of judgment confidence are not discrete but can be seen as marking positions along a continuum. The categorization allows for a range of possibilities in between.

Apportioning one's confidence in a judgment to the strength of the reasons is always epistemologically significant. It is when there is a need to act on the basis of our judgments, however, that the issue of how justified our confidence is in our judgments becomes crucial. The greater the consequences of action (or inaction), the greater the need for a level of argumentative support that warrants a confident judgment. A useful comparison can be made to legal judgments. In criminal cases, where there is a great deal at stake (freedom versus imprisonment, or even life versus death), the standard of proof

is beyond a reasonable doubt, which requires a level of evidence sufficient to warrant a very confident judgment. In civil matters, where there is usually less at stake, the standard of proof is usually balance of probabilities, which clearly requires only an on balance judgment.

6. DEGREES OF CERTAINTY OR UNCERTAINTY

The fact that argumentation is dialectical imposes yet a further requirement on arguers. It is not just a matter of apportioning one's confidence in a judgment to the strength of the reasons. There is also a requirement to communicate the appropriate degree of certainty or uncertainty when making judgments in the context of an argumentative exchange.

There are many ways in which one's confidence in a judgment and hence the degree of certainty or uncertainty may be expressed:

- A very confident judgment implies a high level of certainty and would be marked linguistically by such phrases as "I am very confident that," "it is clear that," "there's little doubt that," "the evidence strongly indicates that."

- A reasonably confident judgment implies a moderately high level of certainty and might be indicated by such phrases as "I am reasonably sure that," "it seems very likely that," "the evidence by and large indicates that."

- A tentative judgment implies some degree of uncertainty, although not enough to preclude making a judgment. A tentative judgment may be indicated by such phrases as "it appears on balance that," "the weight of evidence tips somewhat in favour of," "my tentative conclusion is that."

- A suspended judgment implies a high level of uncertainty and would be indicated by such phrases as "there is not enough evidence to make a judgment," "the reasons on both sides seem

equally balanced," "the judgment will have to be deferred until more evidence is available," "the jury's still out on this."

7. AN OBJECTION

Before going on to defend our claim regarding the requirement to communicate an appropriate degree of certainty, we need, first, to deal with an objection to the underlying claim, that conductive arguments can have a conclusion that expresses uncertainty. In a recent posthumous publication, Adler argues against the claim that countervailing considerations detract from the support for the conclusion in a conductive argument:

> The claim that I dispute is that once the conclusion is drawn, the counter- considerations continue to diminish its support (Adler 2013, p.4).

As a consequence:

> … the conclusion of a Conductive Argument is characteristically detached and accepted without (epistemic) qualification (Adler 2013, p.6).

And further:

> Let me summarize my reasons for taking Conductive Argument to characteristically lead to unqualified conclusions that are accepted and asserted (Adler 2013, p.6).

If we understand him correctly, he is arguing that if we are asking an interlocutor to accept our conclusion, then we are always asking him to accept the conclusion without the modifiers of "all things considered," "on balance," "it is very likely that" etc.

It is significant that Adler's objection is framed in terms of conductive arguments while we frame the issue in terms of conductive argumentation. The difference in framing is

important in terms of the consideration of his objection, a point to which we shall return.

We would maintain that qualified conclusions are common in conductive argumentation. In arguments for factual claims, expressing uncertainty is not unusual, e.g., "The forecast notwithstanding, it looks like it might rain." "Even though he doesn't like parties, Tom is a good friend so he'll likely come to my birthday party." "There are many fine contemporary authors, but she is probably the best of her generation." The communication of the degree of certainty of findings is also a common practice in the kind of argument to the best explanation exhibited in scientific reasoning and scientific reports. The following excerpt from an IPCC assessment report on climate change explains the confidence levels used in the report:

> The degree of certainty in key findings in this assessment is based on the author teams' evaluations of underlying scientific understanding and is expressed as a qualitative level of confidence (from *very low* to *very high*) and, when possible, probabilistically with a quantified likelihood (from *exceptionally unlikely* to *virtually certain*). Confidence in the validity of a finding is based on the type, amount, quality, and consistency of evidence (e.g., data, mechanistic understanding, theory, models, expert judgment) and the degree of agreement. SPM-2

The following examples from the report illustrate the use of these confidence levels:

1. It is *virtually certain* that globally the troposphere has warmed since the mid-20th century. More complete observations allow greater confidence in estimates of tropospheric temperature changes in the extratropical Northern Hemisphere than elsewhere. There is *medium confidence* in the rate of warming and its vertical structure in the Northern Hemisphere extra-tropical troposphere and *low confidence* elsewhere. {2.4} PSM-4

2. It is *likely* that anthropogenic influences have affected the

global water cycle since 1960. Anthropogenic influences have contributed to observed increases in atmospheric moisture content in the atmosphere (*medium confidence*), to global-scale changes in precipitation patterns over land (*medium confidence)*, to intensification of heavy precipitation over land regions where data are sufficient (*medium confidence*), and to changes in surface and sub- surface ocean salinity (*very likely*). {2.5, 2.6, 3.3, 7.6, 10.3, 10.4} SPM-13

Although Adler's argument seems to be directed toward conductive arguments in general ("the conclusion of a Conductive Argument is *characteristically* detached…"), many of his examples involve practical reasoning, where the conclusion is a decision or recommendation about whether to act. Apparently, he would reject a conclusion that "we should probably do X." Yet, in practice, we do often qualify a recommendation by "we should probably," "on balance the best thing to do seems to be," "there are good reasons to" etc.

Given the frequency of qualified conclusions in conductive argumentation, one might wonder what Adler's reasons are for denying their possibility. The basis of his argument is a logical one – that in order for a conductive argument to be cogent, i.e., in order for its conclusion to be correctly accepted as true, the conclusion must stand on its own.[1] His focus is on cogent arguments, that is, arguments that end inquiry. The alternative for Adler is not qualified conclusions but rather suspended judgment.

It is here that the problem of viewing conductive argumentation in terms of individual arguments becomes manifest. Adler's analysis has some plausibility when applied to examples such as the classic argument offered by Wellman:

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1. Surprisingly given his thesis, Adler does acknowledge that "there are loads of arguments that end with qualified conclusions, including, 'plausible' or, more equivocally, 'the best explanation is'" (p. 7). But the rest of his argumentation leads us to believe that he would reconcile this apparent contradiction by asserting that such arguments are not cogent, i.e., they are not arguments which can be put forward for acceptance.

Although your lawn needs cutting, you ought to take your son to the movies because the picture is ideal for children and will be gone by tomorrow (Wellman 1971, p.67). Most of the examples offered by Adler, however, (e.g., mandated health care insurance, stricter rules to restrict immigration, building nuclear power plants) are instances of complex, dialectical argumentation. (Indeed, the distinction between conductive arguments and conductive argumentation is one that Adler himself appears, in places, to acknowledge: Adler, p.2, footnote 1). In such cases, it is inappropriate to expect certainty (for all the reasons outlined above). It is inappropriate to expect conclusions that are "true". What we can expect, instead, are judgments that have varying degrees of support.

Adler's argument does have some prima facie plausibility in that for practical arguments, either we should act, we should not act, or we simply do not know what to do. Indeed, it does seem that when we decide to do something, we have "detached" the decision from the reasoning through our commitment to action. But the detachment is in effect a pragmatic detachment which does not necessarily indicate unqualified confidence, nor will it necessarily end inquiry. On fairly straightforward practical issues, for example which camera to buy, making a decision will likely mark the end of the inquiry. But this may simply be because the action is a *fait accompli* and does not necessarily indicate a high level of confidence that we have made the right choice. With more complex issues, however, even once an action has been taken, inquiry does not necessarily end, e.g., the U.S. government has made a decision with respect to mandated health care insurance, but the debate has certainly not ended.

It seems to be Adler's view that it is only detached, unqualified conclusions that "discern or advance and settle new or interesting or important truths, that are worth believing for ourselves or for our audience. They increase our information and expand our corpus of beliefs" (Adler 2013, p.6). We would

argue, on the contrary, that it is appropriately qualified conclusions that really add to our justified beliefs. We are justified in holding our beliefs on such issues with varying degree of confidence commensurate with the strength of the support. Jane's belief that there should be government mandated health care insurance is one she may hold with considerable confidence given the strength of the reasons in favor and the weakness of the reasons against. She may hold the belief that we should not build nuclear power plants with considerably less confidence given the force of the reasons for as well as against. Adler seems to hold that only unqualified conclusions put "arguers and inquirers in a position that is appropriate to guide further judgments and action" (Adler 2013, p.6). We would argue, on the contrary, that appropriately qualified conclusions are, in fact, more reasonable guides to action. The conclusions of conductive argumentation are judgments and it is a requirement of reasonableness that such judgments should reflect the degree of support provided by our reasons.

8. COMMUNICATING CONFIDENCE AND CERTAINTY

We have been arguing, then, that there is a requirement to apportion one's confidence in a judgment to the strength of the reasons in support of the judgment. We would argue, further, there is also an epistemic and moral responsibility to communicate the appropriate degree of certainty or uncertainty when making judgments in the context of an argumentative exchange. This responsibility arises from the dialectical and interactive nature of conductive argumentation. According to Johnson, that an exchange is dialectical means that "as a result of the intervention of the Other, one's own logos (discourse, reasoning, or thinking) has the potential of being affected in some way" (Johnson 2000, p.161). In other words, the reasoning and judgments made by others can and often should affect my reasoning and judgments and form part of the basis for my actions. Just as offering well justified judg-

ments in the context of an argumentative exchange can contribute to others holding better justified beliefs and undertaking better justified actions, so also can communicating one's judgments at the appropriate level of confidence. Acknowledging uncertainty or confidence as part of one's judgment or decision to act can inform others of how much confidence you or they should have in the judgment. Communicating a judgment at an inappropriate level of confidence, for example with more confidence than is warranted by the evidence, may contribute to other interlocutors holding beliefs or acting in ways that are poorly grounded.

This responsibility is especially significant when one is in a position of epistemic authority. Experts have an obligation to provide reasons for their judgments, however in contexts requiring expertise, recipients of the judgment are often not in a position to assess the reasoning in any detail. These judgments are generally accepted largely on the basis of trust in the expertise and reliability of the authority. Thus the level of confidence that is expressed in the judgment is an important aspect of the information communicated in the judgment. Returning to the IPCC report, it would have been misleading if the report had omitted the confidence levels in their various finding. This is especially important as such judgments often form the basis for decisions regarding action, or may themselves be recommendations for action. Compare the following judgments by a physician: (1.) "I have carefully evaluated all the evidence and would not recommend surgery. It is my judgment that it would not help." (2.) "I have carefully evaluated all the evidence and would not recommend surgery. It is my judgment that surgery is very unlikely to help and the surgical procedure is very risky. But I cannot be 100% confident because there have been a few similar cases where it appears that a surgical invention may have helped to prolong life." To offer the same conclusion without an indication of the confidence level would be a misleading way of putting forth one's conclusion.

In cases where the argument leads to a somewhat uncertain conclusion based on a balancing of conflicting considerations, failure to indicate the presence of these considerations is an epistemic failure. Given that the purpose of conductive argumentation is to consider countervailing considerations and yet come to a reasonable conclusion, failure to communicate the degree of justification or certainty that the arguments provide also violates basic norms of communication.

9. THE L'AQUILA CASE

The trial of the Italian scientists and officials in the L'Aquila earthquake case is a pertinent one to examine with respect to the issue of the communication of certainty or uncertainty. The earthquake had been preceded by a swarm of small quakes, and the charge against the defendants was that they did not do their duty in communicating the likelihood of a major earthquake to the citizens of L'Aquila.

One of the scientists tried, Enzo Boschi, the then-president of Italy's National Institute of Geophysics and Volcanology, is said to have compared the situation to a large quake that struck L'Aquila in 1703. Boschi is alleged to have said at a meeting in L'Aquila on March 31, 2009, "It is unlikely that an earthquake like the one in 1703 could occur in the short term, but the possibility cannot be totally excluded." In a press conference after the meeting, Department of Civil Protection official Bernardo De Bernardinis, also a defendant, is quoted (and on video record) as saying that the situation was normal given the context, posing "no danger," and urging residents to relax (Pappas 2012).

The details of the case are complex and include allegations of political pressure, and of misrepresentation of material. We have no intention to try to evaluate the merits of the case, nor are we in a position to do so. Nonetheless some of the issues raised are pertinent to our discussion. The statements of both Boschi and De Bernardinis would have been grounded in the

knowledge that earthquake swarms are very common in seismically active regions such as Abruzzo but only a very small percentage are precursors to major quakes. In fact, seismologists claim that it is virtually impossible to predict major earthquakes. Yet we can note a difference in the level of certainty communicated in the two judgments. Boschi's judgment that a major earthquake was unlikely could be characterized as a reasonably confident judgment, but in alluding to the possibility of such a quake, it communicated a degree of uncertainty in the judgment. De Bernardinis, in contrast, seemed to be making a very confident judgment that there was no danger of a major quake. His judgment made no reference to the possibility, slight though it may have been. The risk was indeed very low, but not non-existent. Thus his pronouncement, communicated to the public, that there was "no danger" was epistemically overly confident, expressing an unreasonable degree of certainty.

The scientists and officials in question were considered epistemic authorities and the level of certainty communicated by them to members of the public appears to have affected the public's actions. A local investigator, Inspector Lorenzo Cavallo, is quoted as saying: "The Commission calmed the local population down following a number of earth tremors. After the quake, we heard people's accounts and they told us they changed their behaviour following the advice of the commission" (Watt, S. 2011). This account is corroborated repeatedly by witnesses testifying at the trial (Billi 2013).

The specifics of this particular case are complex and contested, and it would be inappropriate and imprudent to attempt to pass any judgments. One thing that we do think that the case demonstrates, however, is a strong recognition of the responsibility to communicate the epistemically appropriate degree of certainty or uncertainty in our judgments. It is unreasonable, (epistemically inappropriate) to make or hold a judgment without the appropriate degree of uncertainty given

the evidence. It is, in addition, a communicative and perhaps a moral failure to communicate a judgment without the appropriate expression of epistemic uncertainty.

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IV. ASPECTS OF THE APPROACH

CHAPTER 8

ASSESSING EXPERT CLAIMS: CRITICAL THINKING AND THE APPEAL TO AUTHORITY

Mark Battersby

1. INTRODUCTION

Much of our understanding and knowledge of the world is based on the authoritative pronouncements of experts. Both our scientific and historical understandings are grounded in this way. Think of the germ theory, astronomy, plate tectonics, ancient history, dinosaurs, the origin of humans; it does not take much reflection to see that most of our understanding of the world is, in fact, grounded on information supplied and warranted by experts. Given how much of our knowledge has this basis, one would think that epistemologists would have given detailed consideration to the issue of appeal to scientific and other intellectual authority. But appeals to authority and the role that authority plays in knowledge have received little attention in modern philosophy. Indeed, philosophers generally have been opposed to such appeals since the very birth of Western philosophy.

Greek philosophy distinguished itself from Greek theology by rejecting appeals to authority (the wisdom of the ancients or the oracle's supply of the word of god) as the primary basis of knowledge and replacing these appeals with appeals to observation and reason as the basis of knowledge. Philosophy in

many ways began with rejection of authoritative pronouncements, and when philosophy revived in the 17th century, the aversion to authority reappeared. By rejecting the authority of both the church and Aristotle, Descartes, Bacon, and Locke helped pave the way for modern science. These authors all rejected the appeal to any authority and, in doing so, marked the beginning of modern philosophy with its emphasis on individual confirmation of claims.

As a result of this history, most contemporary introductions to epistemology do not even mention the issue of appeals to experts and authority, and there is little in contemporary epistemological literature that concerns itself with this topic.[1] But one might expect that critical thinking, with its concern with the practical needs of knowledge assessment, would devote considerably more attention to appeals to authority. In fact, most critical thinking texts do not even refer to appeals to authority and only a few texts give the subject significant treatment. Of those that do treat such appeals, many give appeals a definite secondary and necessary evil status. For example, Walton states:

> generally speaking we only appeal to experts, if in fact, it may be too expensive or otherwise difficult for us to have direct evidence. That is why we may legitimately appeal to experts as a secondary source of subjective knowledge when we have to make a decision (Walton 1987, p.187).[2]

There are at least two reasons for such neglect. One is the philosophical tradition mentioned above, but perhaps the most important reason is that appeals to authority seem to violate the spirit of critical thinking. After all, was not critical

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1. The articles by Walsh (1971), Stitch and Nisbett (1980), Hardwig (1985), and Lehrer (1977), and to some extent the book by Welbourne (1986) are the only ones that I have been able to find. Some of the work in philosophy of science outlining the social nature of justification is related. Unfortunately, most of this literature is relativistic and contrary to the thrust of this paper.

2. I do not know what Walton means by "subjective knowledge"-- although it sounds pejorative.

thinking meant as an antidote to students' all-too-willing acceptance of the authoritative pronouncements of teachers and textbooks? Are we not supposed to be teaching students to question, not just accept authority? Indeed, the very Latin name for the traditional fallacy of appealing to authority, *ad vercundiam*, means literally the appeal to modesty or shyness. It is not implausible to interpret this as inappropriate deference.[3] And surely it is just such deference that we as teachers of critical thinking wish to eliminate. As Locke stated in *An Essay Concerning Human Understanding*:

> For I think, we may as rationally hope to see with other Men's Eyes, as to know by other Men's Understandings. So much as we ourselves consider and comprehend of Truth and Reason, so much we possess of real and true Knowledge. The floating of other Men's Opinions in our brains makes us not one jot the more knowing, though they happen to be true. What in them was Science, in us but Opiniatrety, whilest we give up our Assent only to reverend Names, and do not as they did, employ our own Reason to understand those Truths, which gave them reputation …. In the Sciences, everyone has so much, as he really knows and comprehends: What he believes only, and takes upon trust, are but shreds: which however well in the whole piece, makes no considerable addition to his stock, who gathers them. Such borrowed Wealth, like Fairy-money, though it were Gold in the hand from which he received it, will be but Leaves and Dust when it comes to use.[4]

Plausible as this objection is, it obviously cannot be allowed to stand. Too much of our very real knowledge is based on just such condemned sources. While only a few contemporary philosophers have noted this and attempted to outline the significance that authoritative appeals have for epistemology, Hardwig has shown that even physicists are heavily dependent on the expertise of their fellow physicists in order to develop and understand their own experiments. Hardwig points out

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3. Hamblin, p.43

4. John Locke, An Essay concerning Human Understanding, pp.I, iv, 23, quoted in Welbourne, p.49.

that it is not untypical for thirty to fifty physicists to be involved in a major experiment because only with that range of expertise can the data be assembled and understood. And the final result relies for its credibility on the trust and respect that the participating physicists have for each other, since no single individual is competent to carry out more than a few of the operations involved.

Given the import of appeals to authority, it seems obvious that we should have a proper theory of such appeals. This theory should have implications for epistemology generally, and for critical thinking in particular since much of what a critical thinker must do involves assessing the claims of genuine and would-be experts. A critical but appropriate approach to authoritative appeals must replace not only deference but also the narrow model used in contemporary critical thinking texts.

To develop an analysis of appeal to authority that could be used by the teacher of critical thinking, I will first critique the typical model of proper appeal to authority used in critical thinking texts, contrast this model with the model suggested by court proceedings involving experts, sketch an alternative conception of knowledge which places appeals to authority in the appropriate central role, and, finally, show how all this can be used to illuminate and improve the teaching of critical thinking. A task of such magnitude is, of course, impossible in this limited space and as a result, many important issues will receive short shrift. My hope is at least to sketch the outline of a new approach to authoritative appeals and its implications for critical thinking.

2. CRITIQUE OF THE TRADITIONAL APPROACH

The typical analysis of arguments involving appeals to authority is as follows:

A has asserted P.

P falls within area of knowledge K.

A is a recognized expert regarding K.

Therefore, P is acceptable (Govier 1988, p.83).

Some authors, including Govier, and Blair and Johnson, also point out that additional considerations surrounding such an appeal include:

The expert must not be in a position of bias.

The experts on K agree about P.

The more eminent the expert, the stronger the appeal.

3. DIFFICULTIES WITH THIS APPROACH

Before exploring the difficulties with this approach, I must make a rough and, I hope, uncontroversial distinction between particular and general judgments. By this distinction I have in mind the difference exemplified by an engineer, on one hand, giving her view as to why a bridge collapsed (a particular judgment), and, on the other, offering the physical and engineering theory of stress (general judgment). The reason for this distinction is that an expert's expertise is utilized in different ways in the two kinds of judgments.

In the typical complex particular judgment, the expert is called upon to use her explicit and implicit understanding of the issue. In a particular judgment, there is more reliance on the expert's individual expertise, experience, and even eminence in her field. In contrast, in the general judgment we are relying on the expert's knowledge of views held in her field; her responsibility in enunciating this knowledge is to convey the wisdom of the discipline, not her personal views. In the case of a general judgment, the expert is primarily a vehicle for transmitting the views developed and confirmed in her discipline. Significantly, this is characteristic of the situation we find ourselves in as teachers: we essentially convey knowledge of our discipline.

If, indeed, the expert functions differently in the two kinds of judgments, then any adequate model of appeal to authority

must recognize this distinction. But no model I have found does so. Those models which emphasize the eminence of the authority as part of the criteria of assessment seem to be based on the particular judgment model. Those that only mention the importance of consensus of the expert's discipline seem concerned only with the general claim.

In critical thinking, we are mainly concerned with the expert as a source of general claims – regarding, for example, the nature of the solar system, the causes of cancer. For this reason we are predominantly concerned with the expert as representative of her discipline rather than as someone using her expertise to make a particular judgment. In this paper, I will only discuss appeals to authority in relation to general claims. There remains much to be said about particular claims, especially in value-oriented disciplines and everyday decisions.

What then are the implications of observing that the expert is primarily a vehicle for transmitting knowledge of her discipline rather than an individual source of knowledge? First, we must abandon the model of the expert as someone who can give us knowledge simply by telling us her view. We listen to experts because they are representatives of a body of knowledge. That is why there should not be expert disagreement in the fields to which we are appealing: we are not really interested in the expert's personal opinion, but rather that of her discipline. If there is no consensus in the discipline, then the discipline has, in a sense, nothing (univocally) to say. Only by viewing the expert as a discipline spokesperson can we understand the requirements of appeals to authority, deal with Locke's objection, and even make sense of our role as teachers of critical thinking.

4. EXPERT DISAGREEMENT

One thing should alert us to the weakness of the traditional analysis. In this approach, disagreement among experts ren-

ders appeals to authority fallacious. But many of the interesting cases with which one has to deal will involve conflict among experts. What about conflicting opinions from doctors, disagreement among experts about the proper treatment of AIDS, or the causes of cancer? The courts must deal with expert conflict as a matter of course. Are all such conflicts to be deemed sufficient ground for dismissing the expert opinions presented? This seems much too drastic to be sensible.[5]

5. LEGAL APPROACHES TO THE USE OF EXPERTS[6]

Rather than dismiss competing expert claims, the courts insist that the expert not just deliver her opinion but also explaining her reasoning. Given the model I am criticizing, this requirement would seem surprising. Should one not just accept the claim if the expert has the relevant credentials? But the courts are faced with conflicts among experts and feel too accountable to simply bow to the authority of the expert.

Locke's objection would be taken quite seriously by the courts. They cannot be utilizing mere "opiniatrety" because they are responsible for legal decisions. The courts' compromise is to take expert opinion, but require that the expert explain herself so that the court can both judge (where there is conflict, or just doubt) and understand.

Because courts have to deal with conflicting testimony, they have to make a judgment on the merits of the expert's argument. They assess the clarity, methods, apparent bias, and plausibility of competing experts' explanations in order to decide how to weigh the opinions. Experts in the courtroom are an exception to the general rule that the courts engage in

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5. There has been an effort to deal with expert conflict by Walton (1987) based on the work on plausible reasoning of Rescher. This approach is fairly technical and has not seen implementation in any textbooks. But it, also, is based on the notion of total evidence, although it uses a method for choosing the maximum consistent subset of information. Necessarily this just eliminates one expert's opinion when there is genuine contradiction.

6. I owe most of my understanding of the court's use of scientific information to Imwinkelried (1987).

reasoning and the witnesses are merely to report what they saw, heard, etc. But because the experts' opinions are based on reasoning from the facts and not merely on asserting them, the courts reserve the right to examine this reasoning. In so doing, they are not restricted to considering only character questions when evaluating testimony and argument but rather use all evidence to determine the weight to be given to the experts' claims. It seems to me that this approach is exactly the right strategy for any rational person to take.[7]

The procedures of the court should show us that the sharp distinction made between testimony and argument is untenable. We need the expert's credibility before we will believe her arguments, but her credibility is not the sole basis of our appraisal. Argument assessment is to some extent discipline-specific and, for this reason, we need the assurance of the expert that this line of reasoning and these types of inferences, are respected within her field. We need her reassurance that she is not ignoring counter-evidence or contrary opinions within her field. We also must, of course, comprehend and be persuaded by the evidence and explanations. But even allowing our understanding to be moved by the expert's account is itself an act of trust in her authority.

The crucial point for critical thinking is that *appeals to authority must involve justification and explanation.* What the Lockean model (and the contemporary one given above) ignores is the expert's obligation to supply justification for her position. The model cannot tolerate disagreement among experts because it provides virtually no method of adjudication. This point is the most crucial objection and, indeed, is

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7. John Hardwig suggests that the layperson, when confronted with expert disagreement, will have to base her decision primarily on ad hominem kinds of considerations because of her inability to assess justifications. There is no question that the assessment of the expert herself (but also the credibility of the discipline - ad disciplinium?) is something a layperson should do. Like a judge, the layperson is also wise to attempt to assess the conflicting justifications using whatever evidence she can gather. This is simply an application of the principle of total evidence.

the basis of Locke's criticism: the model seems to require just too much mindless trust in the experts. By not requiring that the expert provide any argument, explanation or justification for her assertion, the model leaves the believer in a hopeless state of acute epistemic dependence.[8] It probably also leaves the layperson who accepts the claim with no real understanding of the claim she now believes.

6. APPEAL TO AUTHORITY AND EDUCATION

To the extent that education consists simply in telling without justification and explanation, it, too, leaves the student in a state of epistemic dependence (to say nothing of ignorance!). But without trust in authority, there would be no successful transmission of knowledge. For example, in part we believe in the biological theory of germs because it is explained to us in a manner that makes sense. But we also believe in it because it is supplied and backed by a well-established discipline. Surely we all now know that it is quite easy to come up with a plausible explanation for some phenomenon that just does not stand up to careful empirical or dialectical attention. The only way we know that the plausible explanations which are supplied to us by our teachers are, indeed, correct (not just plausible) is because of the credibility of the source.

Without the explanation we find ourselves in the position of saying, "I don't know, but they say . . . " When we fail to give any argument that supports the claim (for example, that it is based on these tests, or fits in that existing understanding), we are admitting that we do not really know the claim to be true, only that we have some authoritative reason to believe it. This admission is the weakest of all appeals to authority and should hardly be our paradigm.

Legitimating the demand for explanation and justification is, therefore, the key to the proper use of authority. It provides

8. I owe this phrase to John Hardwig.

for understanding and for the opportunity for the layperson to adjudicate between competing expert claims or claims in fields that are not characterized by consensus. This opens the door to utilizing (with appropriate skepticism) expertise in value-laden fields.

7. APPEAL TO AUTHORITY IN VALUE-LADEN FIELDS

Most authors exclude appeal to authority in value-laden disciplines. But what about great moralists, literary critics, aestheticians? Is there no place for appeal to authority in these cases? Perhaps the appeals are weaker, but are they fallacious? Are these all to be ignored? Lacking a theory to justify the rejection of such appeals to authority, it is hard to see what the basis is for rejection of appeals to authority in art criticism, philosophy, etc. There certainly is expertise among literary and art critics, architects, and town planners, though these fields are rife with appeals to value. Let me suggest briefly that any discipline *qua* discipline must have standards which are more or less consensually shared. Otherwise there would be no discipline, no way to justify awarding degrees, grades, and such. To the extent that there is some underlying consensus, a powerful case can be made for legitimate appeals to at least consensually held views. Again, this all requires much development.

8. EMINENCE

My last criticism of the standard model concerns the claim that the more eminent the expert, the more successful the appeal. In most general cases, someone with adequate and appropriate knowledge of a field — such as a local professor — is all we need. It is not her expertise that we need so much as her competence to transmit the knowledge of the discipline. In some cases, there may be problems in appealing to an eminent expert for she may be vulnerable to, or suspected of, bias because of her involvement with a leading or even a dissenting

theory. Since we usually need the expert to convey the knowledge of the discipline, eminence is not a necessary criterion.

The critique developed above is based on the view that a large part of knowledge is grounded not in observation or intuition, but in expert consensus. I wish to make few remarks in support of this position. Whatever may be its theoretical problems, it seems to me unquestionable that the layperson has justified belief in most theoretical propositions when she knows these beliefs to be supported by the relevant discipline and has some minimal grip on the justification that supports them. I will call the view that knowledge is grounded in expert consensus the "social theory of knowledge".

9. THE SOCIAL THEORY OF KNOWLEDGE

While various philosophers since Descartes have attempted to limit the skeptical effect of his approach, few have abandoned the essentially individualistic approach that led to the skeptical result. But when we start noticing which claims people typically say they "know," we can easily observe that these include theoretical, general claims of their scientific culture, not just claims about their own experience. For example, the view of the solar system as involving planets that revolve around the sun — indeed the picture of the solar system that appears in every popular text on the subject — is a view that most people would rightly claim to know to be true. We also know that the material world is made of atoms that combine together into molecules, that bacteria and viruses are the causes of diseases, that burning is a form of rapid oxidation, and the list goes on. Not everyone may claim to know these, but that is a testimony to their ignorance, not their insight into the true nature of knowledge. And how many of us know these facts in any great depth? In particular, how many of us could prove or even cite the observations that prove them? Are we rendered into a state of mere "opiniatrety" as a result?

I think the answer is clearly no. In fact, as Hardwig and oth-

ers (Walsh, Lehrer) have pointed out, science itself involves mutual dependence and trust among its members. Those who have shown that science is inadequately grounded in experimental evidence are correct, but this position does not have to lead to relativism. Rather, it underlines the crucial role that collective evaluation plays in the establishment of a scientific theory. And the success of this social process is what justifies the layperson's confidence in the results, and justifies appealing to expert pronouncements. There is much more to say here (see Stitch et al. 1980, Walsh 1971, Lehrer 1977), but I now wish to turn to the practical implications of my view.

10. TEACHING AND THE SOCIAL THEORY OF KNOWLEDGE

The primary job of a teacher is to transmit knowledge. The teacher is not in class to share her beliefs and opinions, though, of course, we all do. (And do so rightly, but that is not our main job). We are the representatives of our disciplines and in the classroom we pass on to our students what the discipline believes is both important and true. This is seen most easily, perhaps, in those disciplines where course content is clearly delineated, such as calculus and first year physics, but it is similar for English 100 or even critical thinking courses and since I am writing for critical thinking instructors and since critical thinking is my area of expertise, let me begin to illustrate my point by discussing the role of a critical thinking instructor.

It is one of the curious aspects of the discipline of critical thinking that the deeper epistemological worries of philosophers seldom surface in the texts or in class. Teaching introductory philosophy is always a case of teaching "on the one hand . . . but on the other hand . . ." In critical thinking classes, however, we unabashedly teach students *the* norms of reasoning. And we are, I would certainly argue, quite justified in doing so. Of course, we do not teach that our particular

analysis of a piece of text is a case of knowledge, but we do teach that the "following considerations should be taken into account when assessing a claim based on testimony." We do not teach these epistemological norms as mere beliefs; rather, we teach them as part of the "know how" of being a critical thinker. This does not, and should not, preclude giving the rationale for these rules, but these are rules which a student must know in order to be able to do analysis and arrive at reasonable beliefs about claims and arguments. We ask ourselves as critical thinking instructors, "What basic rules and skills does a student need to know in order to evaluate arguments?" Note that we ask what a student needs to "know" not "needs to believe?" Indeed, if we ask that question, it sounds like we are involved in manipulation. As teachers, we only have a right to transmit what we know. We can, of course, tell our students what we believe and why, but we do not teach, instruct, and test them about our "beliefs." And how do we distinguish the justifiably teachable and testable from our other beliefs? Is it not our perception of the consensus of our discipline that guides us? In teaching critical thinking, as in logic and mathematics, we are operating in an area of significant consensus within a discipline and are authorized, therefore, to teach "one-handed" philosophy; that is, to teach the accepted theories as knowledge. In those cases where our own beliefs differ from our perception of the consensus, we are obligated to alert our students and to make this recognition govern our procedures.

11. IMPLICATIONS FOR TEACHING CRITICAL THINKING

If scientific, historical, and perhaps, all theoretical knowledge is, indeed, grounded in collective decision procedures, especially those of academic peer review, what are the implications for teaching students of critical thinking about authority?

The assessment of authority must be given a more central place

in our textbooks. Equally important, it must not be understood (as it typically is) as simply an appeal to the claims of an individual with appropriate expertise, but rather as an appeal to the claims supported by the consensus of the discipline, for, in cases of general judgments, the expert is primarily a well-informed reporter.

We must recognize that most knowledge and information is going to be supplied to our students and ourselves by experts. As a result, the responsibility for the critical thinker becomes principally learning how to assess sources and expert claims. The student must be taught how to do this, and, indeed, we, as teachers of critical thinking, must think more about this ourselves. As Hardwig points out, when assessing experts we must frequently resort to a variety of *ad hominem* considerations. To the extent this is true, we should supply our students with the methods of appropriate *ad hominems* – for example, understanding the sociology of the disciplines, reading citation indexes, identifying creditable journals, and detecting when experts are going beyond "authorized" claims. We need to teach about the kind of blindness that is apt to infect experts, and about the fallibility and limitations of scientific claims. We must teach our students their legitimate right to question experts and how to assess their answers. It is easy enough to promote the slogan "Question authority!" but, if we do not also give students the norms to assess the answers and defend the questions, they will lack the rational confidence necessary for this questioning to be productive. We all know how to do some of this, but much more could be done in developing the rules of thumb that we could pass on to our students.

The role of consensus must be explained and emphasized. We should explain to our students why consensus or the lack of it is so relevant to assessing appeals to authority.

A new model of appeal to authority which emphasizes the importance of the expert providing explanation and justification must be taught. Below is a preliminary sketch of a new model of appeal to authority. Here I have focused on only one type of claim: an empirical/general claim. Similar models would be needed for all four possible types (including empirical/particular, value/general and value/particular).

A says P

P is in A's area of competence

Is P's claim particular or general?

If the claim is empirical/general, then we can ask whether the nature of A's discipline is fractured or homogeneous?

If it is homogeneous, then:

Is P a well-accepted claim in A's discipline?

If yes,

Why is P well accepted?

If explanation is plausible and intelligible, then P can be considered knowledge.

If no, why does A believe P?

Intrinsic plausibility of claim

The more implausible, the more evidence necessary.

Is the justification plausible?

Are the reasons for rejection of other positions plausible?

What are A's credentials relative to discipline?

What are A's likely biases?

Prestige of A

If discipline is fractured, then weigh crediting of P according to:

Nature of discipline

Intrinsic plausibility of claim

The more implausible, the more evidence necessary.

Plausibility of the explanation.

Reason for rejection other positions.

Clarity versus vagueness.

Reported depth of evidence.

Apparent objectivity of A.

Prestige of A.

Is the expert's claim being scrutinized by her peers?[9]

The model obviously needs refinement both because the situation is more complicated than the model suggests and because, to be useful, the model must actually be simpler in its outline. But let me offer a few remarks. Note that appeals to authority in disciplines that are fractured and/or without consensus are really quite different than appeals to views supported by discipline consensus. In the former, the layperson must base her judgment much more on her own assessment of the arguments than on the weight of the expert. And of course, in these areas, no one can claim knowledge, only justified belief. Disciplines themselves may be said to have degrees of credibility.[10]

12. THE IMPLICATION FOR TEACHING IN OTHER DISCIPLINES

We are far more frequently knowledge consumers than we are producers. Students taking introductory courses in a discipline are unlikely to ever be producers in this area. They should be taught not only the current understandings but also how to be competent consumers of the research in the area (for examples, reputable journals to read, methods of assessment, appropriate size of samples, time required for results to be evaluated and accepted) — basically a discipline-specific sociology of knowledge. This is desirable not because this is the "game you play in biology," but because this is the way biological theories and evidence are validated; this is the way knowledge is produced in this field.

I read with some interest that Mark Weinstein at the Montclair Institute for Critical Thinking appears to be trying to get

9. Another consideration that is sometimes mentioned in the traditional view, and fits nicely with my own theory, is the issue of publicity. It is reasonable to assume that authorities are much more careful in a situation of peer review because they can be taken to task for incorrectly representing the state of the knowledge and the discipline. Given that what we want is accurate reporting, the conditions of publicity are relevant to weighing the experts claim.

10. Walsh, for example, mentions philosophy's justified lack of credibility do to its fractious nature.

faculty to develop and articulate their discipline's authoritative structure under the rubric of epistemology of the disciplines. While I am not saying that epistemology is sociology (and I am not arguing that Weinstein is saying this either), I do want to say that the "authority" structure of a discipline is certainly relevant for assessing claims and for understanding which claims deserve rational belief. For the non-expert, such information maybe some of the most relevant information she can possess in assessing an expert's claims.

13. SUMMARY

The role of authority in supporting knowledge has been insufficiently articulated both in the discipline of epistemology and in the teaching of critical thinking. But because critical thinking instruction aims to give students guidance in the everyday assessment of claims, it is absolutely crucial that use of authorities and their evaluation be taught. The goal of introductory post-secondary education should be to equip students to be rational "information consumers" — individuals who can think critically about and use intelligently all sorts of claims, but especially those supplied by the intellectual authorities of the culture. Whether it as a citizen, businessperson, or intellectual, a rational person's understanding of the world is constituted largely by authoritative knowledge. The critical thinker must be proficient in the use and evaluation of such knowledge as well as understanding the delicate art of rational trust and appropriate skepticism.

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CHAPTER 9

FALLACY IDENTIFICATION IN A DIALECTICAL APPROACH TO TEACHING CRITICAL THINKING

Mark Battersby and Sharon Bailin

1. INTRODUCTION: THE DIALECTICAL APPROACH

The dialectical approach to teaching critical thinking has as its goal enhancing students' ability to make reasoned judgments based on an appropriate inquiry into an issue. We have argued elsewhere for an approach to critical thinking instruction which focuses on a dialectical approach (Bailin and Battersby 2009) and have instantiated such an approach in our textbook, *Reason in the Balance: An Inquiry Approach to Critical Thinking* (Bailin and Battersby 2016). This type of inquiry involves identifying and assessing the relevant pro and con arguments on an issue. Such an assessment of arguments must usually be based on the completion of the inquiry and a comparative evaluation of the arguments. The assessment of the weight or import of even individual arguments cannot usually be done apart from the context in which the arguments are situated. Generally, in order to know how good an argument really is, one has to evaluate it in its dialectical context. Judging how strongly a particular set of premises supports a conclusion frequently requires more information than that supplied in the particular argument. For example, an assessment of the argument that capital punishment deters and that therefore we

should bring back capital punishment requires not only a careful examination of the evidence for the deterrence claim, but also a determination of how well the argument from deterrence, even if true, stands up against counter arguments to capital punishment such as the problem of the execution of the innocent. Neither of these arguments is fallacious and the complex assessment of their contribution to the question of whether we should have capital punishment requires considering them and other relevant arguments pro and con (see Bailin and Battersby 2016; Battersby and Bailin 2010).

2. *PRIMA FACIE* EVALUATION

Thus the identification of fallacies in individual arguments usually cannot, in itself, constitute an adequate evaluation of the strength of the argumentative support for a claim. Fallacy identification can, however, play a subordinate and preliminary or *prima facie* role in argument assessment. Although *prima facie* judgments cannot be definitive about the cogency of an argument, judgments about the fallaciousness of an argument can often be made with considerable confidence. Thus certain arguments can be eliminated from further consideration.

As an example, the argument that we should support capital punishment because there is a long standing tradition of executing murderers can be evaluated and identified as committing a fallacious appeal to popularity or tradition. This provides a basis for not giving consideration and weight to this argument in further considerations of the balancing of pros and cons.

The identification of fallacies also plays a crucial role in ensuring that inquiry dialogues are kept on track and thus contributes to arriving at a reasoned judgment in dialogue situations. Participants in a reasonable dialogue will attempt to avoid making fallacious arguments and should be able to identify and not be distracted or persuaded by fallacious arguments

made by others. Nonetheless, coming to a reasoned judgment as a result of a thoughtful exchange of views involves much more than avoiding and identifying fallacious arguments. As with any inquiry, the reasoned judgment must be made by weighing the strength of contending arguments.[1]

3. ACCOUNTS OF THE NATURE OF A FALLACY

While our view of fallacies places them in a more subordinate role in argument evaluation than is typical in most approaches to informal logic, we still maintain that the identification and understanding of fallacies plays an important role in inquiry. Our characterization of fallacies departs somewhat from many standard accounts, however.

While traditional accounts associated fallacies with invalidity, informal logicians have moved the analysis away from deduction. In an extensive review of developments with respect to the conceptualization of fallacies, Hansen (2002) offers the following summary:

> The survey impresses upon us not only that the ontological component of fallacies as arguments is very firmly entrenched in the tradition (83%), it also shows that the psychological component, that a fallacy appears to be a better thing of its kind than it really is, is widely supported (61%). Although the fallacies tradition does not support HHC, it does support a kindred generalization: a fallacy is an argument that appears to be a better argument of its kind than it really is. No one, however, I believe, has articulated what it is to be a fallacy exactly this way (Hansen 2002, p.152).

This idea that fallacies appear to be better arguments than they really are is a central insight about the nature of fallacies, and one which is also elaborated by Walton. In commenting on his own work as well as that of the Pragma-dialecticians, he makes the following observation:

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1. For a discussion of the process of and considerations involved in such a weighing, see Battersby and Bailin 2010.

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). [...] According to the prag-matic 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 vio-lation, as opposed to an incidental blunder, error, or weakness of execution. [...] The problem is that neither theory has fully taken into account that longstanding intuition, very much evi-dent in Aristotle's treatment of the sophistici elenchi, that fal-lacies are deceptive. They are not just arguments that prejudice efforts to resolve a difference of opinion, wrongly applied argu-mentation 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 cor-rect but are not (Walton 2010, p.279).

In an attempt to address why it is that fallacies seem correct but are not, Walton suggests that the concept of heuristic may provide an explanation. He notes that the heuristics involved are inferential tendencies which by and large serve us well, but which also can on occasion lead to unwarranted inferences. The work of Tversky and Kahneman has demonstrated how these heuristics can lead to unwarranted inferences, while the work of Gigerenzer (1999) and others has shown how these "simple and frugal" heuristics can often lead to reasonable, if tentative conclusions (Walton 2010).

According to Walton's new analysis, the fallacy results from using a heuristic which is often appropriate but is not a reliable guide for the case in question. In our view, fallacies are indeed arguments which seem correct but are not. Our characteriza-tion of fallacy attempts to capture and build on this insight. We further agree with Walton that heuristics could indeed be one

of the sources of fallacious reasoning. We would argue, however, that they are by no means the only source.

