

ISSA Proceedings 2002 - If At First You Don't Succeed: Response To Johnson



Ever since the first ISSA conference in 1986, I have been developing an agenda of relevance to argumentation theory that challenges many of the basic verities of informal logic and critical thinking (Weinstein, 1987, 1991, 1995, 1999). The position, well known in the field, was generally not remarked upon in the theoretic literature until Ralph Johnson epitomized and criticized my views in his recent book *Manifest Rationality* (Johnson, 2000). Johnson, using a phrase from my early work sees me as taking an 'ecological approach,' proposing that 'the study of arguments in their disciplinary environment as the proper way to proceed' (Johnson, 2000, p. 301). He rightly assimilates my view to both Toulmin (Toulmin, et. al., 1979) and McPeck (1981) and identifies my practical agenda. "Weinstein's broad concern is educational reform. He believed that critical thinking, as an educational ideal is a serviceable construct for the purpose of educational reform, but that critical thinking should be seen within the context of the disciplines (ibid.).

My position is vulnerable to what Johnson calls the standard objection: 'the fact that many arguments are not housed in any particular domain but borrow elements from several domains.' (ibid. p. 306). Johnson's sees that my position as less vulnerable to the objection than Toulmin's and McPeck's might be, and after offering a somewhat elaborated perspective, modifies my view to be that 'all significant standards are discipline specific.' I agree, with the caveat that both formal and informal logic are among the disciplines. My view, as he notes, requires that in a given argumentation context a decision as to what standards from which disciplines need to be applied to deal with which significant aspects of the argument must be made. He asks: 'To what (transdisciplinary) standards will the evaluator appeal to decide this matter... from whose perspective will this meta-evaluative question be asked?' (ibid.). The answer to the question is fairly straightforward: It depends.

In what follows, I will attempt to reconstruct my position as the basis for that

indeterminate response. The first section will deal with informal logic and the theoretic core of argumentation evaluation. The next section will address the practical application of argument analysis within the context of critical thinking and education. Finally I will return to Johnson's concerns.

Informal Logic and the Foundations of Argument

During the two or three decades during which informal logic came to relative maturity, many advocates (including myself) saw it as showing the promise of offering a more adequate theory of argumentation. We saw the shift from argument in the sense of the formal logicians to argumentation as the key to advances to follow. Interest in informal logic resulted in a greater appreciation of the richness of argumentation in natural settings, but retained crucial aspects identified with formal logic. Most theoreticians, and many classroom texts, retained the emphasis on short fragments of argument, even when seen as argumentation. In addition, most texts and many theorists offered the standard deductive apparatus as the logical core. Despite cries of deductive chauvinism, something like the standard account of logical inference is overt or covert in most theoretic and applied work in argumentation theory and informal logic.

As at its beginnings, informal logic is focused on two poles: fallacies and argument analysis. Enriched by the work of the Amsterdam school (Eemeren, et. al. 1983) informal logicians have offered a rich outpouring of detailed work on particular fallacies, particularly Douglas Walton (for example, Walton, 1989) and the underlying representations based on Stephen Thomas (1973) have seen significant structural and functional advance in the work of James Freeman (1991). Both of these sorts of efforts, however, bypass the reconsideration of the logical core of argument. That is, informal logicians have left undisclosed the very areas upon which formal logicians have expended most of their efforts: accounts of entailment, truth and relevance. There seem to be a variety of reasons why disregard of the logical core might be justified within informal logic. These include the adequacy of the account found in formal logic, and the irrelevance of matters of the logical core to argumentation. Other less pressing reasons might be division of labor, personal preference and the like. And yet given the depth of the difference in perspective between formal and informal logic as theories of argumentation one should expect real differences on foundational matters, including three main foundational concepts: entailment, truth and relevance.

The formal core of argument, traditionally construed, includes two main theoretic

structures. Implication as the support of the notion of argument validity – and the syntactic apparatus developed sufficient for half of completeness; and truth as the support for the model theoretic apparatus that bonded implication to entailment offering the converse. The problem was that the formal core was subject to manifest irrelevancies, paradoxes of implication from material to strict.

