

Critical Thinking and the State of Education Today

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Understanding Substantive Critical Thinking/ Avoiding the Growing List of Counterfeits

It is now generally recognized that the art of thinking critically is a major missing link in education today, and that effective communication and problem-solving skills, as well as mastery of content require critical thinking. It is now generally conceded that the ability to think critically becomes more and more important to success in life as the pace of change continues to accelerate and as complexity and interdependence continue to intensify. It is also generally understood that some major changes in instruction will have to take place to shift the overarching emphasis of student learning from rote memorization to effective critical thinking (as the primary tool of learning).

It is not so clear to most educators how to bring this important shift about, nor what instruction should look like afterwards. All too often the phrase "critical thinking" is nothing more than a vague place-holder for any of a miscellany of changes and/or conceptions of change. All too often, the phrase is used so imprecisely that no one knows exactly what is being said nor how to assess its unclarified effect. For example, results of recent large-scale research into faculty knowledge of critical thinking conducted by the Center For Critical Thinking For the Commission on Teacher Credentialing and encompassing 75 colleges and universities included the following general conclusions about the involvement of randomly chosen faculty in fostering critical thinking in their instruction:

1) Though the overwhelming majority claimed critical thinking to be a primary objective of their instruction (89%), only a small minority could give a clear explanation of what critical thinking is (19%). Furthermore, according to their answers, only 9% of the respondents were clearly teaching for critical thinking on a typical day in class.

2) Though the overwhelming majority (78%) claimed that their students lacked appropriate intellectual standards (to use in assessing their thinking), and 73% considered that students learning to assess their own work was

of primary importance, only a very small minority (8%) could enumerate any intellectual criteria or standards they required of students or could give an intelligible explanation of what those criteria and standards were.

3) While 50% of those interviewed said that they explicitly distinguish critical thinking skills from traits, only 8% were able to provide a clear conception of the critical thinking skills they thought were most important for their students to develop. Furthermore the overwhelming majority (75%) provided either minimal or vague allusion (33%) or no allusion at all (42%) to intellectual traits of mind.

4) When asked how they conceptualized truth, a surprising 41% of those who responded to the question said that knowledge, truth and sound judgment are fundamentally a matter of personal preference or subjective taste.

5) Although the majority (67%) said that their concept of critical thinking is largely explicit in their thinking, only 19% could elaborate on their concept of thinking.

6) Although the vast majority (89%) stated that critical thinking was of primary importance to their instruction, 77% of the respondents had little, limited or no conception of how to reconcile content coverage with the fostering of critical thinking.

7) Although the overwhelming majority (81%) felt that their department's graduates develop a good or high level of critical thinking ability while in their program, only 20% said that their departments had a shared approach to critical thinking, and only 9% were able to clearly articulate how they would assess the extent to which a faculty member was or was not fostering critical thinking. The remaining respondents had a limited conception or no conception at all of how to do this.

8) Although the vast majority (89%) stated that critical thinking was of primary importance to their instruction, only a very small minority could clearly explain the meanings of basic terms in critical thinking. For example, only 8% could clearly differentiate between an assumption and an inference, and only 4% could differentiate between an inference and an implication.

9) Only a very small minority (9%) mentioned the special and/or growing need for critical thinking today in virtue of the complexities inherent in human life. Not a single respondent elaborated on the issue.

10) In explaining their views of critical thinking, the overwhelming majority (69%) made either no allusion at all, or a minimal allusion, to the need for greater emphasis on peer and student self-assessment in instruction.

11) From either hard data directly, or from minimal inference from those data, it is clear that a significant percentage of faculty interviewed (and, if representative, *most faculty*):

- do not understand the connection of critical thinking to intellectual standards.
- are not able to clarify major intellectual criteria and standards.
- inadvertently confuse the *active* involvement of students in classroom activities with *critical thinking* in those activities.
- are unable to give an elaborated articulation of their concept of critical thinking.
- cannot provide plausible examples of how they foster critical thinking in the classroom.
- are not able to name specific critical thinking skills they think are important for students to learn.
- are not able to plausibly explain how to reconcile covering content with fostering critical thinking.
- do not consider reasoning as a significant focus of critical thinking.
- do not think of reasoning within disciplines as a major focus of instruction.
- cannot specify basic structures essential to the analysis of reasoning.
- cannot give an intelligible explanation of basic abilities either in critical thinking or in reasoning.
- do not distinguish the *psychological* dimension of thought from the *intellectual* dimension.
- have had no involvement in research into critical thinking and have not attended any conferences on the subject.
- are unable to name a particular theory or theorist that has shaped their concept of critical thinking.

Critical thinking is too important, the reforms it makes possible too essential, to leave the concept to the vagaries of faculty "intuition." We can not legitimately assume that knowledge of how to teach for critical thinking is an automatic by-product of the acquisition of a PhD. Of course, some might defend faculty against the charge of faculty chaos in teaching for critical thinking by arguing that since the "experts" do not agree on a "definition" of critical thinking, faculty should themselves be free to adopt *any* view—or by implication *no* view—of critical thinking.

This will not do, for though there is no one common *definition* of critical thinking accepted by all those who have seriously studied critical thinking, there is a common core of meaning reflected both in the multiplicity of

definitions and in the history of the concept. Let us look briefly, then, into why the absence of a universally shared definition of critical thinking on the part of scholars is not a significant problem, both conceptually and historically. I shall argue presently that the problem is not that of a common definition, but a general lack of knowledge of the history of the concept and a lack of discipline-based coordination of research.