4. OUR ANALYSIS OF FALLACIES

We define a fallacy as an argument pattern whose persuasive power greatly exceeds its probative value (i.e., evidential worth). Probative value, as it is used in law, is the legal weight or evidential worth that a piece of evidence should be given when making a judicial finding. Evidence of high probative value includes items such as DNA and finger prints; evidence of low probative value includes items such as hearsay or observations done under poor lighting conditions.

Importantly, courts sometimes refuse to hear evidence even though it has probative value.[2] The refusal to hear this evidence is based on the court's belief that the evidence is too "prejudicial," i.e., the evidence's persuasive power greatly exceeds its probative value. A good example of this is the prohibition on similar fact evidence. Similar fact evidence is evidence that the accused has committed previous crimes that were similar to one that he is currently charged with. In our text we illustrate the court's concern with the following example:

> … let's imagine that "Bill" is accused of using a ladder to get to the second story balcony of an apartment and then entering through the unlocked door and stealing a television set. Being caught with the stolen television set would have strong probative value for his

2. In R. v. B., Justice McLachlin wrote: "The analysis of whether the evidence in question is admissible must begin with the recognition of the general exclusionary rule against evidence going merely to disposition.... (E)vidence which is adduced solely to show that the accused is the sort of person likely to have committed an offence is, as a rule, inadmissible. Whether the evidence in question constitutes an exception to this general rule depends on whether the probative value of the proposed evidence outweighs its prejudicial effect." In Sweitzer, Justice McIntyre of the Supreme Court of Canada wrote: "... where similar fact evidence is tendered ... its admissibility will depend upon the probative effect of the evidence balanced against the prejudice caused to the accused by its admission whatever the purpose of its admission." http://www.duhaime.org/LegalDictionary/S/SimilarFactEvidence.aspx

guilt (of course he might have been given it, so it is not conclusive evidence). On the other hand, if it turns out that Bill has been convicted of breaking into the second floor of apartments before, you might think that this too is relevant evidence.

But such similar fact evidence is usually not allowed to be presented to the court, not because it has low probative value, but because it is **too persuasive**. A jury (perhaps even a judge) on hearing that the accused has been convicted of a similar crime will be strongly inclined to find this evidence very persuasive. Too persuasive. But from a probative point of view, this evidence is very weak because Bill's particular method of crime is very common and could have easily been used by someone else. The crime he is accused of is not only similar to his past crimes, but similar to crimes committed by many others, meaning that the similar fact pattern has low probative value. But because this evidence carries so much more persuasive power than probative value, the courts generally prohibit the presentation of such evidence (Bailin and Battersby 2016, p.78).

We can illustrate how our concept of fallacy works by applying our analysis to an example from one of the dialogues in our text:

> *McGregor:* Your friend Lester is typical of people on the minimum wage. He lives at home with his parents. I don't see why he needs a lot of money, except for frivolities like beer and movies. So raising the minimum wage will just be helping a bunch of well off kids have more spending money. Hardly a good way to help the poor (Bailin and Battersby 2016, p.79).

The tendency, illustrated by McGregor, of confidently asserting a generalization based on one example is the common fallacy of *anecdotal evidence*. Note that McGregor's example is not irrelevant to the generalization about minimum wage workers — after all, this is a case supporting his generalization. Individual experiences are often relevant to supporting a generalization and can play a key role in refuting generalization. Thus such appeals to personal experience usually have some probative value. The problem is that humans have a tendency to assume that their experiences are typical

and therefore an adequate basis for generalizing.[3][4] The fallacy results from taking very limited evidence that is subjectively powerful and persuasive and crediting it as if it strongly supports a generalization.

To return to Walton's analysis, this instance could be seen as a misapplication of the representativeness heuristic described by Tversky and Kahneman, exactly fitting the pattern identified by Walton. We would argue, however, that "natural" heuristics are just one source of persuasiveness that can lead to crediting arguments grossly in excess of the probative value of the reasons presented. In this case, the power of anecdotal evidence also comes from the compelling power of narrative. Both these rhetorical factors contribute to the tendency to give undo weight to what is after all a very small and biased sample. Fallacies are not just created by the misapplication of heuristics, but also by any factor which causes the argument to be significantly more persuasive than warranted by its probative value. As Walton noted in an earlier paper, emotional appeals are also an aspect of many fallacies: "Emotional appeals are not necessarily fallacious arguments, but when they do become categorized as fallacies, it is because they are weak and irrelevant moves in argument" (Walton 1987, p.330).

What he fails to note is that in a fallacious argument, the emotional appeal (which we take to be an example of the argument's non rational but persuasive appeal) tends to exceed whatever probative value is present in the argument. In the article on the *ad hominem* from which this quotation is taken, he notes that many cases of circumstantial *ad hominem* remarks

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3. Extensive research by Tversky, Kahneman and others on the assumption of representativeness supports this observation. People expect their experience to be representative just as they expect a sequence of dice roles to look like a random distribution. See Tverksy and Kahneman 1974.

4. In a recent exchange on Argthry we were invited to share our impressions of the status of critical thinking in post secondary education. Few could resist the temptation of sharing anecdotes, with the suggestion, either explicit or implicit, that these stories and impressions constituted reasonable evidence for a generalization.

about the author are relevant, especially when they provide a basis for raising doubts about the reliability of the claims of the author:

> This type of *ad hominem* argument can be reasonable in some cases because inconsistency of an arguer's position should reasonably be open to criticism or questioning. However, it can become fallacious if the arguer's statement is rejected too strongly, or if the issue is evaded (Walton 1987, p.327).

Why, then, is it a fallacy? Because what is usually inferred from the attacks on the proponent's motivation and circumstances is that the position and arguments of the proponent can simply be dismissed. The effect of persuading the listener to dismiss the argument is the persuasive effect. The *ad hominem* tends to produce a confident dismissal of an argument which is not warranted despite whatever probative value can be given to the circumstantial considerations regarding the author.

5. APPLYING THE ANALYSIS TO FORMAL FALLACIES

This same analysis of a fallacy as an argument whose persuasive power greatly exceeds its probative value can also be applied to formal fallacies, e.g., affirming the consequent, as can be demonstrated by the following simple example:

> If the car runs, then it has fuel.
> The car has fuel.
> Therefore it will run.

This argument also exhibits the characteristic of having some probative value — in this case the second premise does provide some support for the conclusion. But when presented as a deductive argument with the truth of the premises supposedly guaranteeing the truth of the conclusion, it is fallacious. The fact that the car does have fuel has probative value for the claim that it will run, but offered as a deductive argu-

ment, its persuasive effect is to give an unwarranted air of certainty where it should only convey probability.

6. PEDAGOGY

Given our analysis of fallacies, we describe each fallacy in our text as having two aspects: 1. "logical error" – an explanation of why the argument has limited or no probative value, and 2. "persuasive effect" – an explanation of why the argument has a tendency to be persuasive. The most common effect of a fallacious argument is to induce a level of conviction unwarranted by the probative value of the argument. Sometimes the persuasive effect is also destructive of an effective dialogue, producing not only unjustified conviction, but derailing the whole dialogue from its purpose. Thus, even if the claim (e.g., that someone is motivated by sexism) is likely, the effect on the dialogue is to switch it to a discussion of the participant's motives and away from the issue in question. We insist on the identification of both aspects of a fallacy because failure to understand the persuasive aspect of the fallacy makes a person less able to resist its siren call and more likely to miss the reasoning error that is the basis of the fallacy.

Note that we are not claiming that all of these persuasive aspects are necessarily intentional or even intentionally misleading. That is why we describe these fallacious persuasive moves as persuasive *effects* not strategies. Fallacious arguments can, and perhaps often are, made intentionally. But we have all slid into fallacious reasoning unintentionally. Who has not over-generalized from a single experience?

To see how this analysis works, we excerpt from our text our description of the *ad hominem.*

> **Ad Hominem (Attacking the Proponent of an Argument):** Arguers commit the fallacy of ad hominem if they reject a proponent's argument on the basis of critical remarks about the proponent rather than the proponent's argument. The fallacy is an attempt to discredit the proponent's argument or claim

by irrelevantly discrediting the proponent. To be clear, not any personal attack is guilty of the ad hominem fallacy. The fallacy is committed only when the remarks about the proponents are used as grounds to inappropriately dismiss their argument.

Persuasive Effect: The ad hominem discredits an argument by attacking the author's background and behavior and shifts the argument to the proponent and away from the issues at hand. Such a move often leads to the proponent defending his or her personal behavior or background instead of staying focused on the issue at hand. The use of the ad hominem is especially detrimental to conducting a dialogue because, not only does it distract from the issue at hand, but also it tends to inflame people's emotions.

Logical Error: If the proponent has presented credible evidence and arguments, the proponent's background or behavior is largely irrelevant to the logical worth of the argument. When arguments are presented, the issue must be decided on the merits of the argument, not on the qualities of the author.

The situation is different if the proponent is claiming that we should accept the argument because of some fact about the proponent, such as being an expert in the field. In such cases, evaluating the source of the argument can be relevant. What makes ad hominem remarks fallacious is not that facts about the proponent are always irrelevant but rather that we usually tend to give such claims too much weight when assessing an argument. (Bailin and Battersby 2016, p.86).

We also note that some considerations about the author's circumstances can be legitimate, illustrating our general point that what makes ad hominem arguments fallacious is the excessive degree to which people find remarks about an author a basis for dismissing their argument. But information about the author is sometimes relevant because it can form part of the basis on which we decide to trust the author's claims or believe that crucial counter arguments have not been ignored. As Walton notes above, one can and should use knowledge of a person's likely biases to inform the process of evaluation of their arguments (Walton 1987).

7. RESPONDING TO FALLACIES

Another role of fallacy identification in a dialectical approach to critical thinking is its role in guiding an effective response. For fallacy identification to be a useful tool in reasoning and dialogue participation, a student also needs to be able to use this identification to respond effectively. While this understanding is useful in writing responses to arguments, it is especially crucial to have an effective means of responding to fallacies in a dialogue. Teaching students to identify fallacies and their persuasive effect provides them with the means for preventing fallacious arguments (intentional or not) which may lead the discussion off the rails.

The key to responding to fallacies effectively is 1) to notice the persuasive effect and resist its temptation, 2) to recognize the logical error, and 3) to address the logical error in a manner that supports the continuation of a respectful exchange of views. In the case of many fallacies, the key is not to be distracted by arguments of limited or no relevance and to keep the discussion on topic. Effective responses identify the fallacy without name calling and keep the discussion focused on the issue in question.

Below are suggestions from our text on how to respond to the *ad hominem*. Notoriously people respond to personal attacks in an argument by defending themselves against the attack ("I am not a hypocrite. While only yesterday…") instead of returning to the issue in question. This is why it is important to identify the persuasive impact of a fallacy ("I am being attacked, which will distract me from the issue"). The responses below illustrate a variety of ways of responding that keep the discussion on track:

- Yes, he may seem to you to be crazy (neurotic, upset), but, still, he has a point. The arguments he made seem pretty good to me.

- Even if she does work for the . . ., is friends of . . ., is married

to . . ., you still have to listen to her point. I mean she made a pretty good argument about . .

- This isn't about me. The issue is . . . (Bailin and Battersby 2016, p.284)

8. CONCLUSION

While fallacy identification plays primarily a preliminary and subordinate role in our view of critical thinking as inquiry, we still provide students with a somewhat novel and, we believe, powerful method for identifying and analyzing fallacies. Moreover, while not relating fallacy identification directly to the violation of dialogic rules, we do emphasize the need to identify, avoid and respond effectively to fallacies that occur during a dialogue.

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CHAPTER 10

CRITICAL INQUIRY: CONSIDERING THE CONTEXT

Mark Battersby and Sharon Bailin

1. INTRODUCTION

The significance of considering the context surrounding an issue is underestimated and often overlooked in approaches to critical thinking theory and instruction based on informal logic. For example, fallacies of relevance such as ad hominem are seen as fallacious precisely because they appeal to the context rather than to the argument itself. In this paper we challenge this view, demonstrating how and under what circumstances considering context is relevant and even vital to critical thinking.

We begin by arguing that the downplaying of the relevance of context stems from the view of critical thinking as essentially the evaluation of individual arguments. This view, which betrays the vestiges of the deductivist heritage of informal logic, still underpins much critical thinking instruction.

We have argued, on the contrary, that critical thinking is better viewed in terms of what we refer to as critical inquiry in which argumentation is seen as a way of arriving at judgments on complex issues. This is a dialectical process involving the comparative weighing of a variety of contending positions and arguments in order to come to a reasoned judgment on the issue (Bailin and Battersby 2009; Battersby and Bailin 2016).

Further, we argue that critical thinking instruction should focus on this inquiry process (Bailin and Battersby 2016).

In the model we have developed for teaching critical thinking as critical inquiry, considering the context of the issue is an important component. We consider the following aspects of context:

- Dialectical context
- Current state of belief or practice
- Intellectual, political, historical, and social contexts
- Disciplinary context
- Sources
- Self

2. THE ROLE OF VARIOUS CONTEXTS

2.1. Dialectical context

The dialectical context includes the debate around an issue, both current and historical. A knowledge of the dialectical context is centrally important because reaching a reasoned judgment involves more than simply evaluating a particular argument. Rather, it involves making a comparative assessment of the relative strengths and weaknesses of the competing views.

To see the importance of considering the history of an argument, consider the following example. This is a standardization of an argument written by a "lifer" in the Michigan prison system (from Johnson and Blair 2006):

Conclusion: We should not reinstate capital punishment in Michigan.
P1. We have capital punishment in 38 states and their statistics show no significant decrease in capital crimes.
P2. The 1st degree murderer is least likely to repeat.
P3. The 1st degree murderer is most likely to repent.

P4. Nationwide, corrections officials report that lifers are the best prisoners and stabilizers in their prisons.

Some individuals, upon seeing this argument, may initially judge many or even all the premises as irrelevant because they are unaware of the history of the debate about capital punishment. Whereas they usually seem to know the retribution argument, they often do not have the background knowledge of the argument about the alleged deterrent effect of capital punishment or the argument that lifers will produce mayhem in the prisons since there is no further punishment they can suffer. As a result, they fail to see the relevance of the statistics in premise P1 or the relevance of the remark in premise P4 about the contribution that lifers make to prison stability. More sophisticated readers will know about these debates and bring that knowledge to bear on understanding and evaluating the argument.

In addition, the question of premise acceptability is dependent on the reader's awareness of the debate. The fact that capital punishment fails to deter murder has been quite widely accepted for many years. This means that people who know the history of the debate would be inclined to accept premise P1. But for those unaware of the history of this argument, premise P1 may seem counter intuitive and unacceptable.

Sophisticated readers use their awareness of the history of the debate all the time, but this awareness needs to be made self-conscious to enhance reasoning and to teach it. The tendency of critical thinking instruction to extract arguments from their context ignores the methods that sophisticated reasoners use to evaluate arguments. In addition, such an ahistorical approach often results in arguments and insights being underappreciated. If you are unaware of the dialectical context of Newton's, Darwin's, or Descartes' theories, you will probably not appreciate the depth of the insights contained in their arguments. Appreciating philosophical arguments involves

understanding the dialogue that has transpired between historical interlocutors, sometimes over millennia.

Perhaps under the influence of the paradigm of the natural sciences as ahistorical disciplines, 20th century analytical philosophy tended to minimize the importance of the historical embedding of arguments and an account of their history. While the validity of an argument cannot depend on the history of the debate in which it arose, the understanding of and credibility of the argument (and conclusion) can. The first questions given any argument that passes *prima facie* evaluation should be, "What is the history of this debate? What are the counter arguments?"

This is as true for scientific inquiry as it is for philosophical or public policy debate. In science, the current standing of a theory or claim determines the initial burden of proof of a new or counter claim. Without knowing the history of a scientific inquiry, one cannot make a reasonable assessment of the new claim.

2.2. Current state of practice or belief

An understanding of the current state of belief or practice surrounding an issue may reveal what is significant or contentious about the issue. It may also help to establish where the burden of proof resides and thus how strong alternative views and opposing reasons need to be in order to seriously challenge the prevailing consensus or practice.

To see the relevance of current states of belief or practice, consider what Canadians discussing the legalization of marijuana need to know. They need first to understand the current legal situation, including the fact that drug laws are not under provincial but rather federal jurisdiction. Without realizing this, one of our students made the unjustified argument that if marijuana were legalized, then "dopers" from the rest of Canada would flock to Vancouver. To make a reasonable evaluation of the consequences of not de-criminalizing, it is also

important to know the number of people convicted of possession every year in relation to the number of users. In addition, one should be aware of the popular belief, widely promoted by governments, that marijuana is a "gateway drug." Knowing that governments generally oppose legalization means that government websites, normally more or less reliable sources of information, should be viewed with a critical eye.

Consider also the case of individuals evaluating the strength of the argument for raising the minimum wage. In order to make a reasoned judgment, they would need to know the wage in other jurisdictions, when the minimum wage was last raised in their location and by how much, the effect of inflation on wages, costs of living, etc.

As another example, in discussions regarding the provincial imposition of a carbon tax in the province of British Columbia, most citizens did not know anything about the idea of pricing externalities (costs that are not charged through the market system). For most, it was just another tax grab. Some individuals, although they supported the idea of a carbon tax to reduce car usage, found it unintelligible that the tax was not used to support public transport. One could agree with them that the tax should have been used for this purpose, but to actually understand the pros and cons of the tax, they had to understand the political logic of pricing externalities and revenue neutral tax shifts. Without these concepts, they could not make a truly reasoned judgment about the tax.

2.3. Intellectual, political, historical, and social contexts

Understanding the intellectual, political, historical, and social contexts surrounding an issue can aid us in understanding and interpreting arguments and can reveal assumptions underlying arguments and positions. In addition, in the case of practical judgments, factors relating to the political, historical, and social contexts (such as social consequences) play a crucial role in the evaluation of positions.

As an example of the way the larger social context is relevant to argument evaluation, consider the debates about separatism in Canada. One cannot understand or appreciate the debates without knowing the historical origins of the issues (i.e., that there were two founding countries, Britain and France, and that Canada was created as a negotiated country which would respect its two different cultural and national bases). People who naively wonder why Quebec should have special status fail to understand this history. Of course, one cannot argue that because a particular political arrangement has a history, it must be accepted. But to argue against such arrangements is to bear the burden of proof (often a very significant one). Even if one supports a more egalitarian idea of citizenship, the challenges of getting to such a state, given the history, is relevant to the deliberation on the issue. When former Canadian Prime Minister Pierre Elliott Trudeau argued for ending the Indian Act based on a typically liberal stance that ethnicity should not influence one's citizenship status, he was forced to quickly reverse his position in light of the historical basis of native relations and the reality of native living conditions. Arguments for the equal treatment of all sound morally and politically plausible until one comes up against the social realities to which this principle is to apply. Interestingly, the Canadian Charter of Rights and Freedoms, which is similar in many ways to the U.S. Bill of Rights, specifically allows for equality rights to be overridden for the purpose of social improvement.

We might compare our political and cultural world to a natural landscape. Every natural landscape is a product of historical processes, both geological and biological. But the current landscape also needs to be understood in terms of ecology — the current relationships among the various biological components.

The social/political world in which we live also has a formative history and a sustaining social ecology. This world has been shaped by historical processes and is maintained by a web

of social relations. Why is marijuana illegal and not alcohol? Besides the beliefs adumbrated above, the history of marijuana prohibition is linked to the prohibition of serious addictive drugs. It is also connected to the fact that when criminalization began, marijuana's dominant use in the U.S. was by new Mexican immigrants (Bonnie and Whitehead 1970). A relevant social fact is that at this point in time there is an enormous governmental and police investment in drug prohibition. It is also relevant that the primary users are a somewhat marginalized group – young people. Such facts help account for the drug's current legal status and should not be ignored in any debate on the issue.

Any debate about social policy must also take into account the likely consequences of policy implementation. To return to the marijuana debate, one of the likely consequences of legalization is that marijuana use would increase. Another likely consequence is that the sale of marijuana could generate tax revenue. A third likely consequence is that the deployment of police forces could shift to more clearly harmful crimes or could perhaps be reduced. And finally, the market in this illicit drug would be ended and the power of organized crime possibly reduced. No *a priori* liberal argument (that the laws prohibiting marijuana use are an unjustified infringement of individual rights) can be taken as sufficient because these consequences cannot be ignored.

2.4. Disciplinary context

Disciplinary context is part of the intellectual and dialectical contexts referred to above. But because disciplines are such a crucial source of claims and arguments, they deserve special attention. Most academic evaluation occurs within a disciplinary context. The criteria of evaluation vary in important ways from discipline to discipline: claims from sociology cannot be evaluated in the same manner as claims from physics. The disciplinary context can also include the dialectical history of the

argument within the discipline. Arguments and claims that are novel within the history of the discipline bear a different burden of proof than less novel claims.

Knowledge production depends heavily on disciplines which apply varying criteria to assess claims and do so with varying degrees of rigour. There are important epistemic differences among disciplines. For example, appeals to authority have varying relevance, credibility and weight depending on the discipline involved. Anyone conducting a critical inquiry needs to understand the difference between those disciplines that tend to consensus and those that do not. The inquirer also needs to understand the inherent difficulty and uncertainty presented by certain forms of inquiry. Observationally based claims that are common in disciplines such as epidemiology and sociology are by their nature more uncertain than claims about particles in physics. Moreover, much of academic economics is based on highly questionable psychological assumptions (built into the concept of *homo economicus*) about human rationality. One only has to watch the gyrations of the stock market to see that other factors than rational assessment of information influence buying and selling.

Support from a consensus among experts is one of the primary bases for crediting a claim. A layperson assessing the credibility of a claim in a discipline needs to inquire whether the claim is supported by a disciplinary consensus. Disciplines characterized by "schools" notoriously do not develop the kind of disciplinary consensus that provides evidence for the reliability of their epistemic processes and the credibility of their claims. Consensual views emerging from disciplines which have a tradition of achieving consensus based on well-established epistemic criteria deserve our confidence. Nevertheless we can never ignore the possibility of "bandwagoning," i.e., the tendency of individuals to support currently popular views in their discipline for social rather than rational reasons.

A possible example of the bandwagon phenomenon in the

disciplines of epidemiology and nutrition studies is argued for in a recent book by Taubes (2007). Taubes makes an extended case against the view that fat consumption is a primary cause of heart disease and obesity. His position is surprising since this view has been supported by hundreds of epidemiological studies (largely observational). Taubes provides his own analysis of many of these studies and reviews considerable alternative biological and epidemiological literature to support his critique. But he also makes the case that the widespread acceptance of this view was not the result of overwhelming scientific evidence, but rather the result of the intense efforts by leaders in the nutrition research community to promote their view. Taubes argues that adoption of an anti-fat position by governments was premature given the state of research, but once governments became committed, there was little interest in questioning the fat reduction research. As Taubes documents, the science supporting the benefits of reducing fat consumption is actually quite inconclusive. He adds to his argument an account of the political process by which reducing fat consumption became government policy and a health shibboleth, including intolerance toward objectors and the manipulation of funding opportunities by key players. In this part of his argument, he is attempting to explain why the theory that he is challenging could have such widespread acceptance. This is a relevant argumentative strategy since the existence of apparent consensus provides considerable support for the "anti-fat" point of view. To the extent that he is successful, his socio/political analysis enhances his critique of this widely accepted position.

We are not trying to judge his argument, but we do think that he is justified in using this additional non-scientific evidence about the dynamics of the relevant disciplines when making his case against the "fat theory." Public acceptance of the "fat theory" depends on the assumption that the views of the experts are based on an appropriate evaluation of the evi-

dence. Evidence of social and political processes inconsistent with an evidence-based approach creates a justified suspicion of the consensus.

2.5. Sources

Contrary to the view that arguments should be evaluated independently of their authorship to avoid the fallacy of *ad hominem*, we argue that information about who is making an argument is frequently relevant to evaluation (although not determinative) because the credibility of an argument often involves trust that the author of the argument is appropriately knowledgeable and fair-minded. Knowledge of the point of view of a source can inform the process by which arguments and claims are checked. In addition, while explanations of why a person holds a view cannot be used to dismiss a view, such evidence can be used to explain why a view which is lacking sufficient rational support is nevertheless held.

It is well established that information about the source of a claim or argument is justified in cases where trust in the source is the primary basis for accepting the argument or claim. The acceptance of observational claims (testimony) and of claims by experts to special knowledge depend on these sources being both trustworthy and appropriately knowledgeable. Evidence that the sources do not meet these standards is always relevant and sometimes sufficient to dismiss their views. On the other hand, the evaluation of testimony and appeal to authority is usually cited as an exception to the general rule that the strength of an argument and the credibility of its conclusion are independent of the source of the argument. In all other cases, citing circumstantial facts about the author of an argument (such as who she works for or the fact that she does not follow her own environmental dictums) is treated as an irrelevant and fallacious basis for rejecting an argument or conclusion.

In our view, what makes *ad hominem* arguments fallacious is

not that they use irrelevant information about the author, but that they are usually too persuasive. For example, if someone of a left-leaning political orientation hears that an argument against raising the minimum wage is coming from a right-wing policy institute, there is a powerful temptation to just dismiss the view. Arguably to do so would be to commit the *ad hominem* fallacy. But surely the source of the argument is not irrelevant. The problem is that knowledge of the source is often too persuasive. Many fallacies are argument patterns whose persuasive power greatly exceeds their evidential worth.

Ad hominem information can "lead us into fallacious temptation" but that does not mean that *ad hominem* considerations do not have some rational worth. The credibility of an argument is based in part on accepting the premises. In many cases, part of the basis for this acceptance is the trustworthiness of the author of the argument. In scientific papers we trust that the anonymous author is at least not lying about the data. In newspaper editorials, references to facts of the news are usually accepted to the extent that the newspaper is a trustworthy source.

Although one can challenge any premise, for argumentation to proceed most premises will need to be accepted provided that they are plausible and that the author is a trustworthy source. This acceptance is not based on the author's expertise, but rather on a judgment that the author is a trustworthy source of information. In addition, the extent to which we credit the conclusion is not simply determined by the apparent support that the premises give the conclusion. Recognizing the dialectical nature of argument evaluation means that argument evaluation must involve assessment of an argument against its countervailing arguments and consideration. Whoever presents an argument has a dialogical duty to acknowledge counter arguments and to indicate why the supported argument is stronger than these. Trusting an argument's

author to be both candid and knowledgeable about alternative views is part of the basis for a rational acceptance of the argument. If we have reasons to believe that the source of the argument is either not trustworthy (e.g., is not someone who would tell us about key counter arguments or evidence) or is not reliably competent (e.g., is not likely to have done due diligence on the relevant objections to the view), then these characteristics provide a good basis for not accepting the argument or conclusion.

In addition, knowing that a source is coming from a particular point of view can and should inform a more detailed investigation of their argument. One should not dismiss an argument because of the political bias of its source, but such information may give rise to an appropriate skepticism about the view. In the climate change debate, it is striking that almost all opponents of the anthropogenic view appear to have financial and other bases for their opposition. But is this observation an instance of the *ad hominem* fallacy? We think not. While their views should not be dismissed on this basis, this observation can be used against the critics along with other arguments such as their lack of alternative explanations for global warming.

The standard view, with which we disagree, also treats reference to psychological explanations of a person's argument as fallacious. On this view, how one comes to a position, including whatever psychological motivation may be behind it, is not relevant to the assessment of the argument for the position. While understanding a person's motivation is certainly not sufficient for dismissing an argument, we would argue that it is not irrelevant.

The relevance of these considerations is nicely illustrated in a recent column in *Scientific American* by Michael Shermer. Shermer argues against the widely held view that people experience grief in the stages "denial, anger, bargaining, depression, acceptance," citing evidence from a variety of relevant experts

that rejects this reigning view. These include current experts in the field who claim that there are no studies that support this view and that in their counseling work, they do not see any standard pattern. But Shermer does not end his case against the view by merely citing counter evidence from current authorities. He goes on to ask why it is that such a theory is attractive.

Why stages? We are pattern-seeking, storytelling primates trying to make sense of an often chaotic and unpredictable world. A stage theory works in a manner similar to a species-classification heuristic or an evolutionary-sequence schema. Stages also fit well into a chronological sequence where stories have set narrative patterns. Stage theories "impose order on chaos, offer predictability over uncertainty, and optimism over despair," explained social psychologist Carol Tavris, author of *The Mismeasure of Woman* (Shermer 1997).

The well-known errors in the perceptions of correlation and coincidence clearly support this view. Of particular interest to us is Shermer's argumentative use of this information. Shermer uses the fact that there is a non-rational explanation for the view that grief comes in well-structured stages as further evidence against the view. We believe that this form of argument, which involves first providing a rational basis for rejecting a view and then adding a plausible non-rational explanation for why the view is held, is a legitimate use of genetic information and is not fallacious.

2.6. Self

At least since Socrates' famous "know thyself" injunction, self-awareness has been advocated as a key to reasonableness. No one escapes the historical context in which he or she lives. Everyone can, however, become much more self-aware about this context and its influence on their point of view. We reject the idea that all views are biases in the derogatory sense, but acknowledge that while there is no "view from nowhere,"

striving for the regulative ideal of objectivity is one that can be facilitated by personal, intellectual and cultural self-awareness. It can also be facilitated by a number of intellectual strategies such as always seeking alternative views and considering and developing counter examples to reduce the problem of confirmation bias.

While argument evaluation obviously focuses on the argument, the person doing the evaluation is a crucial component of the process. One's initial views on an issue such as legalizing marijuana, or even one's fundamental world view on such questions as free will, justice, or God can influence a person's assessment of an argument. When trying to come to a reasoned judgment on a topic, one should be aware of one's own biases, point of view, and assumptions. Admittedly this is a limitless task, but it is part of the regulative ideal of being reasonable. "My grandchildren are all wonderful" reflects a harmless bias. "The Irish are genetically criminal" (as was sometimes said in New York at the turn of the 20th century) reflects a sinister bias.

Students often have definite points of view on many issues by the time they reach the post-secondary level. This is problematic only when they are unaware that they are adopting a point of view (e.g., a laissez-faire economic view) but think it is just common sense (e.g., the poor are poor because they are lazy). Clearly the insidious form of bias is unselfconscious bias. A point of view is a bias only if it influences our judgment in an unreflective and unwarranted manner.

Let us take the nurture/nature debate as an example. Within our intellectual lifetime, the relative weight given to these two factors has shifted from nurture to nature. The supposed political implications of this shift, along with the evidential basis for it, continue to be debated. The early reaction against sociobiology was clearly motivated by a suspicion that a renewal of the nature hypothesis had sinister implications, from racism

to support for a laissez-faire economic system built on human selfishness.

We do not wish to enter this debate, but we do wish to note that as argument assessors, we are much more willing to view explanations of human behavior through a lens of biological influences than was true forty years ago. This different lens reflects an objective shift of burden of proof. We are much more open to biological/genetic explanations of behavior. The new climate of fascination with genetic and biological explanation also doubtless carries its own collections of blinders and prejudices such as the presumption of a one characteristic – one gene explanation, or the ignoring of the role of biological context in determining gene expression.

Reflective people understand that they evaluate arguments and claims in a particular personal and cultural climate. To ensure that they are making a fair evaluation, they should give special care to the consideration of those views with which they have initial disagreement. Given the well documented phenomenon of confirmation bias, reflective assessors should also be skeptical of their own enthusiasm for evidence supporting their view. One strategy for ensuring that one is taking a fallibilist position is to try to state what kind of evidence would lead one to change one's opinion.

In addition, there is growing body of literature from behavioral economics that documents the pervasive influence of a variety of social conditions that can undermine our ability to be rational (Ariely 2010). The antidote to these influences is self-awareness and a commitment to fair-mindedly consider alternative views. We are not simply arguing that an evaluator of an argument should be a fallibilist, prepared to admit error and willing to consider other views. Rather we are arguing that reasonable assessors should attempt to be cognizant of their own assumptions and intellectual leanings and should make special efforts during an inquiry to seek alternative views and counter arguments. Students need to become aware that they

are embedded in a context and need to reflect on their own judgments in light of this.

3. SUMMARY

A reasonable assessment of an argument with the goal of reaching a reasoned judgment must take into account not only the content of the argument itself, but also a much wider context. This context includes:

1. Dialectical context: Evaluating arguments requires a knowledge of the history of the debate surrounding the issue, especially counter-arguments to the current position or argument being evaluated.
2. Current state of belief or practice: An understanding of the current practice and beliefs in an area is important for evaluation, especially to the extent that this determines burden of proof.
3. Intellectual, political, historical, and social contexts: No issue exists in a social vacuum. Understanding an argument, understanding the significance of a claim, and appropriately conducting an inquiry into an issue, all require knowledge of the historical and social contexts.
4. Disciplinary context: An assessor should be sensitive to both the particular discipline and the state of consensus in that discipline.
5. Sources: All arguments depend for their acceptance in part on trust. Evaluating the trustworthiness of the source of the argument is almost always relevant.
6. Self: The argument assessor or a person conducting an inquiry must be aware that they too are part of the context of evaluation. Self-awareness and a commitment to seeking counter evidence is crucial to reasonable evaluation.

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CHAPTER 11

CRITICAL THINKING AND COGNITIVE BIASES

Mark Battersby and Sharon Bailin

1. INTRODUCTION

A primary aim of critical thinking research and teaching is to improve human reasoning with the intent of getting people to be more rational with respect to their beliefs and actions. For the Informal Logic/critical thinking community, this effort has largely taken the form of analysing the structure of arguments and identifying certain types of errors or problems in reasoning, in particular those commonly identified as fallacies. The focus is on exposing the nature of the error– showing why these particular arguments are fallacious. The pedagogical assumption underlying this focus is that once people are aware of these errors, they will notice them in the arguments of others and be able to resist them, and that they will avoid making these errors themselves.

Much valuable work has been done in this area, including contributions to an understanding of the nature of fallacies, the identification and characterization of a growing number of fallacies, and innumerable rich ideas and strategies for teaching critical thinking. The identification of reasoning errors, in this context, has been based largely on the work of philosophers studying arguments and not on empirical studies of reasoners. In addition, relatively little work has been done by philosophers

(with some notable exceptions, e.g., Walton 2010) on trying to understand why these errors are so common and persuasive.

Since the 1970s, however, much important work on human reasoning has also been done by psychologists who have undertaken systematic empirical studies of reasoning errors and produced many insightful accounts of these errors (Wason 1966; Wason and Shapiro 1971; Tversky and Kahneman 1974; Slovic 1969; Slovic et al. 1977; Kahneman, Slovic and Tversky 1982; Stanovich 2011; Kahneman 2011). Some of these errors map onto identified informal logic fallacies, but some of them have not been previously identified by philosophers.

The critical thinking community has, however, by and large given little attention to the work of these cognitive psychologists.[1] It is our contention that this work can make a contribution both to reflection on reasoning errors and to the development of an appropriate pedagogy to instruct people in how to avoid these errors.

In this paper, we explore some of the intersections between this psychological research on reasoning and the work of critical thinking theorists, as well as the implications of this research for conceptualizing and teaching critical thinking. The paper addresses this theme in terms of the following aspects:

- what this work can add to our understanding of reasoning errors in general, and of the reasoning errors identified by critical thinking theorists in particular

- which reasoning errors identified by this research are not typically identified by the critical thinking community

- the ways in which this research can inform and help to enhance critical thinking instruction.

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1. For recent work on understanding cognitive biases and their significance to critical thinking, see Kenyon 2014; Kenyon and Beaulac 2014; Maynes 2015, 2017; Mercier & Sperber 2017).

2. PSYCHOLOGICAL VERSUS PHILOSOPHICAL ACCOUNTS

Although both philosophers and psychologists offer detailed accounts of reasoning errors, there are important differences between the accounts. Philosophical accounts are primarily normative. The work of philosophers has consisted in specifying the norms of logical reasoning as well as identifying errors of reasoning which are common in arguments and showing in what way they are logically erroneous or epistemologically deficient.

The accounts of cognitive psychologists, in contrast, are largely descriptive, and to some extent explanatory. Their work consists in conducting empirical studies of people engaged in tasks that require reasoning and critical thinking. By means of these studies, they have been able to identify errors that are commonly made, identify patterns in the types of errors made which reflect cognitive biases (errors which are systematic and predictable), amass evidence regarding the frequency and tenacity of such errors, and investigate the circumstances which tend to be correlated with their occurrence. In addition, based on the data accumulated, some cognitive psychologists have also proposed explanatory accounts of these cognitive biases in terms of their likely origins as well as a conceptual framework for understanding how they function.

3. ENHANCED UNDERSTANDING OF REASONING ERRORS

The obvious question, then, is what, if anything, can such a descriptive cum explanatory account add to our understanding that might help us in thinking about and teaching critical thinking?

The findings of the various studies conducted by cognitive psychologists detail an extensive range of cognitive errors which are common and predictable. And many of the fallacies identified by informal logic can be seen as particular instances or manifestations of certain of these cognitive biases. The fallacy of popularity, for example, is likely an instance of the bandwagon effect

— the tendency to do (or believe) things because many other people do (or believe) the same. And the fallacy of hasty conclusion could be a result of any of: belief bias — where someone's evaluation of the logical strength of an argument is biased by the believability of the conclusion; clustering illusion — the tendency to see patterns where actually none exist; and/or confirmation bias — the tendency to search for or interpret information in a way that confirms one's preconceptions. The elucidation and detailing of various cognitive biases can give us a richer understanding of those errors in reasoning which have already been identified by informal logicians.

Many cognitive biases describe systematic errors in reasoning which are not among those traditionally highlighted by critical thinking theorists, however. A few examples are loss aversion – where the disutility associated with giving up an object is seen as greater than the utility associated with acquiring it; and recency bias — the tendency to weigh recent events more heavily than earlier events (such cognitive biases will be discussed in more detail in the next section). The cognitive bias literature can, then, add to the repertoire of reasoning errors which deserve attention by critical theorists and instructors.

In addition to detailing a list of errors, what the research on cognitive biases also indicates is that these errors are systematic and predictable, but also extremely widespread and very tenacious. These are not errors that are made occasionally by people who have momentary lapses in their thinking. Nor are they necessarily the result of people's failure to understand the relevant logical norms. The research provides convincing evidence that they are, rather, very common and extremely difficult to resist. This is an aspect of cognitive biases that needs to be taken into account in critical thinking instruction.

Another helpful aspect that arises from the research is information regarding under what conditions these errors are most likely to occur and whether there are circumstances or conditions which can mitigate them. This type of information can be

useful for critical thinking instruction in providing a basis for the development of strategies to help avoid these errors.

In addition to the guidance provided by the research itself, the explanatory accounts offered by cognitive psychologists also give us a framework for attempting to understand why we make these errors. The ubiquity and tenacity of cognitive biases demonstrate that these are not simply errors in reasoning; they are errors that persuade. The theoretical accounts offer an explanation for why it may be that we are persuaded by them.

These accounts differ from those generally offered by philosophers, which tend to view the primary source of human unreason as the emotions (the explanations of reasoning errors offered in contemporary textbooks, for example, tend to be in terms of ego involvement or ethnocentrism). While not denying that emotional sources can often be a cause of irrationality, the work of cognitive scientists has shown that many reasoning errors are grounded primarily in natural reasoning processes.

What many psychologists have argued is that humans have, over time, evolved a set of quick inferences tendencies which allow a rapid, almost immediate response or reaction. Some examples of these quick inferences are detecting hostility in a voice, driving a car on an empty road, understanding a simple sentence, or answering a simple math problem. Some of these fast mental activities are innate and automatic while others are based on skills and knowledge which have become automatic through prolonged practice (e.g., driving on an empty road, solving a simple math problem) (Kahneman 2011, pp.21-24). This type of thinking is referred to by Kahneman (2011) as System 1 or *fast thinking*.[2] This type of quick inference-making is sufficiently reliable to stand us in good stead in many circumstances, providing quick and generally appropriate initial reactions to challenges under routine conditions. But such *fast thinking* can also lead to cognitive biases as these immediate, unreflective

2. This type of thinking has been referred to variously as automatic, experiential, heuristic, implicit, associative, intuitive, and/or impulsive (Evans 2008).

inference-tendencies are not adequate to the task of dealing with more complex challenges. Tasks such as performing complex calculations, monitoring the appropriateness of one's behaviour, comparing items for overall value, or checking the validity of a complex logical argument require attention, deliberate mental effort, and conscious reasoning. This type of more deliberate, controlled, and effortful thinking is referred to by Kahneman as System 2 or *slow thinking*.[3] According to Kahneman, *slow thinking* is required in order to avoid cognitive biases.

So why are cognitive biases so persuasive? The two systems theory would suggest that they persuade us because they arise from natural inferential tendencies. These tendencies are quick and cognitively easy and are generally the first line of attack when we are faced with cognitive challenges. Moreover, it is rational in many circumstances to rely on these tendencies; they are what allow us to function most of the time. But they can lead to errors in some circumstances and it is important in such circumstances to institute strategies to become more controlled and deliberate. The cognitive bias research suggests that this is not always easy as *fast thinking* occurs automatically. But it is possible.

While these theoretical accounts provide a plausible explanation of the persuasive power of cognitive biases in general, accounts of particular cognitive biases may also help us understand why particular errors are persuasive. This is an element that has been missing in most accounts of fallacies in the critical thinking literature. Fallacies are typically identified in terms of what is erroneous about them. But fallacies are not just any errors in reasoning; they are persuasive errors (Battersby and Bailin 2015; Walton 2010). It is the existence of underlying cognitive biases which make the fallacious inferences tempting. Thus we would argue for the need to conceptualize fallacies not

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3. This type of thinking has been referred to variously as controlled, rational, systematic, explicit, analytic, conscious, and/or reflective (Evans 2008). See Evans for an overview of a number of dual-systems theories of reasoning and cognition.

only in terms of the errors they exemplify, but also in terms of their persuasive power.[4] Understanding why particular fallacies persuade us provides us with a tool for helping us to resist their thrall.

For example, while philosophers have identified the error of making hasty generalizations based on anecdotal evidence, cognitive psychologists have identified the cognitive bias of the "availability heuristic" (estimating what is more likely by what is more available in memory, which is biased toward vivid, emotionally charged, or easily imagined examples (e.g., a plausible story). In a famous study, Tversky and Kahneman (1983) asked which was more likely:

1. a massive flood somewhere in North America this year, in which more than 1,000 people drown
2. an earthquake in California sometime this year, causing a flood in which more than 1,000 people drown.

Despite the fact that what is described in statement #2 is included in statement #1, a large percentage of people found statement #2 more likely since the latter provides a more plausible and easily imagined story. The philosophical accounts identify this reasoning as an error; the psychological accounts tell us that we tend to be persuaded by this particular error because people generally have a strong tendency to make judgments of likelihood on the basis of ease of imagining an event, an ease which can be much facilitated by a plausible story (Kahneman 2010, pp.159-60).

Another example is provided by the fallacy of questionable cause, which has been pointed out by critical thinking theorists, but the tendency to commit this fallacy can be seen to be

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4. In Reason in the Balance (Bailin and Battersby 2016), we define a fallacy as an argument pattern whose persuasive power greatly exceeds its probative value (i.e., evidential worth). We then describe each fallacy in terms of two aspects: 1. "logical error" – an explanation of why the argument has limited or no probative value, and 2. "persuasive effect"– an explanation of why the argument has a tendency to be persuasive.

grounded in the strong tendency, identified by psychologists, to see causal relationships even between unrelated events in order to make a coherent story. This phenomenon is nicely illustrated by an experiment by Hassin, Bargh and Uleman (2002) in which participants were given the following to read:

> After spending a day exploring beautiful sights in the crowded streets of New York, Jan discovered that her wallet was missing.