The reason is not hard to see. Although champions of formal logic still propose and depose formal theories of relevance, it is my contention that formal logic is doomed to irrelevance because of the deepest structural properties of formal theory. Extensionality underlying the model theoretic theory of truth, and atomism underlying the syntactic apparatus, the massive achievements of Tarski and Russell, doomed formal logicians to irrelevance for reasons that informal logicians should be able to see clearly, if only informal logicians would see clearly. The reasons were already available in the work of Carnap. Carnap in his effort to develop a theory of entailment based on formal logic metaphors had to distinguish two sorts of syntactic bases for the semantic correlate of implication. A logical core supported by truths of logic alone, and an extra-logical core, the wide variety of extra-logical postulates needed to support inference in any argumentation context that transcended logical truths alone. As the history of axiomatizations of portions of mathematics and natural science showed extra-logical postulates were describable, and necessary, if models of formal subject matter that went beyond pure logic were to be available. Even the most cursory survey of the functionally analytic elements across the range of knowledge and argumentation, that is, to use the old language, meaning postulates, and inference tickets (tacit or overt) that support the extra-logical core of inferences, points to many types that transcend the extensional constructions that mathematical logic requires.

Such functionally analytic elements, include the meaning of ordinary and technical terms; chemical formulas; physical laws; statistical and others less formal varieties of empirical generalizations in the social sciences; graphic structures such as scalogram analysis in Anthropology and Punnett Squares in Biology; and many kinds of figural models that support inference in particular domains of discourse.

What characterizes inferences of the sort just indicated is that they do not fit into the idealized set-theoretic apparatus that gave mathematical content to the basic set theoretic apparatus understood since Aristotle. To put it in intuitively obvious terms: the problem with formal logic is readily seen as the core problem with the square of opposition. Most generalizations are not strictly universal, so the formal

theory of refutation by a single counter-example is irrelevant to most subjects about which we reason.

Elsa Barth, at a seminar at CUNY over thirty years ago, offered the following poignant example. For Hitler, the Jew was a type with particular characteristics. The type, clearly defined in practice, was resistant to counter-argument for no array of Jews failing to meet a characteristic within the stereotype was sufficient to reject the assignment of that characteristic to the type. That is, Hitler's theory was closed to defeating instances. And yet Hitler's anti-Semitism needed to be argued against on rational grounds. Barth's call was to find a theory of argument adequate to reject characterizations of the Jew.

Other less heart-rending examples are easy enough to find among generalizations of all sorts. We would not be convinced of the wisdom of driving against the red light by any actual series of successful crossings; nor would we have been reasonable in giving up the periodic table in the light of substantial alterations mandated as the history of chemistry has proceeded and its underlying physical structure made clearer.

The reasons for the failure of the classic model of refutation by counter-example is clear (with the exception of mathematics construed as a sub-region of logic). Generalizations only hold true universally within models, and models tend to fit the object of the discourse with degrees of approximation. And yet we must reason with generalizations and instances if we are to reason at all. If there is logic to all of this, it is to be found in the exploration of the warrant kinds that support the practice of generalization (example and counter-example). My conjecture is that these are to be found in the various systems of knowledge that we have developed. That is, the systems of thought that support argumentation practices in the various sciences, and other well-governed discourse practices. That is, the clue to understanding argumentation is to be found in systems of thought and practice of the various sorts that humans have created utilized and improved.

If we are to understand inferences in systems we need to look closely at the limits of inferences within them. The work of Toulmin (1958) offers a first step in understanding this. In the *Uses of Argument* Toulmin begins to catalogue the several of disclaimers that challenges to generalizations permit. As typical of Toulmin's work there, the analysis is ordinary language based and invariably insightful. In his books on the history of science the effort is more diffuse, but perhaps even more profound. Toulmin shows how throughout the history of

science, generalizations resisted or succumbed to counter-examples, showing how in case after case the reasoning offered warranted either the resistance of theories and models to inconsistent data or to their replacement, or permitted counter-examples to be reinterpreted in theoretically favorable ways. And even how sufficient restructuring of theory gave evidentiary precedence to the same putative counter-examples and conundrums as the advance of understanding proceeded.

Such examples give the basic data for an informal logical account of inference. By focusing on the extra-logical apparatus that supports inference (Carnap's true-in-Beta) we may be able to see types of warrants and come up with modified squares of opposition that integrates warrant kinds with appropriate counter-examples. Such a theory of warrants would offer the key inferential apparatus to support a generalized theory of entailment, replacing the all or nothing inclusion relations of classical set theory and logic. Informal logic need not worry about the mathematics of such an approach, relying on varieties of fuzzy-logic to support the richness that a clear exploration of warrant kinds would require.

For the mathematically inclined, such an approach moves towards implication relations that support a range of entailment kinds - showing how meanings and models give tissue to our inferences from generalizations to instances. A formal account of this would furnish correlative implication kinds: validity based, perhaps, on complex and weighted, partial and overlapping homologies (Weinstein, 1999, and forthcoming).

Entailment seen as an outcome of an adequate theory of warrants becomes a key *desideratum* for an informal logic account that can support arguments within argumentation. For without understanding the give and take of counter-example and claim, argument and argumentation fall asunder (Weinstein, 1991).

