

Critical Thinking Dispositions: Their Nature and Assessability

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Abstract: Assuming that critical thinking dispositions are at least as important as critical thinking abilities, Ennis examines the concept of critical thinking disposition and suggests some criteria for judging sets of them. He considers a leading approach to their analysis and offers as an alternative a simpler set, including the disposition to seek alternatives and be open to them. After examining some gender-bias and subject-specificity challenges to promoting critical thinking dispositions, he notes some difficulties involved in assessing critical thinking dispositions, and suggests an exploratory attempt to assess them.

Résumé: Présupposant que les dispositions à la pensée critique sont au moins aussi importantes que les habilités de la pensée critique, Ennis examine la notion de "disposition à la pensée critique" et suggère quelques critères pour en évaluer certaines combinaisons. Il considère une des principales approches servant à les analyser et propose à la place une combinaison plus simple, qui inclut la disposition à rechercher des solutions de rechanges et à y être ouvert. Après avoir examiné certains préjugés sexistes et des défis posés par le caractère spécifique des sujets, lorsqu'on veut promouvoir des dispositions à la pensée critique, il identifie quelques difficultés liées à l'évaluation de ces dispositions et suggère une tentative exploratoire pour évaluer.

Keywords: critical thinking, disposition, alternatives, open-mindedness, assessment

A number of people interested in critical thinking have urged that critical thinking ability is not enough, that critical thinking dispositions are needed as well (see, for example, J. Baron, 1985; Dewey, 1930; Ennis, 1987, 1991; Facione & Facione, 1992; Martin, 1992; McPeck, 1991; Norris, 1992; Norris & Ennis, 1989; Passmore, 1967; Paul, 1990; Perkins, Jay, & Tishman, 1993; Resnick, 1987; Siegel, 1988; and Taube, 1993). Assuming this broad position, I shall here examine the concept of a critical thinking disposition, suggest some criteria for judging sets of critical thinking dispositions, critically consider a leading approach to the analysis of critical thinking dispositions, offer as an alternative a simpler set of critical thinking dispositions, examine some gender-bias and subject-specificity challenges to critical thinking dispositions, note some difficulties involved in assessing critical thinking dispositions, and look at an exploratory attempt to assess a crucial critical thinking disposition—the disposition to seek alternatives and be open to them.

Although a variety of definitions of “critical thinking” would serve here, I shall assume the following one: Critical thinking is reasonable reflective thinking focused on deciding what to believe or do. The emphasis is on reasonableness, reflection, and the process of making decisions.

THE CONCEPT OF A CRITICAL THINKING DISPOSITION

Roughly speaking, a disposition is a tendency to do something, given certain conditions. The brittleness of glass is a standard example of a disposition: a tendency to break into a number of pieces when struck. The notion of disposition has been applied in conceptions of critical thinking. For example, the disposition to be open to alternatives is usually included in conceptions of critical thinking.

Hidden Qualities

Dispositions are not revealed by inspection. We can not see that glass is brittle simply by looking at it. Something must happen to the glass in order that its disposition be revealed. Similarly, critical thinking dispositions are not obvious by inspection. We cannot see the disposition to be open to alternatives. Something must happen in order that the dispositions be revealed. This hidden quality of dispositions is a problem that must be faced by attempts to assess critical thinking dispositions. A related problem is the possibility that people, if the disposition assessment purpose is evident, can often feign the appearance of the disposition without really having it.

Relationship to Inclinations, Sensitivities and Abilities

Perkins, Jay & Tishman (1993) have offered a triadic theory of critical thinking dispositions that sees a disposition as having three components: inclination, sensitivity, and ability—presumably each a necessary component—with all three being jointly sufficient. Although it is plausible to treat inclination as a necessary component of, perhaps the essence of, a disposition, I shall argue that the associated sensitivity and ability do not seem to be essential components of every disposition.

A person could be disposed “to clarify and seek understanding” (one of those on their list of seven basic dispositions, p. 7) without being sensitive to situations calling for clarification, that is, without noticing such situations. The person might have the disposition without knowing when to exercise it. I know such people. Because they do not sense the need for clarification in many situations, they do not exercise their disposition, even though they would try to clarify if they realized the need.