When asked to recall the story afterwards, participants associated the word *pickpocket* with the story more frequently than they did the word *sights* despite the fact that *sights* appeared in the story while *pickpocket* did not. The juxtaposition of the ideas lost wallet, New York, and crowds prompted participants to infer a coherent causal story to explain the loss of the wallet despite the lack of any evidence presented in the story to support this inference.

An important aspect of System 1 or *fast thinking* highlighted by cognitive psychologists is that it is coherence-seeking – it is prone to construct a coherent story out of whatever information is available, whatever its quality and however limited. A common error in reasoning which is a result of this tendency is jumping to conclusions (hasty conclusion), and a particularly troubling manifestation is the failure to look at both sides of an issue or to seek alternatives. A striking illustration of this phenomenon is provided by one study (Brenner, Koehler and Tversky 1996) in which participants had to make a decision based on one-sided evidence. All the participants were given the same scenarios providing background material to a legal case, but then one group heard only a presentation by the defence lawyer, one group heard only a presentation by the prosecutor, and one group heard both presentations (each lawyer framed the issue differently but neither presented any new information). Despite the fact that all the participants were fully aware of the setup and could easily have generated the argument for the other side, the presentation of the one-sided evidence had a significant effect on the judgments.

Moreover, the consideration of only one side of the issue also resulted in the bias of overconfidence. The participants who heard one-sided evidence were more confident of their judgments than those who heard both sides. This is not surprising as it is easier to construct a coherent story with less information. The strength of this tendency to make confident judgments based on limited evidence is a robust and significant finding of the cognitive bias research and strongly suggests the need for deliberate measures and strategies to counter this tendency.

4. IDENTIFYING ADDITIONAL ERRORS IN REASONING

The list of errors in reasoning identified by the cognitive science research which go beyond those typically identified by Informal Logic is too lengthy to detail here. We shall, instead, focus on one of the most striking discoveries by Kahneman and Tversky, the phenomenon of *anchoring* — the influence of irrelevant initial information when estimating a value or making a judgment. In the standard research example, subjects are given a random number, a number which they know is random, and then asked questions such as how many of the states in the UN are from Africa. Those given a larger number guess a relatively larger number of African states and those given a smaller number estimate a smaller number of states. We all recognize that when negotiating, it is common practice for the seller to price her object high and for the buyer to try and low ball. But these strategies, while they may be exploiting the phenomena of anchoring, also introduce relevant considerations. They give us some idea what price the seller or buyer is seeking. What is striking about the phenomenon of anchoring is that the anchoring numbers are known to the subjects to be irrelevant. This might seem to be just a quirky curious fact about human psychology, but a number of studies have demonstrated that it is a phenomenon with profound social implications.

In one study, for example, German researchers examining the effects of anchors on judicial decision-making were able to show

that even trained judges knowing that the information they were given was irrelevant were still influenced in their decision-making in a manner similar to the naïve subjects described above. The researchers ran a number of different experiments providing the judges with information of varying degrees of relevance. In one example, participants were presented with a realistic case description of an alleged rape and were told that during a court recess they received a telephone call from a journalist who asked "Do you think that the sentence for the defendant in this case will be higher or lower than 1 (or 3) years?" Subsequently, they were asked for their own decision and also asked how certain they felt about the decision. Participants who had been exposed to the high anchor chose a considerably higher sentences (mean 33 months, standard deviation of 9.6) compared to those with the low anchor (mean 25 months, standard deviation 10) and participants generally felt fairly certain about the decision. Other experiments have yielded similar, troubling results (Englich 2006).

5. ENHANCING CRITICAL THINKING INSTRUCTION

In what ways might this research inform and help to enhance critical thinking instruction? Cognitive psychological accounts suggest that noticing that we are succumbing to the influence of a cognitive bias is actually quite difficult. As Kahneman suggests, "The best we can do is … learn to recognize situations in which mistakes are likely and try harder to avoid significant mistakes when the stakes are high" (Kahneman 2011, p.28).

Recognizing certain inferences as errors is certainly a sine qua non for avoiding such mistakes, and critical thinking pedagogy has focused effectively on this task. It is not sufficient, however. The cognitive bias research has demonstrated just how strong and ubiquitous are these tendencies. Thus we would argue that helping students to see the naturalness and allure of cognitive biases would be important for helping them to resist their pull. In particular, we have argued for the need to teach students to iden-

tify fallacies not only in terms of the errors they commit but also in terms of their persuasive power.[5]

One of the most important points to emerge from the cognitive bias literature with implications for pedagogy is the necessity to put the brakes on our tendency to rush to inference under certain circumstances. Dealing with complex mental challenges and drawing complex inferences require the kind of deliberate, controlled, and effortful thinking characteristic of System 2 or *slow thinking*. Thus what is required when trying to make a judgment is a conscious attempt to make our thinking more deliberate. Strategies such as following a procedure or a set of guiding questions (Bailin and Battersby 2016, pp.26-36) and consciously monitoring our thinking process (Bailin and Battersby 2016, pp.274-275) are essential aspects of rational decision making.

In addition, it is possible to institute strategies to counter the effects of some of these quick inferential tendencies. The tendency to make confident judgments on the basis of limited evidence seems to be particularly strong and one manifestation of this tendency is the failure to look at both sides of an issue or to seek alternatives (sometimes called "my side bias" by cognitive psychologists). The common habit of philosophers of seeking counterexamples to any claim is a crucial antidote for this tendency. The strategy of actively seeking out counter evidence to one's views, looking for and seriously considering the arguments on various sides of an issue, and deliberately considering alternative positions when making a judgment can go a long way toward countering this tendency of rushing to judgment. The development of the habit of considering counterexamples and alternatives is a crucial aspect of critical thinking instruction and is necessary in order to frustrate the natural tendency to leap to conclusions.

The cognitive bias research has also served to highlight the power of the framing effect – the tendency to draw different

5. See note #4.

conclusions from the same information depending on how that information is presented (for example, people are more likely to accept a risk if they are told that there is a 10% chance of winning rather than a 90% chance of loosing). Deliberately attempting to reframe or change the way one views a situation may be helpful in countering this tendency. For example, one can attempt to view marijuana use as a harm issue rather than as a crime issue and see what effect this has on one's judgment about the legalization of marijuana. The question then becomes: how do the harms resulting from illegality compare to any reasonably anticipated harms to health? When engaging in argumentation, one can try to view the enterprise in terms of making the best judgment rather than in terms of winning or losing. And trying to identify with being reasonable rather than with a particular view can be a helpful strategy for developing open-mindedness and fair-mindedness in inquiry (Bailin and Battersby 2016, p.274).

The bias of overconfidence – the tendency to have more confidence in one's judgment than is warranted by the weight of evidence – is another common cognitive bias which may be somewhat mitigated through deliberate efforts. The strategies outlined above for promoting an examination of the full range of arguments on all sides of an issue is necessary in order to make a judgment with the appropriate degree of confidence, as is making students aware of the need to give explicit consideration to how much weight various arguments carry in making an overall judgment (Battersby and Bailin 2011, pp.152-157; Bailin and Battersby 2016, pp.239-244).

An important concept which runs through the cognitive bias literature is that of mental effort. *Fast Thinking* is quick and easy, virtually effortless, but slower, more deliberate thinking requires more mental effort. Kahneman and others have suggested that our minds have a tendency to go for the easier route much of the time (Kahneman 2010, pp.39-49). For example, the research has shown repeatedly that people have a strong tendency to see an erroneous answer to a simple math problem as correct or

an invalid syllogism as valid when the conclusion is believable (the belief bias error) (Evans 2008). The intuitive answer suggests itself immediately and people generally do not bother to check the reasoning. These are cases when the reasoning could be checked without too much difficulty. Nonetheless overriding the intuitive response requires some mental work, and most people do not appear to be initially inclined to put in this effort.

An important idea for our pedagogical purposes is Kahneman's argument that this failure is due at least in part to insufficient motivation (2010, p.46). Indeed, the fact that many people willingly put considerable mental effort into certain activities (e.g., Sudoku) when they find them interesting and engaging suggests that a task can elicit mental energy when it is seen as being worth the effort. Thus one of our challenges as educators is to help students to see thinking critically as being worth the mental effort.[6]

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6. We have further explored the issue of bias and pedagogical strategies for addressing bias in subsequent work. We have argued that the confrontation of conflicting views inherent in our inquiry approach (and in particular the use of the dialogical arguments table) can help mitigate confirmation bias (Bailin and Battersby 2016, 2018) as can group deliberation involving the confrontation of diverse views (Bailin and Battersby 2018; Battersby and Bailin 2017). Battersby's paper "Enhancing Rationality: Heuristics, Biases, and the Critical Thinking Project" (in this volume) criticizes how the term "bias" is used by behavioural economists in relation to economic decision-making, arguing that it is based on an ideological notion of rationality as purely instrumental and self-interested. Thus these alleged biases should not be included in critical thinking instruction.

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CHAPTER 12

DAMED IF YOU DO; DAMED IF YOU DON'T: COHEN'S "MISSED OPPORTUNITIES"

Sharon Bailin and Mark Battersby

1. INTRODUCTION

In his paper, "Missed Opportunities in Argument Evaluation," Cohen (2015) has in his sights a "curious" asymmetry in how we evaluate arguments: while we criticize arguments for failing to point out obvious objections to the proposed line of reasoning, we do not consider it critically culpable to fail to take into account arguments for the position. Cohen views this omission as a missed opportunity, for which he lays the blame largely at the metaphorical feet of the "Dominant Adversarial Model" of argumentation – the DAM account. We argue here that while Cohen criticizes the DAM account for conceptualizing arguments as essentially agonistic, he accepts its basic framing and does not follow his critique where it leads. In so doing, he misses the opportunity to develop an alternative, non-adversarial account of argumentation which would avoid his criticism of how we evaluate arguments.

2. MISSED OPPORTUNITY

Let us exam in more detail the conundrum that motivates Cohen's paper. His focus is the kinds of argumentative moves which are problematic and for which proponents of argu-

ments can and should be held accountable. Among these is the failure to address relevant objections to one's argument. In such cases, it is part of the mandate of the opponent to the argument to point out such an omission, and failure to do so means being remiss in his or her dialectical obligation.

Cohen notes, however, that missing relevant arguments in support of one's position is equally problematic as it lessens the potential strength of the argument, yet we do not hold arguers accountable for such omissions. Pointing out this failure is not part of the mandate of the opponent of the argument, and indeed is in tension with this mandate. Nor is it the responsibility of the other, non-direct participants such as evaluators, judges, or audience, as they are to remain neutral with respect to the actual argumentative exchange.

Cohen summarizes the problem thus:

> On the one hand, it is taken as fair game to point out obvious objections to a line of reasoning that have not been anticipated. Arguments that fail to do this are not as strong as they could be and should be. Elementary critical thinking textbooks and advanced argumentation theorists all agree that the failure to criticize an argument for failing to take relevant and available negative information into account would be critically culpable. Of course, arguments that fail to take relevant and available *positive* information into account are also not as strong as they could be and should be, but those same voices are curiously silent on this omission (Cohen 2015, p.121).

Cohen clearly believes that this situation is unfortunate, that it would enhance the quality of the argumentation if this omission were pointed out, and that the absence of this type of positive, constructive critical engagement is a missed opportunity.

3. DAM

One of the main sources of this asymmetry is, according to Cohen, the Dominant Adversarial Model of argumentation (henceforth know as DAM). DAM frames argumentation as

essentially an adversarial enterprise in which arguers are opponents or enemies in a battle to win. Offering arguments supportive of an opponent's position would then be ruled out as tantamount to "giving aid and comfort to the enemy." Moreover, the required neutrality of those participants not directly involved in the "battle" (such as judges and audience members) eliminates them as a possible source for this type of helpful criticism. Thus there is no one in a position to point out missed opportunities.

4. ADVERSARIALITY

In advancing his critique of DAM, Cohen adds his voice to those of a substantial number of theorists who have decried the dominance of battle metaphors in argumentation and the framing of argumentation as essentially agnostic (Lakoff and Johnson 1980, Blair 1987, Moulton 1989, Ayim 1991, Bailin 1992, Cohen 1995, Govier 1999, Rooney 2010, Hundleby 2013). This type of adversarial stance prizes winning over reasoned judgment and undermines co-operation, open-mindedness, and a willingness to concede to the strongest reasons. Hundleby, in her analysis of Govier's view of adversariality, makes the point thus:

> Adversarial and aggressive metaphors can foster interpersonal aggression, encouraging people to slide into arguing against each other when they disagree rather than just questioning each other's ideas. Adversarial structures in law, politics, and debate, and the personal stake we often have in our own views heighten the likelihood that opposing opinions will slip into aggressive modes that interfere with rational exchange (Hundleby, p.240).

Cohen further maintains that these metaphors can interfere with our rational goals since they tend to presuppose that:

> the subject at hand can be carved into distinct and opposing positions, and this tends to squeeze the discussion of even the most complex questions into a black-and-white view of the world (Cohen 1995, pp.180-181).

It has been argued, by Govier (1999) among others (e.g., Hundleby, Mouffe, Rooney), that some degree of adversariality is necessary in debates over controversial issues since controversy, by its nature, involves the confrontation of opposing views:

> It would appear that in any controversy there must be proponents and opponents of various views. Insofar as we are engaged in a controversy, we will be arguing with others who disagree with us and are, in that sense at least, our opponents or antagonists (p.247).

And further:

> The existence of controversy is a healthy thing in many contexts, and if controversy implies a degree of adversariality, then perhaps some modest adversariality is acceptable in the interests of critical thinking and lively debate (p.51).

The type of adversariality supported by Govier is what she calls minimal adversariality:

> I would submit that argument is not *necessarily* confrontational, and that adversariality can be kept to a logical, and polite, minimum… I am concerned to show that argument may embrace the positive goals of persuasion and justification without necessitating adversariality in any negative sense (p.55).

It is clear that the type of adversariality which Govier supports is not that suggested by the argument-as-battle metaphors nor the winning-at-all costs view of argumentation, of which she is highly critical. To the extent that her argument is referring to adversariality in the sense of the confrontation of opposing views, we would tend to agree: getting the strongest arguments on various sides of an issue on the table for consideration is crucial for the comparative evaluation of arguments about controversial issues.

Adversariality for Govier seems to go beyond the confronta-

tion of opposing views, however, to encompass a confrontation between arguers:

> When we argue for a claim, we at the same time, and necessarily, argue against an envisioned opponent, one who does not accept the claim (p.243).

Her characterization of an adversarial practice as one in which "people occupy roles which set them against each other, as adversaries or opponents" (p.242) seems to confirm this, as does her reference in the quote above to those who disagree with us as opponents or antagonists.

This slide from "arguing *for* claims" to "arguing *against* people who disagree with those claims" is, we would argue, problematic (as Govier herself seems, in places, to acknowledge).[1] Moreover, viewing the person holding the opposing position as one's opponent introduces an unnecessary and unhelpful element of adversariality (Rooney, p.221). As Rooney states:

> [W]hy are you my "opponent" if you are providing me with further or alternative considerations in regard to X . . . whether I end up agreeing with X or not-X? (p.221)

Govier herself, in fact, recognizes the difficulty inherent in this oppositional terminology:

> If we accept that there is a positive value in controversy . . . then what reason is there to regard those who participate with us in controversy as opponents or antagonists with whom we are in conflict? Given all the positive aspects of controversy, there is an important sense in which such people are helping us by disagreeing with us. Thus we might wish to regard them as partners, not opponents (p.254).

Argumentation involves the confrontation of ideas with the goal of reaching the best justified position but this need not and indeed should not be viewed in terms of a conflict between

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1. "We can argue for a claim without arguing against a person – even in contexts where we are addressing our arguments to other persons with whom we deeply disagree" (Govier, p.64).

individuals. Arguers may come to an argument with various initial intentions including, but not limited to, wanting to persuade their interlocutor of a different view. But so long as they are open to seriously considering alternative arguments, and willing to follow the reasoning where it leads and to alter their own position accordingly, they are involved in a joint endeavour and are not opponents (Bailin and Battersby 2009, 2016).

5. THE DAM DILEMMA

The critique of the DAM account is at the heart of Cohen's argument, but in our view, it does not go far enough. The conundrum which motivates the paper is, we would argue, a consequence of this failure to follow the critique where it leads. On the one hand, Cohen argues that argumentation should not be viewed as adversarial, that interlocutors should be seen as colleagues or partners in argumentation rather than as opponents and enemies, and that arguers should help each other by pointing out missed opportunities. On the other hand, he accepts the language and assumptions of the DAM account, that is, he frames the issue in terms of proponents and opponents (and "supporting cast"). The problem is that opponents are not supposed to help each other (nor are the supporting cast supposed to help the main players). Cohen is not happy with this situation and is trying to find a way to interpret the roles in such a way as to allow for such help. Nonetheless, the language of "proponents" and "opponents" presupposes adversariality:

> When we talk about opponents, about adopting and defending positions, scoring points, or, simply, winning and losing arguments, it is difficult to know how we might articulate the things we mean by these phrases without using these warring and related sports metaphors (Rooney, p.211).

We might imagine a parallel conundrum to Cohen's with respect to a child's cooperative game. In this type of game,

players do not compete with each other but instead must work together to overcome some common obstacle. Thus, one might say that the opponents in this game should not view the other players as adversaries, which means that they should work together and help each other. But helping each other is antithetical to the role of opponents, so we have a problem.

Clearly, in this context, it makes no sense to speak in terms of opponents the way one might in a traditional competitive game. The language of opposition only makes sense in a context where winning is the goal, that is, in an adversarial context.

6. THE PROBLEM WITH ROLES

One of the main reasons for Cohen's acceptance of the DAM language is his commitment to the notion of roles in argumentation. The puzzle regarding missed opportunities is predicated upon arguers having defined roles in argumentation which generate particular duties and expectations. Cohen explains it thus:

> What emerges, then, is a more or less natural division of labor and division of expectations for the participants in arguments:
>
> - *Proponents* are expected to find good reasons for their positions, so they can be criticized when they do not.
>
> - *Opponents* are not expected to point those reasons out for the proponents when they don't present such reasons, so they cannot be criticized for remaining silent.
>
>   …
>
> - *Critics* are expected to note missed opportunities, so they should be open to criticism for their silence on that score [although Cohen further notes that the expectations of impartiality and non-interference preclude them from taking on this responsibility].
>
> - *Judges*, *juries*, and *audiences* do have critical roles, so they can be expected to take note of missed opportunities, but they are

not expected to point them out and, in many cases, expected to remain neutral, i.e., not to interfere and to refrain from pointing them out (Cohen 2015, p.125).

This neat division into roles is problematic, however, as Cohen himself acknowledges. Roles are fluid and often overlap in practice, thus making it difficult to separate them:

We may start out in the proponent's primary logical task of arguing for a position but then find ourselves in the subsidiary, dialectical task of *defending* it against objections or *revising* it in light of those objections, and then we might end up as an opponent arguing *against* a contrary position. Similarly, objecting to a pro-argument, another opposition role, presupposes argument evaluation, a critic's activity. As van Radziewsky 2013 notes, the transitions are continual, effortless, and seamless (Cohen 2015, p.124).

This fluidity of roles is, he argues, a source of contradictory expectations on arguers; for example, critics can be expected to note missed opportunities but are also expected to be impartial and thus should not point them out.

Given the fluidity of roles, the impossibility of separating them, and the paradoxes generated by the resulting conflicting role expectations, one might wonder about the utility of the concept of roles in thinking about argumentation. The situations in which the concept is most applicable are those that are formally structured as adversarial and involve clearly defined roles, for example the courtroom or a formal debate. Even in such cases, however, the participants need to perform a number of different dialectical tasks in fulfilling their roles, e.g., a defense attorney will propose alternative arguments; a prosecuting attorney will need to defend his arguments against objections; a supreme court judge may question apparent problems or weaknesses in lawyers' arguments. Moreover, the arguments offered by Cohen and others (including ourselves) suggest that such formally structured cases are not paradigmatic of argumentation. The concept of role would seem to

have little applicability, as least with respect to identifying expectations for particular arguers in other contexts.

Nonetheless, Cohen is intent on defending the existence of distinct roles, claiming that, although they are intertwined in practice, they are conceptually distinguishable in theory and useful in analyzing arguments. The concept of role is ambiguous, however. It can refer to a particular individual performing a particular task, e.g., an opponent in an argument, whose role is to argue against a position and who has certain dialectical obligations with respect to this role. The argument to this point has, however, shown this notion of role to be problematic (with the exceptions noted above).

We might instead conceive of the various roles in argumentation in terms of aspects. There are various aspects to argumentation, various dialectical tasks involved in the practice, for example, coming up with an argument, finding objections, evaluating arguments, revising positions, generating alternative arguments, and so on. These tasks may be performed by, shared among, and even switched between various numbers or combinations of individuals. They may be performed by two individuals arguing different points of view, but they may equally be done by one person in an individual inquiry, by a group of individuals engaged in solving a problem, by presenters and commentators, and so on. It is important for successful argumentation that the various tasks be performed, but the division of labor is, we would argue, incidental. We agree that the concept of role in the sense of aspects can be useful in analyzing the tasks of argumentation, but it is generally not helpful as a way to categorize arguers, except in adversarial contexts.

We would also contest Cohen's claim that the notion of different roles is useful because the different roles have different goals, they require different skill-sets, and they follow different rules which generate different expectations (Cohen 2015, p.124). Although it is possible to make conceptual dis-

tinctions among aspects, for example, between constructing arguments and evaluating arguments, these aspects are intertwined and inseparable in practice. For example, constructing arguments integrally involves critical evaluation. Such constructions most often arise from the recognition of problems in other arguments, they involve building a coherent chain of reasoning conforming to the critical standards that guide evaluation, and they must take into account any logical vulnerabilities in the argument. Similarly, argument criticism involves constructive aspects such as the interpretation of arguments, supplying missing premises and unstated assumptions, coming up with counter-examples, constructing a cogent argument to support the critique, and revising one's argument in the light of objections and alternative arguments. Argument construction and evaluation are, thus, inseparable and intertwined aspects of the same process. Nor should the constructive and evaluative aspects be viewed as separate and distinct processes which take place sequentially. One does not simply generate arguments in an unconstrained, non-evaluative way and then choose among them using critical judgment. Rather, the arguments one comes up with are based on an evaluation of other arguments and involve critical judgments in their construction. Thus one evaluates in the process of constructing. Similarly, the various constructive aspects of evaluation described above mean that one constructs in the process of evaluation. Perhaps a less ambiguous way to frame Cohen's insight that the argumentative enterprise involves going in and out of various roles is to conceive of it in terms of performing various interrelated dialectical tasks (Bailin 2003).

7.   EPISTEMOLOGICAL   VERSUS   DIALECTICAL CONCEPTIONS

At the heart of the conundrum with which Cohen is struggling is, we believe, a deeper tension between two different perspectives on argumentation, dialectical and epistemologi-

cal. On the one hand, Cohen's discussion of roles is grounded in a dialectical perspective on argumentation which focuses on argumentation as a social practice. Argumentation takes place in a variety of contexts and is structured in various ways in practice. There are formally structured contexts such as traditionally structured debates and argumentation in a courtroom, in which there is a clear division of labour with respect to the argumentative tasks and clear expectations of those who play the various roles. These are contexts in which there are formally declared winners and losers, and which are thus inherently adversarial. But there are many other ways in which argumentation is conducted in practice including an individual trying to persuade another of his or her position (in a discussion, a speech, an editorial, letter to the editor, or blog, etc.), an individual deliberating about an issue, several people inquiring together in a collaborative group, and individuals with differing views trying to come to an agreed-upon judgment.

But there is also another perspective on argumentation at play here, implicit, and at times explicit, in Cohen's argument, that is an epistemological perspective. The focus here is on the overarching goals of argumentation. Regardless of how argumentation may be structured in different contexts, the underlying goal is seen as an epistemological one. There are variations in how this goal is cashed out by different theorists — to yield knowledge or reasonable belief (Biro and Siegel 1997, 2006), to lead to rationally justified belief (Lumer 2005), to come to a reasoned judgment (Bailin and Battersby 2009, 2016), the bettering of our belief systems (van Radziewsky 2013) — but all are versions of epistemic goals.

Cohen (2014) explicitly cites an epistemic goal for argumentation, "the bettering of our cognitive systems." He further claims, in the paper under discussion, that even if one "loses" an argument, it can be a good argument if one has made cognitive gains. And his dissatisfaction with the problem of missed

opportunities seems to stem from the belief that positive, productive critical engagement is desirable epistemologically.

In our view, the problem which troubles Cohen is rooted in a tension between these two perspectives. On the one hand, the epistemological goal for argumentation which he proposes — the bettering of our cognitive systems — necessitates that arguers are colleagues and partners in the enterprise. On the other hand, the dialectical roles of arguers, which are grounded in an adversarial paradigm, preclude such a constructive critical partnership.

8. A NON-ADVERSARIAL ACCOUNT

In our view, the resolution to this tension lies in accepting the epistemological perspective as fundamental and viewing argumentation in its various dialectical instantiations as instances of trying to "better our cognitive systems" (or what we have called inquiry) (Bailin and Battersby 2009, 2016).

It is true that arguers may have various intentions when they begin, from the genuine desire to resolve a puzzlement or dispute to the wish to persuade their interlocutor without any intention to co-operate. We would argue, however, that such intentions are irrelevant epistemologically. Van Radziwesky (2013) makes a distinction that is helpful in this regard:

> [T]he goal someone might have while arguing is not the same as the good or goal of argumentation as a whole: One is the good that the arguer expects for himself in one instance of argumentation, the other is what we expect from argumentation as a phenomenon altogether (p.3).

The goal of argumentation is to better our cognitive systems, or in our terms, to inquire in order to reach a reasoned judgment. Even in cases of rational persuasion, there is an epistemological obligation on arguers to inquire into the issue under discussion before trying to persuade someone else of a position, as "only then have you satisfied yourself (at least)

about the strength of the grounds for its correctness" (Blair 2012, p.78). In addition, the various normative constraints on arguers in conducting rational arguments (e.g., van Eemeren and Grootendorst 1983), for example a willingness to modify one's position if the arguments warrant or to concede to the strongest argument, require that claims be put to the test of reason and that those which are to be accepted are the ones which have the strongest warrant. Thus, whatever the initial intentions of the participants, provided that they are willing to abide by the rules of rational argument, the epistemological structure of the enterprise necessitates inquiry (Bailin 1992, Bailin and Battersby 2009).

There are, however, contexts in which it is possible to win arguments, or lose them. Obvious examples are courtroom argumentation (in the Anglo-American system) and formal debates. Both these contexts are structured in an adversarial manner with "proponents" and "opponents" and there are formally recognized winners and losers (this is the prototypic case of the DAM model). In the courtroom case, however, there is a judge or jury who is charged with making a judgment, and although winning is the goal of the particular proponents and opponents, the goal of the enterprise as a whole is to come to a reasoned and just decision. In the case of formal debates, the primary goal is to win. The possibility for epistemic gains is minimal as there is a forced choice between opposing positions with no allowance for the recognition and possibly incorporation of the strongest aspects of each side.[2]

It might be argued that winning and losing are also possible in cases of rational persuasion. In such cases, one of the arguers may win and the other lose in the sense of being suc-

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2. There are alternative forms of debate which are more conducive to inquiry, for example structured controversy, in which participants argue for both sides of a controversial issue and ultimately come up with a balanced view, and U-shaped debates in which participants are encouraged to physically change their position around a semicircle as they hear reasons from their peers that cause them to want to shift their view on the issue under discussion (see Bailin and Battersby 2015).

cessful or unsuccessful at persuading (Aberdein 2015). The first point to note, however, is that defeating someone in an argument may silence them, but it does not necessarily persuade them. But even in cases when the interlocutor or audience is persuaded (or not), these are not really cases of winning (or losing) when viewed from an epistemological perspective. Aberdein's distinction between real and mere winners and losers is helpful in this regard:

> [T]here are two sorts of loser: *real* losers, who lose the argument deservedly, because they are in the wrong, and *mere* losers, who lose the argument undeservedly, because they are in the right. Hence there must also be two sorts of winner: *real* winners, who win the argument deservedly, because they are in the right, and *mere* winners, who win the argument undeservedly, because they are in the wrong (p.2).

Even if one does not accept Aberdein's framing of the issue in terms of arguers being right and wrong and instead talks of arguers being rightly or wrongly persuaded, his distinction is still useful. In the case of mere winners, that is, when the audience is wrongly persuaded (unjustifiably persuaded), no one is a winner epistemologically. In the case of real winners, that is, when the audience is rightly, or justifiably persuaded, everyone is a winner epistemologically in that all participants have undergone an improvement to their cognitive systems, including those who have changed their minds. Rooney makes this point with respect to cases in which one comes to accept the interlocutor's position:

> [W]e are now very close to an additional step . . . which involves a claim we also readily make in the event that, after our exchange of evidence and reasoning, I end up agreeing with your not-X. I lose the argument and you win . . . But surely I am the one who has made the epistemic gain, however small. I have replaced a probably false belief with a probably true one, and you have made no such gain (though, of course, you might claim some

achievement and satisfaction in helping me to my epistemic gain) (Rooney, pp.121-122).

Johnson makes a similar point:

[O]ne reason argumentation is such a powerful practice is that if each party does its very best, then both sides will gain as a result of the process (Johnson, p.243).

The epistemological perspective also makes sense of Cohen's observation that arguers can walk away from an argument having had their positions changed, either by winning or losing or listening and learning, and declare it a good argument on that account (p.129).

Much of the discussion regarding adversariality takes as its context two person persuasive argumentation. This is a context in which the framing in terms of winning and losing is most plausible. The collegial nature of argumentation can be seen more clearly with respect to cases of group deliberation, where the goal of the group is to come up with the best decision, and where the participants have a clear individual and as well as collective interest in making the best judgment.

9. MISSED OPPORTUNITY AS A FAILURE OF JUDGMENT

From an epistemological perspective, the argumentation project is a collective one: arriving at better justified judgments. Thus, regardless of the division of labour in particular argumentative interactions, arguers are essentially "colleagues and partners" in the project. If argumentation is viewed in this way, the problem Cohen envisages is no longer problematic as the offering of arguments both for and against a position is an integral aspect of the enterprise.

It is important, from an epistemological perspective, that the various dialectical tasks be covered but the responsibility for covering them can be seen to be a collective one. They may be covered in various ways by various participants, and in some contexts, particular individuals may take on particular

tasks. In group deliberation, for example, it may be useful to have a participant play the role of devil's advocate to discourage groupthink or deferral to the implicit group hierarchy and to ensure that alternative arguments are given due consideration. Although this may appear to be a case of adversariality, it is really the ideas which are in confrontation. And any arguer is in a position to offer such criticisms and objections as well as to propose arguments, offer supporting arguments, revise arguments, and so on. The process of inquiry can be considered faulty if any of the aspects are omitted, including the offering of additional arguments in support of one position or another. We have referred to the failure to undertake a comprehensive examination of the various competing arguments as a failure of judgment:

> Since reaching a reasoned judgment involves a comparative evaluation of the various reasons and arguments on an issue, the failure to take into account any of the significant arguments on the issue constitutes a serious defect in a case (Bailin and Battersby 2016, p.245).

10. OVERCOMING OBSTACLES TO CRITICAL INQUIRY

In the end, Cohen tries to resolve his conundrum by observing that one of the roles all arguers must play, regardless of whatever other roles they have, is that of argument evaluator, and that, as such, they all have the obligation to recognize missed opportunities. He further points out, however, that there are significant obstacles for arguers to overcome in order to do this, obstacles largely created by the DAM account and stemming from the different argumentative roles. For proponents, the primary obstacle is the difficulty of acknowledging, and even spotting weaknesses in one's own arguments; for critics, the obstacle is their required stance of neutrality and non-interference; for opponents, the obstacle is the injunction against helping one's adversary.

Although we are not in agreement with Cohen's construal of

the issue in terms of roles, we do agree that there are obstacles to be overcome in arriving at reasoned judgments (Bailin and Battersby 2016). We also agree that the DAM account is a part of the problem.[3] But we would argue that at least part of the solution lies in a more complete rejection of the language and assumptions of adversariality. Framing the argumentative project in terms of proponents and opponents, however these roles are construed, likely reinforces the tendency for arguers to see the project as, on the one hand, making a case for positions they already hold and defending them against any proffered objections, and on the other, finding faults in arguments with which they disagree and ignoring any points in their favour. This framing works against fostering the habits of mind or virtues of argumentation.[4] With this construal of the project, promoting positive and constructive critical engagement is an uphill battle. If, however, we frame the argumentative project as inquiry, then considering all sides of an issue in a fair-minded way is integral to the enterprise and positive, constructive critical engagement is the name of the game for all arguers. With this construal of the project, habits of mind or virtues such as open-mindedness, fair-mindedness, and a willingness to follow an argument where it leads can be seen as embedded in the practice and required by its epistemic goals (Bailin and Battersby 2015). Thus, for example, someone exhibiting the virtues of inquiry evaluates opposing views in a fair and open-minded manner because she understands that such a weighing is what is called for in order to reach a reasoned judgment (Bailin and Battersby 2009, 2015).

11. CONCLUSION

The critique which Cohen offers of the DAM account and

3. For an account of a number of other obstacles to inquiry, as well as strategies for overcoming them, see Bailin and Battersby 2016, pp.267–276.

4. For an account of argumentative virtues, see Aberdein 2010, Bailin and Battersby 2015, Cohen 2013.

its adversarial construal of argumentation is right on track. By focusing on the conundrum of missed opportunities, he elucidates one way in which such an account works against a more adequate, collegial conception of argumentation. We have argued, however, that his critique does not go far enough. The framing of the issue and of his attempt at resolution in terms of proponents and opponents makes the adversarial assumptions built into the DAM language unavoidable. Elucidating a collegial conception of argumentation within this framing is a task fraught with contradictions. What is required, instead, is a truly alternative, non-adversarial account based on the epistemological underpinnings of argumentation.

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V. APPLICATION OF THE APPROACH

CHAPTER 13

BEYOND THE BOUNDARIES: THE EPISTEMOLOGICAL SIGNIFICANCE OF DIFFERING CULTURAL PERSPECTIVES

Sharon Bailin and Mark Battersby

1. INTRODUCTION

The question which motivated this paper arose initially in the context of another paper by one of the authors (Bailin 2006). To supplement her previous analytic work on creativity, she had begun to investigate arts practices and conceptions of artistic creation in non-Western contexts. The paper in question explored the issue of the epistemological benefit of such cross-cultural investigation, and argued for the value of investigating alternative perspectives from other cultures for improving our beliefs and practices.

Although the paper made a general claim regarding the benefits of such investigation, the issue was explored largely in the contexts of the arts and of questions regarding ways of life. One of the questions which remained unanswered and which is the major focus of this paper is how far this claim can be extended. Is there a general epistemological duty to take into consideration alternative perspectives from other cultures in all our own deliberations? Are views that are held without exposure to alternatives from other cultures less credible than those that have undergone such exposure?

2. GENERAL BENEFIT OF CONSIDERING ALTERNATIVES

Johnson (2000, 2003, 2007), Missimer (1994) and others have argued that an essential part of critical thinking is the consideration of alternative views — what Johnson calls the "dialectical tier." This aspect of critical thinking involves the appropriate consideration of alternative positions when developing and articulating one's own view or theory. In areas of controversy this is obviously of great significance. By definition, arguments in areas of controversy involve claims and arguments on both (or many) sides of a question. That is what controversy is. It is also obvious that coming to a reasonable position in a controversial context must involve the weighing (assessment) of various positions and evidence on all sides. Identifying the weakness of opposing arguments may be as important a source of support for one's position as articulating the strengths of supporting arguments. Consider, for example, argument against capital punishment. Not only can one object to the barbarity involved in such punishment, or the inevitable injustices that will result when an innocent person is put to death. One can also question the inconsistency of the appeal to the "eye for an eye" principle that is often used to justify capital punishment but not for example, in assault.[1]

Whether disputes are ethical or factual, the range of alternative arguments that are considered tends to be established historically. From capital punishment to the Big Bang, what count as alternative theories and positions is determined by the history of the debate (e.g., big bang vs. steady state) within the Western ethical or scientific traditions. Disciplinary fields also serve to delimit the range of considerations relevant to a disputed claim. The tradition of beginning scholarly work with a "review of the literature" acknowledges the role that

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1. One of the authors cites the example of the paper by Jerome Cornfield "Smoking and Lung Cancer: Recent Evidence and a Discussion of Some Questions" which basically turned around the debate over whether smoking caused cancer. It was primarily directed at refuting the views of those who opposed the claim that smoking caused cancer (Battersby 2007).

consideration of alternative views plays in reflective discourse. But such a review is usually limited to the literature designated by the disciple as relevant. Such a limited review can leave out crucial information and insights from other relevant disciplines. Typically, economists review only economic literature and psychologist review only psychological literature despite the obvious relevance of psychology to much economic theorizing — a point that is slowing being acknowledged in economics with the emergence of behavioural economics (Camerer 1996).

It would seem a fundamental principle of rational reflection that, ceteris paribus, positions developed and grounded in a broader knowledge of a problem area are stronger than those that are narrowly limited. While such a principle seems almost platitudinous, it obscures a deeply complex problem: determining the boundaries of reasonable consideration.

While the relevance of psychology to economics may seem obvious, the relevance of other historical and cultural perspectives may seem less so. For example, the strange claim that sunspot activity influences the stock market (because of its correlation with stock market activity) seems plainly not worthy of consideration.[2] In this paper we explore the role that broader cultural boundaries should play in delimiting the consideration of alternative points of view. Historically, ethnocentrism and the confidence resulting from the success of Western science have led, implicitly and explicitly, to the boundaries of investigation being set at the boundaries of Western civilization, and frequently at the boundaries of current research within local disciplinary traditions. While such a

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2. In 1843, the amateur astronomer Heinrich Schwabe found that sunspots come and go in a predictable 11-year cycle. Ever since that announcement, many have tried to correlate the Sun's cycle with all sorts of events on Earth - some have even believed the Sun influences the stock market! Although there is no evidence that solar activity affects economic trends, by predicting what the Sun will do in the future we can better prepare for the many other impacts solar activity has for life on Earth. http://science.nasa.gov/newhome/headlines/ast22jul99_1.htm accessed Feb. 9, 2007.

limit has practical advantages for scholarly research, it would not appear to have epistemic justification.

3. ARGUMENTS FOR CONSIDERING ALTERNATIVES FROM OTHER CULTURES

Various cultures have developed sophisticated systems of belief and elaborate practices in their interactions with the world, and it would be ethnocentric arrogance to assume that none of these has any value and that all knowledge and wisdom resides in one's own culture. As Wong points out: "When facing hard problems it is simply a good strategy to consider a wide range of enduring, respected ideas bearing on those problems" (Wong 2005, p.12). And surely other cultures are an important source of "enduring, respected ideas." Thus there may be something to be learned by looking at the kinds of theoretical and practical ideas which have been developed by those in other cultures in order to understand the world and deal with human problems.

There appears, then, to be at least a *prima facie* presumption in favour of considering beliefs and practices from other cultures in one's deliberations. It is important to be clear, however, that this point is in no way an endorsement of relativism. We are not arguing that all the views of other cultures are equally acceptable and should be given equal weight. We are arguing, rather, that if we view different cultures' beliefs and practices as alternative responses to understanding the world and alternative solutions to human problems, then this provides a reason for taking them into consideration as possible sources of knowledge. In this regard, Taylor (1994) recommends as a starting hypothesis with which to approach other cultures, the presumption that "all human cultures that have animated whole societies over some considerable stretch of time have something important to say to all human beings" (p.66). He makes clear, however, that it is a starting presump-

tion only – "the validity of the claim still has to be demonstrated concretely in the actual study of the culture" (p.67).

4. INCOMMENSURABILITY OBJECTION

Before examining in more detail the possible benefits, and appropriate limits, of such cross-cultural investigation, it is necessary to deal with a possible objection regarding the feasibility, indeed the very possibility of the entire enterprise. The essence of this objection is that cultures are incommensurable, i.e., that there are radical differences in basic concepts and modes of inquiry between cultural traditions, and thus there is no possibility of understanding or meaningful comparison and interaction between cultural frameworks. The claim of incommensurability is made with respect to both understanding and standards.

In response to this objection, we would simply echo the views of the many theorists who argue that the radical incommensurability thesis is untenable. First, the very idea of unintelligibility and incommensurability between cultures has been successfully challenged by Davidson (1974) and Putnam (1981), among others, in their critiques of the idea of a conceptual scheme and of untranslatability. What is more, incommensurability presupposes that cultures are distinct, unified, self-contained, unchanging, and mutually exclusive. A closer look at the nature of cultures reveals, however, that they are, on the contrary, fragmented, have indefinite boundaries, and have a history of interaction and change (Appiah 2006; Bailin 2006; Benhabib 2002; Waldron 2000). This observation, along with the fact of common human biology and common human problems (related to birth, death, disease, obtaining food, order, relationships, and education) render highly likely the existence of overlaps, parallels and commonalities among human experiences across diverse cultures which would provide grounds for understanding and comparison.

Such human commonalities also render probable at least

some commonalities and overlaps in standards of evaluation at some level (there will, for example, likely be some standards related to physical well-being, social well-being, effective functioning of the society, and success in interacting with the world), although differences may emerge at a more detailed level of analysis.[3] In addition, apparent incommensurabilities of standards may sometimes reflect differences of emphasis rather than radically different standards. One possibility for engaging in comparison when faced with such apparent differences of standards lies in moving to a higher level of analysis where commonalities become evident. Taylor (1994) follows Gadamer (1975) in referring to this process of dialogue or dialectic between frameworks as a "fusion of horizons". In the process, some of one's initial standards may be transformed. This is not, however, a matter of accepting contradictions nor of eschewing evaluation, but rather of learning "to move in a broader horizon." Each framework or horizon is necessarily always open to the possibility of critique and revision, as any fallibilist would agree.

An example of this process was evident in the recent interactions of one of the authors with builders in Italy. When their work was approached with our North American standard of efficiency, it failed dismally. It quickly became clear, however, that there are values which are placed well above efficiency – in particular aesthetics and sociability. Any work done must be beautiful, and considerations of time and cost pale in comparison. And the workday must include ample time to socialize with friends over a long lunch and to chat with clients and passers-by about the work, food, and life in general. Once our author managed to let go of her North American obsession with efficiency and time and to step back, she came to appreciate the priority of these other values and the role they can

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3. There is, for example, evidence that art objects in a vast array of cultures are valued for the skill of their execution, but what precisely constitutes such skilful execution varies from culture to culture (Anderson 2004).

play in a rich and satisfying life. She had good reasons not to completely abandon her valuing of efficiency, but she did come to see that there are efficiency/aesthetics and efficiency/sociability tradeoffs and that there may also be good reasons for her to relocate herself along those continua.

It is true that a cross-cultural comparison of views presents challenges of interpretation. It must be remembered, however, that interpretation is a necessary part of all evaluation, and that it is never an algorithmic process. There are particular pitfalls to avoid in interpreting the views of another culture, including errors of chauvinism and of romanticism, but the fact that there are errors to be avoided implies that there are also less erroneous ways to interpret (Nussbaum 1997).

5. EXAMPLES

We shall proceed now to explore some of the possible epistemic advantages of examining alternative perspectives from other cultures by detailing several examples where such examination seems to be of benefit. In a later section, we will endeavor to extract some general principles or considerations regarding to what extent and under what circumstances such a consideration is appropriate.