No One Definition But A Common Core of Meaning

Given the complexity of critical thinking—its rootedness in 2500 years of intellectual history as well as the wide range of its application—it is unwise to put too much weight on any one “definition” of critical thinking. Any brief formulation of what critical thinking is is bound to have important limitations. Some theoreticians well established in the literature have provided us with a range of useful “definitions,” each with their limitations. In *Educating Reason: Rationality, Critical Thinking, and Education*, Harvey Siegel (1988) defines critical thinking as “*thinking (that is) appropriately moved by reasons*”. This definition highlights the contrast between the mind’s tendency to be shaped by phenomena other than reasons: desires, fears, social rewards and punishments, etc. Robert Ennis (1985) defines critical thinking as “rational reflective thinking concerned with what to do or believe.” This definition usefully calls attention to the wide role that critical thinking plays in everyday life, for since all behavior depends on what we believe, all human action depends upon what we in some sense decide to do. Matthew Lipman (1988) defines critical thinking as “skillful, responsible, thinking that is conducive to judgment because it relies on criteria, is self-correcting and is sensitive to context.” This definition highlights the need for intellectual standards and self-assessment.

Scriven and Paul (Paul, 1995) define critical thinking (for the National Council For Excellence in Critical Thinking) as follows: “Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.” ... “critical thinking can be seen as having two components: 1) a set of information and belief generating and processing skills, and 2) the habit, based on intellectual commitment, of using those skills to guide behavior. It is thus to be contrasted with: 1) the mere acquisition and retention of information alone, because it involves a particular way in which information is sought and treated; 2) the mere possession of a set of skills, because it involves the continual use of them; and 3) the mere use of those skills (“as an exercise”) without acceptance of their results.”

The point is that there is no one way to define what critical thinking is, nor one way to explain it. Nevertheless, there is lurking behind the diverse definitions common understandings. For example, consider the basic explanations of critical thinking expressed in interviews of a number of scholars in the

field of critical thinking research conducted by John Esterle and Dan Cluman of The Whitman Institute of San Francisco (1993). One of the questions asked all interviewees was, "What is your conception of critical thinking?" A review of these answers demonstrates, as above, that despite diversity of expression there is a core of common meaning in the field.

CAROLE WADE: "In our introductory psychology book, Carol Tavis and I have a definition we thought quite a bit about. We define critical thinking as "the ability and willingness to assess claims and make objective judgments on the basis of well-supported reasons." We wanted to get in the *willingness* as well as the ability because a person can master critical thinking skills without being the least bit disposed to use them. Also, we didn't want critical thinking to be confined to problem solving. Unless you construe problem solving extremely broadly, critical thinking goes beyond that, to include forming judgments, evaluating claims, defending a position. We said "well-supported reasons" rather than "evidence" because, although our own discipline emphasizes empirical evidence, we wanted to recognize that you don't reach all conclusions or assess all claims on the basis of such evidence. Sometimes there is no empirical evidence and critical thinking is purely a process of reasoned judgment."

MICHAEL SCRIVEN: "... it's the skill to identify the less obvious alternatives to positions, claims, arguments, generalizations, and definitions and to evaluate the alternatives with reasonable objectivity. Both are equally important. You may be commenting on what's there, but often that's only the tip of the iceberg. If you haven't seen the hidden presuppositions or the built-in point of view, then you're not thinking critically, however smart you are in analyzing the stuff that's actually presented. And the other way around: You may be good at seeing the presuppositions, the prejudices and so on, but very poor at actually analyzing them. So both those skills are key."

STUART M. KEELEY (interviewed together with BROWNE): "Rather than using a formal I definition, we emphasize primarily the questions critical thinkers *think* should be questions and *want* to be questions. In other words, there is a set of questions that constitutes a rubric of what it means to be a critical thinker."

M. NEIL BROWNE (interviewed together with KEELEY): "And it's a set of questions, not *the* set of questions. I would add that a *sine qua non* of critical thinking is a focus on assessment, or evaluation, of the link between a claim and the basis for the claim. If there's not some orientation designed to move

toward improved judgment—not right judgment but improved judgment—then I would be reluctant to label such a thing critical thinking. Our questions were not generated out of any theoretical framework but from our teaching practice. We were led to questioning as a format to express our standards because, unlike declarative stipulations of standards, there's greater openness to questioning, there's greater curiosity implied by questioning, and there's a requirement of action on the part of the person receiving the question.

We're personally not as interested in a process that improves reflection as we are in a process that improves living, that improves practice, and that thus improves judgment. I don't think I'd want to put a lot of energy into something that just enables me to reflect more profoundly. Not that there's not merit in that, but I prefer something that people can use to address problems in their lives."

RICHARD PAUL: "I think the best way to get to the nub of it is to see that everyone thinks and that their thinking is deeply involved in every dimension of their daily life. If there's one thing that you can't escape, it's your own thinking. It's everywhere you are and it's always shaping and influencing everything you do—your emotions and all your decisions. Every nook and cranny that's in you is thought-ful, i.e. full of thought. The key question is: Are you in charge of your thinking, or is your thinking in charge of you? You discover critical thinking when you realize how deeply the quality of your life is dependent on the quality of your thinking, and that it's possible to take charge of your thinking—to make it what you want it to be rather than what it has been made to be by your environment, your parents, your society, the media and so on. That's the basic idea behind critical thinking. It's intrinsically connected with a self-determining way of living. It's a commitment to continually upgrade the quality of your thinking so as to upgrade the quality of your life."

CAROL TAVRIS: "We developed what we called eight guidelines to critical thinking. We don't care about the number—there could be fourteen, there could be six. Several people have said, "You know, really you've got four and a half here and several of them should be combined." I don't care! They work. They're handy. And they identify different steps in critical thinking, different dispositions, and different skills: How to ask questions. Why are things this way? The fact that everybody says it's so doesn't mean it's so. You need to examine evidence, look for other interpretations of phenomena, and tolerate uncertainty, some things we're never going to know. By the second edition of our book, we realized that many people were confusing 'critical thinking' with exclusively negative thinking—debunking, tearing down. So we now speak of 'critical *and* creative thinking,' to show that the other face of critical thinking is the ability and willingness to envision new possibilities and solutions.