Furthermore, someone could have the disposition to clarify and seek understanding without having “the ability to ask pointed questions and to build complex conceptualizations” (which is one of the abilities they have specified under this disposition, p. 7). I know such people. One of my goals in my critical thinking classes is to teach people who are so disposed how to ask pointed questions and build complex conceptualizations. They say, for example, “I know that this is confus-

ing, but I do not know what to do about it,” in a situation where asking pointed questions, like “What’s the main idea?” and “What does that imply for the situation?” would help.

This last point would hold, even if Perkins, Jay & Tishman were less demanding—by asking only for the ability to clarify and seek understanding. For example, I know people who on occasion are disposed to clarify, but do not have the ability to clarify what they are saying on that occasion, or, to any significant extent, the ability to clarify what others are saying either.

In sum, sensitivities and abilities are not necessary conditions for dispositions. However, they are still important (as are all of the many items on the Perkins-Jay-Tishman list). Without the associated sensitivities and abilities, having the disposition is not of much use. Furthermore, *assessment* of some dispositions might well require the presence of the corresponding sensitivity and ability (a point urged by Norris, 1992, with respect to ability), at least in large scale assessment. In large-scale assessment, it might be difficult to be confident that someone has the disposition to clarify, if the person does not actually exhibit some clarifying behavior (which would presumably require the appropriate sensitivity and the ability).

The Obligation to Conform to Everyday Meanings vs. the Scientist's Freedom to Create New Meanings for Existing Terms

In personal communication, Perkins and Tishman have indicated that in their theory they are not trying to conform to the everyday meanings of these terms, and that most of my concerns assume these everyday meanings. This is true. But I hold that they should try to conform to the everyday meanings in this sort of activity in this context. Of course scientists have the right to invent new meanings for existing terms, and often do so with useful results. For example, in physics as I used to teach it, the term ‘work’ does not have its everyday meaning. You can carry a heavy block of ice for a long distance at the direction of your boss, but not have done any work in the special physics sense of the term. The special meaning is acceptable, even useful, so long as no one is misled by the shift in meaning. That is, no boss can withhold pay for carrying that ice on the ground that you have done no work (in the physics sense of the term).

In the critical thinking disposition context, when we are formulating goals for the schools, and guidelines for assessment (which often become goals, and at least are supposed to provide people with some idea of how they are doing), changing meaning can bring confusion and damage. For example, if the dispositions include the abilities, teachers might be tempted to teach the dispositions, neglecting the abilities, thinking that in teaching the dispositions, the ability comes automatically (by definition). In a way, they would be justified in doing so, because if anyone has acquired the disposition (in the Perkins-Jay-Tishman sense), that person has necessarily acquired the ability. But unsuspecting teachers might not have picked up on the fact that the word “disposition” is being used in a way different from

the one they are used to, and might feel that their job is done when the disposition (in the ordinary sense) is taught.

Actually, such teaching might be an effective strategy. People who have acquired the disposition might then generally be motivated enough to then go on to acquire the ability. I do not know. But if it is effective, we should discover that by experimenting, and not have it forced on us by linguistic maneuvers.

Empirical Support for the Distinction between Dispositions and Abilities

Taube (1993) and Norris & Hollett (1992) have independently and in different ways gathered empirical evidence supporting the distinction between critical thinking dispositions and abilities. Taube did a confirmational factor analysis of an open-ended critical thinking test, *The Ennis-Weir Critical Thinking Essay Test* (Ennis & Weir, 1985), together with some separate tests of critical thinking dispositions and abilities, and found that the Ennis-Weir contained two factors, a disposition factor and an ability factor. Norris & Hollett used two versions of three different tests (one of which was also the Ennis-Weir) and found the members of the pairs to be quite different from each other. They also argued (with empirical evidence) that the multiple-choice tests were ability tests and that the open-ended tests were in part tests of dispositions. They concluded that "the two test formats test for different constructs" (p. 30), one of which included a dispositional component.