5.1. Alternative conceptions: Art

Conceptions constituting generalizations regarding human practices must encompass the entire range of practices that may fall within their purview. Finding practices which are not accurately captured by these generalizations will challenge these conceptions.

As an example, a typical conception of art in Western societies is in terms of disinterested contemplation – art is set apart from life and is made and appreciated for its own sake. In traditional societies, however, the kinds of objects and practices which we consider art are very much integrated into daily life, and everyone engages in some form of art-

making. Thus, investigating the arts practices of some traditional cultures might serve to reveal the limitations of a Western "aesthetic" conception of art by revealing that it does not have universal applicability. One response might be that the aesthetics conception captures what art really is, although people in some other cultural contexts may not (yet) appreciate this. What the latter really amount to, however, is the making of a claim about what art should be in the guise of describing what it is. Such a normative claim requires justification. If one insisted on maintaining disinterested contemplation as defining of art, then one would have to recognize that one's conception of art applies only in a contemporary Western context, and to maintain that the activities and artifacts of these other cultures which look to us like art-making and art objects could not constitute art. Alternatively one could alter one's conception of the nature of art. Looking at art phenomena cross culturally can cause one to look critically at one's prevailing conceptions, revealing unexamined normative claims, and possibly supplying grounds for revision of those conceptions, or least putting appropriate limitations on them.[4] It might also prompt us to look more seriously at the artistic practices of other cultures, for example seeing the value of the integration of art into various aspects of life, engaged in by a large segment of the population.

5.2. Alternative practices: Aboriginal justice

Holding our beliefs and practices up against those of other cultures may prompt reflection on deeply entrenched assumptions of our tradition and serve to demonstrate that there are other possibilities in situations where we had previ-

4. A more culturally inclusive conception of art is exemplified in Richard Anderson's wide-ranging cross-cultural study. He suggests the following as common characteristics of art across cultures: it embodies culturally significant meaning; it inspires an emotional reaction (but in very few cultures is it a "disinterested aesthetic response"), and it exhibits skill. He does point out, however, that how these characteristics are manifested varies greatly from culture to culture (Anderson 2004).

ously considered our own ways "neutral, necessary and natural." Such an awareness constitutes a crucial aspect of evaluation, as it provides the basis for comparison. This recognition may, in turn, help one "to distinguish, within their own tradition, what is parochial from what may be commended as a norm for others, what is arbitrary and unjustified from that which may be justified by reasoned argument" (Nussbaum 1997, p.32). What is more, the traditions may actually interact and enrich each other.

An example can be found within the realm of the criminal justice system. The North American system of courts, trials, judges and juries, and incarceration may seem to us to provide a reasonable (if imperfect) embodiment of the principles of justice and fairness through impartiality and due process. An alternative possibility is embodied, however, in native systems of justice which offer a non-judgmental environment for resolving cases of criminal behaviour. They operate through such means as healing circles which bring young offenders together with their guardian, victim and community members; mediation; family and group conferencing; circle sentencing; community work; and restitution. The aims are the healing of the offender and the repairing of the relationships among the victim, the offender, their families and the community. Looking seriously at native systems of justice may bring to the fore the assumptions embedded in our criminal justice system regarding justice as fairness, impartiality, retribution, deterrence, and the necessity of an adversarial structure, and offer an alternative for dealing with criminal behaviour based on a concept of restorative justice underpinned by values of healing, reconciliation and prevention. Such principles and practices, although developed specifically in the context of First Nations' cultural values and practices, embody ideas which may be worthy of consideration in dealing with criminal behaviour in the larger North American society, dealing with problems inherent in our current system by offering pos-

sibilities for crime reduction, rehabilitation, and strengthened communities. Whether such benefits do indeed accrue would need to be the subject of serious assessment, as would the possible problems regarding, for example, the fairness of treatment when there is no assurance of impartiality. Regardless of the results of such an assessment, our beliefs about how best to deal with criminal behaviour could not but be strengthened by this comparison.

5.3. Alternative theories and practices: Traditional Chinese medicine

5.3.1. Alternative empirical beliefs

The beliefs and practices of other cultures may be a source of new ideas about the world which have not been considered seriously because they do not fit into prevalent models of understanding. Beliefs from other cultures may come in the form of observational claims: that certain herbs cure certain illnesses or that acupuncture relieves pain, or in a more theoretical form, e.g., that illness can be explained by certain bodily processes being out of balance. Chinese medicine seems to provide both kinds of claims and is an interesting test case for assessing the epistemic value of considering non-normative views from other cultures.

Take the herbal remedies used by traditional Chinese medicine (TCM), as an example. If some of these herbs are proven, after testing, to have medical benefits, then a stock of new justified beliefs will be added to our repertoire. In addition, some of our beliefs about the appropriate origin of medical remedies may be challenged. There are a number of reasons for investigating at least some herbal remedies: 1) Many herbs have proven efficacious in the treatment of ailments and some have formed the basis for new drugs. 2) It seems reasonable to assume that societies which have survived over a considerable period of time have had some success in finding effi-

cacious treatments. 3) The possibility of their efficacy is not contradicted by our scientific theories; and 4) There are standards shared between the cultures which are the sources of the remedies and Western cultures as to what counts as success, i.e., improvement in health.

It might seem a straightforward matter to assess the truth of claims about herbal medicines, but it is not. Herbal remedies are usually a mixture of potentially active ingredients, and in TCM, it is the combination which is believed to engender the results. The approach of contemporary western medicine (CWM) to assessing the value of such treatments would, however, involve that isolation of one causal agent at a time to assess its efficacy. The categorization of disease necessary for such testing may also prove difficult either because certain symptomatic categories are different or because the practitioners of TCM are reluctant to lump together a variety of people with somewhat similar symptoms to create treatment and control groups. But as Thagard points out, with sufficient good intention some of the apparent epistemic incommensurability can probably be addressed (Thagard 2003, pp.14-21). Presumably both TCM and contemporary western medicine (CWM) have enough of a shared idea of human health and can agree when a particular treatment has achieved the goal of returning someone to health. If there is *prima facie* evidence for the efficacy of a treatment used by TCM (including anecdotal evidence which is, after all, much of what clinical observation consists of), it would seem reasonable to attempt to test such treatments. Of course life is short and funding for research limited, so some method is required to distinguish which of the "alternative" treatments are worthy of study.

Acupuncture is a striking example of a remedy developed by TCM which is being successfully tested by the assessment procedures of CWM. In the case of acupuncture, a consensus panel of NIH concluded that

…there is clear evidence that needle acupuncture is efficacious

for adult post-operative and chemotherapy nausea and vomiting and probably for the nausea of pregnancy. It also found some evidence of efficacy for postoperative dental pain, and suggestive but not conclusive evidence for pain relief in other conditions such as menstrual cramps. Since acupuncture has minimal adverse effects, the panel stated that acupuncture may be a reasonable option for a number of clinical conditions such as stroke rehabilitation and osteoarthritis (NIH 1997).

5.3.2. Alternative theoretical model: Traditional Chinese medicine

The case of acupuncture is similar to the herbal remedy case in that it adds new practical knowledge to our repertoire. There seems good reason to investigate its effects because of the sheer weight of anecdotal evidence attesting to its efficacy, because of the group survival argument cited above, and because of largely shared standards for success (e.g., pain relief, alleviation of symptoms). This case differs from many others in one significant respect, however. Its efficacy cannot be readily explained by our current scientific theories. This demonstrates some incompleteness in our theories and puts pressure on these theories to furnish an explanation. Thus looking seriously at acupuncture has the potential both to add to our practical knowledge and to test some of our theoretical assumptions. In particular, there is the question of whether the theory used by acupuncture practitioners is of any value in understanding how the human body works.

5.3.2.1. What is the theory of traditional Chinese medicine (TCM)?

Simplistically, the Chinese theory of medicine which provides the theoretical basis of acupuncture and various herbal remedies involves a balance between yin and yang. The theory of acupuncture has been usefully and clearly summarized in a paper by Thagard and Zhu (2003).

Diseases arise when there is disequilibrium of *yin* and *yang* inside the body. This principle is central to traditional Chi-

nese medicine, and its application dominates the diagnosis, treatment and explanation of diseases. For example, a patient's high fever, restlessness, a flushed face, dry lips and a rapid pulse are *yang* symptoms. The diagnosis will be a *yin* deficiency, or imbalance brought by an excess of *yang* over *yin*. Once the *yin–yang* character of a disease is assessed, treatment can restore the balance of *yin* and *yang*, for example by using *yin*-natured herbs to dampen and dissipate the internal heat and other *yang* symptoms. The imbalance of *yin* and *yang* can be caused by either exogenous factors, such as climate, traumatic injuries and parasites, or endogenous factors, such as extreme emotional changes (anger, melancholy, anxiety, and so on), abnormal diet, intemperance in sexual activities and fatigue.

Acupuncture is a remedy involving another concept used in TCM: Q*i* a kind of vital force that flows easily in a healthy body. Blockages or a lack of appropriate levels of *Qi* cause symptoms which can be appropriately treated with acupuncture.

Clearly the TCM theory of illness is incompatible with CWM. TCM is not reductionist, is non-microbial, and provides explanations that refer to entities and bodily "parts" that have no physical manifestation. It appears that some practitioners of this approach do not even expect there to be physical manifestations of Qi, though recent efforts in China to find the channels referred to in acupuncture theory suggest that at least some practitioners do expect physical correlates of their theory (Fan 2003, p.215).

While the ability of acupuncture to bring relief from nausea and pain in certain circumstances is impressive, that might not justify us in attempting to evaluate in any detail the supporting theory because it is so far removed from the approach of CWM. Here there seems to us an issue of where fair-mindedness and medical wisdom might require a different evaluative approach. We may try to translate the reflections of

TCM into a more modern guise such as a holistic approach to health. WCM shares with TCM the view that the body is a system that has built in stability which constitutes health. Where TCM and WCM tend to differ significantly is with respect to the emphasis placed on the exogenous causes of illness, especially the role of viruses and bacteria. But perhaps WCM gives such causes too much focus.[5] The testing methods of WCM have built-in biases to search for microbial causes of illness and treatments that can be manufactured and sold. Nonetheless, both approaches share a recognition that health involves the internal mechanisms of the body (e.g., the immune system or eliminative processes) operating correctly. While CWM will typically look for a micro agent that is the cause of an illness, the causes focused on by Chinese medicine are often lifestyle issues — an area of increasing focus in CWM.

5.3.3. Case study: Ulcers

How might these two approaches be compared? Let us take a case study. Recent research in microbiology has established that the bacteria, *helicobacter pylori,* is the cause of most ulcers.[6] The causal role of *helicobacter pylori* in ulcers was first postulated in the early 1980s and subsequent research, in particular the impressive remedial efficacy of antibiotics in the treatment of ulcers, has led to a rejection of the previous theory that ulcers were caused by excess stomach acid, perhaps produced by stress. The evidence in support of the earlier acid theory was that drugs which reduce or neutralize stomach acid did reduce ulcers and relieve pain. In addition, there was

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5. Evidence-based medicine tends to focuses on external therapeutic interventions that can be administered in double blind randomized control trials. Obviously many possible interventions, from eating broccoli to heart transplants cannot be tested by such methods.

6. The other main cause are CWM treatments such as non-steroidal anti-inflammatories like aspirin.

evidence from animal studies that stress increased acid production in the stomach (Thagard 1998).

Initial reaction to the bacteria theory of the cause of ulcers was skeptical because the stomach normally contains so much acid that it was thought that bacteria could not live and reproduce in such an environment. As it turns out, *helicobacter pylori* has developed mechanisms for protecting itself by hiding beneath the mucous lining of the stomach and surrounding itself with acid neutralizing chemicals.

Despite the identification of *helicobacter pylori* as the cause of most ulcers, there is still a question concerning the mechanism by which the bacteria cause ulcers. The current view is that the bacteria cause the stomach to produce too much acid (sound familiar?) which is then the proximal cause of the ulcer. So what the new theory does is identify a "semi-proximal" cause of stomach acid; elevated stomach acid is still the immediate cause of ulcers. An additional puzzle is that 80% of people with the bacteria do not get ulcers and there is still no well-established theory of why the bacteria produce ulcers in only some stomachs.

Anyone with the slightest sympathy towards a more holistic account of human health and illness is not going to be satisfied with the *helicobacter pylori* account of ulcers. One can easily understand why the medical profession, charged primarily with curing an illness, would be satisfied with the bacterial discovery, especially since, within the time frame of studies, there is no recurrence of the ulcer. But the well-known correlation between outbreaks of ulcer and stressful conditions such as war and earthquakes supports the view that stress may well be a more distal cause of ulcers. The correlation between over-use of drugs and alcohol and ulcers is also suggestive of lifestyle causes of ulcers (Zuger 2007).

These observations show that the "stress theory" of ulcers has not been eliminated, although its role and mechanism are not clear. Viewing stress as a cause of ulcers has much in com-

mon with the TCM account of the cause of ulcers in terms of an imbalance between yin and yang.[7] This explanation would not be inconsistent with the view that bacteria are only the immediate and most easily treated cause of ulcers. Although CWM now knows that once the bacteria is established, it needs to be eradicated, it seems likely that something more holistic or systemic might be the distal cause. Just as lifestyle decisions and personality type seem to play a crucial role in causing heart disease in certain people, so might lifestyle and stress play a major causal factor in the pathogenesis of ulcers. Having to address the TCM account could enhance our assessment of the CWM account or perhaps result in its revision (Lowenstein 1999).

5.4. Alternative theoretical models: Religion and hydrology

A cautionary tale describing the dangers involved in replacing traditional methods with application of modern scientific methods is described by Suzuki in his book, *Good News for a Change*. He provides an account of the unsuccessful application of modern hydrological theories and genetically modified rice to the traditional agricultural system of Bali.

The Balinese irrigation and agricultural system is extraordinarily complex. Water is diverted through a complex system of canals and aqueducts and the distribution of the water is determined by the priests. Their religion has a great deal to do with the sacredness of water, especially with the timing of its release. Worshippers at each temple from the single farmer

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7. The four most common patterns seen when gastro-intestinal problems are differentiated are as follows: Spleen Chi Deficiency, which is caused by chronic fatigue or chronic illness; Damp Heat Retention, which is caused by improper diet, environmental factors, or infections; Disharmony of Liver and Spleen, which is caused by emotional disturbance; and Spleen and Kidney Yang Deficiency, which is caused by chronic illness or aging. To treat these imbalances, Chinese medicine commonly uses acupuncture, herbal medicine, and moxibustion. When applied properly, these modalities balance Yin and Yang, harmonize Chi and Blood, nourish the organs, and eliminate Damp Heat. http://www.tcmpage.com/hpgastrointest.html accessed February 19, 2007.

at his shrine up to the United temple at the lake, have yearly meetings in which the high priests assign times of irrigation water release to each sharing village. The timing of the release of the sacred waters naturally influences dates of planting, the variety of rice that is planted, the timing of the harvest and the scheduling of fallow fields or alternative crops.

The system is also characterized by a variety of planting methods including rotation of crops which both protect the fertility of the soil and provide pest control. In 1965, the fall of Sukarno and the recent breakthrough in the development of genetically modified rice provided the rationale for introducing a new approach into the Balinese agriculture system. Suzuki observes that:

> The practitioners of the Green Revolution worked then (and still do now) under the reductionist assumption that agriculture is a purely technical process, and that production can be optimized when everyone simply plants high yielding varieties as often as possible. Problems of the soil fertility and pests can be handled with petrochemical inputs… (Suzuki, p.165).

Farmers were encouraged to abandon the traditional cropping patterns and plant high yielding varieties as often as possible. Problems immediately emerged. As the water priests lost control over both irrigation and cropping patterns, there was soon chaos in the water scheduling and an explosion of pests. New breeds of rice were introduced in the 1980s to defeat the pest problems and farmers became locked into the struggle to stay one step ahead of the next rice pest by planting the latest resistant variety. They also had poorer diets and more health problems because of the loss of protein from fish and ducks which had shared the rice paddies previously.

By the mid 1980s, things were so bad that a team of agronomists from Udayana University was commissioned by Bali's Department of Public Works to investigate. They reported that the government needed to take note of the connection between the hierarchy of the temples and the cropping pat-

terns. An American anthropologist in Bali worked with a systems ecologist to develop a computer model of the various water management methods in order to take the temple functions out of the realm of fate and superstition and put them into an argument form that modern experts could understand and respect. They ran the model using different planting and irrigation systems following traditional methods and the new cropping patterns based on the Green Revolution and showed that the traditional method, which had evolved over many years, was capable of doing a better job than the Green Revolution and centralized government control. The use of the computer model led to a report from the Asia Development Bank that stated that:

> the substitution of high technology and bureaucratic solution proved counterproductive and was the major factor behind the yield and crop area declines … The cost of lack of appreciation of the merits of the traditional regime has been high. Project experience highlights the fact that the irrigated rice terraces of Bali form a complex artificial eco-system which has been recognized locally over centuries (Suzuki, p.168).

The danger is, as the cliché has it, throwing the baby out with the bath water. Traditional views about physical, mental and environmental health typically have a religious and spiritual theoretical basis. But as the Balinese example shows, it is likely that many of these approaches survive because they produce real, tangible benefits. The limitations of these theories, in particular the lack of micro mechanisms that fit with the western scientific theory, may obscure the more systemic perceptions that they embody. A belief in the interconnectedness of things can be based on claims of mystical unity, or can be the result of study of systemic interrelationships modelled by computers. The latter approach may be ontologically more sophisticated, but the more spiritual approach may still provide practical insights.

The benefit from evaluating competing theories from very

different cultures probably depends on the willingness of the investigator to extract from the competing theory as much wisdom as possible. An arrogant dismissal, based on the theory's incompatibility with contemporary western science's emphasis on micro processes explaining macro events runs the risk of ignoring the benefit of looking at the value of a more systemic and holistic account.[8] Of course some criteria for ascertaining of *prima facie* value must be employed in the allocation of research effort and expense. The careful and respectful consideration of alternative views demonstrated by the NIH has advantages from the epistemic, political, and medical points of view. The current interest in alternative medicine has many sources: from desperation for treatment in the cases where CWM is unable to provide a cure to the suspicion that the reductionist model of micro-causation and treatment of illness has significant limitations as an approach to health care. Given this intellectual climate, an open minded and fair consideration of alternative theories is intellectually and politically required. Inevitably some therapies will prove of benefit while others will be shown to be inadequate, even grossly inadequate, compared to the approach of CWM. But in either case, the suspicion of bias, narrow-mindedness and too limited a paradigm will have been addressed, adding credibility to all validated theories. It does not seem epistemically justified to presume *a priori* that the explanatory paradigm of CWM is the only model worthy of consideration.

6. DELIMITING ALTERNATIVES: CONSIDERATIONS AND CHALLENGES

Given that germane alternative theories and information are relevant to the assessment of claims and views, the ques-

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8. Barry Spencer, in an article entitled "The unbearable bunkness of stress," exhibits the kind of close-minded intolerance to explanations outside the microbial paradigm that precludes gaining understanding from alternative approaches. http://www.batnet.com/spencer/stress2.html accessed February 20, 2007.

tion remains as to what factors determine whether and to what extent a theory is germane. We have been arguing that the boundaries of relevance should not be co-extensive with the boundaries of the discipline in question, nor should they be co-extensive with the boundaries of the cultures. Yet it is clear that, given constraints of time and resources, it is not possible to consider all alternatives equally seriously. Nor would it be useful to do so. Some perspectives appear to be so far outside the realm of plausibility as to not be viable candidates for consideration. Yet one would still need to know enough about the view to know that it does not merit further consideration. In addition, in ruling out some perspectives *a priori*, there exists the danger of leaving certain of our own theoretical assumptions unquestioned and thus perpetuating prevailing ethnocentric biases.

Are there some general principles which might be useful in attempting to delineate the appropriate realm for serious consideration?

First, there do seem to be some differences with respect to realms of inquiry. The strongest (least controversial) general arguments for the necessity of considering alternatives from other cultures appear to be in those areas dealing with values and ways of life. Although western cultures have developed powerful scientific tools which have facilitated significant advances in knowledge about the physical world, there does not seem to be a similar justification for assuming that their views and practices regarding ways to live need inspire the same degree of confidence. Indeed, given that scientific models tend to focus our thinking in certain directions (e.g., toward mechanistic-reductionist explanations), "we may be able to learn something about values from societies where science is less deeply implanted than ours" (Appiah 2006, p.43). Given the commonalities of the human situation, it is likely that the perspectives of other cultures in areas such as the arts, social institutions and practices, family structure, or social

attitudes (for example attitudes towards the older members of the society) can serve to throw into relief our own assumptions and be a source of viable alternative possibilities.

It may initially be tempting to think that the requirement of considering alternatives from other cultures is limited to these normative spheres but does not apply in the natural sciences given the fact that western science has shown itself to be vastly superior to other methodologies of investigation in terms of understanding the physical world. Certainly, our confidence in the theories and findings of science are justified to a significant degree. The well-established principles of confirmation of western science, along with a store of well-confirmed findings, and its superior resources for investigation (including both methods and tools) have provided significant advantages in empirical investigation (e.g., the prohibition against dissection and autopsies in China meant that Chinese medical theories had to be developed without the aid of significant anatomical knowledge). We would certainly not argue for giving equal consideration to non-scientific theories in explaining empirical phenomena.

We have argued, nonetheless, that the consideration of alternatives from other cultures is also important in science, as our examples have demonstrated. The reductionist model of western science, although exceedingly powerful, can also be limiting in some circumstances. An example is the bias against non-mechanistic explanations exhibited in the field of medical science, for example a reluctance to countenance psychological or systemic explanations, as demonstrated in the ulcers example.[9] It appears, then, that the line between science and non-science or between the empirical and the normative is not the appropriate way to think about how to delimit those

9. Atwood, for example, says the following with respect to the public's perception of the cause of ulcers even after the discovery of the hpp bacterium: "Ironically, 60 percent of the general public still thought that the cause was 'stress,' a vague, whimsical, and mildly insulting 'mind-body' hypothesis that medicine hadn't taken seriously for at least a generation." Ironically, stress is now being reconsidered as a causative factor in ulcers!

cases where consideration of certain cross-cultural alternatives is appropriate. What, then, are some of the factors which determine whether an alternative claim or view is worthy of serious consideration?

One obvious factor is the availability of empirical evidence for the claim or the view, even if it is only anecdotal. In the case of acupuncture, for example, it seems to have been the *prima facia* support given by its apparent practical efficacy which prompted further investigation, and justifiably so. Such investigation is least problematic when the claim can be accommodated within our current scientific theories, or at least is not contradicted by them, as is the case with claims regarding the efficacy of herbal remedies as described above. There seems to be good reason to consider these claims seriously especially since the possibility of their efficacy is not precluded by our scientific theories. Moreover, they are, in principle, testable (although there are challenges in testing them, as we have seen). Another factor which could affect the strength of the evidence of efficacy is the length of time we have had to test a particular theory. We would have good reason to reject theories which have undergone testing over a significant period of time and have still not demonstrated practical efficacy. We might want to be more cautious about rejecting theories which are newer to our culture and have not had the opportunity to demonstrate their efficacy (or lack thereof).

The situation is more complex with respect to claims which are not supported by or explicable in terms of our scientific theories, as is the case with acupuncture. The weight of anecdotal evidence seems to provide reason to take claims regarding its efficacy seriously, but the fact of its not conforming to our models and not being explainable by our theories has provided reasons historically for its not being considered as a serious alternative. The lack of accord with the theoretical structure of CWM and the lack of substantiation for its theo-

retical claims means that there is no requirement to seriously consider the theory on which acupuncture is based. Nonetheless, the empirical claims regarding its efficacy might still be justified. And if the efficacy of acupuncture is confirmed (as seems to be the case at least in some instances), then this fact would exert pressure on the theories of CWM to explain the fact. Thus there may also be some gains at the theoretical level, a possibility supported by the consensus panel of the NIH in its statement that the discovery of the mechanisms which provide a western scientific explanation for some of the effects of acupuncture may provide novel insights into neural, endocrine and other physiological processes (NIH 1997). In addition, although there may be grounds for rejecting the theoretical underpinnings of certain views, there may be some epistemic merit in their approach to explanation. For example, while there may be no grounding for some theoretical constructs of TCM such as chakras and qi, we may be able to learn something from their non-reductionist approach to explanations and more holistic orientation to health and well-being.

Thus a blanket dismissal of claims and views which do not accord with our theories does not seem justified as this may prevent us from investigating potentially viable alternatives and allow us to avoid possible productive challenges to some aspects of our theory. Yet does this leave us in the position of recommending the serious consideration of a theory such as astrology? It might be instructive at this point, then, to see if there are some general considerations which might be offered in helping to determine which alternative views are worthy of consideration, and to compare astrology and acupuncture as test cases using these principles.

One consideration is apparent efficacy, as discussed in detail above. Astrology has demonstrated no evidence of efficacy despite the fact that its generalizations regarding personality and its predictions of the future have been subjected

to considerable examination over a long period of time. It continues to be very popular nonetheless, but apparent practical efficacy must be distinguished from mere popularity. Acupuncture, on the other hand, has shown apparent practical efficacy, and is currently being subjected to rigorous testing which is showing positive results in some contexts. Not only does astrology lack evidence of efficacy, its acceptance would require a virtually unthinkable revision of the scientific world view (e.g., abandoning the inverse square law). This may be compared with acupuncture, which, while probably requiring some change in our account of pain and nausea would not presumably require substantial and deep revision of the scientific outlook.

It is important to make clear that our discussion of the desirability of considering alternatives from other cultures is directed, in general, at the level of the discipline. We are not suggesting that it is incumbent upon each individual researcher to seek out alternatives from other cultures in all of his or her individual investigations. We are suggesting, rather, that it should be a part of the epistemic responsibility of particular disciplines to include a consideration of credible alternatives in the ambit of its disciplinary investigations. Thus, while it is not necessary that every researcher dealing with pain investigate acupuncture, such investigation should be taking place somewhere within the field (as indeed is the case).

Our last factor for delimiting consideration of alternative views is the historical situation. The duty of disciplines to consider views of other cultures is partly based on the role such disciplines play in the generation of the shared understanding within society. Alternative views that have considerable following outside the discipline deserve attention because of the role that disciplines play in promoting public understanding. Attention to the "dialectical tier" requires that competing views that are seen as credible in the culture be given consideration and evaluation. Fair-minded considera-

tion of alternative views is both epistemically and politically necessary for the maintenance of the credibility of intellectual inquiry. What counts as a relevant alternative view is usually determined by historical and social context both within and outside the academic or scientific community. Views such as the creationist/design theory of evolution, astrology, and TCM need addressing by the scientific community in part because they have epistemic status outside of that community—they are seen as viable alternative views. Ignoring them, as opposed to respectful refutation, (i.e., not the kind of arch sarcasm with which these views are typically treated by people in Sceptic Societies) results in their continuing to attract adherents and in most cases, unjustified epistemic respect.

The general dialectical approach referenced at the beginning of the paper, viz., that a claim's epistemic status is enhanced not only by bringing positive evidence in support, but also by demonstrating the weaknesses in alternative views, should be recognized. It should be remembered that scientific claims, while resting on evidence, still depend on arguments, viz., arguments for the best explanation. Failure to make such arguments based on cultural presumption (or apparent cultural presumption) can only lower the status of science in the minds of many. Avoiding and being seen to avoid, the temptation of ethnocentrism when evaluating claims is an important political project of those committed to reason.

7. CONCLUSION

Given a history of Eurocentric arrogance, it is especially important to be cautious of the possibility of prejudice in treating views and practices from other cultures. An attitude of open-mindedness and fair-mindedness seems the most appropriate way to proceed — an approach of looking to see what wisdom might be gleaned, what we might be missing and what we might learn. We may come away with our origi-

nal views intact, or the interaction may result in the re-evaluation of our own paradigms by holding them up against those of others, and/or the incorporation of new knowledge and insights. Whatever the outcome, the epistemological benefits are clear.

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CHAPTER 14

TEACHING CRITICAL INQUIRY IN SCIENCE: THE ROLE OF DIALECTICAL CONTEXT IN SCIENTIFIC REASONING

Sharon Bailin and Mark Battersby

1. INTRODUCTION

This paper examines the role of the dialectical context in scientific reasoning. In our textbook, *Reason in the Balance: An Inquiry Approach to Critical Thinking* (Bailin and Battersby 2016), we have introduced a dialectical approach to fostering critical inquiry, centered on a comparative evaluation of reasons and arguments. This type of evaluation requires knowledge of the dialectical context surrounding an issue. We argue here for the salient role of this dialectical aspect in scientific reasoning and its central importance in science education.

2. INQUIRY AS DIALECTICAL

We have argued elsewhere (Bailin and Battersby 2009, 2016) for the centrality of critical inquiry for learning reasoning in a variety of areas. By critical inquiry we mean the enterprise of coming to a reasoned judgment on an issue or question. Coming to a reasoned judgment is at the heart of the kind of reasoning which takes place in a variety of contexts, disciplinary as well as everyday. In our book we demonstrate how the process of critical inquiry is manifested in such

diverse areas as the social sciences, philosophy, and the arts, and, of course, in science.

An important aspect of critical inquiry is that it is essentially a dialectical enterprise (Bailin and Battersby 2009, 2010). This means that it takes place in the context of some debate or disagreement and that there is a diversity of views on the issue in question. It also means that there is an interaction between arguers and between arguments involving criticisms, objections, responses, and frequently revisions to initial positions. An implication of this view is that it is seldom the case that reasons and arguments can be evaluated individually, other than in a preliminary, *prima facie* manner (Bailin and Battersby 2016). Rather, they must be evaluated in the context of this dialectic. In order to reach a reasoned judgment, arguments need to be evaluated comparatively, in light of alternatives and competing arguments and views (Bailin and Battersby 2009, 2016).

3. DIALECTICAL CONTEXT

This type of evaluation of arguments and views in light of alternative arguments and competing views requires knowledge of the dialectical context. Dialectical context is a term which refers to the various aspects of the debate surrounding an issue. The primary of these is constituted by the details of the current debate, which Johnson refers to as the dialectical environment (Johnson 2007). The dialectical environment, which he defines as "the dialectical material that congregates around an *issue*," is composed of the various arguments, objections and criticisms, responses to the objections, counterarguments and alternative arguments and positions which have been put forward regarding the issue. In order to reach a reasoned judgment, simply identifying reasons and arguments in support of one's judgment is generally insufficient. In addition, it is necessary to respond to criticisms and objections to

one's position and to comparatively evaluate its strengths (and weaknesses) in light of the available alternatives.

Included also in the dialectical context is the history of the debate. Knowledge of the history of the argumentation which has led to the current debate is important for evaluating the various positions which are currently contesting for acceptance. This includes knowing which arguments have been rejected and why, and why current views are accepted. This aspect of dialectical context will reveal the nature and strength of the arguments that contending views are up against. Also, importantly, it will play a role in determining where the burden of proof lies.

In addition to this dialectical context, there are several additional aspects of contexts which are relevant to reaching a reasoned judgment by playing a role in the determination of both the significance and the weight of reasons. These include the intellectual, social, political, and historical contexts. The combination of social and political forces at work at a particular time may affect debates by bringing certain issues to salience and by exerting pressure in support of or in opposition to certain positions.

4. ARGUMENT TO THE BEST EXPLANATION

This dialectical aspect is particularly evident in the form of argument which is predominant in science – argument to the best explanation. Scientific reasoning goes beyond the presentation of the evidence and arguments which support a theory. It includes, as well, and importantly, an attempt to show that the proffered theory offers a better explanation for the phenomenon under investigation than competing or alternative theories. We use the term "argument to the best explanation" rather than "inference to the best explanation" in order to underscore this dialectical dimension. Inference implies a direct move from reasons (or premises) to conclusion, whereas it is our view that this type of scientific reason-

ing involves the making of arguments which must be evaluated in a context and in comparison with alternatives.

Given the comparative dimension of this type of reasoning, it is clear that the history and the state of the controversy in which a scientific theory is put forward play a crucial role in the evaluation of the theory. It is, for example, only possible to understand the ascendancy of a current scientific theory by knowing what other theories they defeated and why. Only in this way is it possible to understand why the dominant theory is seen as the best explanation and what issues still remain contested. In addition, the current standing of a theory or claim determines the initial burden of proof of a new or counter claim. Without knowing the history of a scientific inquiry, one cannot make a reasonable assessment of the new claim.

Other types of contexts, including the intellectual, social, and political contexts, also often assert an influence on the evaluation of scientific theories, as is evident in several of the examples below.

5. EXAMPLES FROM THE HISTORY OF SCIENCE[1]

The importance of dialectical context is evident when we examine examples of scientific reasoning. We can see how scientists not only offer the observations and evidence in support of their theory, but also how they address objections and counter-arguments, both existing and possible, and attempt to demonstrate in what ways their theory provides a better explanation of the phenomenon they are investigating than existing or competitor theories. We can also see how the state of the controversy, the history of the debate, and other contextual factors play a role in the evaluation of the theories in question. We present here several examples from the history of science which demonstrate the dialectical aspect of scien-

1. These examples are taken from Bailin and Battersby 2016.

tific inquiry and could be used with students to illustrate the role of dialectical context in scientific reasoning.

5.1. Galileo's *Dialogue Concerning the Two Chief World Systems*

The first is an example from Galileo's *Dialogue Concerning the Two Chief World Systems.* In this excerpt, Salviati (representing Galileo's position) argues that the existence of sun spots constitutes evidence that heavenly bodies can change, while Simplicius calls on the authority of Aristotelian teaching that the heavens are unchanging.

> **Simplicius:** To tell the truth, I have not made such long and careful observations [of sun spots] that I can qualify as an authority on the facts of this matter; but certainly I wish to do so, and then to see whether I can once more succeed in reconciling what experience presents to us with what Aristotle teaches. For obviously two truths cannot contradict one another.
>
> **Salviati:** Whenever you wish to reconcile what your senses show you with the soundest teachings of Aristotle, you will have no trouble at all. Does not Aristotle say that because of the great distance, celestial matters cannot be treated very definitely?
>
> **Simplicius:** He does say so, quite clearly.
>
> **Salviati:** Does he not also declare that what sensible experience shows ought to be preferred over any argument, even one that seems to be extremely well founded? And does he not say this positively and without a bit of hesitation?
>
> **Simplicius:** He does.
>
> **Salviati:** Then of the two propositions, both of them Aristotelian doctrines, the second — which says it is necessary to prefer the senses over arguments — is a more solid and definite doctrine than the other, which holds the heavens to be inalterable. Therefore it is better Aristotelian philosophy to say "Heaven is alterable because

my senses tell me so," than to say, "Heaven is inalterable because Aristotle was so persuaded by reasoning". Add to this that we possess a better basis for reasoning about celestial things than Aristotle did. He admitted such perceptions to be very difficult for him by reason of the distance from his senses, and conceded that one whose senses could better represent them would be able to philosophize about them with more certainty. Now we, thanks to the telescope, have brought the heavens thirty or forty times closer to us than they were to Aristotle, so that we can discern many things in them that he could not see; among other things these sunspots, which were absolutely invisible to him. Therefore we can treat of the heavens and the sun more confidently than Aristotle could.

It is of note that Galileo (a.k.a. Salviati) does not simply cite observations of the existence of sun spots and argue that these constitute evidence that heavenly bodies can change. He also argues against the Aristotelian doctrine that the heavens are not alterable. He does this, first, by using another of Aristotle's doctrines – that what sensible experience shows ought to be preferred over any argument. He further argues that contemporaries could have more confidence in their judgments about the heavens than could Aristotle because of the telescope, supporting this confidence with another of Aristotle's pronouncements – that those whose senses could better represent the heavens would be able to philosophize about them with more certainty. For these reasons, Galileo/Salviati argues that the alterable heavens view is a better explanation for the existence of sun spots than the unalterable heavens view.

This dialogue forms part of Galileo's case for the Copernican view that the earth and other planets revolve around the sun. In order to make this argument, he had to defend the Copernican view against the Aristotelian picture of the uni-

verse which was prevalent at the time. Such was the hold of the Aristotelian geocentric cosmology that Galileo, in making a case contradicting this view, had to discharge a strong burden of proof. The burden of proof was particularly strong given the predominant role of abstract argument in theorizing about the natural world. Thus Galileo also had to make the case for the crucial role of sensory evidence, a case which we see him making in the excerpt. In addition, strong influences from the religious context affected the debate. Because of the religious implications attached to the geocentric view, championing the heliocentric view was seen as heretical (as is well known, Galileo was, in fact, convicted of heresy by the Inquisition).

5.2. The History of Geology

5.2.1. Hutton

The next series of examples come from the history of geology. Hutton's work in the late 18th century will provide a starting point. At the time Hutton began his research, biblical scholarship had determined that the earth was a mere 6000 years old. Hutton developed a very different view based on observation rather than biblical scholarship. Observing that there were two different kinds of rocks on his two farms, he hypothesized that there must be a place where these two kinds met. He did, in fact, find horizontal layers of gray shale piled on top of vertical layers of red sandstone. In addition, he noted that there were fingers of granite running into the sandstone. From these and other observations he concluded the following:

1. The lower, upturned sandstone layers must have been deposited a long time ago, tilted and then eroded down.
2. These sandstone layers must then have been covered with

new layers of sedimentation that had also eroded and created the upper layers.

3. The fingers of granite meant that the granite must have been molten at some time and therefore there must be great heat in the earth where this process could occur.

In addition, from observation of the current, almost undetectable rate of erosion and depositing of sand in the oceans, he reasoned that all these processes would involve enormous amounts of time.

In terms of dialectical context, Hutton's insights about the evolution of the earth's crust and therefore revision of the view of the age of the earth had to go up against the acceptance of the Genesis view of the earth's creation which claimed a much shorter time frame. Hutton's theory offered an explanation for the observed phenomena which the biblical-based account was unable to explain. Nonetheless, Hutton's breakthrough required a significant revision of the current understanding of the world. The ease with which such a revision is accepted depends to some extent on the degree to which the view conflicts with well-established views.

5.2.2. Wegener

In 1912, Wegener proposed a theory of *continental drift* to account for the apparent fact that the continents such as Africa and South America appear to fit together. Some earlier geologists had speculated that the continents had at one time fit together, but what Wegener added to earlier theories was the observation, supported by considerable evidence, that the rock formations and fossilized plants and animals showed appropriate similarities at matching continental margins. His theory was, however, greeted with considerable hostility, as the following comment by Dr. Rollin T. Chamberlin of the University of Chicago indicates:

> Wegener's hypothesis in general is of the footloose type, in that it takes considerable liberty with our globe, and is less bound by restrictions or tied down by awkward, ugly facts than most of its rival theories (cited in UCMP).

A major issue was that Wegener was unable to offer a convincing mechanism for such continental movement. Because he was unable to give an account or *model* of how continents could "drift" around the world, his theory was largely rejected. His theory explained some observations, but was not credited because it could not be made coherent with what was then believed about the physical structure of the oceans and continents. Since these existing beliefs were well established, Wegener's theory bore the burden of proof. It was unable to discharge this burden because it could not offer a plausible alternative account of how the continents could move.

5.2.3. Hess

The theory of continental drift was revived in the 1960s, led by an American geologist, Harry Hess, who offered the theory of plate tectonics to explain the phenomenon. The theory was that the recently discovered mid oceanic ridges were spreading and that the continents were sitting on plates which were propelled by the slowly moving "currents" of the underlying mantel.

Hess addressed likely objections to his theory by acknowledging that it was initially speculative. In addition, it was lacking in confirming data, and it ran contrary to current theories. He argued for its superiority to existing theories by demonstrating that it did have the virtue of being the most reasonable inference from existing knowledge, providing a way to account for Wegener's observations and an increasing collection of anomalies regarding sedimentation, the fossil record, and the magnetic orientation of rocks. (There was magnetic data accumulating that showed that rock near the equator had formed at locations much nearer the poles than their current

locations.) Since continental movement had been rejected, there was no adequate explanation for these observations. Hess explicitly argues for his theory as providing a plausible explanation for these unexplained phenomena:

> …mantle convection is considered a radical hypothesis not widely accepted by geologists and geophysicists. If it were accepted, a rather reasonable story could be constructed to describe the evolution of ocean basins and the waters within them. Whole realms of previously unrelated facts fall into a regular pattern, which suggests that close approach to satisfactory theory is being attained (Hess 1962).

Hess's theory of sea floor spreading was quickly confirmed by the discovery of additional data that was supportive of his theory. New measurements of ocean floor changes in magnetism showed that indeed the ocean floor was moving away from the oceanic ridges. A U.S. Geological Services article about Hess's discovery summarizes thus:

> In 1962, Hess was well aware that solid evidence was still lacking to test his hypothesis and to convince a more receptive but still sceptical scientific community. But the Vine-Matthews explanation of magnetic striping of the seafloor a year later and additional oceanic exploration during subsequent years ultimately provided the arguments to confirm Hess' model of seafloor spreading. The theory was strengthened further when dating studies showed that the seafloor becomes older with distance away from the ridge crests. Finally, improved seismic data confirmed that oceanic crust was indeed sinking into the trenches, fully proving Hess' hypothesis, which was based largely on intuitive geologic reasoning (U.S. Geological Services).

6. DIALECTICAL CONTEXT IN SCIENCE EDUCATION

The history of science is replete with examples such as these that could be used to illustrate the dialectical nature of scientific reasoning. In our book, *Reason in the Balance* (Bailin and Battersby 2016), we have students inquire into historical cases such as these. This involves laying out the reasons and argu-

ments offered on various sides of the issue, as well as criticisms, objections, and responses; investigating the history of the debate; and inquiring into other relevant aspects of context. Finally, they look at how the reasons and arguments were comparatively evaluated and the conclusion reached. The same structure can be used for evaluating scientific claims in contemporary debates, for example the safety of vaccination or the relationship between fat consumption and heart attacks.

This process gives students a sense of the dynamic and evolving nature of scientific inquiry. Emphasizing that science is a dialectical enterprise that involves argument within an ongoing context of debate is a welcome corrective to the widely held misconceptions among students (and the general public) about the nature of science as involving a collections of facts which have been proven to be true by studies and experiments. Such a misconception leaves them vulnerable to taking as "proven fact" the results of every new study reported in the media. Correlatively, the discovery that there are conflicting positions with respect to a claim or theory may result in relativism or even scepticism about the possibility of scientific knowledge. Learning that scientific inquiry takes place through a process of argument to the best explanation involves an understanding that having competing theories is the norm, but that there are better justified and less well justified views and that it is possible to comparatively evaluate claims and arguments. It also highlights the importance of seeking alternative views when evaluating claims and theories, in science and in other areas of inquiry.

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CHAPTER 15

APPLIED EPISTEMOLOGY AND ARGUMENTATION IN EPIDEMIOLOGY

Mark Battersby

> A main cause of philosophical disease – a one-sided diet: one nourishes one's thinking with only one kind of example.

> Wittgenstein. *Philosophical Investigations* p.593

1. APPLIED EPISTEMOLOGY AND ARGUMENTATION

This paper is a further development of the concept of "applied epistemology" that I first proposed in a paper in *Informal Logic* (Battersby 1989). After explaining the idea of applied epistemology, this paper focuses primarily on the science of epidemiology and what "applied epistemologists" (né informal logicians) can learn from the epistemological practices used in epidemiology. In the spirit of the Wittgenstein quotation, I invite those who are interested in applied epistemology and are looking for a model of how a "hard" science actually establishes causal claims to look at epidemiology, rather than the traditional paradigm of physics. Epidemiology is a highly successful science and, to some extent, epistemically self-conscious. It is not characterized by over-arching laws à la Newton, nor does it lend itself to the application of the Popperian principle of falsifiability. Because epidemiology is fundamentally a stochastic science, and no experi-

ment is sufficiently conclusive to falsify a claim, falsification is as elusive as proof. Despite that, epidemiology has had enormous success in contributing to both an understanding and an enhancement of human health through the identification of the causes of diseases and to the resultant development of crucial public health recommendations. But first a bit of background on the idea of applied epistemology.