... Since this book came out we've developed our ideas in a handbook called *Critical and Creative Thinking: The Case of Love and War*, which introduces these guidelines and shows how they might be applied to subjects that many people think irrationally about—love, attraction, and intimacy, and prejudice, hostility, and war.

Carole Wade and I have become interested in the psychological impediments to clear thinking, and the way in which the mind is designed to serve itself, to protect self-esteem, to protect its own way of seeing the world, to keep things orderly so that everything fits into the existing framework."

JOHN CHAFFEE: "To understand the nature of critical thinking, we first have to define the concept of *thinking*. From my perspective, thinking is a very practical, holistic integrated mental activity we engage in to make sense of the world. We use thinking in many different contexts: to solve problems, move towards goals, analyze complex issues, communicate with other people, and make informed decisions. So the thinking process is a global, purpose-seeking, meaning-seeking activity that is the essence of being human. Critical thinking builds on this fundamental process. The heart of thinking critically is developing a reflective orientation toward our minds. It involves exploring our thinking and the thinking of other people so that we can understand how our minds work, how we conceptualize the world and construct knowledge. Becoming a critical thinker goes beyond developing intellectual abilities. It also involves developing basic attitudes and dispositions.

In a way, it's a whole philosophy of life, a process of personal transformation. A critical thinker views the world in a qualitatively different way from someone who is not a critical thinker. In this sense, there are intrinsic qualities that characterize a critical thinker: thinking actively, carefully exploring issues with penetrating questions, developing independent viewpoints based on analysis and reasoning, exploring issues from different perspectives, engaging in dialogue with other people, and exchanging views with them. Thinking critically is a community activity as well as a reflective process, by listening to and sharing ideas with others, our own thinking is expanded, clarified, and enriched.

The other distinction that's important is that while people *think* all the time, that doesn't mean they are *thinking critically*. A critical thinker is not only *capable* of reflecting, exploring, and analyzing but *chooses* to think in these advanced, sophisticated ways. For example, seeing something from a variety of perspectives involves the intellectual capability to empathize or identify with somebody else, but it also involves the desire to do it. Becoming a critical thinker is a melding of our intellect, with our emotions, attitudes, and dispositions."

MARLYS MAYFIELD: "Ideally, I would say a critical thinker shows awakens and alertness, particularly to incongruities, and a willingness to challenge incongruities. And all this takes courage and initiative. A critical thinker also appreciates clarity and precision, really relishes these qualities, and values the truth—whatever that might be—over being right. By my definition, those are the traits necessary to be a critical thinker."

Each of these definitions, I argue, as many others in the field, cut in fundamentally the same direction. All deal with the problem of up-grading the quality of human thinking by the cultivation of special skills, abilities, and insights that, in turn, enable the thinker to take mindful command of his or her thinking. What is most obvious from a serious examination of these multiple characterizations of critical thinking is how much they share a common set of concerns and objectives—quite in line with the history of the concept, as we shall shortly see.

The most basic theme underlying traditional approaches to critical thinking is, in my view, something like this: Though it is certainly of the nature of the human mind to think—spontaneously, continuously, and pervasively—it is not of the nature of the human mind to think critically about the standards and principles guiding its spontaneous thought. The human mind has no built-in drive to question its innate tendency to believe what it wants to believe, what makes it comfortable, what is simple rather than complex, and what is commonly believed and socially rewarded. The human mind is ordinarily at peace with itself as it internalizes and creates biases, prejudices, falsehoods, half-truths, and distortions. The human mind—in a natural state of uncriticalness—spontaneously experiences itself as in tune with "reality," as directly observing and faithfully recording it. It takes a special intervening process to produce the kind of self-criticalness that enables the mind to effectively and constructively question its own creations.

Learning to think critically is therefore an extraordinary process that cultivates capacities merely potential in human thought and develops them at the expense of "irrational" or "non-rational" tendencies spontaneously activated from within human nature and reinforced by "normal" socialization. It is not "normal," or even common, for a mind to discipline itself intellectually and direct itself toward intellectually defensible rather than egocentric, and socio-centric beliefs, practices, and values. This problem is, I claim, amply reflected in the history of critical thought. Let us now look at one brief reconstruction of that history.

A Brief History of the Idea of Critical Thinking

The intellectual roots of critical thinking are as ancient as its etymology, traceable, ultimately, to the teaching practice and vision of Socrates 2,400 years ago who discovered by a method of probing questioning that people could not rationally justify their confident claims to knowledge. Confused meanings, inadequate evidence, or self-contradictory beliefs often lurked beneath smooth but largely empty rhetoric. Socrates established the fact that one cannot depend upon those in "authority" to have sound knowledge and insight. He demonstrated that persons may have power and high position and yet be deeply confused and irrational. He established the importance of asking deep questions that probe profoundly into thinking before we accept ideas as worthy of belief. He established the importance of seeking evidence, closely examining reasoning and assumptions, analyzing basic concepts, and tracing out implications not only of what is said but of what is done as well. His method of questioning is now known as "Socratic questioning" and is the best known critical thinking teaching strategy. In his mode of questioning, Socrates highlighted the need in thinking for clarity and logical consistency.

Socrates set the agenda for the tradition of critical thinking, namely: to reflectively question common beliefs and explanations, carefully distinguishing those beliefs that are reasonable and logical from those which—however appealing they may be to our native egocentrism, however much they serve our vested interests, however comfortable or comforting they may be—lack adequate evidence or rational foundation to warrant our belief.