Entailment alone is not sufficient for an informal logic theory of argument adequate to support the theory of argumentation. A theory of truth, and ultimately a theory of relevance that permits informal logic to escape the trivialization of implication typical of formal logic is needed as well.

Formal logic has been captured by a mathematical version of the most pervasive metaphor underlying theories of truth. Tarski semantics offers a clear analogue to the notion of correspondence, but at an enormous price. The power of Tarski semantics - the yield being completeness, that is, all formally valid proofs yield logical true conditionals - requires that the models be extensional, requires that

all function symbols in the formal language are definable in terms of regular sets. That is sets closed under the standard operations of set theory, and definable completely in terms of their extensions.

The problem, of course, is that the overwhelming majority of both ordinary and theoretic terms have no obvious extensional definition. Thus, co-extensionality is a poor surrogate for many substantive equivalence relations. The impoverishment of extensional models (and the analogous standard interpretation of syllogism) is interestingly illuminated by the solution to modalities (necessity, possibility, and variants such as physical possibility) offered by formal logicians: that is relationships among worlds as in Kripke semantics. This moves the focus from truth within models, extensionally defined, to relationships among selected worlds. Such relationships may vary widely, each one specific to a relationship, as in the analysis of physical causality in terms of a function that maps onto physically possible worlds. Little can be said about the general restrictions on mappings across worlds, for inter-world relationships, if we take the intuition behind accounts of physical causality, are broadly empirical-historical. That is, what makes a world physically possible is relative to that laws of physics interpreted as restrictions on functions across possible worlds.

This should be good news for informal logicians. If my intuition about entailment is correct, informal logicians rooted in the realities of argument have no choice but to take the world of actual warrants seriously. This enables us to get much more serious about truth. There are at least two uninteresting sorts of truths: statements of the cat on the mat variety and logical truths. Everything else relies heavily on movements across inference sets. Sentences ranging from 'the light is red' to 'John has pneumonia,' in their standard occurrences, are warranted as true (or likely, or plausible etc.) because countless other statements are true (or likely or plausible etc.). To verify each of these, or any other interesting expression, is to move across a wide range of other statements connected by underlying empirical and analytical theories (systems of meaning, generalizations etc.). All of these have deep connections with observable fact, but more importantly are connected by plausible models of underlying and related mechanisms. These include all sort of functional connections that enable us to infer from evidence to conclusion, and to question, in light of inconsistencies connected to elaborate networks of claims and generalizations of many sorts. For most estimations of the truth of a claim offer a rough index of our evaluation of the context that stands as evidence for it. Under challenge, that body of evidence

can be expanded almost indefinitely, all of this still governed by the available meaning postulates and inference tickets cited, assumed, or added as inquiry and argumentation proceed. A similar account needs to be given for other normative judgements, including ethical and legal claims based on non-epistemic warrants.

Just as informal logicians need to look to families of interesting warrant kinds in support of entailments, informal logicians should look to the strength of inferential connections, as kinds of truth-connected inference relations are described and better understood. Likelihoods, probabilities, plausibilities, and even limited ranges of possibility (e.g. physical possibility) to be understood, need to be articulated as a reasonable family of kinds, for without an understanding of these kinds and how the transfer of truth, plausibility, likelihood and the like to claims based upon evidence, is inferentially well-managed there is no hope of an informal *logic*.

Relevance leads us to similar terrain. Relevance as a syntactic restriction is either hopeless, or as Walton (1982) suggests, primitive. But yet judgements of relevance are made all of the time. As informal logicians rightly see, judgements of relevance are part of the practice of argument evaluation. But where are the principles governing relevance to be found? I say look to the area which informal logic calls into view. Look at the sorts of relevance decisions made. Inherently pragmatic, and bound to various systems of referee, relevance is the most clearly institutional of the our three foundational concerns (Weinstein, 1995). This is horrible news for formal logicians interested in syntactic accounts, but it should be grist for the mill of informal logicians. Since relevance is so often an institutional outcome, frequently subsumed with clear rules of procedure as in the law, the obvious step is to look at the various practices for clues to an adequate account. But are we to be condemned to some sociology of relevance?

Our prior discussion offers the possibility of a unifying theory. With a theory of entailment that describes the various sorts of analytic relationships between constituent elements which govern the practice of positive inference and counter-example in place (the warrant kinds that indicate the strength of generalizations viz. a viz. instances); and with an account of how various sorts of truth-like properties are inherited across the chain of various sorts of inference, we can begin a normative theory of relevance in light of which practices can be assessed. As Trudy Govier (1987) has rightly seen, relevance both affects and reflects the estimation of truth. Generalized to a wide range of truth-like predicates, with a

clearer sense of what sort of truth is contained in any particular line of defense or attack, and what the consequences for the networks of supporting ideas are across the evidentiary bases, as well as estimations of the robustness of the theoretical connections among items, we can see the affects of particular lines of defense and attack: that is we can give a principled account of our judgements of relevance.