1.1. Why "applied epistemology" and how does it relate to argumentation?

The Stanford Encyclopaedia of Philosophy's definition of "informal logic" is:

> . . . an attempt to develop a logic which can be used to assess, analyse and improve the informal reasoning that occurs in the course of personal exchange, advertising, political debate, legal argument, and in the types of social commentary found in newspapers, television, the World Wide Web and other forms of mass media (Groarke).

I rejected this view of "informal logic" in the earlier paper referred to and argued that the enterprise was better thought of as "applied epistemology," analogous to applied ethics. The terms "informal logic" tends to anchor[1] the study of arguments in formal logic. Such a nomenclature tempts us to use models of reasoning based on deduction and to potentially miss the actual nature of most reasoning. "Applied epistemology," on the other hand, focuses the discipline towards the actual practice of how people come to and should come to justified beliefs. On analogy with applied ethics, the study of people's actual epistemological practices can provide both information and challenges for the theoretician of reasoning.

Applied ethics has created a robust research project and

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1. The concept of "anchoring" is used in psychology to describe the tendency of people to be non-rationally influenced by where ever they start their deliberations. For example, in buying real estate, the asking price often influences people's offers independent of the worth of the property.

stimulated ethical thinking both inside and outside philosophy. Studying and theorizing about the epistemological and argumentative practices of other disciplines may yield comparable insights. There is no reason for applied epistemology (or informal logic) to limit itself to the study of popular arguments as described in the above definition. "Informal" reasoning, argumentation, is the most important reasoning in virtually every discipline. Even those disciplines characterized by a high degree of mathematization (such as epidemiology) still involve non-formal arguments. The only exception may be mathematics itself. Studying how professionals in other fields actually reason (the arguments that they actually make in support of their claims) and how they evaluate claims, provides important information for any theory of applied epistemology — just as studying how medical practitioners make moral decisions informs applied ethics. Philosophers who focus on the norms of informal reasoning and argumentation may well be able to contribute to other disciplines by suggesting ways to improve reasoning and epistemological evaluation in those disciplines. However, applied philosophy is not just about philosophy being "useful," it is also about learning from the practices of "reflective practitioners." The place of applied epistemology in relation to epistemology generally can be seen in the following table that sketches my view of the parallels between ethics and epistemology.

Level	Ethics topic examples by level	Epistemology topic examples by level
Meta-ethics/ epistemology	Meaning of "Good"	Meaning of "know"
Normative ethics/ epistemology	Utilitarianism vs. deontology	Rationalism vs. empiricism
Applied ethics/ epistemology	Criteria for morality acceptable euthanasia	Criteria for accepting a causal claim

Applied epistemology also focuses an approach to argumentation on epistemological criteria rather than on rules for nor-

matively correct dialogue and discourse, the approach often favoured in argumentation theory. This paper will illustrate how the analysis of argumentation in epidemiology can contribute to the identification of criteria for justifying causal claims and will also explore in what ways argument analysis can contribute to the improvement of both the criteria and their use in argumentative discourse.

1.2. Epidemiology

What is epidemiology? Below are two typical definitions:

Epidemiology: a branch of medical science that deals with the incidence, distribution, and control of disease in a population. (*Merriam-Webster Online*)

Epidemiology: Epidemiology is the study of the distributions and (causal) determinants of disease in populations. (from the *Dictionary of Epidemiology* 62, (John M. Last, ed., 4th ed. 2001, quoted by Weed 2004)

These are typical definitions, but I believe that a more descriptively accurate definition would be:

The scientific study of human health and illness based primarily on the statistical study of human populations.

This definition allows epidemiology to study everything from the Atkins Diet, the costs and benefits of using estrogen with postmenopausal women to the spread of avian flu and the effectiveness and dangers of Vioxx. Epidemiologists are usually medically and statistically trained researchers.

Epidemiology provides an excellent discipline for the applied epistemologist to study because, despite using rigorous statistical methods, claims to have established correlations and causal relationships must be defended through argument involving a large range of complex considerations. This claim may seem surprising to anyone who has looked at medical research since most research emphasizes statistical

concerns such as whether claims are "statistically significant." But, in fact, few studies actually meet the random sampling criteria for the application of these statistical methods. Therefore, researchers must argue for the credibility of their results, not merely apply a formula. Justifying a causal claim requires even more arguments than for a correlation. Epidemiologists must argue for any causal claim they make using a variety of relevant considerations. Claims are seldom established by critical experiments or the confirmation of a precise prediction. Rather, they are established by an evaluation of numerous relevant considerations — as they are in many sciences. Establishing a causal claim typically involves making a case (i.e., argument) that appropriate epistemological norms, such as the following, have been satisfied:

- The correlations identified are reliable.

- Confounding factors were appropriately controlled.

- Biological analogies from animal experiments, other lab experiments, and accepted biological theories support the claim.

- Counter-arguments and objections can be dealt with effectively.

2. CAUSALITY IN EPIDEMIOLOGY

2.1. History and the development of criteria

It is informative to study the history of epidemiology from an epistemological perspective. In the 19th and 20th centuries, the field of epidemiology went through a series of fundamental revisions as to how causal claims should be established. Early epidemiologists, such as the famous John Snow, whose work helped prevent cholera epidemics in mid 19th century London, did not have models of the causal mechanism for the spread of disease. Because of this lack, they were

restricted to establishing correlations between exposure and illness. For example, Snow identified a correlation between certain water sources and the incidence of the cholera. Lacking a biological theory, early epidemiologist could only speculate on possible linking causes. Today, epidemiologists utilize not only statistical methods, but also whatever biological models are available to establish causal relationships between causal factors and health outcomes: e.g., broccoli leads to reduced cancer, bacteria lead to ulcers. Claims are established by combining the statistical results of studies and results from laboratory experiments together with the best biological knowledge.[2] Epidemiologists study not only causes of illness but also putative cures. The studies that confirmed the viability of the polio vaccine are one famous example of epidemiology in service of preventative medicine.

My focus on epidemiology as a paradigmatic science is not without a somewhat ironic precedent in analytic philosophy. Carl Hempel, in his classic *Philosophy of Natural Science* (1966), used an account of the effort of an early epidemiologists, Ignatz Semmelweis, to introduce scientific reasoning. Hempel describes at some length Semmelweis' efforts to discover the cause of a higher incidence of puerperal fever in one of the two maternity wards in his hospital. As many will recall, Hempel uses Semmelweis' story to illustrate how science often proceeds by trial and error and the elimination of competing hypotheses. Despite beginning with this story, Hempel goes on to theorize about causal explanations largely with reference to reasoning in physics not medical research.

As Hempel records, Semmelweis theorized that the cause of higher mortality from so-called "puerperal fever" in one of the two maternity wards was due to "cadaverous matter" on the

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2. Actually, there is still a debate within epidemiological circles over whether to take a "black box" approach and just crunch number, or to incorporate biological theories. This approach is often embodied in the use of terms like "risk factor" which avoids having to make a causal claim

hands of medical students emerging from the nearby autopsy room before examining the pregnant women in that ward. By having the students wash their hands, Semmelweis was able to reduce the level of mortality in the higher mortality ward to a rate comparable to that in the other. Regrettably, there still was a 3% mortality rate in both wards which underlies the complexity of epidemiological causal reasoning: cadaverous matter was neither necessary (3% were infected anyway) nor sufficient for the illness (the rate in the ward with higher mortality was 9%). And as we all know, it was not only matter derived from cadavers that caused the illness. Semmelweis himself later theorized that it was "putrid" matter because he realized that the illness was being transmitted from the sick, not just the dead.

One of the theories that Semmelweis rejected before his discovery was the theory that puerperal fever was caused by "cosmic telluric changes." This type of causal theory was a common place in early medicine—ascribing many illnesses to a general miasma that just affected some people.

In the late 19th century, as the germ theory of illness gained acceptance, this miasma approach to aetiology was rejected by the renowned German pathologist, Jakob Henle and his student Robert Koch, who articulated the following rigorous criteria for a causal claim in medicine:

- The agent should be present in every case of the disease under appropriate circumstances.

- The agent should not be present in any other disease as a fortuitous and nonpathogenic agent.

- The agent must be isolated from the body of the diseased individual in pure culture, and it should induce disease anew in a susceptible animal (Pai 2005).

Helpful and rigorous as these criteria were, they later required extensive revision as the study of disease moved

from a focus on pathogens to a focus on a complex of factors. The presupposition of one disease/one pathogen just did not fit emerging facts about such illnesses as cancer. For example, the research into smoking that was done in the early 50s revealed a strong association between smoking and lung cancer, but also, a strong association with coronary artery disease. Critics of the day argued, using the Henle-Koch criteria, that this showed that smoking could not be the true cause of lung cancer (Stolley, p.65). Rather than accept this criticism, researchers began to develop alternative *criteria* that would form the basis for establishing causal claims about diseases.

The 1964 Surgeon General's Committee on Smoking and Health developed explicit criteria to determine whether smoking caused the diseases under review because of the public scrutiny to which their study would be subjected. The list included (with my comments):

- *Consistency of findings.* Conflict in evidence mitigates against a causal claim.

- *Strength of association.* The dramatically high relative risk of lung cancer among smokers was a crucial basis for the causal claim.

- *Specificity.* A bit of a left over from previous criteria, though the committee points out that smokers only have higher mortality in a few other diseases

- *Temporality.* Cause must occur before effect

- *Biological coherence.* Under which they included biological mechanisms and fit with existing understanding, biological models and animal experiments.

- *Dose-response.* More tobacco use correlated with a higher lung cancer rate.

- *Exclusion of alternate explanations.* Such as bias but also

competing explanations such as 3rd causes (e.g., genetic tendency to both smoke and get cancer).

A year later, Bradford Hill, a leading biostatistician, articulated the following slightly more complex set of considerations (he called them "viewpoints"). Strangely, he left out consideration of the exclusion of alternative explanations, which is, of course, crucial to making a "causal case." His approach ignores, as I will argue below, that making argument for a causal claim is really best seen as "argument to the best explanation." The justification for rejecting competing explanations is central to such an argument. So crucial is the rejection of competing explanations that other theorists include it under "Hill's Criteria" (Arbruzzi 2005).

- *Strength.*
- *Consistency.*
- *Specificity.* Still left over from Henle-Koch but often reinterpreted as high strength of association
- *Temporality.* A cause must precede an effect in time.
- *Biological gradient.* Dose-response relationship.
- *Plausibility.* The idea of causation must be biologically plausible.
- *Coherence*. The idea of causation must accord with other observations.
- *Experimental evidence*. Supporting data from human or animals experiments, such as lung cancer in animals exposed to cigarette smoke, helps establish a causal relationship.
- *Analogy.* For example, if thalidomide can cause birth defects, perhaps other drugs taken during pregnancy can also cause birth defects. Analogy can be helpful, although the help seems limited since anybody with a little creativity can probably dream up an analogy.

Hill's criteria are neither necessary nor sufficient for ascribing causality. They are analogous to a set of considerations that one might suggest for moral decision making such as Ross's famous list of *prima facie* duties[3] or any procedure of moral reflection that invites one to consider a list of crucial considerations such as: 1. the rights of individuals affected, 2. the relevant obligations, both general and specific (e.g., occupational), 3. the consequences to all parties affected, etc.

As in ethical reflection, different researchers emphasize different criteria at different times. This could be a bad sign if it revealed inconsistency or bias. As with most disciplines, epidemiology is not characterized by a consistent epistemological self-consciousness. While frequent mention is made of the "Hill Criteria," researchers tend to refer only to a convenient sub-set. It is an open question (discussed briefly below). whether a precise list of weighted criteria could be developed. Nevertheless, the example below, on the efficacy of prayer, suggests that a more reliable use of criteria could eliminate at least egregious examples of implausible claims.

2.2. The need for criteria

The following is an entertaining demonstration of the need for the application of epistemological criteria and for understanding that a claim needs argument, not just methodologically sound statistics. This study appears to violate almost every criterion for establishing a causal claim and yet was published in the *British Journal of Medicine* in 2001. I believe it was published because of the respect accorded by editors to the norm of statistical significance. The criterion of statistical significance is simply a statistical convention for determining

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3. Ross 1930. Ross' list: Fidelity: the duty to keep promises, Reparation: the duty to compensate others when we harm them, Gratitude: the duty to thank those who help us, Justice: the duty to recognize merit, Beneficence: the duty to improve the conditions of others, Self-improvement: the duty to improve our virtue and intelligence, Nonmaleficence: the duty to not injure others.

that an apparent correlation is probably not due to chance. Regrettably, statistical significance often serves as both a necessary and sufficient condition for publication.

The study by an Israeli researcher, Leonard Leibovici, was entitled "Effects of remote, retroactive intercessory prayer on outcomes in patients with bloodstream infection: a randomized controlled trial."

Abstract

Objective: To determine whether remote, retroactive intercessory **prayer**, said for a group of patients with a bloodstream infection, has an effect on outcomes.

Design: Double blind, parallel group, randomised controlled trial of a retroactive intervention.

Setting: University hospital.

Subjects: All 3393 adult patients whose bloodstream infection was detected at the hospital in 1990-6.

Intervention: In July 2000, patients were randomised to a control group and an intervention group. A remote, retroactive intercessory **prayer** was said for the well-being and full recovery of the intervention group.

Main outcome measures: Mortality in hospital, length of stay in hospital, and duration of fever.

Results: Mortality was 28.1% (475/1691) in the intervention group and 30.2% (514/1702) in the control group (P for difference=0.4) [*i.e. this result does not meet the typical criteria for statistical significance of <.05*]. Length of stay in hospital and duration of fever were significantly [*i.e., statistically significant*] shorter in the intervention group than in the control group (P=0.01 and P=0.04, respectively).

Conclusions: Remote, retroactive intercessory prayer said for a group is associated with a shorter stay in hospital and shorter duration of fever in patients with a bloodstream infection and should be considered for use in clinical practice.

Unsurprisingly this study produced a stream of protest letters, but many letter writers failed to point out the conflict

with the temporality condition. Only one writer identified the obvious alternative explanation that it was simply a statistical fluke. As all statisticians know, what the claim of *statistical significance* means in this context is that there was only a 1/100 or 4/100 chance that the results would occur by chance. Rare, but hardly out of the question, and a lot more credible explanation than the causal efficacy of *retroactive* prayer.

2.3. The tempting illusion of statistical precision

It is the sign of an educated man that in every subject he studies, he seeks only that degree of precision which the nature of the subject permits (e.g., it is absurd to expect logic from a public speaker or probabilities from a mathematician) (Aristotle, *Nicomachean Ethics*, 1094b23-28).

In view of the somewhat unreliable way in which the criteria are used, various efforts have been made to articulate a tighter set of criteria. Predictably, there is also increased interest in finding more algorithmic approaches.

While no doubt something will be learned by such a formalization project, the effort to formalize the inference from evidence to causality seems unlikely to succeed. There are just too many factors that are difficult to quantify to establish a realistic mathematical measure. There is also a danger that the use of mathematics will create an appearance of precision that is misleading. Even the current use of statistical inference in epidemiological research is often misleading. For example, almost no studies meet the condition of random sampling which provides the mathematical basis for applying the formulae. The so-called "case controlled studies" which play an important role in epidemiological research consist of matching a group of people who have an illness with a comparable group of people who don't have the illness and then looking for factors that are more prevalent among the ill than among the controls.

Obviously, the choice of comparable controls can have a

great effect on the utility of the comparison. Yet there are not and cannot be mathematical standards for selecting the controls. The controls are selected on assumptions about what aspects of an individual are crucial for identifying relevant similarity. The obvious factor of age is almost always taken into account, but even gender and race are frequently ignored. And what else is missing?

To see how this works in practice, take the case of early studies into the smoking/lung cancer link. In the early 1950s, two retrospective studies of approximately 600 to 700 cases of lung cancer were done that compared the history of smoking among lung cancer victims and "control" groups made up of other hospital patients of "similar" characteristics who did not have lung cancer. The samples of subjects used in this approach are known as "samples of convenience." Both of these early studies found a slightly higher rate of smoking among the cancer victims than the control group, but the differences between the rates were not great enough to be statistically significant, i.e., the researchers could not be 95% confident that the differences in the rate of smoking between the groups was not due to chance. Researchers still believed there was a relationship between smoking and lung cancer, although their study had failed to "statistically" demonstrate it. Why had the study failed to demonstrate what is, in fact, a strong correlation? With the advantage of hindsight, we can clearly see the problem. None of the patients in the "control group" had lung cancer, but many of them had illnesses to which we now know smoking contributes (such as heart disease). The control group was not representative of the non-lung cancer population. The controls had a larger percentage of smokers than in the non-lung cancer population of comparable age. The unrepresentative percentage of smokers in the control group obscured the actually dramatic difference in the rate of lung cancer between smokers and non-smokers (Cornfield 1959, p.182).

This is not just a problem in scientific research. While it is widely believed that the ideal sample for polls is a "representative" sample of the population, pollsters have learned the unreliability of such samples. The famous pollster, George Gallop, initially gained great renown in the 1940s when he used *representative* sampling to more or less correctly predict the re-election of Roosevelt. His poll was based on the sampling of some 8000 people, in contrast to the *Literary Digest* poll which surveyed millions and made the wrong prediction. Nonetheless, when Gallop used the same technique for the subsequent Truman election, he predicted the wrong victor and his prediction was badly off. Subsequently he went to random sampling *not* representative sampling, recognizing that it is not possible to reliably identify the factors that make for a representative sample. Gallop's lesson has not been reflected in most scientific research simply because such random selection techniques usually cannot be used in this research. Participants in studies are necessarily volunteers who were not randomly selected and many diseases have too low an incidence to be effectively studied using random selection. My point is not to deride the research, but to re-emphasize that judgment and argument (not probability theory) must be used to support the claim that the samples and control groups that were studied provide a reasonable basis for the correlational and causal claims being made.

2.4. Argumentation in epidemiology

As argued above, statistical inference is often not adequate for establishing correlations in most studies. It is never adequate for establishing causal claims. Correlations are necessary but not sufficient for a causal claim. Epidemiologists must, therefore, use informal arguments to make their case for a causal claim. Basically, what epidemiologists do is argue that their claim is the best explanation. While the status of "inference to the best explanation" as the best account of scientific

reasoning remains controversial in philosophy, it seems clear that the argumentative process in epidemiology is best characterized in this way. The primary objection of philosophers to "inference to the best explanation" account of scientific reasoning is that the notion of "best explanation" is vague and/or circular. But if we take an applied epistemological approach to analyzing the work of epidemiologists, we can see how they use the criteria discussed above to substantiate their positive claims and reject counter theories.

One of the most famous and effective examples of what I wish to call "*argument* for the best explanation" was made in 1959 by Jerome Cornfield and others arguing the case that smoking is the primary cause of lung cancer. This article is widely considered to have established the case for smoking as a cause of lung cancer and led to public policy efforts such as the Surgeon General's Report cited above.

In his summary, Cornfield both argues for his claim and rejects alternative hypotheses:

> The magnitude of the excess lung cancer risk among cigarette smokers is so great that the result cannot be interpreted as arising from an indirect association of cigarette smoking with some other agent... The consistency of all the epidemiological and experimental evidence also supports the conclusion of a causal relationship ...while there are serious inconsistencies in reconciling the evidence with other hypotheses which have been advanced (Cornfield 1959, p.173).

In his article, Cornfield first reviews the existing literature in support of the causal claim, and then devotes most of the paper to responding to criticisms of the studies. He divides the responses into 5 major topics:

- population data
- retrospective and prospective studies
- studies on pathogeneses

- other laboratory investigation

- interpretation

In the first section, he replies to the objection that the significant difference in the rate of lung cancer among men and women is grounds for discarding the causal hypothesis. He points out that the data shows that men have been smoking for significantly longer than women, especially in the over 55 age group, which is the demographic that mainly experiences lung cancer. In addition, he notes that the rate of lung cancer among both male and female non-smokers is similar.

In a section on criticisms of retrospective studies, Cornfield argues: " . . . for the most part, the specific points of criticism apply only to some of the studies and not to others" (p.181). He argues for the overall convergence of the research despite specific problems with any particular study.

In another section, Cornfield replies to the objection that experiments involving rats exposed to smoke have failed to induce lung cancer, as being " . . . true at the time of this report, although it can be questioned whether any animal received as large a dose of cigarette smoke through indirect exposure as a human being does by voluntary deep inhalation." He had earlier noted the difference in rates of lung cancer among inhalers and those that did not inhale.

Cornfield acknowledges that nothing short of randomized trials could provide a clear cut answer to what he calls the "constitutional hypothesis," the idea that some people are prone genetically to both smoke and get lung cancer. Nevertheless, he argues this hypothesis is inconsistent with the following observations:

1. changes in the lung cancer mortality over the last half-century, 2. carcinogenicity of tobacco tars for experimental animals, 3. effect of pipe smoking on larynx cancer but not lung cancer, 4. reduced lung cancer among discontinued smokers. No one of these considerations is perhaps sufficient by itself to discount

the constitutional hypothesis, ad hoc modifications of which can accommodate each additional piece of evidence. A point is reached, however, when a continuously modified hypothesis becomes difficult to entertain seriously (Cornfield 1959, p.191).

Lastly, Cornfield replies to the well-known question of why many smokers never get lung cancer: "We have no answer to this question. But neither can we say why most of the Lubeck babies who were exposed to massive doses of virulent tubercle bacilli failed to develop tuberculosis [*note the argument by analogy*]. This is not a reason, however, for doubting the causal role of the bacilli in the development of the disease" (p.197).

The foregoing are only a sample of the arguments that fill the 30-page article. But as can be clearly seen, they involve a wide variety of informally presented appeals to science and common sense. In fact, the only statistical part of his response is placed in an appendix. Cornfield's paper was published before the Surgeon General and Bradford Hill published their epistemological reflections. Nonetheless, a detailed study of his arguments reveals that he employs the notions of:

- *Strength.* He cites the high relative risk of lung cancer for smokers.

- *Consistency.* As mentioned, almost all studies point in the same direction.

- *Specificity.* Here the issue is to confirm that the relation is not actually the result of other factors where smoking is just a token for these factors. For example, smokers have a higher mortality rate from all causes, not just lung cancer, which would suggest that something else could be at work in the lung cancer – smoking association. But in response, Cornfield points out that these correlations are weak compared to that of smoking and lung cancer.

- *Temporality.* He emphasized the lag time between exposure and cancer to explain some apparent anomalies.

- *Biological gradient.* Heavier smokers get lung cancer at a higher rate.

- *Plausibility.* He speculates on possible causal models while admitting this is a weakness in the argument.

- *Coherence.* The lung cancer result fits with the fact of higher levels of upper respiratory cancer in pipe smokers who do not inhale.

- *Experimental evidence.* Rats painted with tars had high rate of skin cancer.

- *Analogy.* Cited above, re-exposure not necessarily producing disease.

- *Exclusion of alternative explanations.* Argument against the genetic theory above.

Notice that no explicit weighting is given. He simply marshals the overall evidence, replies to critics, and shows that the weight of evidence supports the causal hypothesis.[4]

Experimental	Inferential
Analysis of a single study	Integration of multiple studies
Randomization essential	No "crucial experimentation"
Specificity of association	Strength of association

While Passcandola's contrasts are not quite parallel, the table provides a useful brief summary of the issue seen from inside the discipline. Historically, the experimentalist lost the smoking/lung cancer debate, though introductory books on experimental method and statistics (largely written by statisticians) still tend to emphasize the former approach (cf.

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4. It should be admitted that my view of the epistemology of epidemiology is not universal in that discipline. In an informative overview of the history of the smoking and lung cancer debate, Mark Passcandola (June 2004) identifies two approaches which he calls the experimental and the inferential. He contrasts them as follows:

the generally excellent introduction statistics book by Jessica Utts, 2005).

3. APPLYING EPIDEMIOLOGICAL CAUSAL CRITERIA TO OTHER DISCIPLINES

The criteria used by epidemiologists to make their argument that their causal claim is the best explanation may also be used in other disciplines. For example, the debate over the causal effects of pornography continues although currently at a much lower key than in the late 20th century. This issue, like many of those in epidemiology (such as the causal effect of passive smoke) has profound public policy implications. Those who argue for the negative effects of pornography have a fairly strong burden of proof as they are up against the strong presumption in favour of free speech.

A recent review of the research by a student of mine, Lindsay Johnson, found that such strong evidence was difficult to find and that, in fact, there was some powerful counter-evidence that suggested another, far more significant causal factor. In her study, she cited work by Dodson which makes the following claims (I have indicated in italics the various causal considerations that are implicitly appealed to):

> Studies on violent pornography are inconsistent. Some find it increases aggression in the lab; some find it does not. Research also finds that aggression will be increased by anything that agitates a subject (that raises heart rate, adrenaline flow, etc.), not only violent movies but riding exercise bicycles. Agitation will boost whatever follows it, aggression or generosity. *(lack of specificity, alternative explanations)*
>
> Dr. Suzanne Ageton, measuring violence out of the lab, found that membership in a delinquent peer group accounted for 3/4 of sexual aggression. *(alternative explanation)*
>
> Studies in the U.S., Europe, and Asia find no link between the availability of sexual material and sex crimes. The only factor linked to rape rate is the number of young men living in a given area. When pornography became widely available in Europe, sexually violent crimes decreased or remained the same. Japan,

with far more violent pornography than the U.S., has 2.4 rapes per 100,000 people compared with the U.S. 34.5 per 100,000. *(no evidence of "dose" relationship)*

Since the difficulties of establishing causal claims are probably even more complex in the social sciences than in epidemiology, I would suggest the social sciences could also benefit from making the case for their claims using "argument to the best explanation" and making appropriate use of epidemiological criteria when doing so. Neither of the two famous efforts by the United States government to address the causal effects of pornography displayed the kind of epistemological self-consciousness shown in the Surgeon General's Report on Smoking referred to above.

4. HOW MIGHT "APPLIED EPISTEMOLOGISTS" CONTRIBUTE TO WORK IN EPIDEMIOLOGY? JUDGMENT AND THE PROBLEM OF BIAS IN EPIDEMIOLOGY

Cornfield's paper illustrates that judgment and argument play a central role in the assessment of causal claims. Unfortunately, judgment and argument provide considerable opportunity for bias. The natural sciences, because of their emphasis on "letting the data speak for themselves" have been largely able to avoid the kind of epistemologically undermining influence that bias plays in say political "science" or economics. Nonetheless, as the historic debate about the effects of smoking and recent pharmaceutical testing scandals illustrate, bias can be a crucial factor in epidemiological work. Fair-mindedness and a careful respect for both the significance and difficulties of any research are important in any discipline, but are crucial in one in which arguments and "judgment calls" are central.

Such observations have implications not only for the administration of scientific funding, but also for the adjudication of scientific results. What evaluative weight, for example, should be given to the fact that research was funded by a man-

ufacturer? How can we make appropriate use of a researcher's statements of conflict of interest without slipping into the *ad hominem* fallacy?

The debate over passive smoking, or more technically, Environmental Tobacco Smoke (ETS), illustrates many of these problems. The studies in this area exhibit much more conflict and, not surprisingly, a much weaker association between smoke exposure and lung cancer incidence. The commonly cited risk factor of 1.2 (an average of many studies') means that people who are exposed to ETS have an approximately 20% higher risk of getting lung cancer than those who are not exposed. This is in contrast to the relative risk of smokers which is between 6-16 times the risk of non-smokers (depending on amount smoked). An additional problem with ETS research is determining the amount of exposure.

Two recent studies related to ETS illustrate both the difficulties involved in the research and the problem of evaluating the appearance of bias without descending into the *ad hominem* fallacy.

An article by **James E. Enstrom** and **Geoffrey C. Kabat** published in the *British Journal of Medicine* (Enstrom and Kabat 2003) caused a storm of protest when it published the following results from a prospective study of 120,000 Californians: "For participants followed from 1960 until 1998 the age adjusted relative risk (95% confidence interval) for never smokers married to ever smokers compared with never smokers married to never smokers was 0.94 (0.85 to 1.05)." That is, they failed to find a correlation between spousal exposure and increased lung cancer rate. Enstrom and Kabat concluded: "The results do not support a causal relation between environmental tobacco smoke and tobacco related mortality, although they do not rule out a small effect."

The authors admitted in their statement of interests that:

In recent years JEE (**James E. Enstrom)** has received funds orig-

inating from the tobacco industry for his tobacco related epidemiological research because it has been impossible for him to obtain equivalent funds from other sources. GCK **(Geoffrey C. Kabat)** never received funds originating from the tobacco industry until last year, when he conducted an epidemiological review for a law firm which has several tobacco companies as clients. He has served as a consultant to the University of California at Los Angeles for this paper. JEE and GCK have no other competing interests. They are both lifelong non-smokers whose primary interest is an accurate determination of the health effects of tobacco.

Much was made of the authors' tobacco industry association in the subsequent firestorm of objections to the paper.

So virulent was the attack (which also involved arguments that BJM should not have published the paper because of the comfort it would give to the tobacco lobby) that the editor of BJM felt the need to respond:

Firstly, we've considered again whether we should have a blanket policy of refusing to publish research funded by the tobacco industry. We've twice considered this question in the *BMJ* and twice decided against. The *BMJ* is passionately antitobacco, but we are also passionately prodebate and proscience. A ban would be antiscience.

Secondly, we are not in the "truth" business. Scientific truths are all provisional. Most of science falls away as new paradigms emerge. This doesn't mean that we are in the "lies" business, but we are in the "debate" business.

Thirdly, with research papers we first ask if we are interested in the question. We must be interested in whether passive smoking kills, and the question has not been definitively answered. It's a hard question, and our methods are inadequate.

We then peer review the study, but we are well aware of the extreme deficiencies of peer review. Of course the study we published has flaws—all papers do—but it also has considerable strengths: long follow up, large sample size, and more complete follow up than many such studies. It's too easy to dismiss studies like this as "fatally flawed," with the implication that the study means nothing.

Fourthly, I found it disturbing that so many people and orga-

nizations referred to the flaws in the study without specifying what they were. Indeed, this debate was much more remarkable for its passion than its precision. **Richard Smith,** *editor*

As Smith's remarks indicate, many of the criticisms suffered from the *circumstantial ad hominem fallacy*. In fact, one of the authors in responding to the accusations argued: "Scientists, and particularly epidemiologists, who deal with the criteria for judging causality, should be wary of imputing motives based on the *flawed logic of guilt by association.*"

Whatever the flaws in the study, it seems clear that the suspicion of bias and the role of tobacco funding played a crucial role in the debate. Were the critics who objected to the authors' funding all guilty of the *ad hominem* fallacy? What weight should be given to the authors' funding sources? Interestingly, there is "epidemiological" evidence that some weight should be given. A 1998 article also in the *British Journal of Medicine*, by Barnes and Bero entitled "**Why Review Articles on the Health Effects of Passive Smoking Reach Different Conclusions**" argued that bias was definitely at work in passive smoking research.

Abstract

The authors reviewed review articles on the topic of ETC and found that:

Data Synthesis. A total of 106 reviews were identified. Overall, 37% (39/106) of reviews concluded that passive smoking is not harmful to health; 74% (29/39) of these were written by authors with tobacco industry affiliations. In multiple logistic regression analyses controlling for article quality, peer review status, article topic, and year of publication, the only factor associated with concluding that passive smoking is not harmful was whether an author was affiliated with the tobacco industry (odds ratio, 88.4; 95% confidence interval, 16.4-476.5; *P*<.001).

Conclusions. The conclusions of review articles are strongly associated with the affiliations of their authors. Authors of

review articles should disclose potential financial conflicts of interest, and readers of review articles should consider authors' affiliations when deciding how to judge an article's conclusions **(Barnes and Bero 1998).**

While the numbers in the abstract are a bit incomprehensible, there does seem to be a strong *prima facie* case that bias is at work in this area of research. But we should be careful. The claim of funding bias is that the funding is causally related to the judgment in the study. But all that the evidence establishes is that there is a correlation. We must be careful about the inference to causality, in particular the application of the criteria of *temporality*. Funding support may follow research that happens to support the position desired by willing funder rather than researchers being paid to do studies that support the funder's point of view. This appears, for example, to be what happened in the passive smoking article cited above.

How should readers "consider the affiliations of the author"? As the comments by the editor of *British Journal of Medicine* indicate, what to do about corporate funding in science is a huge question. Disclosure of financial interests certainly seems essential, but clearly such disclosure may result in the fallacious dismissal of legitimate research. If you believe that any use of *ad hominem* observations in an argumentative context is fallacious (and irrelevant), then you would not even require that authors cite their funding sources. The reason that *ad hominem* remarks are often fallacious, as the BJM editor notes, is that they tempt people to facile dismissal without looking at the details of the study. On the other hand, the problem with ignoring information about the authors' funding support (or even publication record) is that this is clearly information that can help contextualize (thought not refute) an author's argument. I believe that most informal logicians would support the BJM editor and the article's authors in discouraging people from solely basing their judgments of a study on the basis of an author's funding sources, but would

also support a policy of requiring authors to acknowledge their funding sources. To understand the breadth of this issue, it should be noted that all testing of new drugs is funded by pharmaceutical companies.

5. APPLICATION: EXPLORING THE RELATIONSHIP BETWEEN ARGUMENTATION, APPLIED EPISTEMOLOGY AND EPIDEMIOLOGY

5.1. Applying critical thinking to reading medical research

In *Evidence Based Practice: Logic and Critical Thinking in Medicine* (Jenicek and Hitchcock 2005), the authors do a masterful job of describing a critical thinking approach to epidemiological reasoning – what I would call an excellent example of *applied epistemology*. The authors use work in critical thinking and epidemiology to lead the student through the appropriate reasoning processes for argumentation in medicine and for the assessment of causal claims. They provide a list of considerations that articulate the criteria for justifying causal claims in epidemiology, basing their list on a number of contemporary textbooks.

Assumptions (prerequisites, before any causal criteria apply)

- Exclusion of the play of chance
- Consistency of results with prediction
- Even observational studies respect as much as possible the same logic and similar precautions as used in experimental research
- Studies are based on clinimetrically valid data
- Data are subject to unbiased observations, comparisons, and analysis
- Uncontrollable and uninterpretable factors are ideally absent from the study

Criteria of causation

Major:

- Temporality ("cart behind the horse")
- Strength (relative risk, odds ratio, hazard ratio)
- Specificity (exclusivity or predominance of an observation)
- Manifestational ("unique" pattern of clinical spectrum and gradient as presumed consequence of exposure)
- Causal (attributable risk, etiological fraction, attributable risk percent, attributable hazard, proportional hazard)
- Biological gradient (more exposure = stronger association)
- Consistency (assessment of homogeneity of findings across studies, settings, time, place, and people)
- Biological plausibility (explanation of the nature of association)

Conditional:

- Coherence with prevalent knowledge
- Analogy

Reference:

- Experimental proof (preventability, curability)
- Clinical trial, other kind of controlled experiment or "cessation study"

Confirmation:

- Systematic review and meta-analysis of evidence

(Jenicek and Hitchcock 2005, 155)

Their list differs from the historical lists cited above, but this should not be surprising. The development and establish-

ment of the criteria is an ongoing example of applied epistemological reflection at work in epidemiology. Jenicek and Hitchcock distinguish between assessment of the data for establishing a correlation (rightly calling these "prerequisites" for applying causal criteria) and criteria for the inference to a causal claim. Unfortunately, from my perspective, they leave out a key basis for a causal claim: the rejection of competing explanations. A further discussion of the criteria and how one might weight them is an issue for another paper (continuing the research project of applied epistemology).[5]

5.2. The symbiotic relationship between informal logic and the epistemological reflections of epidemiologists

To see some of the mutual benefits of looking at the considerations for causal claims identified by epidemiologists and the work of informal logicians, we might compare the Surgeon General's and Hill's list to the very credible list of questions that Walton (1989, p.230) uses to evaluate a causal claim. I have changed the order of the various lists to facilitate comparison.

5. The merits of Jenicek and Hitchcock's work notwithstanding, I do wish to voice a reservation about the authors' choice of the Toulmin model of argument. This model, with its emphasis on a single warrant between evidence and conclusion does not appear to provide a normatively correct model of the way diverse consideration must be brought to bear when making a judgment of causality. For example, their figure 5-2 (Jenicek and Hitchcock 2005, 165), which is an example of how the authors attempt to use the model, seems to illustrate the limitations of trying to impose the model rather than illuminating how actual arguments should be represented and evaluated.

Surgeon General	Hill	Walton
Consistency of findings	Consistency	Is there a positive correlation between A and B?
		Are there a significant number of instances of the positive correlation between A and B?
Strength of association	Strength	
Specificity	Specificity	
Temporality	Temporality	Is there good evidence that the causal relationship goes from A to B, and not just from B to A?
Dose-response	Biological gradient	
Biological coherence. *biological mechanisms and fit with existing understanding, biological models and animal experiments*	Plausibility. *The idea of causation must be biologically plausible* Coherence. *The idea of causation must accord with other observations.* Experimental evidence.	
	Analogy	
Exclusion of alternate explanations		Can it be ruled out that the correlation between *A* and *B* is accounted for by some third factor (a common cause) that causes both *A* and *B*?
		If there are intervening variables, can it be shown that the causal relationship between *A* and *B* is indirect (mediated through other causes)?
		Can it be shown that the increase or change in *B* is not solely due to the way *B* is defined, the way entities are classified as belonging to the class of *Bs*, or changing standards, over time, of the way *Bs* are defined or classified?

Walton's list is more exhaustive than those found in many in critical thinking textbooks and contains important considerations lacking in Hill's and the Surgeon General's list. Nonetheless, his list omits the importance of the strength of a correlation and ignores the role of explanatory models (biological or others), and the "dose" relationship. On the other hand, his list and the Surgeon General's include the exclusion of alternative explanations.

This is not the place for me to attempt to propose an ideal list, but some comments are, perhaps, apt. A clear distinction needs to be made (as Jenicek does) between criteria for a well-established correlation and criteria for a causal claim. The role of models as explanations (consider the "greenhouse model," for example) needs to be given crucial place in making a strong causal claim, even though epidemiological results often precede detailed biological understanding (see Cornfield). The "juridical" nature of causal claims (we often seek causes in order to assign blame or identify where to intervene) also needs addressing—which may bring in ethical considerations. Ethical considerations will certainly come into play when epidemiologists make recommendations on public policy. The criteria for "announcing" causal claims (while not the same as those for making the claim *simpliciter*) must be epistemically justified while also being related (*à la* Cornfield) to the public policy significance of the finding. The historical context of the debate and issues of onus also need to be addressed. Some of the other criteria referenced in the literature on inference to the best explanation (e.g., simplicity, consilience, etc.) should also be considered. The task is far from easy but it seems clear

that both applied epistemologists and epidemiologists could benefit from sharing this task.

6. SUMMARY

My general goal in this paper was to encourage informal logicians and others interested in applied epistemology to look at epidemiology as a paradigmatic science crucially dependent on argumentation. My two specific goals in this paper were: 1. to give an example of applied epistemology by looking at causal argumentation and justification in epidemiology, and 2. to show that there could be a symbiotic relationship between epidemiology and work in various applied reasoning disciplines such as argumentation, informal logic, philosophy of science and "applied epistemology."

Epidemiologists are an important example of disciplinary practitioners who develop and apply epistemological criteria. I have argued that epidemiologists would benefit from seeing the justification of a causal claim as making an "argument for the best explanation" which involves not only commonly-used criteria for justifying a causal claim, but also consideration of arguments against alternative explanations. The need for application of some obvious criteria beyond statistical significance was illustrated by the example of the supposed effects of retroactive prayer, and the application of the argument for the best explanation was illustrated by the 1959 paper of Jerome Cornfield on the causal relationship between smoking and lung cancer. I also gave an illustration of how causal criteria used in epidemiology might well be useful in other stochastic sciences such as sociology and psychology.

Of additional interest to informal logicians and argumentation theorist are the dialogic problems that appear periodically in epidemiological discussions around controversial issues such as the effects of passive smoking. The common of use of the *ad hominem* fallacy in these debates represents a shared concern for both informal logicians and epidemiolo-

gists. The appropriate assessment of bias and its relationship to argument evaluation is a topic on which informal logicians should be able to make significant contributions once they take into account the complex role that funding plays in such sciences as epidemiology.

Epidemiology is a rich source of examples for all applied philosophy, but especially applied epistemology. My hope is that this paper will help encourage others to expand their intellectual interests beyond a "one-sided diet" of examples from newspaper editorials or deductivist sciences such as physics.

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VI. TEACHING

CHAPTER 16

THE COMPETENT LAYPERSON: RE-ENVISIONING THE IDEAL OF THE EDUCATED PERSON

Mark Battersby

1. INTRODUCTION: AN EDUCATIONAL SUCCESS STORY

The doctor has told you that you have lung cancer and because you have a number of different sites in your lung, the cancer has clearly metastasized. An operation would be useless, chemotherapy a painful and futile palliative. You probably have only a few months to live. *Do you accept the doctor's opinion and go home and die? Or do you take an intelligent interest in your problem? Did your education give you the confidence and skills to take such an interest?*

This is a very real question. Such a diagnosis was given to my sister-in-law in 1995. Fortunately she did not just go home and give up. My sister-in-law, a good friend of hers, my wife and myself set about learning about lung cancer and about the problems of diagnosis.

For years, I have used Stephen Jay Gould's wonderful *Discover* article (Gould 1985) on medical prognosis in my critical thinking classes and I immediately gave her a copy. Gould makes the point that whatever the "average" life expectancy of a given diagnosis, there are always outliers — individuals who dramatically exceed the average — lying practically off the curve. Youth, general health, availability of excellent care,

a positive attitude, and even misdiagnosis may all contribute to the possibility that one is among the "outliers". Reasonable skepticism can be a source of hope.

My sister-in-law quickly transferred to a government cancer clinic, leaving the hospital where the initial diagnosis was done and where two different doctors had given her a death sentence. In the local cancer clinic, doctors work together in teams and, to some extent, encourage patient involvement. We immediately went to the clinic's library and received considerable help from the librarian. The team of doctors raised some questions about the initial pathologists' report. What type of cancer cell was involved? Were the sites independent or linked to one another? Further testing was required. But at the end of these inquiries it remained the opinion of the team and particularly the clinic's pathologist that the cancer sites involved identical (metastasized) cells.

Through this diagnostic process we learned that the judgement of whether the cancer had metastasized was based on judgements of visual similarity. There appeared to be no "gold standard"—no clear means to check the reliability of the pathologist's judgements. In addition, we learned that lung cancer with multiple sites in the lung was quite exceptional. No one was sure that such a diagnostic appearance meant that the cancer had metastasized.

Using cancer textbooks, *Medline*, and an article in the *Scientific American,* we came to the conclusion that the initial diagnosis was not well validated. We noted that the pathologists disagreed about the cell type, though the new pathologist assured me he was "90% certain" that the cells were identical and hence had the same source. But knowing there was no "gold standard," I was aware that this "90%" figure was just a subjective assessment of confidence and not a real measure of reliability. Based on my wife's reading about DNA testing in a colon and brain cancer study in the *Scientific American,* we asked why DNA testing wasn't being done in this case.