Socrates' practice was followed by the critical thinking of Plato (who recorded Socrates' thought), Aristotle, and the Greek skeptics, all of whom emphasized that things are often very different from what they appear to be and that only the trained mind is prepared to see through the way things look to us on the surface (delusive appearances) to the way they really are beneath the surface (the deeper realities of life). From this ancient Greek tradition emerged the need, for anyone who aspired to understand the deeper realities, to think systematically, to trace implications broadly and deeply, for only thinking that is comprehensive, well-reasoned, and responsive to objections can take us beyond the surface.

In the middle ages, the tradition of systematic critical thinking was embodied in the writings and teachings of such thinkers as Thomas Aquinas (*Summa Theologica*) who—to ensure his thinking met the test of critical thought—always systematically stated, considered, and answered all criticisms of his ideas as a necessary stage in developing them. Aquinas heightened our awareness not only of the potential power of reasoning but also of the need for reasoning to be systematically cultivated and "cross-examined." Of course, Aquinas' thinking also illustrates that those who think critically do not always reject established beliefs, only those beliefs that lack reasonable foundations.

In the Renaissance (15th and 16th Centuries), a flood of scholars in Europe began to think critically about religion, art, society, human nature, law, and freedom. They proceeded with the assumption that most of the domains of human life were in need of searching analysis and critique. Among these scholars were Colet, Erasmus, and More in England. They followed up on the insight of the ancients.

Francis Bacon (England) was explicitly concerned with the way we misuse our minds in seeking knowledge. He recognized explicitly that the mind cannot safely be left to its natural tendencies. In his book, *The Advancement of Learning*, he argued for the importance of studying the world empirically. He laid the foundation for modern science with his emphasis on the information-gathering processes. He also called attention to the fact that most people, if left to their own devices, develop bad habits of thought (which he called "idols") that lead them to believe what is false or misleading. He called attention to "Idols of the tribe" (the ways our mind naturally tends to trick itself), "Idols of the market-place" (the ways we misuse words), "Idols of the theater" (our tendency to become trapped in conventional systems of thought), and "Idols of the schools" (the problems in thinking when based on blind rules and poor instruction). His book could be considered one of the earliest texts in critical thinking, for his agenda was very much the traditional agenda of critical thinking.

Some fifty years later in France, Descartes wrote what might be called the second text in critical thinking, *Rules For the Direction of the Mind*. In it, Descartes argued for the need of a special systematic disciplining of the mind to guide it in thinking. He articulated and defended the need in thinking for clarity and precision. He developed a method of critical thought based on the principle of systematic doubt. He emphasized the need to base thinking on well-thought-through foundational assumptions. Every part of thinking, he argued, should be questioned, doubted, and tested.

In the same time period, Sir Thomas More developed a model of a new social order, *Utopia*, in which every domain of the present world was subject to critique. His implicit thesis was that established social systems are in need of radical analysis and critique. The critical thinking of these Renaissance and post-Renaissance scholars opened the way for the emergence of science and for the development of democracy, human rights, and freedom for thought.

In the Italian Renaissance, Machiavelli (*The Prince*) critically assessed the politics of the day, and laid the foundation for modern critical political thought. He refused to assume that government functioned as those in power said it did. Rather, he critically analyzed how it did function and laid the foundation for political thinking that exposes both, on the one hand, the real agendas of politicians and, on the other hand, the many contradictions and inconsistencies of the hard, cruel, world of the politics of his day.

Hobbes and Locke (in 16th and 17th Century England) displayed the same confidence in the critical mind of the thinker that we find in Machiavelli. Neither accepted the traditional picture of things dominant in the thinking of their day. Neither accepted as necessarily rational that which was considered "normal" in their culture. Both looked to the critical mind to open up new vistas of learning. Hobbes adopted a naturalistic view of the world in which everything was to be explained by evidence and reasoning. Locke defended a common sense analysis of everyday life and thought. He laid the theoretical foundation for critical thinking about basic human rights and the responsibilities of all governments to submit to the reasoned criticism of thoughtful citizens.

It was in this spirit of intellectual freedom and critical thought that people such as Robert Boyle (in the 17th Century) and Sir Isaac Newton (in the 17th and 18th Century) did their work. In his, *Sceptical Chymist*, Boyle severely criticized the chemical theory that had preceded him. Newton, in turn, developed a far-reaching framework of thought which roundly criticized the traditionally accepted world view. He extended the critical thought of such minds as Copernicus, Galileo, and Kepler. After Boyle and Newton, it was recognized by those who reflected seriously on the natural world that egocentric views of the world must be abandoned in favor of views based entirely on carefully gathered evidence and sound reasoning.

Another significant contribution to critical thinking was made by the thinkers of the French enlightenment: Bayle, Montesquieu, Voltaire, and Diderot. They all began with the premise that the human mind, when disciplined by reason, is better able to figure out the nature of the social and political world. What is more, for these thinkers, reason must turn inward upon itself, in order to determine weaknesses and strengths of thought. They valued disciplined intellectual exchange, in which all views had to be submitted to serious analysis and critique. They believed that all authority must submit in one way or another to the scrutiny of reasonable critical questioning.

Eighteenth Century thinkers extended our conception of critical thought even further, developing our sense of the power of critical thought and of its tools. Applied to the problem of economics, it produced Adam Smith's *Wealth of Nations*. In the same year, applied to the traditional concept of loyalty to the king, it produced the *Declaration of Independence*. Applied to reason itself, it produced Kant's *Critique of Pure Reason*.

In the 19th Century, critical thought was extended even further into the domain of human social life by Comte and Spencer. Applied to the problems of capitalism, it produced the searching social and economic critique of Karl Marx. Applied to the history of human culture and the basis of biological life, it led to Darwin's *Descent of Man*. Applied to the unconscious mind, it is reflected in the works of Sigmund Freud. Applied to cultures, it led to the establishment of the field of Anthropological studies. Applied to language, it

led to the field of Linguistics and to many deep probings of the functions of symbols and language in human life.