I might add that it is generally accepted that one can have critical thinking ability (or abilities) without the accompanying dispositions, and this fact is offered as a reason to emphasize critical thinking dispositions in instruction and assessment. But the reverse holds as well, I have argued. Accordingly, both should be incorporated in the goals for critical thinking instruction, and both should be incorporated in critical thinking assessment.

WHAT ARE THE CRITICAL THINKING DISPOSITIONS?

The task of specifying critical thinking dispositions for purposes of teaching and assessment is not an easy one. Norris (1992) emphasizes the disposition to think critically. Siegel (1988) does also, as well as having a critical spirit, for which he offers several subdispositions: objectivity, intellectual honesty, impartiality, a willingness to conform judgments and actions to principle, and a commitment to seek and evaluate reasons. Facione, Sanchez, & Facione, (1994) offer seven disposition factors: openmindedness, inquisitiveness, systematicity, analyticity, truth-seeking, critical thinking self-confidence, and maturity.

Although all of these items are valuable, I have some reservations. I shall briefly hint at them, realizing that each set deserves more extensive treatment. Norris's being concerned with the disposition to think critically is very important, but that disposition alone is too broad and vague to provide sufficient guidance to teachers and assessors. Seigel's list neglects the disposition to try to be well-informed and to try

to be clear about things. Furthermore, one wonders what are the principles to which our judgments and actions are expected to conform. Lastly, there are some basic judgments (such as judgments about a basic principle) that cannot conform to principle on risk of infinite regress or circularity. The Facione list's "maturity" and "critical thinking self-confidence" are too vague; this list also neglects the disposition to be clear; and its genesis, being in part based on a factor analysis, makes me wonder whether the terms are used in their everyday way in this list. Factor analysis is notorious for its users' inability to defend the selection of terms to label the factors.

In contrast, Perkins, Jay & Tishman (1993) have developed a long elaborate list, to which I shall devote more attention. It consists of approximately seventy dispositions (depending on how you count). However, on first impression, it consists only of seven dispositions (presumably a manageable number for purposes of instruction and assessment). It too incorporates many important things (p. 6):

1. To be broad and adventurous
2. Toward sustained intellectual activity
3. To clarify and seek understanding
4. To be playful and strategic
5. To be intellectually careful
6. To seek and evaluate reasons
7. To be metacognitive

This list of seven, when one considers the conjunctions, becomes a list of ten or eleven dispositions (e.g., both seek *and* evaluate in #6). But there is more: The authors have elaborated the list so that it incorporates approximately thirty-seven inclinations, and thirty-three sensitivities (all of which also seem to be dispositions), making up to seventy dispositions in all.

If each of the sub-dispositions actually fit under its associated main disposition, this expansion would simply be an elaboration of parts, but a number of them seem to go well beyond the seven, making the list rather confusing, and adding substantially to the length and complexity of the list. For example, the three inclinations, "to be open-minded, to probe assumptions and [to] examine alternative points of view," appear under the first major disposition, "to be broad and adventurous" (p. 7), although these three inclinations do not appear to fit well under being broad and adventurous in the standard sense of these terms. So the inclinations and sensitivities constitute important supplements which must also be considered in an attempt at dispositional assessment. So the list is actually more complex and considerably longer than would appear at first sight.

Assuming that the set is supposed to be comprehensive (that is, that it should include all of the most important things), I am somewhat disappointed by the neglect of two dispositions: the disposition to be well-informed and the disposition to take a position when the evidence and reasons are sufficient to do so. These two are important to include, especially in view of some well-known complaints about the critical

thinking movement. In particular, Hirsch (1988) and McPeck (1990) have objected to what they think is a neglect of content by the movement. Although this is a misperception, it is important to affirm our concern for content with the inclusion of the disposition to be well-informed. Furthermore, a common public perception is that critical thinking is negative, and encourages skepticism. The disposition to take a position when the evidence and reasons are sufficient to do so, is a disposition not to be a skeptic. It needs to be included in our goals for teaching critical thinking.