The foregoing has done little more than raise deep challenges to informal logic as currently construed. It is rooted in a deep sense of the correctness of the informal logic revolution, but it is deeply critical of the complacency of much of the work in the field, work that incorporated deep logical structures from the formal theory of argument. And so I call upon like-minded logicians to join in rebuilding the foundations upon which an adequate theory of argument rests. But as Johnson notice my work has both a theoretic and a practical dimension. The latter is expressed in my concern with critical thinking

Critical Thinking, Education and Thought

The issues of critical thinking rest uneasily between a normative core and an empirical surround. This seems inherent to any discussion of human behaviors that have epistemological force. For to think well is both to satisfy norms, whether tacit or expressed, and also to do as people do. 'Critical thinking,' to ape a classic philosophical discussion, is a term of achievement. To think critically is to have fulfilled to some extent or other the demands made upon thinkers as exemplified by human practices, practices that have to some extent been codified and theorized about by both philosophers and psychologists.

This dichotomy is already apparent in Aristotle: on the one hand, the concern with logic and the attempt to formulate inference rules (as in the *Prior Analytic*) and on the other, descriptions of practice and hints for its well management (as in the *Sophistical Refutations*). The tension the dichotomy creates, seeing reason as inherently normative versus seeing reasoning as a human practice conditioned by human ends and qualified by human capacities and limitations, is reflected in the current discussion of reasoning that underlies critical thinking, discussions where normative recommendations shade without notice into empirical claims. This is to be expected, for as an educational reform movement, critical thinking advocates incorporating sound practices of reasoning into the school curriculum so as to foster, in the words of Harvey Siegel (1988) students' ability to be 'appropriately moved by reasons'. The phrase bridges the gap between the normative and the empirical, for we want both appropriate reasons and student outcomes. In Robert

Ennis' (1987) words, critical thinking seen as 'reasonable and reflective thinking that is focused on what to believe or do' requires both the identification of norms and functional understanding of how norms can be inculcated and employed in practice.

The current movement for educational reform through critical thinking follows Aristotle by placing logic at the core of these norms and sees logical norms to be exemplified in both what is taught and what is required of students. So, merely as an indication, the most well know of the instruments used to assess critical thinking culminates in the logically defined procedure of drawing valid conclusions and judging the validity of inferences (*Watson-Glazer Critical Thinking Appraisal*; see Glazer, 1941). Similarly, Ennis, in his widely accepted taxonomy of critical thinking abilities and dispositions, includes analyzing arguments, deducing and drawing and evaluating inductive conclusions, as well as the ability to employ fallacy labels (Ennis, 1987). This tendency is not only found in theoretical discussions and instruments for assessment, but constitutes the main practice of teaching critical thinking as evidenced by the current array of textbooks developed for such use.

Such logic based approaches to the conceptualization and teaching of reasoning, comports with similar approaches in recent psychology. Many studies of reasoning competence became studies of subjects' ability to perform traditional logic well (Inhelder and Piaget, 1958 offers the foundation; Wason and Johnson-Laird, 1972 offers typical studies of that period; Johnson-Laird, 1983 offers a more complex recent statement). Such approaches are supported by an atomistic landscape composed of logical micro-skills aligned with discrete and abstract rules of inference. These are reflected in the teaching of thinking in short stylized units, in part to meet the image of recursiveness found in the most sophisticated accounts of logic itself, and in part to reflect a predilection in psychology for structures of discrete functional types, as in, for example, Guilford's classic model for the 'structure of intellect' (Guilford, 1967). Logic and reasoning, on such views, are both seen and taught as linear, hierarchical and cumulative - a fair description of formal systems, but perhaps less obvious as an accurate description of human thinking skills and procedures.

Logic or informal logic based critical thinking courses, reflecting the perspective just described, have been under attack from feminists, critical theorists and advocates of hermeneutics and culture studies. Kerry Walters' volume, *Rethinking*

Reason, brings together a collection of such critical views in response to recent attempts to answer the questions: 'What does it mean to think well? What's the most effective way to teach students the basics of 'good thinking'?' (Walters, 1994, p.1). It presents a "second wave" of perspectives on critical thinking that 'take exception to what might be described as the "logicistic" bent of the critical thinking movement ensconced in colleges and universities... *the unwarranted assumption that good thinking is reducible to logical thinking*' (*ibid.* italics in original).