In the 20th Century, our understanding of the power and nature of critical thinking has emerged in increasingly more explicit formulations. In 1906, William Graham Sumner published a land-breaking study of the foundations of sociology and anthropology, *Folkways*, in which he documented the tendency of the human mind to think sociocentrically and the parallel tendency for schools to serve the (uncritical) function of social indoctrination:

Schools make persons all on one pattern, orthodoxy. School education, unless it is regulated by the best knowledge and good sense, will produce men and women who are all of one pattern, as if turned in a lathe...An orthodoxy is produced in regard to all the great doctrines of life. It consists of the most worn and commonplace opinions which are common in the masses. The popular opinions always contain broad fallacies, half-truths, and glib generalizations (p. 630).

At the same time, Sumner recognized the deep need for critical thinking in life and in education:

Criticism is the examination and test of propositions of any kind which are offered for acceptance, in order to find out whether they correspond to reality or not. The critical faculty is a product of education and training. It is a mental habit and power. It is a prime condition of human welfare that men and women should be trained in it. It is our only guarantee against delusion, deception, superstition, and misapprehension of ourselves and our earthly circumstances. Education is good just so far as it produces a well-developed critical faculty...A teacher of any subject who insists on accuracy and a rational control of all processes and methods, and who holds everything open to unlimited verification and revision is cultivating that method as a habit in the pupils. Men educated in it cannot be stampeded...They are slow to believe. They can hold things as possible or probable in all degrees, without certainty and without pain. They can wait for evidence and weigh evidence...They can resist appeals to their dearest prejudices...Education in the critical faculty is the only education of which it can be truly said that it makes good citizens (pp. 632, 633).

John Dewey agreed. From his work, we have increased our sense of the pragmatic basis of human thought (its instrumental nature), and especially its *grounding in actual human purposes, goals, and objectives*. From the work of Ludwig Wittgenstein we have increased our awareness not only of the importance of *concepts* in human thought, but also of *the need to analyze concepts* and assess their power and limitations. From the work of Piaget, we have increased our awareness of the *egocentric and sociocentric tendencies of human thought* and of the special need to develop critical thought which is able to *reason within multiple standpoints*, and to be raised to the level of "conscious realization." From the massive contribution of all the "hard" sciences, we have learned *the power of information* and the *importance of gathering information with great care and precision*, and with

sensitivity to its potential inaccuracy, distortion, or misuse. From the contribution of depth-psychology, we have learned how easily the human mind is self-deceived, how easily it unconsciously constructs illusions and delusions, how easily it rationalizes and stereotypes, projects and scapegoats.

To sum up, the tools and resources of the critical thinker have been vastly increased in virtue of the history of critical thought. Hundreds of thinkers have contributed to its development. Each major discipline has made some contribution to critical thought.

The State of the Field Today: Three Waves of Research, With Little Sense of History

Though it is possible to trace a common core of meaning reflected in a rich history of the concept of critical thinking, it does not follow that most of those working in the field are now aware of that history or work with a keen sense of the core meaning of the term (as reflected in that history). In fact, recent history of work in the field suggests that there is a significant level of theoretical "confusion" resulting from the fact that so many scholars working on the concept function independently of each other in multiple disciplines without any unifying agenda or common awareness of the history of the concept.

Part of the reason for this is that critical thinking studies is not a distinctive recognized academic field and hence lacks the discipline-based continuity of such a tradition. The result of recent research in the last 36 years is therefore diffuse rather than centered. Many working on the concept are working on it in a partial way, often heavily influenced in their analysis by their own academic discipline or background.

It goes without saying that insights into how the human mind can "malfunction" intellectually can come from many different sources or fields. Documentation of the problem of cultural bias, for example, is more likely to come from the research of cultural anthropologists than from parasitologists or neurologists. Documentation of the problem of self-deception in human thought is more likely to come from depth psychologists than from, say, physicists. A problem results, of course, when an insight into one problem of human thought is treated as if were the sole problem for critical thinking to solve. The field of critical thinking studies suffers from the natural tendency of those in all disciplines to treat critical thinking in terms of the insights of their home discipline, failing thereby to do justice to its interdisciplinary meaning and power. This is reflected in the last 30 years or so of research. Let's review those years since the early 70's, in which there are three discernable waves of research into critical thinking.

The three waves represent, in essence, different research agendas and point to different emphases in application. Each wave has its committed adherents, and each therefore represents an important choice influencing future work in the field. The third wave, as I conceptualize it, represents a very recent movement in the field, and, if it takes root, will perform a synthesizing function, integrating the most basic insights of the first two waves and transforming the field into one which is much more historical and conceptually broad than it is at present. But I am getting ahead of myself. I shall summarize these three waves in outline, and then deal with them in more detail.

The first wave of the last 30 years of critical thinking studies is based on a focus on the theory of logic, argumentation, and reasoning. It has become a virtual field unto itself, dominated by philosophers. First wave theorists tend to be "informal logicians" and tend to focus only on those instances of thinking in which persuasion and argumentation are explicit. In addition, they tend to analyze "arguments" with a minimum of background context. They tend to view reasoning and logic in what seems to me to be a relatively narrow and technical fashion, ignoring the broad family of related uses of the word 'logic' (which one might review in any dictionary of the English Language).

The broad notion of critical thinking as, say, articulated by Sumner above, is not adequately dealt with by this philosophically-based tradition. The tools provided do not make for a broad use of critical thinking in everyday life. For example, the role of thought in the shaping of feelings, emotions, and values; the role of subconscious thought; the role of thought in shaping concepts, presuppositions, questions, and points of view—all these are often thrust into the background, or ignored entirely, in the conceptions of critical thinking articulated in work developed by informal logicians.