There is much room for discussion of the actual assessment-relative size and comprehensiveness of the Perkins-Jay-Tishman list. I am only trying to suggest that this list is not so simple and comprehensive as it appears, even though the items on their long list all seem valuable and comprehensible when the terms are taken in their standard meaning. But I am not assuming that making a simple, comprehensive list is an easy task. It is not.

Criteria

So far, I have employed six criteria for judging a set of critical thinking dispositions prepared for purposes of guiding instruction, assessment, and research. They are simplicity, comprehensiveness, value, comprehensibility, conformity of its language to our everyday meanings, and the fitting of subordinates (if any) under superordinates. A seventh possible criterion, mutual exclusiveness, is often a useful criterion for lists. But in this case, I believe that its use would conflict with providing comprehensible and unconfusing guidance for students, teachers, test makers, and textbook writers. A system that provided mutually exclusive categories, though desirable for some research purposes, would quite probably be too artificial and incomprehensible to serve the purpose I mentioned. I have tried many times over the years to make such a system, but was never able to achieve mutual exclusivity of the categories together with comprehensiveness and sufficient comprehensibility for the students, teachers, test makers, and textbook writers.

Of the first six criteria, the Perkins-Jay-Tishman system satisfies the third (value). If its terms were used in their everyday sense, it would satisfy the fourth criterion (comprehensibility) as well, but most people, I suspect, will not comprehend their special meanings.

A Simpler System

As an alternative, I have developed the following conception of critical thinking dispositions (Ennis, 1996a, pp. 368-369), which I believe roughly satisfies all of the first six criteria. As in the Perkins-Jay-Tishman system (as well as the Seigel and Facione systems), its categories do overlap, so it does not satisfy the criterion of mutual exclusiveness. This is not a disabling factor, but we must be aware of it.

This system has three basic broad dispositions: (1) to “get it right” to the extent possible, (2) to represent a position honestly and clearly, and (3) to care about the

dignity and worth of every person. The first two are constitutive, the third correlative. More about that distinction later. Each broad disposition has several subdispositions. More specifically, in this conception, ideal critical thinkers are *disposed* to:

1. Care that their beliefs be true, and that their decisions be justified; that is, *care to "get it right" to the extent possible*, or at least care to do the best they can. This includes the interrelated dispositions to do the following:
 - A. *Seek alternatives* (hypotheses, explanations, conclusions, plans, sources), and *be open* to them;
 - B. *Endorse a position to the extent that, but only to the extent that, it is justified* by the information that is available;
 - C. *Be well-informed*; and
 - D. *Seriously consider points of view other than their own*.
2. *Represent a position honestly and clearly* (theirs as well as others'). This includes the dispositions to do the following:
 - A. *Be clear* about the intended meaning of what is said, written, or otherwise communicated, seeking *as much precision as the situation requires*;
 - B. Determine, and maintain *focus* on, the conclusion or question;
 - C. *Seek and offer reasons*;
 - D. Take into account the *total situation*; and
 - E. *Be reflectively aware of their own basic beliefs*.
3. *Care about the dignity and worth of every person*. This includes the dispositions to:
 - A. *Discover and listen to others' view and reasons*;
 - B. *Take into account others' feelings and level of understanding*, avoiding intimidating or confusing others with their critical thinking prowess; and
 - C. *Be concerned about others' welfare*.

A few interpretive comments:

(a) Several of the dispositions (1D, 2E, and 3A) contribute to being well-informed (1C), but are separate dispositions in their own right.

(b) In my expressed concern with true belief, I accept the view that our concepts and vocabulary are constructed by us, but also that (to oversimplify somewhat) the relationships among the referents of our concepts and terms are not constructed by us. We can have true or false beliefs about these relationships.

(c) The disposition to care about the dignity and worth of every person (3) is not required of critical thinking by definition, but in order that it be humane. I call it a "correlative disposition," by which I mean one that, although not part of the definition of *critical thinking*, is desirable for all critical thinkers to have, and the lack of which makes the critical thinking less valuable, perhaps of no value at all, perhaps even harmful.