Walters identifies the target of critique by naming, among others Harvey Siegel and Robert Ennis. But he points to the large supporting ground in text and teaching when he identifies the movement in terms of the, mainly, philosophers who see 'teaching 'critical thinking,' at least at the introductory level has become almost synonymous with the methods of applied informal logic' (*ibid.* p. 5).

Such college texts share a concern with the identification and definition of central normative aspects of reasoning, and afford practice in the application of the norms in order to develop skills in applying these norms across a wide range of contexts. The first of such texts, *Critical Thinking* (1946) written by Max Black set the tone. Ennis' classic article in the *Harvard Educational Review* set the parameters (Ennis, 1962). His most recent effort exemplifies the current practice (Ennis, 1996).

The overwhelming majority of exercises and examples in informal logic texts are abstractive, decontextualized and presented to be viewed through a single perspective - the logical skill or norm (see Weinstein, 1990, 1993b, for my critique of the approach). This basic style of concept and drill, common in many math and science texts, draws from the logic texts that were the basis for teaching thinking and reasoning until the informal logic revolution. Informal logic, of course, replaces the familiar truth tables and Venn diagrams of traditional logic with argument diagrams. Such diagrams, rather than looking to sentential connectives or relationships between terms, describe the overall structure of arguments, distinguishing premises from conclusion, as well as various qualifying statements, in order to display the architecture of the premises, exposing the relationships among them and upon which the conclusion rests. In most informal logic and critical thinking texts, the traditional logical task of translation into symbols or other stylized expressions and proof construction is replaced by the analysis of paragraphs in English that include arguments, so as to make the premise-conclusion relationships appear. This has resulted in types of argument

structure being identified, as for example, between arguments in which premises are jointly required, and arguments where each premise yields some support independently of the others. (Freeman, 1988 offers an enriched version based on Toulmin, et. al (1979); see Govier 1987 for a theoretic discussion). Argument diagramming as a surrogate for the syntactic analysis of formal logic forms one pole of informal logic; the other is the study of fallacies.

Recent years have seen significant theoretic work in the fallacies that even if not yet incorporated in texts, point to the complexity of current understanding. Fallacies have been richly articulated and deeply connected to discourse (Walton 1982; 1989 are noteworthy). The role of fallacies in supporting critical discourse has been the object of serious research by argumentation theorists (Eemeren and Grootendorst, 1984) including an empirical research program moved forwards by specialists in speech communication (see Eemeren, Grootendorst and Henkemans, 1996 for an overview and bibliography). All of this is no doubt useful, but it remains limited by the logical model. That is, abstract characterization of key concepts and technique, and their application to atomized and decontextualized examples in the traditional textbook manner. Is there an alternative?

At the Institute for Critical Thinking at Montclair State University we saw critical thinking, particularly at the post-secondary level, to require engagement with the forms of inquiry. The forms of inquiry, embedded in language as used in the disciplines, yield the tools for inventing, organizing and communicating the content of the various areas of human concern. These, rather than the typical content of informal and critical thinking textbooks constituted the arena of our efforts. This requires a comment. Clearly, both natural language and language based in inquiry is governed by logic at the most abstract level of critical analysis. Equally clearly, natural language applications are governed by norms of the sort articulated by informal logicians, which play a role in disciplined inquiry as well (Weinstein, 1990). The underlying theoretic questions is: At what level of abstraction does the analysis of languages and their logic as used serve the purposes of critical thinking?

We have been guided in our efforts by Matthew Lipman's analysis of critical thinking seen to require the skillful, responsible, self-correcting and context-sensitive use of criteria in support of good judgment (Lipman, 1991). We therefore saw critical thinking to require the identification and reasonable

application of criteria appropriate to particular contexts of inquiry. And so our focus was turned away from the general criteria that lay at the center of recent concern with critical thinking, and towards the disciplines and the crucial role they play in determining the more specific criteria that govern the particulars of practice.

Our perspective raised a number of fundamental questions about the relation of critical thinking to language seen as the ground in which inquiry is embedded. Three senses of language relevant to inquiry needed to be distinguished.

1. Language as a “language game” in the sense of Wittgenstein: Expressive of a “form of life,” language includes a set of *paradigmatic practices* that underlie the particular concepts and argument types characteristic of a discipline. Language as “language game” relates the overt language in use to the lived reality of practitioners of the discipline and draws from the historical experience that gives each discipline its characteristic profile.
2. Language as a specific set of concepts and argument prototypes: particular vocabulary and characteristic modes of organizing disciplinary content.
3. Language as a set of basic competencies: students are required to perform tasks deemed necessary to how understanding of a discipline and the information and procedures that it includes (Weinstein, 1988 articulates the details and includes examples).