The result is that "first wave" theoreticians do not focus on command of "the logic of language" or "the logic of questions" as key components of critical thinking. What is more, if one views the compass of critical thinking as dealing with those "logical structures" that underlie all human thought, emotion, and behavior, the framework and writings of most informal logic theorists appears narrow, specialized, and of limited usefulness. For example, Piaget's research—with his broad and rich sense of "logic"—has had no discernable influence on the work of informal logicians. Even Ryle's classic essay on "Formal and Informal Logic" has had little influence—since Ryle treats informal logic in that essay in a very broad and encompassing way.

The second wave, as I see it, represents, to some extent, a reaction against the first. Unlike the first wave, it is not grounded in any one discipline. It represents a loose conglomeration of interested persons, producing work of mixed quality, developed from many different standpoints. This diversity of standpoints gives to second wave research a scattered character. It includes: some working on critical thinking from the standpoint of cognitive psycholo-

gy, some from the standpoint of "critical pedagogy," some from the standpoint of feminism, some from the standpoint of particular disciplines (such as critical thinking in biology, business, or nursing), and yet others from the standpoint of some element purportedly missing from first wave research agendas (such as "emotion," "intuition," "imagination," "creativity," etc.)

Taken collectively, therefore, second wave projects are more comprehensive than first wave projects, since second wave analysis looks at critical thinking typically outside the tradition of logic and rhetoric. Unfortunately, second wave work (lacking a shared intellectual tradition) is collectively far less integrated, less coherent, and sometimes more "superficial." While exceptional work has been done during the second wave, the gain is too often breadth at the expense of depth and rigor.

The third wave, as I envision it, presupposes some recognition of the problems generated by the first two waves and represents a commitment to transcend those problems (rigor without comprehensiveness, on the one hand, and comprehensiveness without rigor, on the other). Third wave theorists are still relatively rare, though the work of a variety of intellectuals and scholars is relevant to third wave research agendas.

The principles and standards of the National Council for Excellence in Critical Thinking (NCECT), and the Sonoma conference tradition, illustrate significant attempts to answer the need created by the limitations of the first two waves of critical thinking theory. For example, the NCECT research projects based on comprehensive principles and standards explicitly go beyond a "narrow" view of logic and critical thinking. The Sonoma conference tradition, in turn, has explicitly been premised on fostering a comprehensive core concept of critical thinking that goes beyond any one discipline or definition (over 30 academic disciplines have been represented by papers and presentations at the conference) and each conference of the 16 has represented a more and more discipline-based balance of presentations.

Still, the field is at a crucial juncture, for if comprehensiveness and rigor are not combined in the work of the field, it is likely to split even further into a narrow technical field on the one hand, and a hodge-podge on the other. However, it is too early to tell whether and to what extent the need for both comprehensiveness and rigor will be answered by the full development of third wave research agendas.

Unfortunately, third wave agendas cannot go forward without a general recognition of the importance of a deep and comprehensive theory that goes beyond the "narrowness" of most first wave research and the "superficiality" of much second wave research. It requires a willingness to think outside one's discipline or at least to think within one's discipline from the standpoint of a broader range of concerns. It requires, on the one hand, informal logicians

willing not only to examine the problems posed by second wave theorists, but also to move to a broader conception of logic, one that recognizes that there is a logic to thinking within different disciplines, a logic to human emotions, a logic to human behavior, a logic, indeed, to every dimension of human life in which thinking is the driving force. On the other hand, it calls for those with second wave concerns to take seriously the insights of first wave research and not simply to grudgingly (and abstractly) admit some value to it.

In other words, while first wave researchers need to recognize the importance of broadening the sweep of their concerns, second wave researchers need to recognize the need to build on the theoretical rigor of the first wave, to internalize, not ignore, the insights of the first wave, and to build on them. Only out of a real marriage of first and second wave concerns, only by a deep integration of insights, can the third wave fully develop. Those who would contribute significantly to the field of critical thinking research need to internalize the strengths of the first two waves. Now, with this rough background in mind, let us look at the three waves in a more formal way.

The First Wave of Critical Thinking Research & Practice 1970-1996 Formal & Informal Logic Courses

First Wave Research Concerns:

- The design of individual courses in critical thinking or informal logic
- The critique of formal logic as a tool for the analysis and assessment of "real world" reasoning and argumentation
- The development of theories of fallacies in thought
- The development of theories of informal logic, reasoning, persuasion, rhetoric, and argumentation, etc.
- The exploration of philosophical issues raised by theories developed to account for informal logic, reasoning, and argumentation

In the first wave of critical thinking practice, the dominant paradigm came from philosophy and logic and the dominant educational manifestation was a formal or informal logic course. The idea was to establish a basic course in critical thinking which would provide entering freshmen with the foundational intellectual skills they need to be successful in college work. Almost from the beginning, however, there was a contradiction between the concerns and ideals that gave rise to the theory and practice and actual classroom practice. The ideals were broad and ambitious. The practice was narrow and of limited success.

For example, the State College and University System of California defined the goals of the critical thinking graduation requirement as follows:

Instruction in critical thinking is to be designed to achieve an understanding of the relationship of language to logic, which should lead to the ability to analyze, criticize, and advocate ideas, to reason inductively and deductively, and to reach factual or judgmental conclusions based on sound inferences drawn from unambiguous statements of knowledge or belief. The minimal competence to be expected at the successful conclusion of instruction in critical thinking should be the ability to distinguish fact from judgment, belief from knowledge, and skills in elementary inductive and deductive processes, including an understanding of the formal and informal fallacies of language and thought.