A criticism of critical thinking for a definitional omission of caring for the worth and dignity of every person could well be based on the unreasonable assumption that the concept, *critical thinking*, should represent everything that is good, an overwhelming requirement indeed. On the other hand, any educational program that includes critical thinking but not the correlative disposition to care about every person's worth and dignity would be deficient and perhaps dangerous. The power of critical thinking unaccompanied by this correlative disposition could lead to serious trouble.

The Defensibility of This Conception

This set of somewhat overlapping dispositions is the result of years of my attending to—in many contexts—the kinds of ways that people (including myself) seem to go wrong, and my attending to the critical thinking dispositions suggested by others (including people mentioned earlier: Perkins, Jay & Tishman; Seigel; Norris; and Facione, Sanchez & Facione). The twelve sub-dispositions, though interdependent in a number of ways, each respond to a significant and common failing that I have found. Jointly, the basic three and the twelve sub-dispositions seem to cover the area fairly well. The list as a whole is fairly simple and comprehensible, and the subordinate parts do fit fairly well under the three major ones, although they do not exhaust the meaning of the major ones—a feat as difficult as achieving mutual exclusivity, if the other criteria are to be satisfied. Lastly, all items are valuable, I think you will agree. The lack of mutual exclusiveness does not seem a serious problem, given the purpose of the list. Lack of comprehensiveness or comprehensibility would be more serious, and lack of simplicity would be a difficulty.

Thus this list, though subject to further revision as time goes by, has support for its being an adequate basis for teaching and assessment. It fairly well satisfies the first six criteria specified above, and is based on years of observation of the ways people go wrong.

SOME OTHER ISSUES IN THE CONCEPTUALIZATION OF CRITICAL THINKING DISPOSITIONS

In addition to the questions about the satisfaction of seven basic criteria for such a system, other content issues can arise. I shall here discuss two: the possible gender bias and subject-specificity issues. In another place, I have discussed the issue of whether critical thinking so conceived is culturally biased (Ennis, 1998).

Gender Bias of Critical Thinking Dispositions

Consider the dispositions to care, to avoid distancing oneself from the things one is studying, and to listen to one's personal voice. Recent feminist critiques of the critical thinking movement (Noddings, 1992; Thayer-Bacon, 1993; and Martin, 1988) have urged the inclusion of one or more of these dispositions in the conception of critical thinking. Each has attractions and problems.

Caring

It is deeply unfortunate when any person is not a caring person, yet it is also true that caring about something can lead to unfair decisions. For example, decisions by teachers about the treatment to be accorded to a teacher's pet, someone for whom the teacher cares much more than for the other students, can be unfair and be the direct result of excessive caring. Furthermore, caring for some kinds of things, such as getting at the truth, certainly is constitutive of critical thinking. So one thing to note in discussions of caring is the object of the caring. Some caring can be harmful to critical thinking; other caring can be helpful, even essential. A blanket endorsement of all caring seems unwarranted.

How about caring for the worth and dignity of every person, including caring for the welfare of others throughout the world? Though indeed valuable, it might well not be (and I think is not) constitutive of critical thinking. However, I feel that it is a very desirable trait for critical thinkers, and have included the associated disposition as a correlative disposition.

An alternative way to handle caring for the worth and dignity of every person would be to make critical thinking a broader concept and include such caring as constitutive of critical thinking. I have not adopted this alternative because my sense of our current everyday language tells me that we do not use the term 'critical thinking' this way. There is no obligation to include all good things in our conception of critical thinking. To do so is to invite confusion and excessive vagueness.

A third way to handle this sort of caring would be to completely remove caring for the worth and dignity of others, including their welfare, from our set of critical thinking dispositions. Being a caring person of this sort is a good trait, but not all good traits must necessarily be part of our conception of critical thinking. Critical thinking is not the only good thing. There are many other good things.

I have not chosen this third alternative because it risks the neglect of caring about others in an educational program that incorporates critical thinking, possibly making the critical thinking a dangerous weapon. (Of course, this neglect would not be risked by the adoption of the second alternative, which makes such caring constitutive of critical thinking.) This neglect, when it occurs, is probably a basic cause of many current complaints about critical thinking. One good way to help avoid the neglect is to incorporate this kind of caring correlatively in our conception of critical thinking.