The two focuses, general natural language based logical skills, and the more specialized logical skill drawn from disciplinary practice are, to varying degrees, each subject to the tension created by two poles that support the critical thinking enterprise. On the one hand, there is the philosophical ideal: critical thinking as, in Harvey Siegel’s phrase, “the educational cognate of reason,” the deeply humanistic notion of the critical spirit, and a supporting non-relativistic epistemology (Siegel, 1988). On the other hand, there is the technology of thinking skills, with foundations in logic and informal logic, cognitive science, and educational theory and practice.

The two poles, one deeply normative and socially compelling, the other empirical and pragmatic, pull in opposite directions, yet are deeply intertwined. For the context of education requires praxis, and within practices facts and values blend gently into each other. Praxis yearns towards well functioning. Janus-faced, education looks to achieve its preferred ends by enhancing the functions that serve these ends. But an end does not entail a functioning through which it is

served, and so from the desirability of an end we can not derive the existence of a human ability sufficient to achieve that end. That being the case, it is foolhardy to suspect that for each end (or cluster of ends) there is a simple ability definable in terms of the concepts available within normative theories of human functioning. Articulation of the norms governing our cognitive ends underdetermines the structures needed to understand and remediate the functional capacities upon which their achievement depends.

Although ends do not entail the mechanism to achieve them, ends, more often than not, grow out of practices through which the ends are achieved to some extent or other. This often gives us a clue as to how to articulate the underlying apparatus through which the ends are served and so, may indicate how to educate in their name. In the ideal case our practices coherently reflect our norms, and the structures underlying both form a coherent theoretic grid that permits identification of the salient aspects that constitute the process through which the practice is directed towards its ends. An example of such an ideal case would be the following: logic is a sufficient normative basis for critical thinking, all people are potentially logical in their practices, and teaching logic suffices for enabling people to think critically, in that it speaks directly to the underlying cognitive mechanisms through which critical thinking is performed. Even as fanciful a case as this has been taken, at various times, as reasonable if not true. Logic has, indeed, at times been taken as sufficient for critical thinking construed as argument evaluation, has formed the basis of many theories of human judgment, and has constituted a core educational practice. (Weinstein, 1994a, offers a case study of the vagaries in the application of logical skills)

Our practices do, to some extent or other, reflect the norms that govern them, but this gives us precious little to go by when attempting to understand the cognitive structures or conceptual practices upon which our ability to participate in such practices depends. That is because, in actual cases, our idealized practices are often imperfect indicators of the underlying constitutive structures. One can not immediately go from culinary norms and dietary practices to the physiology of digestion, nor can one go from probability theory and sanctioned inductive practices to the underlying cognitive mechanisms that individuals employ, nor can one go from the best philosophical analyses of norms to recommendations of a conceptual apparatus to be employed in thinking governed by those norms. *Modes ponens* constitutes a universal norm; it is structurally identifiable in

arguments of all sorts, and it is a useful tool for doing lots of things. Yet the vagaries of its application to cases as evidenced by decades of experimental studies of reasoning point away from some unitary modes ponens function “wired” into our thinking apparatus, whether psychologically or neurologically construed (Johnson-Laird, 1983). Logic textbooks accounts of modes ponens and their deployment are neither necessary nor sufficient as a condition for critical thought.

It is the tension between the apparent universality of the norms to which critical thinking ascribes and the apparent particularity of the processes through which these norms can be addressed that underlies the debate within the field as to the generalizability of critical thinking (Weinstein, 1993a). On the one hand, common experience and innumerable experimental findings remind us that most people are better at some areas of cognitive concern than others, reflecting the divergent demands on thinking that each requires. On the other hand, intellectual norms and many cognitive procedures apply to many if not all arenas of thought. On the one hand, critical thinking is constituted by the many different things that people do when they think critically; on the other hand, what people do when they think critically is supported by apparatuses (ranging from dialogical to neurological) that are, plausibly, common to all normally functioning individuals.

What is the connection between the underlying unity and the diverse exemplifications? There are two questions here. First we may ask: What underlying unity supports the diverse exemplifications? This first question is one that sits easily with the assumptions of many philosophers and psychologists for it envisions the search for unity underlying diversity that has characterized philosophical and scientific thought in the modern era. There is, however, a second question: How does the existence of practices constrain both our forms of understanding the functioning that underlies a practice, and the functioning of the practice itself? This is a subtler task and one requiring analysis, whether philosophical or empirical, of another sort. The analysis requires what may be termed ‘socio-logic’: the description of the norms of practices with an emphasis on particularity and boundaries. The socio-logic of a practice reflects universal norms, in so far as they are truly universal. But it will, invariably, contain much else. How various particular and universal norms function, their relative importance, their relationships, and their articulation and interaction in the practices they support remains to be seen. There is no obvious and simple

relationship between norms, no matter how general, and the development of whatever strategies there may be for educating in the name of such norms. Neither is there a readily accessible normative map that enables us to identify whatever underlying cognitive structures there are that support the correlative processes. Further, there is little reason to suppose that the most salient level of analysis for theory and practice is that of universal norms or generalized versions of more particular normatively structured procedures.