On the one hand, we have a global comprehensive goal and on the other hand a fairly narrow and specialized way to meet that goal. Students do not, in my experience, achieve "an understanding of the relationship of language to logic" leading to "the ability to analyze, criticize, and advocate ideas"; they do not develop "the ability to distinguish fact from judgment" or "belief from knowledge" simply because they have been drilled in "elementary inductive and deductive processes" nor because they have been exposed to the theory of formal and informal fallacies. The misfit between goal and means is obvious to anyone who takes the goals in the above paragraph seriously. One three-unit course in critical thinking can at best open the door to the beginning of critical thinking, provide an opening framework. It cannot result in the students having deep notions like "an understanding of the relationship of language to logic" or sweeping abilities like "the ability to analyze, criticize, and advocate ideas."

No one or two isolated courses can change the basic habits of thought of anyone. Furthermore, as a practical matter, many of the courses established to accomplish the objective fell far short of the best design. Often, for example, a course in formal logic was allowed to qualify as a course in critical thinking even though such courses generally are confined to teaching only the mechanical manipulation of symbols in accord with rules for such manipulation, a practice that does not result in changing habits of thought. Under questioning students who have taken such courses demonstrate little insight into why they were doing what they were doing and no sense of how to transfer their "manipulative" abilities (with the symbols of formal logic) into practical tools in everyday thought.

Substituting informal logic courses for formal ones was one of the earliest shifts in emphasis as more and more instructors recognized that the formal logic approach had little transfer effect. The emphasis in the informal logic approach to the improvement of thinking was a giant step in the right direction. In place of highly abstract and contrived "arguments" in symbolic form, the students had to read and analyze arguments that came from editorials and everyday speech and debate.

Unfortunately, the informal logic textbooks were often rich in vocabulary and sophisticated distinctions but, unfortunately, poor in fostering deep internalization. The distinctions were generally well-thought out, but there were far too many distinctions for a one semester course, and furthermore, they were too typically narrow in their scope. Consequently, most students were rushed on to new distinctions and concepts before they had internalized the "old" ones. There was little emphasis on the construction—as against the critique—of reasoning. There was little done with the essential dispositions and values underlying critical thinking. The goals remained broad and profound, the means narrow and unrealistic.

Furthermore, the problem of transfer remained; it was still not clear to students how to transfer their analyses of bits and pieces of argumentation into learning what they were being taught in other courses, namely, sociology, psychology, biology, etc. And so most students, once their critical thinking courses were finished, reverted to their established lower-order, survival skills—principally, rote memorization and cramming—to get by.

The problem of most first wave work is both theoretical and pedagogical. Theoretically, little if anything was done to work out a comprehensive theory of "logic" sufficient to make sense of the logic of Biology, the logic of Sociology, the logic of Anthropology, Geography, Literature, the Arts, etc. The concept of logic implicit in informal logic research is too narrow to provide the basis for transfer of critical thinking from, in fact, informal logic courses (no matter how well designed) to the broader curriculum, nor into the complex problems of everyday life and thought (except in a narrow range of such problems).

Pedagogically, little was done to work out the practical problems of restructuring instruction and learning overall. After all, how is one to teach anyone anything in such a way as to foster their taking command of their thinking, so that they develop not only intellectual skills but the basic dispositions and values that underlie critical thinking? How are academic subjects to be taught such that students leave school with the intellectual skills necessary to adapt to incessant and accelerating change and complexity? How are we to teach so that students explicitly recognize that the work of the future is the work of the mind, intellectual work that demands global skills of reasoning and intellectual self-discipline? These questions must be addressed.

The Second Wave of Critical Thinking Research & Practice 1980-1996

Critical Thinking Across the Curriculum Across the Grades

Second Wave Research Concerns:

- The development of a model for teaching critical thinking at some educational level or within some particular subject
- The development of a theory of critical thinking within a given domain or subject
- Exploration of the relation of critical thinking to emotion
- Exploration of the relation of critical thinking to the media
- Exploration of the relation of critical thinking to problem-solving
- Exploration of the relation of critical thinking to creative thinking
- Exploration of the relation of critical thinking to sound business organization and management
- Exploration of the relation of critical thinking to parenting
- Exploration of the relation of critical thinking to political and ideological agendas
- Research in cognitive psychology

The second wave of critical thinking research and practice began when increasing numbers of educators and administrators began to recognize that one course in critical thinking at the college level does not a critical thinker make. The problem for these reformers was transformed from "How should one design an isolated critical thinking course for college students?" to "How can critical thinking be integrated into instruction across all subjects and all grade levels?"; from "What is informal logic, reasoning, and argumentation?" to "What is the role of emotion—or intuition or culture or gender or problem solving or creative thinking or political and ideological positioning—in thinking?"

Unfortunately, many second wave reformers were not at all clear on how to integrate critical thinking into instruction across the curriculum or across grade levels. The concept of informal logic which had been developed in and for critical thinking and informal logic courses did not translate readily into the "logic" of the disciplines, let alone into the "logic" of everyday life. For, though informal logicians were often clear and rigorous in the development of theory, the theory they developed was narrowly conceived. In other words, most informal logicians have never seriously considered the challenge of developing a theory of critical thinking adequate for the teaching of all subjects across all grade levels. Informal logic was not conceived as applicable

to virtually all human contexts. The theory of the informal logician remained the theory of a specialist thinking and writing for other specialists (about a subject of relatively narrow scope). It was not the thinking of a comprehensive educational thinker writing for educational reformers. It was not the thinking of a comprehensive mind considering broad and comprehensive problems.

From a third wave perspective, an adequate account of informal logic and critical thinking must shed significant light on the logic of everyday thinking as well as on the logic of the disciplines (if it is to attract the attention of educational reformers and those concerned with the application of critical thinking to everyday life). Problems in business, parenting, everyday relationships, politics, civics, and such, cannot easily be addressed within the framework of current theories of logic. And since critical thinking makes sense whenever and wherever thinking might go awry, the logic of critical thinking must be broad and encompassing, not narrow and specialized.