For reasons still unclear, the doctors at the cancer agency had not used such procedures in lung cancer cases. They now do. When they used DNA testing on my sister-in-law's lungs, it became clear (to the amazement of the pathologist) that the separate sites were not from the same source, but independent. The cancer had not metastasized and the risk of an operation to remove the cancer was justified — it is many years since her operation and my sister-in-law remains cancer free.

I believe that the above story is (among others things) an educational success story. Our actions and reflections embodied the ideal of a liberal education: intellectual autonomy. By dealing thoughtfully and carefully with expert advice, by bringing in disparate sources of knowledge, by understanding the structure of evidence and claims, and by having the confidence to raise questions, we were able to intervene in empowered, freeing and life preserving ways. None of us had training in biology, medicine or any science, though all of us had considerable formal education and confidence in our ability to research and think about any issue. My own knowledge of critical thinking and general issues around statistical reasoning was certainly valuable but, as it turned out, what was most crucial was my wife's awareness of DNA testing to track cancers — an awareness which was a result of her interest and pleasure in reading about science.

The confidence and intellectual abilities we used are ones that any graduate of a university should possess. I believe that the goal of producing graduates who have these abilities and attitudes is a way of making meaningful the traditional liberal ideal of education as intellectual liberation and empowerment. Never has the need and opportunity for people to become empowered by knowledge been greater. Thanks to the Internet, everyone can have access to an incredible amount of information. But making good use of this access requires its own expertise. Because we are dependent on experts for most of what we know, intellectual liberation

comes crucially from knowing how to make (thoughtful and critical) use of expert knowledge. I characterize a person who is good at dealing with experts and expertise outside his or her own field as a "competent layperson."

2. THE IDEAL OF THE COMPETENT LAYPERSON

It is not only in scientific areas that we need a layperson's competency. When we attend movies and plays, when we read for pleasure, we do so as laypeople, and we do so with varying degrees of competence. Non-professional members of an audience should be competent laypeople. More generally, competent laypeople are people who:

- Have a broad understanding of the intellectual landscape

- Have strong generic intellectual abilities

- Know how to evaluate information and claims outside their area of expertise

- Can delve more deeply into an area of specialization with efficiency and appropriate confidence

- Are an informed and appreciative audience for works of arts and science.

- Have an informed appreciation and understanding of nature and society

Competent laypeople know their intellectual limits, but also have the confidence and competence to expand them. Most of our lives are spent working and dealing with issues that are outside of our specific training: dealing with everything from car problems to personal problems, from doctors to computer technicians, from troubled children to financial problems, from an appreciation of film to the understanding of political affairs. The sheer breadth of such involvements can seem daunting, but that is what is involved in the kind of personally, professionally, and publicly rich lives we hope for

graduates. In developing a liberal undergraduate program, we need to consider how we can best prepare students for such a full life.

The usefulness of the notion of a competent layperson is not limited to applied fields such as medicine. It can also help guide the development of aesthetic responsiveness in students, so that they truly "appreciate art," and take an informed and sophisticated enjoyment in human creativity. Courses in art and music appreciation are explicitly developed with such instructional ends in mind, but all disciplines are expressions of human creativity. All introductions to disciplines should also have *appreciation* as a fundamental goal. One should emerge from introductory courses with an interest and understanding not only of the theories that constitute the disciplines (emerge with what a colleague calls "high conceptual understanding, low facility"), but also an appreciation of the intellectual enterprise, an understanding of the excitement involved in the reflection and inquiry. This is what the "inspiring teacher" often achieves. But, of course, disciplines are about something. We do the most service to students if we encourage and facilitate their interest in the world studied by the discipline. An informed appreciation of nature, the past, and social phenomena should provide the basis for an ongoing intelligent interest in the world.

Not only is the concept of a competent layperson tied to the liberal arts tradition of intellectual empowerment, it is also well suited to give practical meaning to another key goal: *citizenship*. It is widely acknowledged that a liberal education should prepare one to be an active and thoughtful citizen (the etymology of liberal education appears to come from the education for a "liber" — a "freeman"). Citizenship is the paradigmatic layperson activity. In principle, the citizen is called on to make decisions about a wide range of matters, e.g., public health, allocation of resources, environmental issues, criminal justice, social housing, town planning, economic strate-

gies, community morality, international relations. In a representative democracy, the extent to which citizens are actually involved in such decisions is limited. However, citizens must provide a critical audience for the debates, and more and more citizens are involved in direct action through advocacy groups. In either role, the citizen is called on to make judgements, to express opinions, and to vote on issues involving complex considerations and the input of a wide variety of experts.

3. THE EPISTEMOLOGICAL FOUNDATION

The traditional ideal of liberal arts as education for *liberation* — for freedom from the thrall of tradition and ignorance — continues to be a worthy one. Unfortunately, associated with this ideal is often the idea that appeals to authority should be rejected. The great philosophical traditions of the modern age, empiricism and rationalism, are both grounded in the notion that individuals can and should decide what the facts of a matter are solely on the basis of their own reasoning or experiences.

However such an epistemology won't do. Most of what we know, we know and have rational confidence in because it has appropriate authoritative support. Laypeople must make decisions informed by these expert claims. The epistemological basis of the educational ideal of a competent layperson rests on this very important point: since most knowledge claims are rightly grounded in authoritative support, knowing how to evaluate such support and to question it when appropriate should be a central educational goal. Instruction should strive to develop students who have the requisite knowledge, confidence and ability to use and question authoritative knowledge. The ideal of the competent layperson is the Enlightenment ideal of the reasonable and autonomous person augmented by recognition of the intellectual dependency that we have on expert developed and credited knowledge.

The typical Enlightenment attitude towards information supplied by authorities was expressed by John Locke (1690):

> The floating of other men's opinions in our brains, makes us not one jot the more knowing, though they happen to be true. What in them was science, is in us but opiniatrety; whilst we give up our assent only to reverend names, and do not, as they did, employ our own reason to understand those truths which gave them reputation. Such borrowed wealth, like fairy money, though it were gold in the hand from which he received it, will be but leaves and dust when it comes to use.

Locke (like other Enlightenment philosophers) was concerned to liberate people from accepting hand-me-down claims that were untested and unquestioned by the recipient. Intellectual liberation meant the rejection of such claims and the move to establish independently and personally the truth of claims. He also believed that this was the model of science.

While such advice was especially salutary at the beginning of modern science, the situation today is much more complex. None of us is equipped to independently establish most of the claims that we depend on. In our own areas of expertise, we may be able to verify claims, but as Steven Pinker, a leader in cognitive science, points out: "Nowadays we specialists cannot be more than laypeople in most of our own disciplines, let alone neighboring ones" (Pinker 1991). In our own lives, we may be uniquely equipped to verify certain historical claims (I was in San Francisco on Sunday), but outside this narrow ambit, we are in a state of "epistemic dependency" (Hardwig 1988).

This dependency is not necessarily bad; it means that we can know many more things than we could if left to our own devices. It is part of the great power of society and language that such knowing can be passed on. The danger, of course, is that erroneous beliefs can be passed on using the same powerful vehicles. The Internet is rightly criticized for being a powerful source of "dis-information" since anyone can

publish claims. Like any great source of power, the Internet comes with its dangers and the key is knowing how to harness its power. Knowing how to evaluate and question sources is the key to sorting between knowledge and falsehood. In my sister-in-law's case, when we challenged our local medical authorities, we did so on the basis of research reported by other authorities, not by independently doing pathology assessments.

The competent layperson must understand the social processes that collective verification and disciplinary debate play in scientific and other disciplined investigation. The competent layperson, recognizing that there is considerable time lag between initial claims and their verification, knows to look for the debate and counter-evidence in assessing novel claims. (The front page of the May 23, 2001 *Globe and Mail* contained the headline: "Scientists prove boys will be boys." The article is more judicious than the headline, but a competent layperson would be immediately skeptical of such absurd claim of scientific proof.)

The competent layperson may well have to adjudicate between expert claims much as a judge does when faced with contending experts. The ability to make such judgements is a key critical thinking ability. It requires an understanding of how claims are verified and established within a discipline or profession, including an understanding of the importance and limits of consensus.

Despite the power of this concept, many involved in the liberal arts may have concerns about its implications. Below I will try to address some of these.

4. CONCERNS

4.1. The loss of the ideal of the "liberally educated person"

The competent layperson may seem a poor replacement for the rather grander notion of the "educated person." The

educated person is one who is appropriately steeped in the knowledge of the culture (which used to be limited to Western culture, but now requires even broader knowledge). This is usually taken to include familiarity with the classics of both fiction and non-fiction and a minimal familiarity with contemporary science and mathematics.

The lack of effective general education requirements in most institutions demonstrates that this ideal is seldom actually pursued. But its echoes are found in educational mission statements, and it influences the thinking and much of the talk about curriculum, especially for those who work in the humanities. This is an ideal of liberal education that is more timeless and less driven by the narrow economic immediacy that governs courses in areas such as business and engineering. The ideal of educating individuals in the knowledge of their culture serves to remind us that curriculum should have an historical dimension that reaches beyond the passing fads and demands of contemporary culture. It is crucial that higher education base its curricular goals (even in the applied fields) on concerns and times that extend beyond the immediate needs of the economy and work.

While more obviously practical in its orientation, the ideal of a competent layperson also embodies the more timeless goals of liberal education. By emphasizing abilities and knowledge that are not job or profession specific, the ideal of the competent layperson emphasizes the development of universally valuable skills and understanding. By stressing the intellectual empowerment necessary to deal with the complexity of our time, the ideal goes beyond the notion of the educated person. The competent layperson, like the "educated person" should have the requisite knowledge necessary to be a fully educated member of society. The difference is that the curriculum of the "educated person" was determined by tradition and what was socially expected of a member of an educated elite. What determines the curriculum of the com-

petent layperson is not what is *socially* required, but rather, what is needed to function fully and thoughtfully in one's personal, vocational, and public life. The educated person was one who had appropriate knowledge; the competent layperson has appropriate abilities and understanding.

It might be thought that the educational ideal of developing a competent layperson is only applicable to the first two years of an undergraduate education. Presumably it has always been an implicit goal of the general education requirement to develop "layperson expertise." But since many majors no longer prepare one to directly enter a career, they should be seen (and have been seen for some time) as part of the general preparation of an educated person. The traditional rationale for having a student who is not planning to go on in a discipline take a major is that it gives a student an understanding of what it is to delve deeply into a topic. For such students, the major is just an aspect of their liberal education. The idea that a BA is mainly about general education is exemplified by the widespread claim that a liberal arts education (not just the first two years) prepares you for life and work by "teaching you to think." Like the ideal of the educated person, the ideal of the competent layperson should be a concept that informs the entire undergraduate project.

4.2. Practicality

It may be objected that the seemingly practical approach to education captured by the idea of a competent layperson does a disservice to the higher aims of what is, after all, supposed to be *higher* education. But the difficulty is that most of the abstract celebrations of liberal education are too far removed from the actual lives of students and from the instructional objectives of faculty to be of real guidance to educational practice. As the great American philosopher, Charles Peirce, pointed out, the way we make our ideas clear is by indicating how we would test them (Peirce 1878). The kind of behavior

that we can expect a competent layperson to exhibit is just the kind of demonstration of intellectual autonomy we ought to look for in a liberal arts graduate. It may not be all we are looking for in a liberal education, but in the classic words of the University Chicago President and Great Books advocate, Robert Hutchins, education's job is to "strengthen minds." A competent layperson has a strong mind.

Adopting the ideal of the competent layperson should also help clarify the undergraduate project. Ironically, this project is often hijacked by the *vocational* demands of graduate and professional schools in the liberal arts and the interest that faculty have in preparing acolytes. If we were clear that it is competent laypeople that liberal programs are preparing, not pre-competent professionals, many courses would change. We would be preparing students to be readers not literary critics, playgoers not playwrights, biology watchers (see Thomas 1978) not biologists. Those who went on in these fields would still have a good general grounding in their field, while the vast majority who do not go on would have had an ongoing interest and general understanding.

4.3. Aesthetic and intrinsic value

One of the key virtues of the traditional ideal of the educated person was the emphasis (in theory) on enhancing students' appreciation of what is intrinsically valuable, including literature, art, and scientific inquiry.

While the ideal of the competent layperson includes the idea that education should prepare students for meaningful work, it should not be seen as limited to this instrumental function. Like the ideal of the educated person, the ideal of the competent layperson also emphasizes the importance of cultivating an appreciation of the richness of intrinsically valuable pursuits. The public and media preoccupation with work and consumption tends to create an extraordinarily limited view of human possibility. A key goal of liberal education is

to expand the students' ability to enjoy the intrinsic pleasures that derive from appreciation of such pursuits as science and the performing arts. Competent laypeople are the audience that any thoughtful creator would wish for. The competent layperson is competent to enjoy the ends of life and not just competent at pursuing its means.

4.4. Pedagogy

The goal of post-secondary education as development of a competent layperson raises questions not only about curriculum but also about pedagogy. Clearly if a student is to graduate with the intellectual power and confidence of a competent layperson, they must have practiced what Sharon Bailin and I call "critical inquiry" (Bailin and Battersby 2016). This involves delving into issues that engage students, but uses the power of scholarly research to support reasonable judgments. It involves the recognition of the need to consider legitimate arguments and counter-arguments on controversial issues but provides students with tools and concepts to wade through these arguments and come, where possible or necessary, to a reasoned judgment (which could be that "we just don't know enough to decide").

A useful pedagogy is to have students work in small groups on a controversial issue of shared interest in the subject being studied. Assign students initially to pro or con sides of a question for their initial research. I have the students create a shared "wiki" or their "pro-con" research which they then all use as the basis for constructing the case for their individual, reasoned judgment. I also provide in-class time for them to discuss the question initially from their assigned point of view, and then from whatever point of view they have come to hold. Forcing students to initially defend positions with which they disagree is one of the most effective means of getting students to understand the complexity of controversy and

to avoid the fallacy of confirmation bias. If tests are needed for the course, the test created by the Collegiate Learning Assessment (CLA) provides a model of the kind of "prompts" that might be used to assess students' ability to do a critical inquiry. While the test model – the prompt – is a good one, the current method of evaluating the commercially available test is unsatisfactory (see Possin 2013 for concerns about the commercially graded version). (The test prompt is illustrated at:

http://cae.org/images/uploads/pdf/CLA_Practice_Assessment.pdf.)

5. TWO RESOURCES

Although I wrote the first version of this article many years ago, it has not been published in full until now. Since writing that first version, I have written two books which are meant as textbooks for the competent layperson. A brief description of each follows because they illustrate the kind of curriculum that I believe is necessary for the development of competent laypeople.

The first, *Is that a Fact: A Field Guide to Scientific and Statistical Information* (2016), is a layperson's guide to understanding, evaluating, and using statistically-based scientific information. It gives the reader a basic understanding of the epistemological basis for statistics but goes beyond statistics to describe how to evaluate the status of any scientific claim. One focus of the text is epidemiology because so much of popular health discussions are based on this research, but it includes chapters on reliability of polls, evaluation of graphs, and various social statistics such as the crime rate, GDP, etc. The goal is not to teach "statistical skepticism," but rather how to make thoughtful use of such information.

The other text, written together with Sharon Bailin, *Reason in the Balance: An Inquiry Approach to Critical Thinking* (2016),

is a critical thinking text that aims not merely at "logical self-defense" but teaches students how to conduct a *critical inquiry*: how to find and assess information and use it to make "reasoned judgments." This approach addresses the key abilities of a competent layperson as listed above:

- A broad understanding of the intellectual landscape

- Strong generic intellectual abilities

- Know-how to evaluate information and claims outside their area of expertise

- Ability to delve more deeply into an area of specialization with efficiency and appropriate confidence

- Ability to be an informed and appreciative audience for works of arts and science

- An informed appreciation and understanding of nature and society.

We address these abilities by having the last chapters of the text exhibit how to conduct a critical inquiry in the natural sciences, social sciences, art criticism, philosophy and conspiracy theories. For example the dialogues in the these chapters address questions such as:

- Does the theory of natural selection prove that people are not altruistic?

- Does playing violent computer games make people violent?

- How should we evaluate and appreciate art such as Picasso's *Guernica*?

- Is ethical relativism defensible?

- Are conspiracy theories credible?

The idea is that by providing numerous examples of how

students might conduct an inquiry, they will be empowered to do so themselves. The relevant pedagogy is described in the pedagogy section above. While our book is designed for a critical thinking course, all courses could have, as part of their curriculum, exercises in applying the strategies of inquiry or applying the concepts being learned to issues of current public or personal interest.

6. CONCLUSION

The idea of the competent layperson is as timely as the Internet. With increasing access to education and information, society and educators should revisit the idea of what it is to be an educated person. The current emphasis on "practical" education in a world where knowledge is power and money risks missing the crucial power of a broad education. Vocationally specific competencies and knowledge are often crucial to initial employment success. In the longer term, however, the abilities and knowledge necessary for our general competency as laypeople not only contributes to vocational success, they enhance and empower the whole breadth of our intellectual, personal and social lives. Focusing explicitly on the development of the knowledge and abilities required for the competent layperson could significantly change undergraduate education, providing a more genuinely liberating education.

Changing educational habits will be no easy matter. While this process is challenging, it may be helped by the realization that many, if not most, people in higher education are competent laypeople — albeit not usually because of explicit efforts of their education to make them so. Their abilities as competent laypeople are what enable them to live rewarding and varied lives. As educators, we should be striving to enable all students to do the same.

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CHAPTER 17

CRITICAL THINKING AS INQUIRY IN HIGHER EDUCATION

Mark Battersby and Sharon Bailin

1. INTRODUCTION

This paper will describe and argue for an approach to fostering critical thinking in higher education based on inquiry. This approach encompasses both critical thinking in everyday contexts and critical thinking within the disciplines.

A common approach to teaching critical thinking in higher education in North America is through separate courses. The focus tends to be on the evaluation of individual arguments typically found in everyday contexts (e.g., newspaper editorials). It is assumed that such a focus will result in students being able to think critically in real contexts. It is often also assumed that acquiring the skills of argument evaluation in these contexts will transfer, where relevant, to critical thinking in particular disciplinary areas. On the other hand, the assumption of traditional teaching in the disciplines has generally been that the modes of argumentation and reasoning of the discipline will be acquired automatically by students through learning the discipline.

We argue in this paper that these assumptions are unfounded. Focusing on the evaluation of individual arguments is problematic, based as it is on a faulty model of critical thinking which neglects the dialectical and contextual dimen-

sions of reasoning. Knowledge of the arguments on various sides of an issue as well as of the historical, intellectual, and social contexts is essential to making a reasoned judgment on everyday issues as well as in disciplinary contexts.

The assumption that critical thinking will be acquired automatically through disciplinary pedagogy is also unfounded. Reasoning and argumentation are seldom a focus of disciplinary pedagogy. Moreover, this approach neglects the common aspects of argumentation which transcend disciplinary boundaries.

What we propose as an alternative is an *inquiry approach* to critical thinking pedagogy which focuses on the comparative evaluation of competing arguments with the goal of making reasoned judgments (Bailin and Battersby 2016). This approach emphasizes both the aspects common to inquiry across a range of areas and the modes of argumentation that are specific to the area. This approach can be the focus of a separate course and can also be integrated into disciplinary instruction.

2. CRITIQUE OF CONVENTIONAL CRITICAL THINKING COURSES

It is often the case that the only concerted, overt attempts to teach critical thinking and argumentation at the postsecondary level take place through separate courses on critical thinking. Such courses are commonly offered in philosophy departments (at least in North America) and generally limit their focus to logic, formal or informal, and the evaluation of individual arguments. The arguments used are usually taken from the media, political speeches, and other sources of "everyday" arguments and are often presented out of context. Although some popular critical thinking texts with many editions (e.g., Moore and Parker 2010; Vaughn 2012; Waller 2011) have started to make some moves away from a sole focus on analyzing de-contextualized arguments, these efforts are

episodic (e.g., a section on analyzing longer arguments). None of these represents a unified focus on developing the abilities and habits of critical inquiry (Hamby 2012; Hitchcock 2013).

We therefore believe that this approach is inadequate (Bailin and Battersby 2009, 2016). In our view the goal of critical thinking instruction is to provide students with the understanding and skills necessary for thinking critically in real contexts. And the kind of critical thinking which actually takes place in real contexts, both in the disciplines and in everyday life, centrally involves making reasoned judgments on complex issues. The focus on reasoned judgments marks an approach to critical thinking which can be seen as epistemological (Siegel 1988, 1997; Lipman 1991; Paul 1990). An epistemological conception views critical thinking in terms of the quality of and criteria for good reasoning, and focuses less on arguments per se than does a more logically-oriented conception.

Indeed, it is our view that arriving at reasoned judgments on complex issues involves more than the evaluation of individual arguments. It involves a process which is dialectical (Blair and Johnson 1987, pp.45-46). To say that the process is dialectical means that it takes place in the context of some controversy or debate. This implies that it is initiated by some question, doubt, challenge, and that there is a diversity of views on the issue, arguments both for and against (if the controversy is genuine, then it is likely that there will be at least some plausible arguments on both sides (Johnson 2003, p.42)). The dialectical aspect also means that there is an interaction between the arguers and between the arguments involving criticism, objections, responses, and, frequently, revisions to initial positions (Bailin and Battersby 2009; Johnson 2000).

An implication of this view is that it is seldom the case that reasons and arguments can be evaluated individually in any comprehensive or significant manner. It is possible to evaluate individual arguments in a preliminary, *prima facie* manner,

discovering fallacies or errors in reasoning and evaluating the reasons or evidence in support of the conclusion (Bailin and Battersby 2016). In order to reach a reasoned judgment on the issue in question, however, we must go beyond this *prima facie* evaluation and evaluate the arguments in the context of this dialectic, of this historical and ongoing process of debate and critique. In order to reach a reasoned judgment, arguments need to be evaluated comparatively, in light of alternatives and competing arguments and views (Bailin and Battersby 2009, 2016; Johnson 2007, p.4; Kuhn 1991, pp.201f).

A major weakness of traditional critical thinking courses is that they do not focus on the kind of comparative evaluation which we make in actual contexts of disagreement and debate. It is this dialectical and contextual dimension which is largely missing from traditional critical thinking instruction.

3. CRITIQUE OF CONVENTIONAL DISCIPLINARY TEACHING

A different sort of problem arises in the context of attempting to develop critical thinking in the disciplines. The assumption of traditional teaching in the disciplines has generally been that the modes of argumentation and reasoning of the discipline will be acquired automatically by students through learning the discipline. Yet this assumption appears to be unfounded. Much research has indicated that even post-secondary students studying a discipline do not necessarily reason well in that discipline (Hestenes, Wells and Swackhamer 1992; Jungwirth 1987; Ferraro and Taylor 2005). This should not be particularly surprising given the fact that reasoning and argumentation are generally not a focus of disciplinary pedagogy. While many instructors admit the need to emphasize critical thinking, this concern is often overridden by the need to cover disciplinary content.

Another problem with leaving the acquisition of reasoning to the vagaries of disciplinary teaching is that this approach

neglects the aspects of argumentation which transcend disciplinary boundaries. To the extent that the reasoning in the discipline is a focus of study, it is likely to be limited to the type of reasoning and argumentation characteristic of the particular discipline, for example "scientific method" in the sciences. The aspects of argumentation common to various disciplines and to non-disciplinary contexts such as the procedures for conducting an inquiry, the logical analysis of arguments, fallacies and common errors in reasoning, the evaluation of sources, and those criteria for evaluation which are common across domains are not likely to be included. Thus the connection between inquiry in the particular discipline and the larger enterprise of inquiry is not likely to be made.

An additional problem with much traditional disciplinary teaching is that it tends to neglect the dialectical dimension of argumentation. But, as was pointed out above, reasoning and argumentation need to be evaluated in the context of the dialectic in which it arises and is embedded. This is equally the case for making a reasoned judgment in a discipline as it is for making judgments in everyday contexts. Making such judgments involves weighing and balancing competing arguments and so requires an understanding of the dialectic and a grounding in the debates within the discipline.

Simply introducing students to a variety of competing theories is insufficient, however. They also require the resources for comparatively evaluating these theories and judging among them. One of the requirements for comparatively evaluating competing theories and views is an understanding of discipline specific modes of argument and criteria, for example causal reasoning in science, statistical reasoning in the social sciences, or historical reasoning in history, which may not be addressed in separate critical thinking courses. Without a grounding in the debates within the discipline and without an explicit focus on the modes of argumentation and the evaluation criteria which are specific to the area, the modes of

argumentation and reasoning in particular disciplines are not likely to be learned.

4. TEACHING CRITICAL THINKING AS INQUIRY

What we propose as an alternative is an inquiry approach to critical thinking pedagogy. We use the term inquiry to refer to the careful, critical examination of an issue in order to come to a reasoned judgment. While the term inquiry is not common in the critical thinking literature, Hitchcock's notion of argumentative discussion has considerable overlap with our notion of inquiry: "An argumentative discussion is a sociocultural activity of constructing, presenting, interpreting, criticizing, and revising arguments for the purpose of reaching a shared rationally supported position on some issue" (Hitchcock 2002, p.291).

There are several aspects of inquiry that are significant in this approach. The first is that inquiry requires focus on an issue. An inquiry is initiated by some challenge, controversy or difference of view that is in need of resolution. The second aspect of significance is that inquiry involves a critical examination of evidence, arguments and points of view. It is not just an information-gathering enterprise but involves, centrally, a critical evaluation according to relevant criteria. The third significant aspect is that inquiry aims toward a reasoned judgment. By a reasoned judgment we mean not simply a judgment for which one has reasons, but a judgment for which one has good reasons, reasons which meet relevant standards. Making a reasoned judgment is not simply a matter of evaluating individual arguments, however. Rather, it requires the comparative evaluation of competing arguments and views (Bailin and Battersby 2016).

An inquiry approach emphasizes both the aspects common to inquiry across a range of areas and the aspects and modes of argumentation that are specific to an area. Conducting inquiries on relevant topics can be used as a focus for and way

of structuring free-standing critical thinking courses and it can also be integrated into subject area instruction. Thus critical thinking pedagogy is structured around complex, authentic tasks. The various aspects that go into the process of inquiry are learned not as de-contextualized "skills" but rather in the context of coming to reasoned judgments on complex issues.

4.1. Teaching Inquiry in Separate Courses

How might one teach critical thinking as inquiry in a separate course? Our critical thinking text, *Reason in the Balance: An Inquiry Approach to Critical Thinking* (Bailin and Battersby 2016), provides one example of an inquiry approach to teaching critical thinking. The text uses dialogues among an ongoing cast of characters involved in realistic situations as a context for discussing the various aspects that go into the practice of inquiry, including identifying issues, identifying the relevant contexts, understanding the competing cases, and making a comparative judgment among them. These aspects are instantiated in inquiries on topics such as vegetarianism, the minimum wage, the legalization of marijuana, the regulation of dangerous dogs, the evaluation of a film, the bombing of Hiroshima, and the right of hate groups to speak. These various aspects are also applied to inquiry in specific contexts, including science, social science, philosophy, and the arts. There is also considerable emphasis placed throughout on the habits of mind which are essential for inquiry, including (among others) open-mindedness, fair-mindedness, the desire to act on the basis of reasons, the acceptance of uncertainty, and respect for others in dialogue – habits of mind which we characterize as the spirit of inquiry.

4.1.1. Guiding questions for inquiry

The following set of guiding questions is used to structure inquiry throughout the text:

- What is the issue?

- What kinds of claims or judgments are at issue?

- What are the relevant reasons and arguments on various sides of the issue?

- What is the context of the issue?

- How do we comparatively evaluate the various reasons and arguments to reach a reasoned judgment?

The text devotes chapters to each of these questions, with the students developing an understanding of each, applying them in practice contexts, and then using each one in turn to progressively develop an inquiry on a topic of their choosing. Through this process, the various aspects of inquiry are integrated and students gain proficiency in conducting inquiries.

We have reproduced here an excerpt from one of a series of dialogues between two students, Phil and Sophia, on capital punishment. We shall use this example (the present excerpt and the dialogues that follow it) to illustrate each of the aspects of inquiry.

Phil has been reading an opinion piece in a newspaper in which the chief of police of his town is arguing for capital punishment for murder.

Phil: Hey, Sophia—let me read you something interesting:

"Society has an obligation, first and foremost, to protect its citizens from harm. And the most serious form of harm is murder. Protecting citizens from murder involves ensuring that murderers don't repeat the offence. It also involves dissuading others from committing murder. Now I and other law enforcement officers know from a vast amount of firsthand experience with criminals that the only form of punishment that can effectively achieve both goals is the death penalty. Capital punishment involves taking the life of a person who has committed

murder in order to save the lives of innocent people, and so is the best option under the circumstances."

Phil: What he says makes a lot of sense. After all, society needs to do whatever it can to protect innocent people. And murderers have really given up their right to be protected because they've taken someone else's life. So killing them to save innocent people seems OK.

Sophia: Hold on a minute, Phil! Not so fast. You're leaping to conclusions again. You haven't even thought the issue through.

Phil: But what this guy says seems right.

Sophia: So are you just going to believe what he says without checking it out? What else would you expect a police chief to say?

Phil: Well, he does have a lot of experience with crime.

Sophia: But you haven't considered the other side. Your police chief certainly hasn't given us any of the arguments *against* capital punishment.

Phil: But what about his argument?

Sophia: I think that there's a lot more that we need to know before we can decide whether his argument is any good. We need more information. We need to know some facts about capital punishment. We need to look at all the arguments on both sides . . . We need to … I know. What we need to do is…

Sophia and Phil: . . . Conduct an inquiry!

Sophia: Now the first step, if I remember right, is to be clear about what the issue is.

Phil: That's pretty easy. The issue is whether we should have capital punishment.

Sophia: For what crimes? We need to be specific. In some countries, there's the death penalty for adultery.

Phil: No, no — I wasn't suggesting that. I'm only thinking about cases of premeditated murder.

Sophia: I'm glad you're clear about that.

> *Phil:* OK . . . next question—what kind of judgment does this involve?
>
> *Sophia:* Well, since we're talking about what we "should" or "should not" do, then I guess it's an evaluative judgment. But I can see already that we'll also need to look at some factual claims on the way—like whether capital punishment really does help prevent murders (Bailin and Battersby 2016, pp.185–186).

What is the issue?

In order to even begin to inquire, it is of vital importance to be clear about the issue which is to be impetus for the inquiry. Among the characteristics of an appropriate issue are that it be sufficiently focused to allow for productive inquiry; precisely and neutrally framed, avoiding vague, ambiguous, or biased formulations; and controversial, evoking genuine disagreement.

In the dialogue excerpt, Sophia notes that Phil's original formulation of the issue, whether we should have capital punishment, is too vague as it does not specify for which crimes.

What kinds of claims or judgments are at issue?

It is important to understand what types of judgments are called for by the inquiry which we are undertaking because different types of judgments are supported by different types of reasons and arguments and are evaluated by different criteria. For example, while a judgment in science will appeal to the criterion of fit with observations, a moral judgment will appeal to reasoning according to moral principles. Although there is a range of types of judgments, they can be categorized broadly into three types: factual judgments, evaluative judgments, and interpretive judgments.

In the dialogue, Phil and Sophia recognize that their inquiry calls for an evaluative judgment about whether capital punishment *should* or *should not* be practiced, but that it will also involve factual judgments, for example with respect to whether capital punishment really does act as a deterrent. As

the inquiry proceeds, they also recognize that their inquiry will require moral judgments, for example with respect to the risk of the state executing innocent individuals.

As another example, if students wished to address the issue of climate change, they would need to be able to distinguish among the kinds of judgments required by different questions about climate change, e.g.: "Is the climate changing significantly?" (factual descriptive); "Is climate change humanly caused?" (factual causal); "What, if anything, should we do about climate change?" (evaluative).

What are the relevant reasons and arguments on various sides of the issue?

A key aspect of inquiry involves laying out the arguments on various sides of an issue. This will include the various positions on the issue in question that have been offered; the evidence that has been brought forward and the arguments that have been made in defense of the various positions; the objections that have been levelled against the positions and the responses that have been made to these; the alternatives that have been put forth.

In the dialogue, Phil is initially inclined to accept the one argument in favor of capital punishment which he reads but Sophia recognizes the need to look at the whole debate and to evaluate the arguments on both sides of the issue before making a judgment. In a subsequent dialogue, after doing some research, they discover a number of arguments which are generally offered both in favor of capital punishment (e.g., arguments from deterrence, incapacitation, retribution, and cost) and against (e.g., arguments focused on the immorality of taking a life, the immorality of executing innocent individuals, rehabilitation, and the social causes of crime). They also find the various objections and responses which have been offered to these arguments. Making a judgment on the issue of capital punishment will ultimately require them to be aware of this entire dialectic.

What is the context of the issue?

Finding out about the contexts in which issues are situated can provide valuable information when conducting an inquiry. There are three aspects of context that we believe need to be considered: the state of practice, the history of the debate, and the intellectual, social, political, and historical contexts.

The state of practice refers to how things currently stand with respect to the issue. An understanding of the state of practice can provide information necessary for making a reasoned judgment. For example, in order for students to make a reasoned judgment regarding the raising of the minimum wage, they would need to know information such as the wage in other jurisdictions, when the minimum wage was last raised, the effect of inflation on wages, costs of living, and so on.

The history of the debate refers to the history of argumentation and deliberation which has led to current practice or thinking about the issue. Knowledge of the history of the debate can be helpful and is in some cases essential to understanding what is significant or contentious about an issue and in understanding the various positions which are contesting for acceptance. Knowing the history of a debate is also important in determining where the burden of proof lies.

Understanding the intellectual, political, historical, and social contexts surrounding an issue is also important in that it can aid us in understanding and interpreting arguments and can reveal assumptions underlying arguments and positions which may be important for their evaluation. For example, in making judgments about the legalization of marijuana in North America, it would be important to understand aspects of the history and social context of marijuana prohibition, including the fact that there is an enormous governmental and police investment in drug prohibition.

In a dialogue subsequent to the one reproduced above, Sophia and Phil investigate each of these aspects with respect

to the capital punishment debate. They discover the current state of practice in their location (that there is no capital punishment) as well as the situation worldwide – a general trend toward abolition, and recognize the argumentative implications of these facts in terms of which views carry the burden of proof (those which go against current practices). Looking at the history of the debate, they discover that some of the arguments (e.g., retribution, deterrence, and incapacitation) have very ancient roots, and also that the primary argument offered in favor of capital punishment has changed recently from deterrence to retribution in light of the lack of evidence of a deterrent effect. With respect to the intellectual, social, political, and historical contexts, they recognize that the pro and con positions on capital punishment tend to be associated with different worldviews with respect to issues such as tradition versus change in society, individual versus societal responsibility, and social order.

How do we comparatively evaluate the various reasons and arguments to reach a reasoned judgment?

• *Evaluating individual arguments*

The core of an inquiry is the evaluation of the various views and arguments in order to reach a reasoned judgment. A crucial aspect involves the evaluation of the individual arguments which have been made. It is here that the usual criteria for evaluating arguments come in. Undertaking a *prima facie* or preliminary evaluation of the arguments for fallacies or errors of reasoning is an important first step. In addition, the various claims need to be evaluated according to the relevant criteria — factual claims by looking at evidence in support of claims and the credibility of sources, evaluative claims by assessing the argumentation.

In conducting their *prima facie* evaluation in a subsequent dialogue, Phil and Sophia do encounter fallacies of anecdotal evidence and improper appeal to authority, as well as possible

bias in the police chief's argument. They realize, however, that the fact that there are fallacies in the arguments does not invalidate the views which he is defending. What it does mean is that they must go on to evaluate the various claims.

With respect to the factual claims, after extensive investigation, they succeed in determining that there is a consensus in the research that capital punishment does not act as a deterrent to murder. The also discover that the claim that capital punishment is less costly than life imprisonment is false. With respect to the moral arguments, they decide that there is a morally appropriate desire for justice behind the retribution argument for capital punishment, but that the concern about the state executing innocent people constitutes a very strong moral argument against capital punishment.

- *Comparative evaluation*

The evaluation of the individual arguments is necessary, but it generally cannot on its own lead to the making of a reasoned judgment. In order to come to a reasoned judgment, we need to perform a comparative evaluation of the arguments in order to determine their weight in terms of the overall case, and then combine the various evaluations in order to make a final judgment. This process involves balancing the various considerations which have come to light.

In their final dialogue on capital punishment, Sophia and Phil summarize their evaluation of the various arguments and weigh their comparative strength. In terms of the pro arguments, they conclude that there is no support for the deterrence or cost arguments, that incapacitation can be achieved by less drastic means than putting the perpetrators to death, and that there is some moral legitimacy to the retribution argument in terms of the desire for justice but that it can be achieved through life imprisonment. In terms of the con arguments, they conclude that the risk of the state killing innocent citizens is a very strong argument which overrides the retribu-

tion argument, especially as there are less morally problematic alternatives to capital punishment which can achieve retribution. Their anti-capital punishment judgment is strengthened by the worldwide trend toward abolition which places a burden of proof on the pro side.

4.1.2. Inquiries in Specific Areas

It is our belief that, if our goal is to foster students' critical thinking in the range of contexts which they will encounter, then it is important in a critical thinking course to include inquiries that focus on disciplinary knowledge and criteria in areas such as science, social science, philosophy, and the arts. Thus, in addition to focusing on topics such as capital punishment, the text also focuses on topics which require a knowledge of discipline-specific procedures and criteria, for example polygamy (philosophy), the effects of violent video games (the social sciences), interpreting a challenging work of art (the arts), and some historical examples of inquiries in geology, epidemiology, and evolutionary theory (the natural sciences). These inquiries exemplify both how the guiding questions, procedures and criteria apply in various areas and also the criteria which are specific to the discipline.

5. INTEGRATING INQUIRY INTO SUBJECT AREA INSTRUCTION

The inquiry approach can also provide a method for instilling critical thinking into discipline-focused courses while still providing adequate coverage of course material. Organizing teaching around inquiries can serve to illuminate the common structure and aspects of inquiry as well as illustrating how this structure and these aspects are manifested in the particular area. This approach also highlights the specific concepts, forms of reasoning, argumentation and criteria which are particular to and dominant in the particular discipline. Nosich's recommendation to focus student thinking on a deep understanding

of the central concepts of a discipline is very much in consonance with an inquiry approach (Nosich 2012).

For an inquiry approach to be successful, the instructors need to be clear about the long-term learning goals of the course. This is especially important for introductory or general education courses where students are unlikely to go on further in the discipline. Presumably the goals will include engaging the student in the subject and the disciplinary approach to subject matter, but should also include empowering students to use the methods and information produced by the discipline to make thoughtful and reasonable decisions as individuals, citizens and workers. As long as the primary goal of a course, especially an introductory course, is to lay down a basic vocabulary or get students to retain abundant factual information, it will be difficult to devote enough time or student energy to learning how to inquire and to understanding argumentation in the discipline. But if the primary outcomes include an understanding of the issues and claims in the discipline and the ability to make reasoned judgments using disciplinary criteria, then the inquiry approach can be used both to reinforce the learning of subject material and to develop those abilities and habits of mind that lead to reasoned judgment. For example, students in an ecology course could be asked to assess local laws governing logging. Through engaging in this inquiry, students would learn the requisite ecological concepts of forest development and sustainability, but they would also learn what is involved in coming to a reasoned judgment on the issue.

To illustrate how one might integrate the inquiry approach into disciplinary teaching, we will show how each of the guiding questions could be used to address the questions of logging and forest management.

What is the issue?

In order to pursue this inquiry, students would need, first, to be clear about the issue or question. Is the question what regu-

lations would provide for sustainable logging? Or is the question how to protect ecosystems for animal conservation?

What kinds of claims or judgments are at issue?

It would be important, for this inquiry, to distinguish between normative claims and judgments about the value of forests, and scientific claims about the consequences of logging on fishing or ecosystem health. The idea of "ecosystem health" is a good example of a concept that students would need to grapple with in trying to sort out value and factual questions. "Health" is a complex concept including both norms and facts and getting clear about what is at issue is an important intellectual challenge.

What are the relevant reasons and arguments on various sides of the issue?

Ecological issues are often characterized by bias, and getting a full range of views with their attendant arguments is obviously important for making a reasoned judgment. Students must have adequate conceptual knowledge and be able to apply an understanding of the scientific approach to these issues to evaluate the debate. In addition, students would need to understand the economic pressures that are part of this debate as well as the normative questions that are involved.

What is the context of the issue?

There are a number of ways in which understanding the history of ecological debates is important for coming to reasoned judgments. For example, one well-known debate surrounding logging of old growth forests in the United States is the spotted owl debate. Because the spotted owl's habitat is old growth forest and because the United States has strong endangered species legislation, preservation of the spotted owl has been used to protect large areas of old growth forest from logging. If one does not know this background, the intensity of the current debate over strategies to preserve the owl (including the idea of culling competing species) would be incomprehensible.

It would appear to be about owls, but it is actually about logging old growth forests.

Understanding the history of a debate is also important for determining the burden of proof on an issue. At any historical moment in most disciplines there are accepted theories or factual claims which are supported by a wide consensus, and these constitute the default views. Anyone wishing to refute these views bears the burden of proof. Determining where the burden of proof lies with respect to the issue of logging regulation would form an important aspect of this inquiry, although the fact that ecology is a relatively young discipline makes this determination particularly challenging. For many introductory students, the default view is whatever they have learned from their upbringing or even perhaps from their own experience. It is interesting to invite students to reflect on the question of who bears the burden of proof and to consider whether their position can be appropriately treated as the default view.

How do we comparatively evaluate the various reasons and arguments to reach a reasoned judgment?

While the issue of logging regulation involves numerous ecological questions, it also involves economic and ethical ones. How do we weigh short term economic benefits against long term ecological sustainability? There are no easy answers, but explicitly addressing these issues and attempting to balance competing values and interests is crucial to making a well informed and reasoned judgment.

The preceding is but one example of how an inquiry approach can be used in disciplinary teaching, in this case with respect to an interdisciplinary issue having a strong scientific component. We would like to stress, however, that this approach can be used in virtually any subject area, for example in the social science (e.g., Should we allow our children to watch violent video games?), in the arts (e.g., Is Duchamps's urinal really art?), or in philosophy (Should polygamy be legal?) (Bailin and Battersby 2016).

6. FOSTERING INQUIRY ACROSS THE DISCIPLINES

Some more general strategies can also be employed in all areas in order to foster inquiry across disciplinary areas. The goal is to promote an understanding of the process of inquiry practiced in the particular area as just one example of the enterprise of inquiry more broadly, involving a similar aim, namely to reach a reasoned judgment, common guiding questions, some common or overlapping concepts and criteria, and the same habits of mind (e.g., open-mindedness, fair-mindedness, a commitment to reason, an inquiring attitude) (Bailin and Battersby 2016).

One particularly important habit of mind that is central for inquiry in all areas is the propensity to always consider alternative views and theories. In order to develop this habit of mind, students can be required to defend competing theories with which they disagree and attempt to come to reasonable conclusions despite conflicting evidence and theories. It is often an illuminating experience for students to understand their resistance to evidence and argument for a theory with which they have a prior disagreement.

Many key concepts are used widely in many areas (e.g., concepts common in the sciences such as the distinction between correlation and causation, the problem of getting reliable data, the question of experimental validity, the problem of confirmation bias). All these widely shared concepts can be reinforced in almost any subject. Even such subjects as literary or artistic analysis can be shown frequently to involve reasoning to the best explanation while considering alternative points of view.