Concluding Thoughts

As Matthew Lipman has taught us, critical thinking is implicated in the judgments we make. When we wish to judge well we must speak to criteria appropriate to the task at hand, while addressing the particulars of context. This requires knowledge in at least two essential senses: knowledge of the appropriateness of the procedures to be employed when applying criteria in judgments, and knowledge of the supporting facts of the matter and their relationships to generalizations and other determining principles. This raises an essential question: What would a theory of knowledge in support of critical thinking look like?

My conjecture is that it would draw deeply on constructed and situated knowledge, knowledge as testified to by the practices of successful inquiry, including concern with boundaries and the hither-to unexplored - what I have called applied epistemology (Weinstein, 1994b). Successful inquiry is of many types and requires both articulation of overarching principles that reflect successful inquiry in some general sense, epistemology as generally construed; and working paradigms of many different sorts that furnish indications of kinds of strategies, less universal than traditional philosophical epistemology, but general enough to support a wide and interesting range of cases. Like traditional epistemology, applied epistemology is normative, but unlike the standpoint familiar in the standard model, applied epistemology retains a descriptive core. Of course, many traditional epistemologies more or less openly showed their basis in practice: mathematics and dialectics for Plato; taxonomic biology and rhetoric in Aristotle; Newtonian mechanics in Kant; and modern science in Peirce.

The intuition behind my view is that those who engage with knowledge have, in seeking to succeed, identified, articulated, defended and modified norms as the ongoing practice dictates. And so the normative history of successful practice offers the basic data from which a normative account is to be drawn. Within this history of developing ideas and successful projects is the deeply a prioristic

practice of philosophers. Philosophers offering the most general epistemic frameworks, rely heavily on analytic and logical coherence as a hallmark for adequacy. And this is an essential part of the task. But it is not the entire task. For others engaged in knowing and acting in the world have established rationally defensible practices that offer richness and particularity necessary if any epistemological account is to touch the many things human beings have learned and learned to do. It is social-normative description, rational reconstruction, if you will, of the many epistemologically relevant practices that is the special concern of applied epistemology

Applied epistemology calls for a research program already underway in the work of empirically oriented argumentation theorists, and some informal logicians (e.g. Finocchioro, 1980; Fisher, 1988). In such a research program analyses would occur on many different levels and reflect many different analytical styles. Including, but not limited to a priori analysis, applied epistemology calls for case studies; social analyses, accounts of particular epistemic genre, (e.g. mathematics; natural sciences, social sciences, humanities) and their sub-regions and overlaps; studies of particular logical elements (for example, fallacies and argument kinds); historical accounts; and most essentially, a look at boundaries and across horizons, going beyond standard cases to novel and provocative accounts of knowledge in overlooked milieus.

This relates to what I see as Johnson's major contribution in *Manifest Rationality*: the notion of 'dialectical tier.' (Johnson, 2000, pp. 165-167). Johnson sees the dialectical tier as the surround of the actual argumentation (the 'illative core') constituting the problematic within which the argument is put forward and sees as a core problem of argumentation theory defining which of the possible counter-arguments an argument must confront if it is to be effective. My work points elsewhere. I rather see the notion of the dialectical surround to be the complex of issues and decisions that an unformed argument must address. This includes the choice of analytic hypotheses (entailments), policies on the robustness of truth requirements, and consideration of relevance appropriate to decisions as to what the argument context requires to move the discussion forward. It is against such an enriched understanding that the argument must be evaluated, and will vary as a function of what the situation provides. That is, no decision can be made in principle as to what a given argument in a particular context requires. Rather, it is by being generally informed of the problem situation that one determines whether the principles required are substantive or logical. Arguments can not be evaluated, in general, by logical considerations, for it is often not the case that the

logic of the argument, as opposed to its truthlikeness, the stability of its entailments and the relevance of supporting claims, is the central concern. This is the heart of my ecological posture. Argument presentation and evaluation takes its normative force from its surround, and so knowing how to put forward and evaluate arguments is highly context dependent. And so the meta-logical policy of which principles, whether logical or substantive, need to be applied to a given argument depends on the broad understanding of the argument and the particular context within which it is put forward.