Unfortunately, second wave reformers did not set out to broaden the basis of informal logic and reasoning. Rather, some second wave reformers mistakenly rejected "logic" rather than worked to expand it. To some logic constrained thinking, limited creativity, discounted intuition. Others seemed simply to ignore logic and focused instead on any of the various "discoveries" and popular theories of thinking. In fact, the field of "thinking" became, and still is, a veritable hodge-podge, some work bordering on charlatanism. Quick-fixes for teaching and understanding thinking became commonplace. Quick-fixes ruled, and still rule, reform efforts at all educational levels.

Otherwise respectable educational organizations sponsored approaches to thinking that were simplistic and glitzy. Big money began to move into the field, since there was much money to be made by quick-fix programs that implied that thinking could be quickly and painlessly upgraded by educators, even by those who had never themselves studied thinking and thought poorly themselves. Instant success was promised. The phenomena of pseudo-critical thinking became common.

States set up new testing strategies that were claimed to be higher order. California mounted a very expensive new testing system in reading and writing which was touted to be focused on critical thinking—when it in fact was simply subjective and poorly designed. The result was a political battle between the "liberals" who liked the test and "conservatives" who thought it advanced a liberal agenda. Eventually the governor vetoed the test.

Other second wave researchers—most principally cognitive psychologists—have focused concern on the manner in which experts and novices think. They have developed various theories of "thinking" and "intelligence," however this research and these theories often lack a philosophical foundation, regularly ignore the problem of the intellectual assessment of thinking, and, like first wave informal logic research, lack a clear connection to the comprehensive problem of teaching subject matter in a variety of fields. The

"practical" suggestions developed were more often like a bag of tricks than a coherent pedagogy. The problem of long-term infusion was significantly addressed.

Though second wave did not explicitly call for an abandonment of "logic" and additional attention was directed at explicating various subject areas in the light of some theory of critical thinking, there was little effort to marry the insights of the first wave with the needs of the second. Little was done, for example, to explicate the logic of history, the logic of math, biology, socio-logic, psycho-logic, the logic implicit in disciplined ways of thinking. After all, what does it mean to think historically, to think geographically, to think mathematically, to think philosophically, to think aesthetically, etc. These are pressing second wave questions. However, since most subject matter specialists have not studied informal or formal logic, they are not well-positioned to integrate insights from logic into their concept of their field.

In short, the variety of attempts to reconstruct (with little background in informal logic or theory of critical thinking) the role of critical thinking within a domain, has tended to result in disjointed and sometimes superficial results. The upshot is often a hodge-podge of ideas, often superficial, usually incomplete, and in some cases, arbitrary. The phenomenon of instant-expert in critical thinking becomes commonplace. Those who decide to write an article on critical thinking become, in their minds, an expert overnight. Programs are rushed into press to capitalize on the emerging market for critical thinking materials.

The Third Wave of Critical Thinking Research & Practice 1985- Depth & Comprehensiveness in Theory & Practice

Third Wave Research Concerns:

- integrating the insights of first and second wave research
- developing a theory of critical thinking that is rigorous and comprehensive
- explicating intellectual standards that have general application both within and beyond academic environments
- accounting for the appropriate role of emotion and values in thinking
- understanding the leading role of thinking in the shaping of emotion and behavior
- integrating the empirical work of cognitive psychology into critical thinking theory
- establishing common denominator principles and standards within the field of critical thinking research and practice
- developing effective assessment tools
- identifying and critiquing pseudo-critical thinking models and programs

The third wave of critical thinking research and practice is only just now beginning to emerge. As yet there are few who see clearly the enormity of the task which the field faces. The success of the third wave can be achieved only with a growing recognition of the strengths and weaknesses of the first two waves. First wave research needs to bring its rigor and depth into a broader complex of concerns. Second wave research needs to integrate rigor and depth into its comprehensiveness. Theories of teaching and learning (based on theories of thinking, emotion, and action) need to be carefully integrated.

The field needs a comprehensive theory of thinking and critical thinking. It needs a clear set of intellectual standards. It needs an integrated set of dispositions. It needs a comprehensive concept of logic which accommodates the role of emotion, intuition, imagination and values in thinking. It needs to make clear the leading role of thinking in the shaping of human feelings and behavior. It needs to provide a framework into which can be set integrated theories of teaching and learning in the widest variety of human contexts. It must provide both for the universal elements in reasoning and for those which are domain- and context-specific.

Conclusion

Though it is now generally recognized that the art of thinking critically is a major missing link in education today, and that effective communication and problem-solving skills, as well as mastery of content require critical thinking; and though it is now generally conceded that the ability to think critically becomes more and more important to success in life as the pace of change continues to accelerate and as complexity and interdependence continue to intensify; and though it is also generally understood that some major changes in instruction will have to take place to shift the overarching emphasis of student learning from rote memorization to effective critical thinking (as the primary tool of learning)—it does not follow that university educators are well informed about the core meaning of critical thinking, nor even (ironically) that all of those working in the field of critical thinking studies have a clear sense of the core concept or of its history.

In fact, if my analysis and perspective are sound, the last 30 or so years of research into critical thinking is quite "imperfect" and reflects a very basic need which has not yet been significantly recognized or taken up by the bulk of those involved in research in critical thinking. The question, "How can we who work in the field of critical thinking studies develop a keener sense of the history of the concept, a fuller sense of the need to integrate insights from multiple disciplines (without losing coherence or rigor), and a more effective way of communicating advanced work in the field to those concerned with classroom instruction?" is still a vital, unanswered question. The Center For Critical Thinking, the National Council for Excellence in Critical Thinking, and the Sonoma conference tradition are committed to comprehensiveness and rigor in the field. Future events, however, will judge whether or not critical thinking studies emerge as a vibrant, positive, and unifying influence in education in the near future, or whether it fades into a cacophony of specialist voices and awaits re-discovery by some future generation of broad-minded, interdisciplinary thinkers.

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