The ideal situation for teaching inquiry across the disciplines would be one in which instructors were aware of how faculty in other disciplines presented the key concepts of inquiry and critical thinking so that these concepts could be reinforced in all courses. This is a lot to hope for, but the notions of seeking alternative explanations, weighing compet-

ing arguments, and coming to a reasoned conclusion are suffi-
ciently applicable across a range of subject areas that parallels
can usefully be drawn. It is useful to ask students whether
they recognize that argumentative and evaluative approaches
in one course have analogies with those approaches used in
other courses.

Because many of the problems of the real world involve
interdisciplinary or multidisciplinary inquiries, there is a
wealth of topics and issues which may be of genuine interest to
students and which could be used to illustrate how some of the
relevant evaluative criteria can be applied across disciplines.

7. CONCLUSION

We believe that an inquiry approach to teaching argumenta-
tion and reasoning is to be recommended for several reasons.
First, in broadening the focus from the evaluation of individ-
ual arguments to the making of reasoned judgments, it aims
to foster the kind of critical thinking which takes place in real
contexts of disagreement and debate. This changed emphasis
brings to the fore the dialectical and contextual dimensions
of argumentation, which are central to the making of rea-
soned judgments. An inquiry approach also makes room for
the inclusion of disciplinary criteria and modes of argumen-
tation when dealing with everyday issues, the knowledge of
which is often essential for making judgments with respect to
complex, real-world issues.

There are also dispositional benefits to an inquiry based
approach. The requirement to actively seek information and
arguments in order to resolve an issue or puzzlement may fos-
ter habits of mind such as intellectual curiosity, truth-seek-
ing, self-awareness, and intellectual perseverance. In addition,
an open-minded, fair-minded, and flexible attitude is much
more likely to be encouraged by an approach which focuses
on inquiring through the evaluation of competing cases rather

than on one focused exclusively on the evaluation of individual arguments (Bailin and Battersby 2009).

With respect to teaching within the disciplines, an inquiry approach has the advantage of putting an explicit focus on disciplinary reasoning and argumentation, making reasoning a central part of what it means to learn a discipline. By highlighting the aspects of argumentation which are distinctive to particular disciplines, it gives students the tools to reason well within those disciplines and with respect to issues which call on disciplinary understanding. But it also has the additional merit of highlighting those aspects of argumentation which are common to inquiry across disciplines. In so doing, it makes explicit the connection between disciplinary inquiry and inquiry more broadly, enabling students to view reasoning and argumentation in any discipline not as an isolated activity but rather as connected with other critical practices of investigation, discovery and creation.

To date, our main basis for evaluating an inquiry approach is personal experience. We have been teaching using this approach for several years, both in undergraduate critical thinking courses and in an M.Ed. program for practicing educators, and our results have been extremely promising in terms of students' ability to conduct reasoned inquiries. In addition, Hitchcock (2013) has collected data on more than 400 students over the three occasions in which he used *Reason in the Balance*. What he found was that, although students did not do as well as previous students on some types of multiple-choice exam questions testing the micro-skills of argument analysis and evaluation, they did noticeably better on items testing their ability to identify a counter-example to a generalization, judge the trustworthiness of a source of information, and analyze and evaluate causal arguments. Their performance was comparable on items involving supplying missing premises, evaluating conditional arguments, judging deductive validity, and identifying fallacies. These multiple-choices exams did not,

however, test the ability of students to conduct inquiries leading to reasoned judgments. More systematic evaluation of the approach, especially in terms of the extent to which it enhances the making of reasoned judgments, would be an important subject for further research.

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CHAPTER 18

FOSTERING THE VIRTUES OF INQUIRY

Sharon Bailin and Mark Battersby

1. INTRODUCTION

The notion of virtue, recently popular in epistemology, has now also found application in argumentation theory. Indeed, a number of theorists are attempting to ground a theory of argumentation around virtue, much in the way that epistemologists have tried to do with virtue epistemology (Cohen 2007, 2009, 2012; Aberdeen 2007, 2010). Whether or not one accepts this type of agent-centered account of argumentation, it is clear that the notion of virtues forms a central component of most theories of critical thinking. What has been given insufficient attention, however, is how one might go about fostering these virtues. It is this issue that is the focus of this paper.

We begin by examining the notion of virtue and what constitutes the virtues of argumentation or critical thinking. We argue that the notion of virtue is more appropriate for characterizing this aspect than the notion of dispositions commonly employed by critical thinking theorists. We also make the argument that it is more illuminating to speak of the virtues of inquiry rather than of argumentation. The remainder of the paper focuses on the issue of how these virtues might be developed.

2. THE VIRTUES OF INQUIRY

What, exactly, are the virtues of argumentation or critical thinking (Cohen uses the two interchangeably)? Cohen describes them thus:

> In order to bypass the debates as to exactly what sort of thing a virtue is, let us stipulate that argumentative or *critical* virtues are the acquired habits and skills that help us achieve the goals of critical thinking (Cohen 2009, p.54).

Cohen's inclusion of "skills" as well as "habits" in his conception of virtue runs counter to common usage. Indeed, theorists tend to include the dimension referred to by the term virtue in their conception of critical thinking to refer to precisely the aspect which goes beyond skills.[1] The aspect of critical thinking of interest here, and the aspect commonly picked out in theories of critical thinking by the term "virtue," is this additional dimension.[23]

This dimension, although central to most theories of critical thinking, has been described in various ways by different theorists. Virtue argumentation theorists, as well as some philosophers and philosophers of education (Paul 1990, Burbules 1995, Bailin and Battersby 2007), use the term virtues. Others, e.g., Bailin et al. (1999a), refer to habits of mind. Peters talks about "rational passions" (Peters 1972). The most common characterization, however, is in terms of dispositions (see, e.g., Ennis 1996; Siegel 1988). This dispositional dimension has

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1. See the next section for a discussion of the problems with the concept of skill to capture this aspect.

2. See Aberdein 2007 for a discussion of the importance of distinguishing between argumentative virtues and skills, e.g., "The exact same fallacy, say an equivocation on a word with two subtly but crucially distinct senses, could result from either a failure of virtue, if deliberately intended to deceive, or from a failure of skill, if the utterer did not notice the double meaning" (p.7).

3. Bowell and Kingsbury (2014) do, at times, use the language of virtue for all the aspects, distinguishing between epistemic reliabilist virtues (skills), motivational virtues (the commitment to rational belief and action), and regulatory virtues (the sub-virtues), but they also refer to the reliabilist virtues as skills.

several components. One is a fundamental commitment to rational belief and action, well captured by Siegel's notion of critical spirit (Siegel 1988), Bailin and Battersby's spirit of inquiry (Bailin and Battersby 2016), or Hamby's willingness to inquire (Hamby 2014). The other component is behavioral: an inclination to act in accordance with the norms of reason. Whether they are called virtues, habits of mind, or dispositions, the list of aspects to be included is strikingly similar, for example: open-mindedness, fair-mindedness, curiosity, concern for truth and accuracy, the desire to act on the basis of reason (Bailin and Battersby 2016); love of truth, repugnance of distortion and evasion, respect for the arguments of others (Peters 1972); intellectual humility, intellectual courage, intellectual integrity, intellectual perseverance, faith in reason (Paul 1990). There is some discussion in the literature regarding the inclusion of particular candidate virtues, e.g., sincerity (Cohen 2009b, Allen 2009), ingenuity (Morin 2014), receptivity (Norlock 2013), proportionality (Cohen 2009b, Aiken and Clanton 2010). Nonetheless, an overarching commitment to reasoning and a set of sub-virtues which are grounded in that commitment are common features of the various accounts.

Why, then, characterize this aspect of critical thinking in terms of virtues rather than dispositions? The term disposition is used in this context to describe a behavior, a habit, an individual tendency to act in a certain way; it can also be used to refer to an imputed quality or property of an individual by virtue of which they behave in this manner (Siegel 1999). Thus having a disposition to be fair-minded means that the individual has a tendency to act in a fair-minded manner. It may imply, further, that the impulse to act in this way has an internal rather than an external source (e.g., they are not being forced etc.).

A significant problem with the characterization in terms of dispositions is that it actually tells us very little about why the person tends to act in this way. The property sense does

rule out external sources of behaviour, but it would not rule out cases where the individual behaves in a certain manner because of blind habit or because they have assimilated certain external forces, e.g., if they have been indoctrinated or are unconsciously trying to live up to the expectations of a past teacher. This seems fundamentally different from acting in this manner because they understand the enterprise and value its procedures and goals (Bailin and Battersby 2007). It is the latter that is picked out by the concept of virtue. Burbules (1995) makes the point thus:

> "Disposition" tends to refer to individual tendencies, often ascribed from an external perspective through observation and behaviourist inference. A virtue, on the other hand, is not a mere expression of habit, but an expression of judgment and choice (1995, p.86).

And further:

> they [virtues] are not simply the activating sentiments that motivate us to apply the formal rules we have learned, but the aspects of character that bring us to care about learning or paying attention to such standards in the first place... A person who is reasonable wants to make sense, wants to be fair to alternative points of view, wants to be careful and prudent in the adoption of important positions in life, is willing to admit when he or she has made a mistake, and so on (1995, p.86).

The notion of dispositions gains its currency from its application in the physical realm. According to Quine, "a dispositional term is a promissory note for an eventual description in mechanical terms" (1973, p.14). In the physical realm, such an eventual mechanical description is the goal, but in the case of critical thinking, it is not a mechanical description which is at issue. A promissory note is not required because we already understand how to characterize this aspect – in terms of such concepts as understanding, beliefs, values and attitudes (Bailin and Battersby 2007).

The views highlighted here refer to the virtues of argumentation or critical thinking, but we would maintain that they are better thought of as the virtues of inquiry. We have argued elsewhere (Bailin and Battersby 2009) that the central goal of argumentation/critical thinking is arriving at reasoned judgments, and that this is a dialectical process involving the comparative evaluation of a variety of contending positions and arguments. This enterprise is one which we characterize as inquiry (Bailin and Battersby 2016). It is true that arguers may play different roles in particular argumentative exchanges, e.g., as proponents or opponents, judges or spectators (Cohen 2013). And they often have various intentions in arguing, e.g., rational persuasion, decision-making, justification (Johnson 2007); greater understanding of their own or an opponent's position, or of "the big picture" (Cohen 2009b). Nonetheless, whatever the particular role or intention, because the ultimate epistemological goal is to reach a reasoned judgment, the normative structure of the practice necessitates inquiry and thus the various virtues. For example, even if one begins with the intention to persuade, if the persuasion is to be rational, then one must care about truth and accuracy, be willing to put one's arguments to the test of reason and follow the arguments where they lead, be willing to concede to the most defensible position, etc. (Bailin and Battersby 2009). In other words, one must exhibit the virtues of inquiry.

3. FOSTERING THE VIRTUES OF INQUIRY

3.1. Immersion in the practice

According to many accounts, then, critical thinking is seen to involve two related, but conceptually distinct aspects: skills and dispositions. The problems with the notion of disposition has already been discussed. But even the notion of skills can be problematic if it is seen to refer to some inner mental entity. Critical thinking is skilled thinking in the sense that it meets

certain criteria, and there do not seem to be any grounds, either empirical or conceptual, for positing a connection between the quality of thinking and any putative mental entities or processes (Bailin et al. 1999a, b).

Even if skill is not used to refer to mental entities but only to indicate skilled performance, nonetheless conceptualizing critical thinking in terms two distinct and discrete aspects gives rise to other problems. It is clearly possible to improve students' performance in discrete critical thinking tasks (e.g., diagramming arguments, recognizing fallacies, etc.). There is considerable evidence, however, that the "disposition" to apply these "skills" in other contexts does not necessarily follow, nor do the particular critical thinking virtues (Facione 2000, Behar-Horenstein and Niu 2011). Bowell and Kingsbury (2014) describe the problem thus:

> Critical thinking teaching is beset by what is often called "the transfer problem": it is difficult to get students to use their critical thinking skills in their other studies and in their everyday lives (2).

Viewing the issue of how to foster the virtues of critical thinking in terms of transfer assumes 1) that there are discrete critical thinking skills which can be learned out of context (or in one context) and then transferred to another context, and 2) that whether or not one achieves transfer is a question of motivation and/or perception, which can be examined separately from the issue of skill acquisition.

We would argue that this dualistic way of conceptualizing critical thinking is faulty at its core (Bailin et al. 1999a). We would argue instead for a conception of critical thinking as a practice – the practice of inquiry. In the practice of inquiry, the achievement of skilled performance and the acquisition of the virtues inherent in the practice are intimately intertwined.

What exactly do we mean by a practice? Here we draw on MacIntyre's notion of a practice, which he characterizes thus:

> By a "practice" I am going to mean any coherent and complex form of socially established cooperative human activity through which goods internal to that form of activity are realized in the course of trying to achieve those standards of excellence which are appropriate to, and partially definitive of, that form of activity, with the result that human powers to achieve excellence, and human conceptions of the ends and goods involved, are systematically extended (MacIntyre 1996, p.187).

There has been some debate as to whether argumentation qualifies as a practice. Although argumentation exhibits most of the features of a practice, it has been argued that there are limitations with respect to the applicability of MacIntyre's particular characterization to argumentation (Kvernbekk 2008). As Kvernbekk has pointed out, although some of the goods of argumentation are internal to the practice of argumentation, not all are. We do sometimes argue for the sake of engaging in argumentation (Cohen 2012), but we more often argue for other reasons – to persuade, to justify, to make a decision. We would, however, also agree with Kvernbekk, citing Miller (1994), that not all practices are self-contained, as MacIntyre's conception implies. There are some practices which exist to serve some end beyond themselves – what Miller calls purposive practices. Argumentation (or critical thinking) can thus be seen as a purposive practice, with goods both internal and external to it. This seems very similar to Cohen's notion of argumentation as a tradition (Cohen 2012).

The practice of inquiry is essentially a critical practice, characterized by the give and take of reasons and arguments with the goal of reaching a reasoned judgment. It is a practice constituted by a web of interconnected concepts (e.g., reasons, evidence, argument, justification, premise, conclusion, opinion) which are connected, in turn, to certain principles and procedures, and all the preceding are connected to the goal of reaching a reasoned judgment (Bailin 1999). Inquiry is instantiated in a number of different particular practices, e.g., politics, ethics, science, law, the arts, which involve a diversity

of concepts, principles, procedures and specific purposes. But what these practices have in common is that they are all critical practices. Whatever else they may involve, they also importantly involve the evaluating of reasons, the justifying of claims, and the making of judgments (Bailin 1999).

Learning to think critically, then, is not a matter of learning a number of discrete skills (the approach typically taken in traditional critical thinking courses) and, additionally, picking up certain dispositions in the process. Rather, it is a matter of learning to participate knowledgeably and competently in the practice of inquiry in its various forms and contexts. And acquiring the virtues of inquiry arises through getting on the inside of the practice and coming to appreciate the goods inherent in the practice. The willingness to abide by its normative constraints comes through sharing in the constitutive purposes. Someone exhibiting the virtues of inquiry evaluates opposing views in a fair and open-minded manner because she understands that such a weighing is what is called for in order to reach a reasoned judgment; she is willing to concede to the most defensible position because she understands that her own view could be mistaken (Bailin and Battersby 2009).

Immersion in the practice of inquiry does not, however, imply simply teaching the disciplines in the traditional manner. Traditional disciplinary teaching has had notoriously limited success in fostering critical thinking (Hestenes, Wells and Swackhamer 1992; Jungwirth 1987; Ferraro and Taylor 2005). This is not surprising given that reasoning and argumentation are seldom a focus of disciplinary pedagogy. The nature of inquiry and how it is instantiated in the particular area is seldom made explicit (Bailin and Battersby 2015). And any focus on the virtues of inquiry is, in general, notably absent.[4]

What is required instead, is an immersion in the practice which brings to the fore the goals, principles, and underlying

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4. A notable exception appears to be graduate education, particularly in science, where fostering the spirit of inquiry is a frequent goal and achievement.

structure of inquiry, both in general and within the particular context, and makes explicit its modes of argumentation, methodologies, and normative constraints (Bailin and Battersby 2016; Battersby and Bailin 2015). With such an approach, the virtues of inquiry are part and parcel of learning to inquire as participants come to understand that such virtues are embedded in and required by the practice of inquiry. In order to achieve this, however, an appropriate context for inquiry must be created in which virtues are highlighted, promoted, and expected (Case and Balcaen 2008).

3.2. Creating a community of inquiry

The practice of inquiry is at its core a communal, social practice. Cohen (2014) makes the point thus:

> Arguing would have to be a way of participating in the community. If arguing is to be part of a tradition, it cannot be about who I am or what I do; it's about who *we* are and what *we* do. We argue *with* one another, not in isolation (p.4).

Thus the practice of inquiry requires being a part of and taking part in a community in which people can argue with one another, that is, a community of inquiry (Dewey 1938, Lipman 2003). Communities of inquiry are central to our various collective critical pursuits, and they are particularly central to democratic deliberation (Dewey 1938, Aikens and Clanton 2010).

A community of inquiry is not just a community in which people argue with each other, however. It is a community in which they do it in a way which instantiates the virtues of inquiry. Cohen again:

> Obviously, something more is needed to make logical inferences into dynamic, vital arguments capable of centering a tradition. And that something more is *arguing with* others. But even that is not enough, otherwise being excessively argumentative would make one a pillar of the community! What's needed is not just

arguing *with others*, but doing it *well*, that is, *virtuously* (Cohen 2014, p.4).

A community of inquiry is a community which has as its aim rational inquiry and reasoned judgment. And it is a community which is characterized by certain sorts of relationships and interactions, i.e., by open-minded and fair-minded exchanges, by rigorous but respectful critique, and by a commitment to respectful treatment, meaningful participation, and productive interaction (Bailin and Battersby 2016).[5] The character of these relationships plays a central role in fostering the virtues of inquiry.

> Virtues are flexible aspects of character, related to our sense of self and integrity, but also fostered and encouraged by the communities and relations with others that provide the context in which we decide and act (Burbules 1995, p.86).

And further:

> they [virtues] cannot be analyzed solely as individual possessions: persons acquire, maintain, and express the virtues that they do partly because of the relations they have to others, and how those others act in response to them (Burbules 1995, p.86).

3.3. The practice of inquiry in the classroom

What does an inquiry approach mean for how we go about teaching? It means, first, that an immersion in the practice of inquiry needs to be the focus of classroom activity. Second, the setting, structure, and relationships of the classroom need to instantiate the characteristics of a community of inquiry. How can these features be instantiated into actual pedagogical practices?

This may be best illustrated by contrasting an inquiry class-

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5. Aikens and Clanton (2010) argue that there are characteristics of individual deliberators (group deliberative virtues) that can help to foster virtuous deliberation, including deliberative wit, friendliness, empathy, charity, temperance, courage, sincerity, and humility.

room with traditional classroom structures and activities. For example, in a traditional critical thinking class, the focus of activity is generally on learning and practicing discrete "skills," for example, identifying the structure of arguments, argument diagramming, identifying fallacies. Although there may be some group work, the onus and focus is generally on the individual student and not on student interactions. Assessment is generally summative, i.e., the awarding of grades at the end of an activity or unit for the purposes of summarizing a student's proficiency.

An inquiry orientation will dictate a very different sort of classroom. The focus is not on micro-skills or decontextualized arguments. Rather students engage in the actual enterprise of inquiry, learning to come to reasoned judgments on complex issues. In the process, the criteria and modes of argumentation, both general and within specific areas, are brought to the fore and made explicit. The textbook we have published includes an examination of issues such as capital punishment, the minimum wage, the legalization of marijuana, the effects of violent video games, polygamy, and the interpretation of a challenging work of art (Bailin and Battersby 2016). Students learn the process of inquiry and work through the criteria and modes of argumentation relevant to the particular issue, then go on to conduct inquiries on issues of interest to them, both individually and in groups.

An inquiry classroom will instantiate the features of a community of inquiry. Student interaction is central. Students argue, question, challenge, and critique. They also and continually engage in collaborative activities, providing feedback on each other's work, working on joint projects, and doing collaborative inquiries. This type of collaboration is significantly different from much group work undertaken in educational settings. The latter tends to involve a division of labor, with each student preparing a different piece of the project, then assembling the parts at the end. The former, on the other hand, con-

sists in collaborative thinking, involving students discussing ideas, developing criteria, critiquing each other's work, questioning assumptions, and building on the ideas of their peers. The community created in the classroom will be characterized by the sorts of relationships and interactions described above, i.e., open-minded and fair-minded exchanges, rigorous but respectful critique, and a commitment to respectful treatment, meaningful participation, and productive interaction (Bailin and Battersby 2016). These attitudes or habits of mind can be fostered through instructor modeling and the setting up of explicit expectations among students and between instructor and students.

It might be objected that arguers may assume a variety of roles, including proponent or opponent, judges or spectators (Cohen 2013), and that each of these roles may require or emphasize different virtues. So if one is a defense lawyer, open-mindedness will not be the salient virtue required but rather an unrelenting pursuit of the weaknesses in the arguments of others. And in group deliberation, sometimes the person who doggedly maintains her position despite counter-arguments plays a useful role in ensuring that alternative arguments are given due consideration. Nonetheless in multi-role argumentation, arguments have to be put forward, understood and elaborated, defended, criticized, revised, and evaluated. Thus the virtues related to the various roles would have to be represented among the group in order for effective deliberation to take place. Individuals would also need to be proficient in taking on the various roles depending on the context (Radziewsky 2014). Indeed, with an inquiry approach, there is usually not a sharp differentiation among the various roles. Rather, individuals alternate between proposing, critiquing, defending, revising and evaluating. Moreover, the context we are considering here is education, and as educators we have an obligation to promote the full range of virtues in all our students.

For inquiry to flourish, one needs assessment practices which are consonant with an inquiry orientation, practices which value the activities, achievements, and virtues of inquiry. If what one is looking for is critical thinking, then one has to assess for critical thinking and not just for content. Moreover, assessment can have an important pedagogical function. Too often the only or primary form of assessment is summative. Yet formative assessment, that is assessment that is ongoing and for the purpose of enhancing performance, can assist students to improve their thinking (Scriven 1967, Nichol and Macfarlane-Dick 2006). Assessment becomes a part of the learning process as students come to understand the criteria relevant to evaluating aspects of their inquiries, learn to employ these criteria to assess their own work, to critique the work of their peers, and to revise and improve their own efforts. An inquiry classroom is one characterized by ongoing instructor and peer feedback and continual revision.

Despite our best efforts to foster the virtues of inquiry, there are certain common human attitudes and reactions which are counter-productive to inquiry and which are often reinforced in social contexts. Some examples are the need to be right, the desire for certainty, the identification with our beliefs, defensiveness, and groupthink (Bailin and Battersby 2016, pp.267 – 272; Battersby and Bailin 2014). Another aspect of acquiring the virtues of inquiry, then, involves becoming aware of these cognitive and emotional obstacles which can hamper inquiry, and instituting measures to avoid them or at least lessen their influence. One way to do this is to monitor one's own inquiry process, asking oneself questions such as: "Are my preconceptions and initial perspectives biasing how I evaluate this issue?" "Am I seriously considering other views and arguments?" "Am I being open to criticism?" "Am I identifying with being a reasonable person rather than with a particular point of view?" (Bailin and Battersby 2016, pp.273 – 275). There are also some pedagogical strategies which can help to counter some key obstacles and fos-

ter important virtues. For example, the failure to look at and seriously consider both sides of an issue or to seek alternatives is a significant problem for critical thinking, but there are strategies that can help mitigate this tendency. Requiring students to lay out and evaluate various sides of an issue as an integral part of the inquiry process is one example. Having students come up with the best arguments they can for a position that it is the opposite of what they believe is another.[678]

Another important consideration in trying to promote inquiry and its virtues is motivation (Facione 2000). A key concept which runs through the cognitive bias literature is that of mental effort (Kahneman 2010, pp.39 – 49). Thinking critically and engaging in serious inquiry requires mental work, and much of this literature seems to indicate that people are often not initially inclined to put in this effort. Kahneman has argued that this failure is due, in least in part, to insufficient motivation. Here MacIntyre's notion of seeing the point of a practice is relevant. A significant part of the motivation to engage in inquiry comes through getting on the inside of the practice and coming to appreciating the goods inherent in it (Bailin and Battersby 2007).

But inquiry is also a purposive practice which enables one to investigate complex issues in a rigorous way. The discovery on the part of students that they can tackle real issues which are meaningful and of interest to them, and that they have the means to think their way through them and make reasoned judgments can be significantly empowering and motivating.

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6. Zenker (2014) describes a teaching and learning activity for this purpose involving what he calls "counterfactual meta-cognition" (engaging in reasoning episodes that one does not agree with personally).

7. Another strategy is a U-shaped debate. in which students are encouraged to physically change their position around a semi-circle as they hear reasons from their peers that cause them to want to shift their view on the issue under discussion. For a more complete description of the process, see University of British Columbia (2014).

8. Structured controversy, in which students argue for both sides of a controversial issue and ultimately come up with a balanced view, is yet another example (see Johnson and Johnson 1988).

4. CONCLUSION

There is widespread agreement that fostering the virtues of critical thinking is central to a rational community and a democratic society. Our argument is that a serious commitment to fostering these virtues requires thinking about critical thinking differently and taking our conception into the classroom. Argumentation theorists tend to have a real interest in education and have devoted a great deal of attention to the content of courses in critical thinking. Insufficient attention has been paid, however, to the kind of educational outcomes that we hope to achieve through critical thinking instruction and to the pedagogical practices that might best achieve these outcomes. Our contention is that conceiving of our enterprise in terms of initiating students into the practice of inquiry in its various forms and organizing our teaching to achieve this is the most effective way to foster the virtues of inquiry.

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VII. CRITICAL THINKING AND CREATIVITY

CHAPTER 19

IS ARGUMENT FOR CONSERVATIVES? OR, WHERE DO SPARKLING NEW IDEAS COME FROM?

Sharon Bailin

1. INTRODUCTION

In his review of the book, *Rorty and His Critics* (Brandom 2000), Simon Blackburn makes the following observation:

> Rorty denies that philosophical progress comes about through argument. As he rightly reminds us, argument requires premises and conclusions that belong to the same conceptual family [or field]. Argument, it follows, is for conservatives. And real progress, by contrast, means 'offering us sparkling new ideas or utopian visions of glorious new institutions,' disabusing us of old routes of inference and feeling, enabling us to forget where we once were. It does not mean anything so flat as mere argument (2001, p.39).

The job of coming up with these sparkling new ideas, of proposing new vocabularies, of changing the world, falls to the "strong poet." The role to which those of us engaged in argumentation are relegated seems to be that of the accounting clerk, fitted with visor and sleeve protectors, scrutinizing the ledger book of ideas, making sure that the books balance and that no calculation errors have been made.

I would venture to say that many, perhaps most of us working in the areas of argumentation theory, Informal Logic and

critical thinking like to think of the practice to which we are committed as progressive, as contributing to social betterment and intellectual advancement. We may prefer to imagine ourselves out toiling in those conceptual fields, boots immersed in the muddy waters, planting and grafting as well as pruning and weeding, and perhaps even harvesting a crop from time to time. I suspect that most of us, whatever our political stripe, would resist the idea that we are confined by the very nature of our disciplinary practice, to simply uphold and perhaps rearrange the status quo, either intellectually or politically. But this is the picture that Rorty paints. In this paper I want to look at whether he is right. Can sparkling new ideas arise from argument?

2. RORTY'S VIEW

Let me begin by briefly rehearsing those aspects of Rorty's broader position that frame his views about argument. A central aspect is that it is anti-foundational. He denies the possibility of absolute, certain foundations for knowledge and instead claims that justification is to be sought within human practices. Such justification is, moreover, limited to particular practices, language games, or vocabularies but makes no sense between vocabularies. Argument cannot, then, adjudicate between vocabularies. And even the standards and principles that guide evaluation have no normative force but are simply ways of describing the practice. To think otherwise is to commit the fallacy of "seeing axioms where there are only shared habits, or viewing statements which summarize such practices as if they reported constraints enforcing such practices" (Rorty 1991, p.26).

Consistent with this position, Rorty maintains that the kind of philosophy that he is doing and advocating does not involve putting forth arguments. He denies that he is playing the game of rational discussion but claims, rather, to be engaged in a different practice which he describes thus:

It [the new method of philosophy] does not pretend to have a better candidate for doing the same old thing which we did when we spoke in the old way. Rather, it suggests that we might want to stop doing those things and do something else. But it does not argue for this suggestion on the basis of antecedent criteria common to the old and the new language game. For just insofar as the new language game really is new, there will be no such criteria (Rorty 1989, p.9).

He describes the practice in which he is engaged as "redescribing," and states that the aim is to make such redescription attractive so that people will begin to adopt the new vocabulary. Moreover it is this process of adopting new vocabularies on the basis of their aesthetic appeal and not that of rational choice of alternatives based on argument which effects changes in the culture.

3. INTELLECTUAL INNOVATION

I have described Rorty's view not primarily with the aim of engaging in Rortyan exegesis per se, but rather in order to highlight certain features of the position and bring out the more general picture of intellectual innovation on which his view of argument rests.

One central feature that marks innovation for Rorty is discontinuity. Innovative ideas exhibit a radical sort of novelty. They are not simply continuations and extensions of the previous vocabulary but are characterized by a complete break with what has come before. And because of this lack of continuity, new vocabularies are incommensurable with those they have superseded. This incommensurability means that the innovation cannot be evaluated in terms of the criteria that governed the previous vocabulary.

Another feature of the Rortyan view of innovation is that it draws a radical distinction between the generation and the evaluation or criticism of ideas. The activity of criticism (or argument) is seen as rule-bound and rigid, constrained by the logic of the particular framework or vocabulary. Innovative

ideas are radically new in the sense that they break free of this logic. Thus they cannot arise in the context of the application of evaluative criteria of the previous framework — these criteria would keep one trapped within the old framework. New ideas cannot be a product of a logical process of incremental alteration of antecedent ideas and views. The generation of innovative ideas must be, in some sense, non-logical and unconstrained. Generation and criticism are seen, thus, as qualitatively different and even opposed sorts of activities.

Stated thus, it becomes clear that Rorty's is but one version of a view about creativity that appears, and has appeared historically, in many contexts and guises. Among its most prominent proponents were the Romantics. Reacting against the rationalism of the Enlightenment and the classical emphasis on tradition, the Romantic poets and theorists glorified the imagination and viewed the arts not as imitation but as bringing something new into the world. Coleridge, in particular, highlighted the role of the creative imagination in producing something new and unprecedented, thereby transforming the artist into a God-like creator (Taylor 1989). Such a feat could not be the result of traditional rules or patterns. It was thought to be, rather, the product of poetic inspiration, which differs from ordinary ideation in that it is sudden, effortless and unanticipated. Abrams (1953, p.189) describes it thus: "The poem or passage springs to completion all at once, without the prior intention of the poet, and without that process of considering, rejecting, and selecting alternatives which ordinarily intervene between the intentions and the achievement" (in other words, without critical judgment). Poetic inspiration is the province of the creative genius. We can recognize the genius because there is "no mechanism in him or his work, nothing that can be analyzed and rationalized" (Barzun, p.475). The genius creates "without precedent either in concrete example or in codified precepts and rules" (Barzun, p.195). Originality is the hallmark of artistic creation for the

Romantics and the genius is the originator *par excellence*. The Romantics believed that, in creating beauty, the artist also revealed truth; as a consequence they had great faith in the power of the creative genius to change the world. Poets, according to Shelley, are "the unacknowledged legislators of the world" (quoted in Barzun, p.474). What we have, then, is a picture of a special sort of individual who, through an act of imagination, creates an original, artistic vision, a vision that is unanticipated, unprecedented and not the result of traditional rules or critical judgment, but a vision that can change the world. This is the Romantic creative genius — or Rorty's strong poet.

   Although the Romantic view focused on the arts, the picture of innovation that it elaborated has been extended into other areas as well, including scientific discovery. An influential version is that of Thomas Kuhn (1962) in his distinction between normal science and revolutionary science. Normal science, the mainstay of scientific activity, takes place in the context of a fixed paradigm which guides research, specifying the problems to be undertaken and the procedures, rules and criteria to be used in investigating these problems. Normal scientific activity is uncritical of the assumptions of the paradigm. Revolutionary science, on the other hand, is characterized by a radical departure from the prevailing paradigm and the creation of a completely new one. This new paradigm is not a logical continuation of the previous one, but involves a new way of viewing phenomena and is, thus, incommensurable with the old paradigm. Since criteria of evaluation are applicable only within paradigms, there can be no paradigm-neutral criteria according to which to choose between paradigms. Thus the acceptance of a new paradigm is not made on the basis of rational evaluation but can only be a type of conversion or gestalt switch. The parallels between Kuhn's view of theory change in science and the view of innovation offered by Rorty are very strong.

Another aspect of the Romantic view of innovation applied to science can be seen in the theories of Paul Feyerabend (1975). Feyerabend denies that there are any rules of method that are consistent and invariable with respect to all scientific practice. This is not a descriptive claim about poor scientific practice, however. Rather, he is making the claim that there could not be such rules, that the adherence to any invariable rules of method would be detrimental to scientific progress because they would keep one locked into the presuppositions of an existing theory. The only way in which the hold of a prevailing theory can be broken is by the positing of an entirely new theory, unconnected with the old one. The only method he accepts for scientific discovery is "anything goes."

And even Karl Popper, although disagreeing with Feyerabend's claims regarding the impossibility of rules of method for the evaluation of theories, holds strongly to a discovery/justification distinction and relegates discovery to the realm of the irrational.

> [M]y view of the matter, for what it is worth, is that there is no such thing as a logical method of having new ideas, or a logical reconstruction of this process. My view may be expressed by saying that every discovery contains "an irrational element," or "a creative intuition," in Bergson's sense (1959, p.32).

Aspects of this Romantic view of creativity have also thoroughly permeated popular consciousness, but in a somewhat democratized form. There is common acceptance of the idea that innovations are radically new and that a mode of thinking different from everyday logic is required to generate new ideas. One popular example is Edward de Bono's (1970) concept of lateral thinking. In contrast to vertical thinking, which is logical, evaluative and involves remaining rigidly within a framework, lateral thinking is strictly generative, producing new ideas without judging them, defying the logic of the framework, and making new connections between disparate elements.

One difference between the Romantic view of innovation and this contemporary popular version is that this special mode of creative thinking is no longer thought to be the exclusive purview of the genius. Rather, it can be learned and so is, in principle, open to everyone. Hence the plethora of creativity self-help books and do-it-yourself creativity videos with evocative titles such as *A Knock on the Side of the Head* and *A Kick in the Seat of the Pants,* that offer suggestions for "breaking set" and "thinking outside the box" (my favourite is the video guaranteeing to make you more creative in 30 days or your money back). Such materials warn of the dangers of too much logic; suggest techniques such as visualization, stimulating thinking with random information, and brainstorming (i.e., generating without judging); and offer advice such as: break the rules, unlearn what you know, follow your dreams, and consult a fool (von Oech 1986, 1993; Adams 1986).

One conclusion that can be drawn from this quick march through theories of creativity is that Rorty's view has a history and is linked to a tradition of thinking about issues regarding the nature and source of innovation and the role of logic and argument therein. It is not a new idea. The question still remains, is it sparkling?

4. CRITIQUE

I believe that there are serious problems with Rorty's view of innovation and of argument and that these significantly detract from the lustre of his idea.

4.1. Discontinuity

First, the claim regarding the discontinuity between vocabularies/paradigms/frameworks is problematic both conceptually and empirically. On the conceptual front, the problem is that comprehension seems to presuppose continuity. If a new idea or practice emerged which were totally unconnected

with any human traditions and practices, we would not be able to understand it. It is connections to what is familiar that render innovations comprehensible and give us grounds for seeing them as innovations as opposed to merely being strange. Innovations arise in the context of an enterprise that has a history and is part of a tradition, and the tradition has a direction, goals and meaning in light of which originality can be recognized.[1]

The discontinuity thesis also faces problems on the empirical front in that a close analysis of actual cases of innovation seems regularly to reveal continuities between new works and the previous traditions. The arts represent the model of creation for the Romantics, and to some extent for Rorty, yet even here connections to the problems, methods and techniques of the tradition seem always to be in evidence. A radical innovation such as Picasso's cubism, for example, can be seen as an attempt to grapple with a specifically artistic problem – the simultaneous portrayal of multiple perspectives. Moreover the continuity with the work of earlier and contemporary artists such as Cézanne, Matisse, Derain and Delacroix, and the influences of Iberian sculpture and non-European art are very clear.

Such continuities are evident in science as well. Numerous historians and philosophers of science have pointed out the conceptual and methodological continuities between successive theories and have demonstrated that even scientific discoveries that may appear revolutionary have their roots in the problems and theories of previous paradigms. Hattiangadi (1980), for example, describes Newton's development of the law of gravitation in terms of entirely logical physical and mathematical arguments. Brown (1977) illustrates how Einstein's theoretical innovations arose from his arguments against existing theories and took as their point of departure

1. This discussion of discontinuity is taken from Bailin 1992a.

some of the ideas of the rejected hypotheses. And Toulmin (1972) demonstrates that neither the changeover from Newtonian to Einsteinian physics nor the "Copernican revolution" were characterized by the kind of complete rational discontinuity that Kuhn suggests. Rather, these changes were gradual and there is clear evidence that they were "argued every step of the way" (p.105). He points out, for example, that the testimony of the physicists who switched from a classical to a relativistic position shows no evidence of an intellectual conversion. Rather "they presented the arguments that sanctioned their change of theoretical standpoint" (p.104). Similarly, Kuhn's own historical account makes clear that the "Copernican Revolution" took a century and a half to complete and was the outcome of rational discussion (p.105). Toulmin summarizes thus:

> We must face the fact that paradigm-switches are never as complete as the fully-fledged definition implies; that rival paradigms never really amount to entire alternative world-views, and that intellectual discontinuities on the theoretical level of science conceal underlying continuities at a deeper, methodological level (pp.105-106).

It may be that some changes in traditions appear so radical because we tend to view them from a distance. A closer analysis may be required to see the continuities. Indeed, this is the conclusion of Miller's (1984) historical study documenting the gradual development of the new quantum theories in the early twentieth century:

> The notion of scientific revolutions describes only the gross structure of scientific change. In the fine structure, where change is gradual, resides the fascinating problem of the nature of creative scientific thinking (p.301).

The realm of social and philosophical innovation seems to be of particular interest to Rorty, but here too continuities to past thought are everywhere in evidence. The types of inno-

vations that might be thought to manifest progress have built upon, as opposed to completely overturning, previous social and philosophical ideas (Bailin 1992c). The insights of critical theory, for example, can be traced back through Marx to Hegelian dialectic, and many feminist theories are rooted in previous Marxist and liberal philosophies. The critical theorist Henri Giroux (1991, pp.2-3) acknowledges this continuity thus:

> Modernism provides theoretical elements for analyzing both the limits of its own historical tradition and for developing a political standpoint in which the breadth and specificity of democratic struggles can be expanded through the modernist ideals of freedom, justice, and equality.

Sandra Harding (1990) makes a similar point with respect to feminist theory:

> However a specifically feminist alternative to Enlightenment projects may develop, it is not clear how it could completely take leave of Enlightenment assumptions and still remain feminist. The critics are right that feminism (also) stands on Enlightenment ground (p.99).

The discontinuity thesis is a crucial supporting plank in Rorty's view about the origins of innovation, but it cannot bear the weight of close scrutiny.

4.2. Generation and Evaluation

Let me turn, then, to the other main plank of his view, the opposition between the generation and the criticism of ideas. To recap, the principle idea is that the activity of criticism, which is the realm of argument, is confined within the bounds of particular frameworks (paradigms or vocabularies). It is not, however, possible between frameworks because all criteria of evaluation are framework-specific. For this reason, the generation of new ideas cannot be the product of an evaluative process. Rather, it is a creative process involv-

ing imagination, inspiration and a-rational leaps. Generation and criticism are distinct and mutually exclusive kinds of thinking.

There are problems here as well. First, I think that this opposition is lent plausibility by the discontinuity thesis. If innovation really were discontinuous with past frameworks, then it might appear that the kind of thinking applicable within the framework could not lead to the transcending of the framework. Conceptual change might seem to require explanation in terms of a special kind of thinking. Once it is recognized, however, that there are continuities between frameworks and that some of the criteria of evaluation will remain intact, then a motivating reason for positing such a dichotomy disappears.

4.2.1. Generation as Critical

What of the claim that the generation of new ideas cannot be the product of an evaluative process, in other words that generation is uncritical? It is important to note that what is of interest here is originality, not mere novelty. The generation of novelty is easy. Any random word or bizarre act may be new. What is at issue are new ideas that are effective or valuable, that meet a need or solve a problem, that are significant in the context of a domain — new ideas that contribute to progress, new ideas that sparkle. And it seems clear that the generation of such ideas must involve critical judgment and evaluation. Critical judgment is required in the initial identification of some phenomena as in need of exploration or explanation. Recognizing the inadequacies in current approaches and deciding that a new approach is required are also aspects of generation that involve critical evaluation. And determining potentially fruitful directions for exploration or investigation and recognizing possible solutions or satisfactory outcomes are products of judgment as well. The generation of effective new ideas must be con-

strained by critical criteria. If it were not, the results would be chaos not creation. Not all assumptions, criteria and methods can be overturned. Some elements of the previous framework must remain, elements in the light of which the new idea takes on meaning and significance.[2]

Thus I would argue that the criteria of critical appraisal do not have to be discarded in order to transcend some of the assumptions of the current framework. Rather, one is led to question current assumptions in the light of one's reasoning about the problem or reflection on the situation. It would seem, then, that becoming entrenched in one way to view a problem is not a case of being trapped by the critical procedures of the tradition as Feyerabend, among others, would claim, but is, rather, a failure to be sufficiently critical.

The idea that the generation of new ideas is uncritical also rests on a particular view of the nature of the frameworks within which critical thinking operates. Frameworks seem to be conceived of as rigidly bounded and highly rule-governed, with all the information for making judgments contained within the framework. Yet there are only a very limited number of cases in which we operate within such clear-cut, clearly defined, and rigidly bounded frameworks (formal logic or the game of chess might be examples). In most instances of problem-solving and creation, however, frameworks overlap, shift and have indefinite boundaries. Moreover relevant considerations may emanate from a variety of perspectives or frames of reference (Bailin 1992a).

Given the above, there is no need to posit non-rational, imaginative leaps to explain the generation of new ideas. Going beyond the information given is, rather, a feature of all our intelligent thought and behaviour and does not require special explanation. A number of psychologists have pointed out the incremental nature of thinking that leads to inno-

2. This discussion of generation as critical draws heavily on Bailin 1992.

vation and have demonstrated how ordinary processes such as noticing, recognizing, searching, remembering, and evaluating can, together, contribute to creative results (Weisberg 1993; Perkins 1981). This is not to deny the reality of the feeling of insight we often experience when getting an idea or solving a problem. It is to deny only that such a feeling is an accurate indication that an a-rational leap has actually taken place.

In suggesting a role for critical judgment in innovation, it may appear that I am rejecting the well-known distinction in philosophy of science between discovery and justification and arguing for a logic of discovery. That is not entirely the case, however. The discovery/justification distinction is meant to suggest that considerations relating to discovery are irrelevant to the justificatory enterprise, and I am not disputing this. Whether the solution to a scientific problem were discovered in a laboratory or revealed by the Oracle of Delphi would have no bearing on its justification. What I am claiming is that criteria of justification play a role in discovery. I am disputing Popper's claim that discovery is irrational.