REFERENCES

- Black, M. (1946). *Critical thinking*. Englewood Cliffs: Prentice Hall.
- Ennis, R.H. (1962). "A concept of critical thinking." *Harvard educational review* 32 (1), 81-111.
- Ennis, R.H. (1987). "A taxonomy of critical thinking skills and dispositions." In: J. Baron and R. Sternberg, eds. *Teaching for thinking* (pp. 9-26). New York: Freeman
- Ennis, R.H. (1996). *Critical thinking*. Upper Saddle River, NJ: Prentice Hall
- Eemeren, F.H. van and R. Grootendorst (1983). *Speech acts in argumentative discussions*. Dordrecht, Holland: Foris Publications.
- Eemeren, F. von, R. Grootendorst and F. Henkenmans, F (1996). *Fundamentals of argumentation theory*. Hillsdale, NJ: Earlbaum Assoc.
- Finocchiaro, M. (1980). *Galileo and the art of reasoning*. Dordrecht: Riedel.
- Fisher, A. (1988). *The logic of real arguments*. New York: Columbia University Press.
- Freeman, J.B. (1991). *Dialectics and the macrostructure of argument*. Amsterdam: Mouton de Gruyter.
- Glaser, E.M. (1941). *An experiment in the development of critical thinking*. New York: Teachers College.
- Govier, T. (1987). *Problems in argument analysis and evaluation*. Dordrecht: Foris.
- Guilford, (1967). *The nature of human intelligence*. New York: McGraw Hill
- Inhelder B. and J. Piaget (1958). *The growth of logical thinking from childhood to adolescence*. London: Routledge and Kegan Paul.
- Johnson, R. (2000). *Manifest rationality*. Mahwah, NJ: Earlbaum
- Johnson-Laird, P.N. (1983). *Mental models*. Cambridge: Harvard University Press.
- Lipman, M. (1991). *Thinking and education*. Cambridge: Cambridge Univ. Press..
- McPeck, J. (1981). *Critical thinking and education*. New York: St. Martin's Press.

- Siegel, H. (1988). *Educating reason*. New York: Routledge.
- Thomas, S. N. (1973). *Practical reasoning in natural language*. Englewood Cliffs, NJ: Prentice Hall.
- Toulmin, S., (1958). *The uses of argument*. Cambridge: Cambridge University Press.
- Toulmin, S. R, Rieke & A. Janick (1979). *An introduction to reasoning*. London: Collier Macmillan.
- Walters, K. (1994). *Re-thinking reason*. Albany: SUNY Press, 1994.
- Walton, D. (1982)., *Topic relevance in argumentation*. Amsterdam: John Benjamin.
- Walton, D. (1989). *Arguments from ignorance*. University Park, PA: Penn State Press.
- Wason, J.B. and P. N. Johnson-Laird (eds.) (1972). *Psychology of reasoning*. Cambridge, MA: Harvard University Press.
- Weinstein, M. (1987). "Reason and the theory of argument." In: Eemeren, F.H. van, Grootendorst, R., Blair. J.J. and Willard, C.A. (eds). *Proceedings of the international conference on argumentation* (pp. 372-380) Amsterdam: SICSAT..
- Weinstein, M. (1988). "Reason and critical thinking." *Informal logic*, 10 (1), 1-20
- Weinstein, M. (1990). "Towards a research agenda for informal logic and critical thinking." *Informal logic*, 12 (1), 121-143.
- Weinstein, M. (1991). "Entailment in argumentation." In: Eemeren, F.H. van, Grootendorst, R., Blair. J.J. and Willard, C.A. (eds). *Proceedings of second international conference on argumentation* (pp. 226-235). Amsterdam: SICSAT.
- Weinstein, M. (1993a). "Critical thinking: the great debate." *Educational theory*, 43:1, 99-117.
- Weinstein, M. (1993b). "Critical Thinking and One-Night Stands." *CT News*, 11, 1-3, 5.
- Weinstein, M. (1994a). "The psycho-logic of race prejudice." *Analytic teaching*, 14 (2, 21-33).
- Weinstein, M. (1994b). "Informal logic and applied epistemology." In: R. Johnson and A. Blair, *New essays in informal logic* (pp. 140-161). Windsor: Informal Logic.
- Weinstein, M. (1995). "Relevance in context." In: Eemeren, F.H. van, Grootendorst, R., Blair. J.J. and Willard, C.A. (eds). *Proceedings of the third international conference on argumentation* (pp. 233-244). Amsterdam: SICSAT.
- Weinstein, M. (1999). "Truth in argument." Eemeren, F.H. van, Grootendorst, R., Blair. J.J. and Willard, C.A. (eds). *Proceedings of the fourth international conference on argumentation* (pp. 868-171). Amsterdam: SICSAT.

Weinstein, M. (forthcoming). "Exemplifying an internal realist model of truth."
Philosophica.