Distancing

Avoiding distancing oneself, that is, being deeply involved with the topic, people, materials, etc., that one is considering, in order to make a decision about what to believe or do, is no doubt often helpful in understanding and insight. Barbara McClintock's work in genetics has become a standard example (for example, Keller, 1985; and Martin, 1988). But deep involvement can also lead to blindness and bias. It can lead

one not to see or admit what one should. It can lead one not to be flexible enough to see things from the point of view of the other side, or lead one not to be aware of one's own deep assumptions. So this disposition can be good, and it can be bad. In the conception I offer, the good features come under the disposition to take the total situation into account.

Personal Voice

The disposition to listen to one's own personal voice probably overlaps with the disposition to think for yourself, which is often reasonable in this culture—but not necessarily part of critical thinking. Listening to one's own personal voice is also required by the disposition to get it right, since one should take all relevant information into account. However, there is possibly an added element—the disposition to go beyond existing reasons to “gut feelings.” There is sometimes good reason (!) to go beyond existing reasons and listen to one's gut feelings—perhaps because one's reasons are insufficient—or not well-grounded, or perhaps because one's gut feelings are the result of a thorough subconscious application of critical thinking dispositions and abilities. But one must be wary here. Gut feelings can lead one astray. It seems, then, that the good features of the disposition to listen to one's personal voice come under the dispositions to take the total situation into account, to be well-informed, and more broadly, to employ all relevant critical thinking abilities and dispositions.

These dispositions are three of a range of dispositions that have been discussed in feminist critiques of the critical thinking movement. Wheary and Ennis (1994) have considered these and others in an attempt to clarify the claimed possibility of gender bias in critical thinking—with conclusions similar to the those in this essay. The three dispositions just considered (to care, to avoid distancing, and to listen to one's personal voice), seem too broad to warrant blanket endorsement: some applications seem good—and others bad. The good applications are, I believe, included in the conceptualization of dispositions suggested earlier.

Subject-Specificity of Critical Thinking

Many commentators have held that critical thinking is subject-specific (for example, Glaser, 1984; McPeck, 1990). The critical thinking dispositions are open to the same challenge. This subject-specificity claim, as Ennis (1989) has suggested, could be construed empirically, epistemologically, or logically, the most significant contenders being the first two construals. Empirically, the claim means that even if people evidence a disposition in one area, they might well not evidence the disposition in another area (for example, the able mathematician's being incautious in thinking about educational policy, and not seeking, or being open to, alternatives to his or her current explanation of the current state of education). The extent to which the subject-specificity claim is true in its empirical interpretation needs extensive study for various areas, kinds of people, and situations. But at least in assessment, it is clear that we

must be careful about inferring from evidence that someone has a critical thinking disposition in one area or situation to the conclusion that the person has the disposition in general, or to the claim that the person will evidence it in some other area.

Under the epistemological interpretation of the claim (which would be that the dispositions are different for each area), it seems essentially false. Incidentally, John McPeck (1991), an ardent subject-specificity proponent, has explicitly withheld the epistemological subject-specificity challenge in the area of critical thinking dispositions. It seems clear to all people I know who have considered the question that the listed dispositions are generally desirable in all areas where decisions about what to believe or do are to be made.

ATTEMPTING TO ASSESS CRITICAL THINKING DISPOSITIONS

Since assessment of critical thinking dispositions depends on the dispositions selected, it seems clear that the different conceptions of critical thinking dispositions that I have mentioned could well result in different assessment procedures. However, because there is widespread agreement on certain dispositions, we can at least proceed to consider how those dispositions might be assessed. Among the agreed-upon dispositions, though stated variously, is the disposition to seek alternatives and be open to them.

Fundamental problems in assessing critical thinking dispositions, once we have agreed upon what dispositions to assess, are that dispositions are not directly observable, and that a disposition is something we want students to evidence on their own—without being pushed or prompted to evidence it. Without solving these problems, we do not have good evidence that a student has the given disposition. With these problems in mind, I shall consider multiple-choice, performance-based, and guided open-ended assessment. My suggestions are tentative; the work is exploratory.