Given what we know about the world and about the practice of science, the Delphic Oracle theory of discovery is not a plausible one. Discoveries do not suddenly spring forth fully formed absent of context. Rather, scientific discoveries arise in the context of ongoing scientific investigation. A scientist is always *in media res,* working on particular problems within a rich problem context that includes previous theories, experimental results, techniques of analysis, and standards for judging the worth of scientific contributions (Schaffner 1980, p.198). These are the source of both ideas and constraints. In the course of this activity, problems evolve and are refined and new problems emerge. As Nickles so aptly put it (pace Samuel Butler): "A theory is but a problem's way of generating new problems" (Nickels 1980, p.53).

And the context is the source of constraints on the possibilities for solution. Nickels again:

> the constraints constitute a rich supply of premises and context-specific rules for reasoning toward a problem solution and permit us to explain the fact that scientists do reason to solutions (p.37).

These arguments suggest a process of discovery not as a single moment of inspiration, but rather as a gradual, ongoing process in which insight and justification are interwoven. Hattiangadi (1980) argues, in fact, that it is impossible to clearly distinguish pure contexts of discovery since any idea that might be considered in the context of discovery with respect to one theory will itself be a part of the context of justification of a previous theory out of which it developed. Finocchiaro (1980) makes the same point with respect to Galileo's *Dialogue Concerning the Two Chief World Systems:*

> suppose that the whole *Dialogue* is categorized as an attempt to prove Copernicanism, and hence placed in the context of justification; in the course of such an attempted proof one may find himself formulating the principle of mechanical relativity, or of conservation of motion. Then the same book constitutes context of discovery from the point of view of those principles (pp.94-95).

I am not here arguing for a logic of discovery in the sense of an algorithm for making discoveries. I am, rather arguing for the rationality of discovery. I would agree with Nickels (1980, p.40) that "discovery normally is a reasoned, judgmental process (too rich to be informatively captured by a content-neutral logic)."

4.2.2. Criticism as Generative

We have seen the problems with the idea that the generation of novel ideas is non-critical. I believe that there are also problems with the complementary idea, namely that criti-

cism lacks a generative component. This idea is based on the assumption that the activity of criticism is strictly analytic, selective and rule-determined. Given the necessary information from within the relevant framework and the appropriate reasoning techniques, the process of arriving at a judgment is largely algorithmic.

A closer examination of the process of criticism would suggest, however, that critical evaluation is not algorithmic but has a generative, imaginative component.[3] The application of evaluative criteria is seldom automatic but involves the interpretation of the situation and imaginative judgment regarding their applicability and satisfaction. Overall assessment in any complex circumstance requires the consideration of alternatives and ultimately the construction of a position based on the weighing, reconciling and integrating of a variety of points of view.

Let us take, as an example, the species of argument criticism that is the domain of informal logic. Due to its ancestry in formal deductive logic, the domain of informal logic may appear a closed system involving algorithmic procedures for the correct assessment of arguments. This seems, in fact, to be the picture of argument that underlies Rorty's view. Such a model becomes inappropriate, however, when dealing with real arguments in natural language. In the latter case, argument criticism, although constrained by rules, is not determined by rules but is a constructive enterprise (Bailin 1990).

Criticism involves, first, the interpretation of arguments, but this is not a straightforward and simple process. We construct an interpretation guided by textual information but texts are always and necessarily incomplete, and at times several plausible inferences can be made depending on background knowledge and assumptions. This incompleteness also means that the receiver has a role to play in constructing

3. For an elaboration of this argument regarding the generative dimension of criticism, see Bailin 1990.

meaning, leaving open the possibility of differing equally justified interpretations.

Supplying the missing premises and unstated assumptions of an argument also involves imaginative construction on the part of the evaluator. The fact that considerable debate exits over how to fill in missing premises suggests that it may not be possible to formalize a method for doing so. The constructive dimension becomes even more salient in the case of finding unstated assumptions. As Scriven (1976) has demonstrated, finding the illuminating assumptions of an argument as opposed to the obvious unhelpful ones requires "a substantial slice of original thinking" (p.169). Context and background knowledge as well as informal logical principles are required in order to reconstruct an argument.

The process of argument evaluation also displays a creative dimension. Most natural language arguments are not strictly deductive but rather contain types of reasoning which leave some play between the premises and conclusions. As Blair and Johnson (1987) point out, arguments may contain reasoning in which:

> the conclusion follows, *ceteris paribus*, or on balance, or in some other qualified way which suggests a more tenuous relationship between premises and conclusions than would be the case with either deductive or inductive reasoning (p.43).

As a consequence, the procedure for the assessing of arguments cannot be formalized. There is room for differences of view with respect to the evaluation of particular arguments.

This indeterminacy can be seen in that aspect of argument evaluation dealing with the identification of fallacies and is apparent with respect to all three types of fallacies: fallacies of relevance, of sufficiency and of acceptability. There may, for example, be legitimate debate as to the relevance of certain considerations to an argument and a judgment regarding relevance may depend on what unstated assumptions are sup-

posed. According to Johnson and Blair (1983, p.39), "relevance is always a judgment call, and there is no reason to think that any algorithmic procedure will come along to change that." The situation is similar with respect to fallacies of sufficiency. Although there are principles that guide the assessment of sufficiency, there is no algorithm for determining how much evidence is sufficient. And again with respect to acceptability, Johnson and Blair (1983) tell us that judgments of acceptability are dialectical and must be determined with an imagined audience in mind and in light of purposes.

Evaluating arguments by analogy also requires a contribution on the part of the assessor. Determining the appropriateness of an analogy involves imagining the similarities and differences between the cases and may require considerable imaginative reconstruction and the supplying of context.

Inventing a counter-example to test the strength of an argument is clearly a creative act, as is the consideration of alternative arguments. As Scriven (1976, p.36) so eloquently states:

> The process of trying to think of alternative explanations of a set of facts … is an entirely *creative* process. It is exactly the process which the great original scientist goes through in coming up with a novel theory. There are no precise rules to guide one in such a search, and it requires imagination nurtured by a rich and varied experience to generate the novel hypothesis here. So the very process of criticism necessarily involves the creative activity of generating new theories or hypotheses to explain phenomena that have seemed to other people to admit of only one explanation.

An aspect of argumentation which falls within the domain of informal logic but which seems to be ignored by Rorty's exclusion of argument from innovation is the construction of arguments. The activity of argumentation does not consist solely in interpreting and evaluating already existing arguments. It also consists in coming up with arguments. And coming up with new arguments is a creative activity, con-

sisting in the recognition of problems or alternatives and the construction of a coherent chain of reasoning. Such construction must, however, conform to all the critical standards that guide evaluation. Moreover, the constructor must recognize any logical vulnerabilities in the argument. The constructor is, then, simultaneously a critic. The critic makes an imaginative contribution to the assessment in all the ways previously described and must be able to construct a cogent argument to support the critique. The critic is, then, simultaneously a constructor. Argument construction and critique are, thus, inseparable and intertwined aspects of the same process, the process of argumentation.

In considering the role of argument in conceptual change, it is important to focus on the whole process of argumentation and not just on the assessment of isolated arguments. Argumentation is a dialectical process that involves the construction as well as the evaluation of particular arguments but also, ultimately, of entire beliefs sets or views. In the process of argumentation, claims are proposed along with their justification, the claims and reasons are tested and challenged, they may be rejected or reformulated, alternative arguments may be proposed, these will be tested and perhaps reformulated, and in the end a view is arrived at which takes into account the strengths and weaknesses of the various arguments and synthesizes the strongest elements into a coherent whole. The view thus arrived at will be provisional as any particular instance of argumentation is but one piece of a larger process of belief formation and testing (Blair and Johnson), one moment in an ongoing disciplinary and social conversation (Bailin 1992b).

5. INQUIRY

What I am offering, then, is an alternative picture of how inquiry proceeds to the one suggested by Rorty. For Rorty, inquiry seems to be constituted by two distinct and separate

kinds of activities. On the one hand there is the analytic, logical, bounded and conservative activity of argumentation or criticism, which works with existing concepts and allows for the manipulation of elements within frameworks that are static, singular and self-contained. On the other hand we have the speculative, creative, progressive activity of strong poetry, which transcends frameworks and creates new ideas, new visions, and new vocabularies unconstrained by the strictures of critical judgment and argumentation.

What I propose is a picture of inquiry as a single activity constituted by the dynamic interplay between generation and criticism. Engaging in our various traditions and practices of inquiry always and simultaneously involves both. In attempting to solve problems posed by the tradition, both the constraints of logic and the inventiveness of imagination come into play. And in some cases, our reasoning will lead us to question assumptions, break rules and put elements together in new ways – thus issuing in ideas that may display considerable novelty.

This process of inquiry is instantiated in disciplines and traditions of inquiry that are open-ended, dynamic, plural, and overlapping. There are live questions, ongoing debates and areas of controversy within every discipline that furnish the arena for evolution and change (Bailin 1992a). Moreover a central characteristic of rational inquiry is that "it aims to discover its own weaknesses and rectify what is at fault with its own procedures" (Lipman 1991, p.121). Thus the critical procedures of the traditions provide for the possibility of the evolution of the tradition itself in light of new evidence and arguments, problems and limitations discovered in the course of inquiry, and criticisms from competing strands both within the traditions and outside it. There is no need to posit strong poetry to account for conceptual change. Argumentation, as instantiated in our traditions of inquiry, can achieve that goal.

I want to make clear that in making this argument, I am in no way denigrating the importance of poetry. I have great respect for, indeed passion for poetry and think that the arts have a crucially important role to play in envisioning possible futures. They can, as Greene (1995, p.112) tells us, move us into spaces where "we can create visions of other ways of being and ponder what it might signify to realize them." They can show us "in rich detail, as formal abstract argument cannot, what it is like to live a certain way" (Nussbaum 1990, pp.227-228). Thus they may conjure up evocative instantiations of those utopian visions, or equally powerful evocations of dystopian ones.

There are several points to be made here, however. Poetic creations, like innovative works in other domains, are not discontinuous with the traditions out of which they develop. They have their roots in previous artistic traditions, methods, and problems; reveal influences from other artists; and employ critical analysis of aspects of society and culture. Insofar as such poetic visions are effective, insofar as they touch us and capture our imagination, considerable critical judgment (as well as imagination) would have gone into their creation. Second, this poetic activity does not obviate the necessity for critical evaluation of the ideas or visions thus created. I see poetry, then, as a complement to and not a substitute for argument.

6. CONCLUSION

It is time now to return to the question that prompted this investigation initially: is argument for conservatives? What I think this journey through views about the nature of innovation and the role of argument points to is that Rorty's idea is not a new one, and neither is it sparkling. Rather than forgetting where we once were as Rorty suggests, I think that it is crucially important to remember past traditions in order to participate in the critical dialogues that they embody and to

further the conversation. "Old routes of inference and feeling" can lead to new ones. Argument is not so flat after all. So perhaps we ought to throw open the doors of our studies, discard our visors and sleeve protectors, don our boots and take our rightful place in those conceptual fields, making our contribution to the growth of ideas.

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VIII. ENHANCING RATIONALITY

CHAPTER 20

ENHANCING RATIONALITY: HEURISTICS, BIASES, AND THE CRITICAL THINKING PROJECT

Mark Battersby

1. INTRODUCTION

My intention today is to critically explore the implications to the critical thinking movement of the work by cognitive psychologists and behavioral economists, commonly known as the heuristics and bias research.

But first I wish to position the critical thinking movement in the long historical tradition of philosophy that has been devoted to the development and spread of rationality. From Socrates to John Dewey, from 5th century Athens to 21st century Windsor, the promotion of rationality has been recognized as a core philosophical project.

It is a project not always adequately respected and appreciated in contemporary professional philosophy. This is in part because critical thinking was seen as remedial, but in fact promoting rationality is a cross curriculum challenge and responsibility. Despite this lack of disciplinary support, the critical thinking movement has grown to the extent that practically everyone now wants students to learn to "think critically" and many post-secondary institutions identify critical thinking as their key learning outcome. Business also wants employees and especially management to think critically. This

acceptance and recognition provides those of us in the critical thinking movement with an opportunity and responsibility not far different from that of the philosophers of the Enlightenment. Enlightenment philosophers virtually changed the course of history by advocating for scientific reasoning and rationality to replace the old deference to church and king. What is sometimes known derisively as the *Enlightenment Project*, for all its over reach, had a momentous and largely beneficial effect on the thinking and politics of western civilization. The critical thinking movement is the inheritor of this project, and I suggest that we now think of the critical thinking movement as the **Critical Thinking Project.** But for this analogy to be appropriate, critical thinking instruction must expand to include all of rationality.

2. EXPANDING THE FOCUS OF THE CRITICAL THINKING PROJECT

The theory then was that the barrier to rationality was ignorance of the rules of rational argument and that with proper instruction in the rules of reasoning and argumentation, students would be able to identify and resist fallacious arguments — it was principally (well almost) "Logical self defense."

But as the heuristics and biases literature began to permeate the Critical Thinking Project, there was a realization that, as the famous Pogo carton reminds us, we are also the problem. Not that this was exactly a new idea. As Socrates admonished, "Know thyself" was a key prerequisite to rational thought.

The heuristics and biases literature focuses primarily on the inherent biases of our cognitive equipment. The identification of this source of erroneous reasoning adds significant insights useful to critical thinking instruction — insights which are now being recognized in the Critical Thinking /Informal logic literature. But before we make use of this research we must subject it to a critical evaluation.

3. EXPANDING THE CRITICAL THINKING PROJECT 2: RATIONAL DECISION MAKING

Despite Harvey Siegel's claim that a critical thinker is someone "appropriately moved by reason" (Siegel 2013) and Bob Ennis' definition of critical thinking as "reasonable reflective *thinking* focused on deciding what to believe or do" (Ennis 1987), critical thinking has, historically limited itself to a subset of rationality primarily involving epistemological norms such as identifying and avoiding fallacies, argument analysis and evaluation, and, more recently, reasoned judgment. But rationality and critical thinking include not only deciding what to believe but also what to do, as both Ennis and Siegel indicate. Critical thinking is not limited to applied epistemology as I and others have argued, but also includes **applied rational decision making**.

While the critical thinking movement has failed, by and large, to address rational decision making, neo-classical economics has dominated the concept of rationality as it applies to decision making and used it to promote a narrow-minded, individualistic and self-interested view of rationality known as **rational choice theory**. The Critical Thinking Project must recover the concept of rationality from the neo-classical economists.

Many of the insights emerging from the heuristic and bias literature are of great use to the Critical Thinking Project. However, the research on decision making biases is undermined by use of the norms of rationality embedded in rational choice theory. I will focus here on the heuristics and biases research on decision making rationality both because it has received less attention than the research on epistemic biases, and more importantly, because this model, which describes rationality as the efficient pursuit of individual self-interest, legitimates an ideological position as if that were rationality itself.

Let me start with the concept of bias.

4. WHAT IS A BIAS?

To claim that a person has a bias or is biased in a particular area of judgment is to claim that the person has a tendency to make judgments or engage in actions that violate the appropriate and relevant norms of that area.

Here are a few examples: referees favouring the home team, scientists only attending to supportive information, people believing their experiences to be representative of human experience, favouring male candidates in hiring.

It is obvious that the Achilles heel of this definition is "appropriate and relevant norms." Short of infinite regress, the norms themselves need rational justification.

The norms of reasoning that are used in the bias and heuristic literature are not limited to the traditional norms of ratio-

nality, or the norms of deductive logic. The norms also include the laws of probability theory and norms used in rational choice theory (particularly expected utility). The norms of probability are not contentious, but as indicated, the norms that assume that people should make decisions in accord with expected utility theory i.e., in line with their long term self-interest, are contentious.

5. TVERSKY AND KAHNEMAN

Two Israeli psychologists, Amos Tversky and Daniel Kahneman, did much of the initial research, and created the heuristics and bias nomenclature for this enterprise. Tversky and Kahneman set out to demonstrate the descriptive inaccuracies of the model of human behavior built into neo-classic economics.

As Kahneman recollects:

> One day in the early 1970s, Amos handed me a mimeographed essay by a Swiss economist named Bruno Frey, which discussed the psychological assumptions of economic theory. I vividly remember the color of the cover: dark red. Bruno Frey barely recalls writing the piece, but I can still recite its first sentence: "The agent of economic theory is rational, selfish, and his tastes do not change" (Kahneman 2011).

Tversky and Kahneman created a series of ingenious experiments which demonstrated the **descriptive** inaccuracy of the rational economic agent used in the neo-classical mathematical models of the economy. Their research did not call into question the notion that selfishness was the sole motivation of human behavior, but their research did call into question the extent to which people reasoned in accord with model of rationality used by economists. In the process, they spawned the vast heuristics and bias research. Their work led to the development of a now widely accepted model of human judgment known as the **dual process model**. The model, as suggested by the title of Daniel Kahneman's best-selling review of

this literature, *Thinking, Fast and Slow* (Kahneman 2011), states that we have two modes of judgment: an algorithmic/intuitive mode that is quick and a slower more reflective mode—the latter the kind of thinking encouraged in critical thinking courses.

The dominant "fast process" usually serves us well enough and apparently served our antecedents well enough to become genetically embedded in our thinking processes. Of course, not all fast and intuitive processes are "natural." When we learn to drive a car, we acquire all sorts of quick intuitive processes necessary for effective driving—assessing speed, appropriate following distance etc. Experts also often learn quick intuitive responses that are reliable, e.g., chess masters. But on some occasions and in reference especially to probabilistic reasoning, this fast intuitive process tends to lead to erroneous or biased judgments. These biases have been identified in a wide range of experiments by cognitive psychologists.

6. THE GREAT RATIONALITY DEBATE

As many of you probably know, there were considerable negative reaction to the early work of Tversky and Kahneman, especially to the inference that their studies showed that people were irrational in their probabilistic judgments. There were basically two arguments: 1. that subjects misunderstood the questions about likelihood and therefore their judgments were reasonable given their understanding of the questions, and 2. that the way that people reasoned must by definition be rational so that their answers did not violate relevant norms of rationality. Without going into all the replies, both objections were credibly addressed by the fact that subjects, once they were shown the relevant calculus, understood why their responses were incorrect. In addition, people who were statistically sophisticated and understood the normatively correct answers still felt the pull of their intuitive answers while

conceding that the intuitive judgment was incorrect. Similar objections can arise in relation to people's deviations from the norms of rational choice theory but, as I will show, those objections are more cogent (Stanovich 2011).

7. EPISTEMIC BIASES

I shall turn first to the research on **epistemic biases**. There are two excellent introductions to this material: the best-selling *Thinking, Fast and Slow* by Daniel Kahneman (2011) and a more academic and comprehensive text, *Thinking and Deciding* by John Baron (2000).

Many of the classic experiments are no doubt known to most of you. But let me quickly review the most famous initial results which are also quite relevant to critical thinking. Basically we tend to intuitively judge the likelihood of an event based on a number of factors:

> **Representativeness**: An event that looks like a stereotype is judged to be more likely.
> **Availability**: If the event is easy to imagine, it is judged to be more likely. This ease of imagining can be a function of remembering it happening or remembering hearing about it (the power of the media), or because a description of its happening is plausible (a good story) and easy to imagine.
> **Vividness:** If the event is emotionally powerful, it is judged to be more likely.

Tversky and Kahneman demonstrated that these psychological factors lead to the violation of a basic and quite simple principle of probability, the principle of conjunctive probability: the conjunct of two events is never more probable than either of the events.

This tendency is not just common to the statistically naive. For example, when the following problem of choosing which of two events was more likely was given to graduate students, a majority of them committed the classic fallacy of rating the more complex (but easily imagined) event as more likely.

1. *A massive flood somewhere in North America next year, in which more than 1,000 people drown*
2. *An earthquake in California sometime next year, causing a flood in which more than 1,000 people drown* (Kahneman 2011, p.131).

Choosing 2 over 1 involves violating the conjunctive rule of probability. But when making most judgments of likelihood, we don't "do the math." We make an intuitive judgement on the basis of one or more of the heuristics identified above. Availability and vividness can work together to make an event seem even more likely. All these factors (representativeness, narrative plausibility, availability, and even vividness) come into play to empower what critical thinkers know as the **fallacy of appeal to anecdotal evidence**.

While philosophy has a long tradition of identifying this fallacy, the experiments of Tversky and Kahneman provide experimental illustrations demonstrating just how ubiquitous and powerful is our natural tendency to believe that our experience is and will be "representative" of such experiences generally. Availability is also a function of plausibility—making a plausible causal story, as in the above example, makes it easier to imagine an event and increases our sense of its likelihood. Ironically, the assumption of representativeness tempts even researchers to over generalize from their research to the population in general.

Nor are professors of critical thinking immune from the siren call of anecdotal evidence, as this cartoon by Leo Groake reminds us:

THE CRITICAL THINKING PROFESSOR IN THE CLASSROOM

DON'T TRUST ANECDOTAL EVIDENCE! REMEMBER THE POST HOC! Y FOLLOWS X DOES **NOT** MEAN THAT X CAUSES Y!!

THE CRITICAL THINKING PROFESSOR IN THE DEAN'S OFFICE

OF COURSE THE CRITICAL THINKING COURSE WORKS! EMMA TOOK IT AND SHE GOT **A RHODES SCHOLARSHIP**!!

The literature on cognitive biases contains a large number of other epistemic biases relevant to critical thinking, such as:

- base rate neglect,
- anchoring,
- confirmation bias,
- hindsight bias,
- myside bias, etc.

But in this paper I wish to focus on the biases of instrumental rationality that are identified mainly in the research produced by behavioral economists.

8. INSTRUMENTAL RATIONALITY: RATIONAL CHOICE THEORY AND BIASES

The norms of **rational choice theory**, the mathematically elegant theory developed in the early 1950s, provides the theoretic base for most neo-classical economic models. The theory assumes that humans fit (and ought to fit) the model of "homo economicus" or "econs" as they are called in the behavioral economics literature. For econs, all decisions are self-interested, well informed, based on unchanging tastes, and in conformity with expected utility theory—the model that horrified Kahneman when he first read of it. Unfortunately, it is these norms that provide the basis for identifying decision making errors and biases.

While economists admit that rational choice theory is an idealization of actual behavior, they have argued that it is no worse an idealization than Newton's frictionless plane and is equally theoretically useful. Starting in the late 1970s, the claim that rational choice theory was an appropriate way to build a supposedly empirical economic theory was called into question not only by the research of Tversky and Kahneman but also by the emerging field of **behavioural economics.** The crash of 2008 may well have been the *coup de gras* to the view that real world financial actors such as bankers act rationally. But it is important for our purposes to understand that, while behavioral economists have demonstrated the descriptive inaccuracy of the assumption that humans are "econs," they still accept the associated norms of rationality. As a result, the biases identified in the heuristics and bias literature as decision making irrationalities presume that the description of humans as econs is the normatively correct description of the "rational person."

The critiques of econs as appropriate models of human beings and rational choice theory as an appropriate descriptive model of human behavior are long standing. Indeed, the idea that all actions are motivated by self-interest was effectively critiqued by Bishop Butler in 18th century. Behavioral economists argue that this view of human nature is factually incorrect, but generally fail to criticize the associated norms–their goal is to identify the descriptive inaccuracy of rational choice theory not criticize its norms.

For example, the entertaining and insightful behavioral economist, Dan Ariely, states in the introduction to his book, *The Upside of Irrationality*:

> . . . there is a flip side to irrationality, one that is actually quite positive. Sometimes we are fortunate in our irrational ability because, among other things, they allow us to adapt to new environments, to trust other people, to enjoy expending effort and to love our kids (Ariely 2010, p.12).

How very odd that the abilities described by Ariely should be characterized as irrational. But not odd if you realize the definition of rationality that he is using. As he says: "From a rational perspective, we should make only decisions that are in our best interest ("should" is the operative word here)"(Ariely 2010, p.5).

Kahneman is sensitive to this criticism. He states:

> I often cringe when my work with Amos is credited with demonstrating that human choices are irrational, when in fact our research only showed that Humans are not well described by the rational-agent model (Kahneman 2011, p.333).

But as can be seen from this quotation, he does not go as far as to say that the norms of the rational-agent model are faulty.

Before dealing with the obvious moral failures of the "econ" norms of rational behavior, I wish to look at some of the tendencies (so-called biases) identified in the behavioral eco-

nomic literature that are supposed examples of common human irrationality.

The norms of rational choice are purely "product" norms. They provide criteria for assessing a decision, but not for assessing the decision making process. This is different from many of the norms of rationality used to identify epistemic biases which reference procedural norms e.g., confirmation bias. This focus places significant limitations on the usefulness of rational choice theory as a guide for rational decision making. But first the theory.

The fundamental principle of rational choice theory is that, to be rational, people must be consistent in their preferences. If they prefer A over B and B over C, then they should prefer A over C and should do so over time and in all situations. The principle sounds reasonable enough but its emphasis on unchanging preferences turns out to have significant and dubious implications because it requires our decision making to be indifferent to context. The other key aspect of rational choice theory is the theory of **expected utility**—a theory based on the notion of a good bet.

9. EXPECTED UTILITY THEORY

While expected utility theory is, in principle, applicable to any outcome, most of the discussion focuses on financial gambles. A good gamble is one which if played in the long run will result in your being ahead of the game, i.e., winning more than losing. The best gamble is the option that will yield the most financial return in the long run. In more mathematical terms: the expected utility of a gamble is equal to the probability of the outcome multiplied by the amount of the outcome minus any cost of the gamble.

There are a number of obvious practical difficulties in acting in accord with rational choice theory. One obvious difficulty is that we are often confronted with decisions without knowing the probability of the various outcomes. The next

obvious problem is that the utility of an outcome is subjective. This has led theorist to redefine outcomes in terms of preferences rather than utility. As a result, economists generally talk about preference maximizing not utility maximizing. But since they mainly talk about money, they assume that individual preferences will be to attain the maximum financial benefit.

But even when people know the probabilities and payoffs involved, there are many situations in which most people do not adhere to the norm of expected utility—and quite reasonably so. For example, in most situations the majority of people prefer an outcome that is certain rather than an iffy bet even if the iffy bet would provide a greater payoff in the long run.

10. CERTAINTY BIAS — OR A REASONABLE PREFERENCE?

Tversky and Kahneman used the following question as one of the ways to illicit the certainty effect.

Which of the following options do you prefer?
A. a sure gain of $30
B. 80% chance to win $45 and 20% chance to win nothing
In this case, 78% of participants chose option A while only 22% chose option B (value $36). This illustrates most people's tendency to favour the more certain bet over the less certain bet despite it greater "expected utility" (the expected value of B exceeds that of A by 20%) (Kahneman 2011, pp.364-365).

The fact that that people violate the norms of expected utility theory does not, of course, prove them irrational. For example, consider the purchase of insurance which, in theory, violates expected utility theory.

11. LOSS AVERSION: CONTEXT COUNTS

Even before the work of Tversky and Kahneman, it was noted that people favoured certainty over the promise of long term gain. It was thought that this was because people were risk averse. This analysis of people's decision making was

derived in large part from the work of Daniel Bernoulli (1738) who devised a model of risk aversion which used the declining utility of the dollar to also explain apparent deviations from choosing the "best bet."

But Tversky and Kahneman noted that people were influenced in their assessment of the utility of a financial outcome by considerations other than their current state of wealth. Tversky and Kahneman's research showed people tended to be **loss averse not risk averse**. Loss aversion has two implications:

1. People are only tempted by a bet in which the gain is much greater than the possible loss.
2. If a person sees their situation as a loss, e.g., have already lost a bet or suffered financial reversal, they are now willing to take a greater risk to return to a "no loss situation" than they would if they were not already in a loss situation.

For example, consider the following problems:
> *Problem 1: Which do you choose?*
> (a) Get $900 for sure OR (b) 90% chance to get $1,000
> *Problem 2: Which do you choose?*
> (a) Lose $900 for sure OR (b) 90% chance to lose $1,000

If you are like most people, you will chose (a) in the first problem but (b) in the second. This tendency can lead to all sorts of risky efforts to make up for losses widely seen, for example in compulsive gamblers, but also stock brokers (Kahneman 2011, p.224).

The inclinations to accept or reject a gamble are mostly intuitive system 1 choices. And they clearly do not accord with the norm of expected utility theory which would ignore the framing of the gamble as loss or gain, i.e., ignore the context in which a decision is being made.

As mentioned, rational choice theory treats context (e.g., history, financial situation, social situation, cultural context) as irrelevant. Decisions that take these types of considerations

into account and result in changing preferences will be judged as inconsistent and "biased" by the theory.

12. PERCENTAGE FRAMING

Tversky and Kahneman have also shown other ways that contexts influence our decision making. For example:

> Imagine that you are about to purchase a calculator for $15. Another customer tells you that the calculator you wish to buy is on sale for $10 at another store, located 20 minutes' drive away. Would you make a trip to the other store?
> In contrast, imagine this time that you are buying a jacket for $125 and you learn that you can save $5 dollars on the jacket by driving to another store. Would you drive 20 minutes to save the $5?

> In one typical experiment, 68% of the respondents were willing to drive to the other branch to save $5 on a $15 calculator, but only 29% of respondents were willing to make the same trip to save $5 on a $125 jacket (Kahneman 2011, p.367).

Irrational? From the economists' point of view, 5 dollars is 5 dollars and the context (or frame) of the purchase is irrelevant. But not to most humans. Can our tendency to assess a saving in light of the context lead to irrationality? Yes, but is it fundamentally irrational?—only if you are an econ.

13. MENTAL ACCOUNTING: BUDGET CATEGORIES

1. Imagine that you have decided to see a play and paid the admission price of $50 per ticket. As you enter the theater, you discover that you have lost the ticket. The seat was not marked, and the ticket cannot be recovered. Would you pay $50 for another ticket? (Yes 46%); No 54%)
2. In the alternative, imagine that you have decided to see a play where admission is $50 per ticket. As you enter the theater, you discover that you have lost a $50 bill. Would you still pay $50 for a ticket for the play? (Yes 88%); No 12%) (Kahneman 2011, p.368).

Why are so many people unwilling to spend $50 after having lost a ticket, if they would readily spend that sum after losing an equivalent amount of cash? The difference is our mental accounting. The $50 for the ticket was spent from the play "account"—that money is already spent; the loss of the cash is not posted to the play "account" and it affects the purchase of a ticket only by making the individual feel slightly less affluent.

As Kahneman admits, while this framing violates the economic rationality principle that only the amount of money counts not the context, most people do it.

The normative status of the effects of mental accounting is questionable. It can be argued that the alternative versions of the calculator and ticket problems differ also in substance. In particular, it may be more pleasurable to save $5 on a $15 purchase than on a larger purchase, and it may be more annoying to pay twice for the same ticket than to lose $50 in cash. Regret, frustration, and self-satisfaction can also be affected by framing (Kahneman and Tversky 1982).

So the theory is saved by considerations such as "If such secondary consequences are considered legitimate, then the observed preferences do not violate the criterion of invariance and cannot readily be ruled out as inconsistent or erroneous." As long as you posit subjective utilities as explanations (and these utilities can be "rationally" influenced by frames), you can save the normative theory. But why not just say that the theory is an inadequate account of the norms of rational decision making?

For econs, all money is money and this sort of mental accounting incorrectly allows the influence of budget category framing. But for those of us who try to keep on budget, or for any bureaucratic institution, budget categories serve a very important and rational purpose.

14. ENDOWMENT EFFECT

The endowment effect is the tendency to value something

we have more than we would pay to get it. Another example from Thaler:

> One case came from Richard Rosett, the chairman of the economics department and a long time wine collector. He told me that he had bottles in his cellar that he had purchased long ago for $10 that were now worth over $100. In fact, a local wine merchant named Woody was willing to buy some of Rosett's older bottles at current prices. Rosett said he occasionally drank one of those bottles on a special occasion, but would never dream of paying $100 to acquire one. He also did not sell any of his bottles to Woody. This is illogical. If he is willing to drink a bottle that he could sell for $100, then drinking it has to be worth more than $100. But then, why wouldn't he also be willing to buy such a bottle? In fact, why did he refuse to buy any bottle that cost anything close to $100? As an economist, Rosett knew such behavior was not rational, but he couldn't help himself (Thaler 2015, p.17).

While Rosett couldn't help himself, is it really irrational to value what you have more than what you would currently pay? The emotionally and intellectually rational heuristic—stick with (love?) what you have– seems an eminently sane inclination and supportive of happiness. Irrational?

15. SUMMARY

The model of rationality used by neo-classical economists has a key limit which is the insistence on the irrelevance of context e.g., loss, commitment, ownership, frame, etc. While only a brief review of the research, these examples support the view that the "biases" identified in the research on instrumental rationality do not have the same status as those identified in the studies of epistemic biases. The results of the study of instrumental rationality are best described as common tendencies not biases in the pejorative sense. It may well be that these intuitions which "violate" *econ* rationality contribute to our long run well-being.

An even more troubling implication of the rational choice

approach to decision making is the lack of consideration of **moral** norms relevant to decision making, for example, fairness.

16. FAIRNESS: THE ULTIMATUM GAME

To illustrate this point, take the interesting economic experimental paradigm called the Ultimatum Game. In the Ultimatum Game, there is a sender and a receiver. The sender is given some money, typically $20 and can make any split of the money with a receiver with whom they have no direct contact. The sender decides how to split the money and then offers a share to the receiver. If the receiver accepts the offer, they both get the split money, but if the receiver rejects the offer, neither get the money.

If you are an econ, you take any offer—a buck is buck, but contrary to economic thinking, most receivers refuse offers of anything less than about 40% because of the unfairness.

17. THE SNOW SHOVEL PRICE

Here is another example that illustrates people's concern with fairness and rejection of supposedly rational economic behavior. Markets obtain equilibrium between supply and demand because people raise prices when demand goes up—at least until new supplies arrive. This is the much extolled method by which a free market economy is supposed to stay in equilibrium between supply and demand. But consider this scenario:

A hardware store has been selling snow shovels for $15. The morning after a large snowstorm, the store raises the price to $20. Rate this action as: Completely fair, acceptable, somewhat unfair, or very unfair.

When a couple of hundred Canadians were given this scenario, 18% judged it acceptable while 82% found this basic economic strategy to be unfair. On the other hand, when the

same problem was put to MBAs, 76% judged it acceptable and only 24% unfair. It appears that taking economics can have the effect of making you into a fairness-indifferent econ (Thaler 2015, pp.127-128). It appears that instruction in economics (including the norms of rational choice theory) can have a significantly negative influence on people's moral sense (See Frank *et al* 1993).

18. EVALUATIVE RATIONALITY

The lack of fairness as a criterion of rational decision making reflects a more general problem with the rational choice approach to decision making. Not only does the econ notion of rationality have no place for moral considerations such as fairness, it also has no place for reflection on the goals or preferences of actors. Clearly one can have reasonable and unreasonable goals and desires, and one can deliberate about goals rationally or irrationally; most importantly, one can have concerns about collective outcomes that are not reducible to an aggregate of individual preferences (e.g., the environment).

Basically what the theory leaves out is **evaluative rationality.** Evaluative rationality focuses not on how to efficiently realize chosen ends but rather on the process for rational choice of ends, involving not only a rational assessment of one's self-interest but also relevant moral considerations.

There are two related issues here: **rational choice of individual ends** and **rational choice of collective ends.** Neither is well treated in rational decision theory, although there is work by Kahneman and others on people's unreliable assessment of how they will feel when they experience certain outcomes (*affective forecasting* as it is known). In general, people overrate how happy they will be when achieving desired outcomes (cf. lottery winners studies) but also how unhappy they will still be when experiencing misfortunes or disability (Kahneman 2011).

The complexity and subtlety of hedonic experience make it

difficult for the decision maker to anticipate the actual experience that outcomes will produce. Many a person who ordered a meal when ravenously hungry has admitted to a big mistake when the fifth course arrived on the table. The common mismatch of decision values and experience values introduces an additional element of uncertainty in many decision problems.

The last chapters of *Thinking, Fast and Slow* document the extent to which people are generally poor at predicting how they will feel when they achieve or fail to achieve chosen objectives. There are numerous studies that detail how poorly humans are at affective forecasting. For students faced with a wide range of life and career choices, this research can be very helpful in informing reflection on individual choices.

19. COLLECTIVE RATIONALITY AND CITIZENSHIP

A more egregious problem with rational choice theory is its lack of concern for the common good. Mapped onto collective decision making, rational choice theory entails a commitment to seeing the common good as maximizing the aggregate satisfaction of individual (selfish) preferences. It is an essential part of the myth of the free market that "rational" econs pursuing their private interests will result in the best possible outcome for all.

But as we are all aware, the pursuit of individual preferences (rational or not) can lead to collective defeat. Examples range from traffic jams to the collapse of the east coast fisheries to, most troublingly, global climate change. Everyone prefers to utilize fossil fuels, and while no one intends to degrade the environment, the pursuit of individual preferences results in conditions that are harmful to everyone.

Thinking that the only consideration in rational decision making is your preferences implies that those concerned about the environment are either irrational or simply that environmentalist just have different "preferences" than those whose preferences are self-interested.

There is work in cognitive psychology that addresses effective deliberative processes which I will briefly review, but that literature does not address questions of fairness, intrinsic values, collective goods, etc. But there is a discipline that does: moral and political philosophy. Recent philosophical work on deliberative democracy treats deliberation about the common good as the fundamental rational element of democracy (Elster 1998).

I propose therefore that the study of evaluative rationality be explicitly added to the corpus of rational reflection addressed by the Critical Thinking Project.

While this is not the place to attempt to articulate the concept of applied rational decision making, it seems clear that it would differ from rational choice theory in rejecting maximizing utility as the only norm and in being a truly usable guide to rational decision making. It would be a set of guidelines to insure that the process of decision making took into account all relevant considerations: factual, moral, political and personal.

20. GROUP DECISION MAKING

There is research on group decision making, but the notion of collective or political rationality—how we in fact make and how we should make decisions about the collective good is poorly developed. This is because the research tends to assume that the issue facing groups is either epistemological or only to identify the effective means to a given end, not to deliberate about the choice of ends. For example, the studies of the decision making process of juries focus only on questions of epistemic not evaluative rationality (whereas in actual jury deliberations, concerns about the justice of the law may trump factual concerns).

Collective rationality also involves the norms of argumentation. The proper conduct of such discourse is crucial to coming to a reasoned judgment about what to do or believe.

To some extent, the issue of collective rationality is addressed in informal logic through the study of argumentation and pragma-dialectics, but there is also work in psychology on the study of group dynamics. Again there is psychological and sociological literature that is useful but needs to be critically evaluated. The Critical Thinking Project should address both the norms of rational discourse and procedures for facilitating group rationality. Perhaps surprisingly, there is research which supports the notion that groups can often be more epistemologically rational when making decisions than individuals. The reason for this is that group discussion can involve participants putting forward differing points of view. The research on individual rationality underlines that the most useful heuristic for rational evaluation is to consider counter evidence and counter arguments. A properly constituted group should have people with alternative points of view or, if necessary, have people assigned as devil's advocates to make counter arguments and argue for alternative views (Lunenburg 2012).

The problems of confirmation bias, myside bias, even sunk costs can often be addressed effectively in group discussion. In addition, the research suggests that people make the best decisions when they are required to justify them in the process, subjecting them not only to their own critical reflection, but also to that of others. Presumably this is as true or perhaps truer for moral and political reflections.

There are, of course, well known ways in which group decision making can go awry—e.g., the notorious problem of "groupthink." The research literature provides helpful information on how this can be avoided (Kerr and Tindale 2004; Kerr, MacCoun and Kramer 1996).

Based on the best research on collective decision making, The Critical Thinking Project needs to develop and teach practical and inclusive guidelines for collective rational decision making.

21. THE DIALECTICAL TIER: SOME POSSIBLE OBJECTIONS

Many of the criticisms of the norms of economic rationality are long standing and widely accepted outside the discipline of economics, but one may question the appropriateness of introducing concern for the common good or criticisms of economics into the Critical Thinking Project. Conservative critics of critical thinking already suspect it is a covert means for teaching liberal ideology.

I have two responses to this anticipated objection:

1. Neo-classical economics and rational choice theory are covert ways of introducing ideology under the guise of simple logical principles and need to be countered. As Thomas Piketty comments: "To put it bluntly, the discipline of economics has yet to get over its childish passion for mathematics and for purely theoretical and **often highly ideological speculation**"

2. The push from behavioural economics to revise the behavioural assumptions of economics is an attempt to save economics for its obsessive mathematical idealizations, but not from normative ideology. To teach rationality we will need principles of reasonable decision making and cannot rely on the econs' view because of its use in the heuristics and bias literature.

> "The ideas of economists and political philosophers, both when they are right and when they are wrong are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually slaves of some defunct economist." (J.M. Keynes)

Addressing rational decision making as it applies to evaluating ends and to collective decision making requires a broader and less ideological approach to making rational decisions than provided by rational choice theory norms.

Another objection to increasing the ambit of critical thinking to include evaluative and collective decision making is that these areas are highly controversial and do not lend themselves to Critical Thinking Project instruction the way that other norms of reasoning do. Rational choice theory ignores the decision making process, but critical thinking has always focused on deliberative processes for assessing claims and the same approach is appropriate for decision making. In its simplest form, a check list of relevant considerations about ends and means when making a decision could go a long way to making most people's decision more rational. In the same way, decisions about collective goals can be subject to widely accepted considerations, e.g., respect for minority rights, considerations of fairness and justice, collective well-being, etc.

22. THE CRITICAL THINKING PROJECT

The inadequacy of the model of rationality used in economics and now widely popularized in books about human decision making requires that those concerned about rationality and critical thinking expand their efforts and promote a corrective view of rationality.

I propose, therefore, that those in critical thinking adopt what I have called the Critical Thinking Project, to improve people's reasoning by:

1. Expanding the concept of critical thinking to include evaluative rationality and rational decision making in its most inclusive sense.
2. Developing an alternative model of rational decision making with usable guidelines for a rational decision making process.

3. Making critical use of research coming out of cognitive psychology and behavioral economics to help identify tendencies in human judgment that can lead to irrationality.
4. Developing interdisciplinary research projects with researchers who are concerned with the application of reason to judgment and decision making—in particular cognitive psychologists, behavioural economists and applied decision theorist in business faculties.
5. Teaching for evaluative rationality and rational decision making as well as argument evaluation, reasonable discourse and reasoned judgment.

Before concluding, let me return to the point I made at the beginning. The increasing acceptance of critical thinking as a central educational concept positions those of us involved in critical thinking to significantly affect the intellectual landscape. The skepticism towards economics caused by the 2008 crash has also created a more receptive public environment for critiques of economics. The popular interest in the heuristics and bias literature also provides an opportunity to discuss and explore standards of rationality. Because many of the cognitive psychology researchers in this area are interested in the application of their research, often under the rubric of "de-biasing," it should be feasible to find appropriate colleagues for this effort (Fischoff 1981).

In addition, because critical thinking is fundamentally a discipline focused on application, the development of a broad concept

Never doubt that a small group of thoughtful committed citizens can change the world; indeed, it's the only thing that ever has. (Margaret Mead)

of applied rationality should not become mired in theoretical minutia that characterizes so much of philosophical theorizing.

The Critical Thinking Project, with the addition of a focus on rational decision making, has the potential to make a crucial contribution to individual and collective well-being and even the future of the world.

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