Multiple-Choice Testing

It seems quite unlikely that a good true-false, multiple-choice, or forced-choice test of critical thinking dispositions can be made. If the items are straightforward valid-on-the-face-of-it statements (for example, “When offered a solution to a problem, one of the first things I do is to wonder whether there are alternatives”), any reasonably test-wise person who cares to score high on such an instrument could fairly easily figure out what the test maker wants. I could understand the use of such items in self-appraisal inventories, in instruments that serve as consciousness-raising devices, or as anonymous self-reports of people, possibly for research purposes. But in high, medium, or even low-stakes assessment, I am dubious. It seems too easy to fake the appropriate answers.

If, on the other hand, the items are not clearly aimed at a disposition (for example, “We can never really learn the truth about most things”, an agree-disagree item from the *California Critical Thinking Disposition Inventory*, Facione & Facione, 1992),

then there is no way to tell whether the item is a valid measure of a disposition. Factor analysis is offered as a way, but factor analysis only tells us which items group together by correlation, not what they measure.

I do not mean to be saying that the critical thinking dispositions are irrelevant to choosing multiple-choice critical-thinking-test answers. The disposition to seek alternative explanations, for example, can help one select an answer. But one might select the keyed answer without employing the disposition, and vice-versa. Consider Item 24 from the multiple-choice *Cornell Critical Thinking Test, Level X* (Ennis & Millman, 1985). The situation is a science-fiction exploration of a newly-discovered planet, Nicoma. A group of explorers is looking for the previous and first group from Earth to land on the planet. The hypothesis has been advanced that all members of the first group are dead. Students are asked whether each new piece of evidence A) supports, or B) goes against the hypothesis, or C) neither:

Item 24: You start to drive downstream. After 10 miles of driving, you see smoke rising in the distance. As far as you know, there are no volcanoes on Nicoma.

A possible explanation of the smoke that is an alternative to the “all-are-dead” hypothesis is that members of the first group are alive and have built a fire. The keyed answer is B, since there must be some explanation of the smoke, a plausible one of which is an alternative to the original hypothesis, reasonably weakening support for the hypothesis. The disposition to seek alternatives might help one select that answer. But a stronger application of that disposition might result in choosing C: Since there are so many possible explanations of that smoke, given a good imagination, the smoke does not help us decide at all, a very high-level critical thinker might justifiably think.

On the other hand, someone might choose B (the keyed answer), reasoning that the smoke *proved* that the explorers are alive because they must have built the fire. Choosing the keyed answer for this reason, although exhibiting recognition of the possible probative force of the smoke in this case, fails to evidence the disposition to seek and be open to alternatives, too strongly affirming only one alternative—the survival of some of the explorers who must have built the fire. Furthermore, one might choose C, simply because one sees no probative force in the smoke, not because one has the disposition in question. Hence, the disposition, and the lack of it, could result in the same response. The answer selected gives insufficient evidence of the presence or absence of the disposition. I shall return to this item, because it has potential, given different directions and scoring.

Performance-Based Assessment

On the face of it, assessment of actual performances (the more life-like the better) seems to be an excellent way to assess critical thinking dispositions. The person being assessed is then focused on the performance, and will presumably do things as he or she is disposed to do them. Thus, dispositions, given the appropriate circumstances,

will generally be evidenced (in context) to the extent that the person has the disposition. If we wait long enough, the appropriate circumstances for the exercise of the disposition will arise, and we will see whether indeed the person has the disposition, given all the details of the situation, which will be very "rich," to use a term favored by some qualitative researchers.

But there are several standard difficulties. First, the process is very expensive, usually requiring one-on-one observation, and requiring the observer to wait around until the disposition is evidenced. Waiting long enough could take a long time. Suppose that we are interested in the disposition to be clear about the intended meaning. We might have to wait around a long time to see this evidenced, not only because unclarity might not show up while we are watching, but because the social situation might be such that the person of interest will not react to the unclarity. Although various devices can be used to hasten the process, such as requiring, for graduation, an acceptable portfolio that includes a reaction to something we know in advance to be unclear, they are still costly and introduce a degree of artificiality into the situation. Furthermore, the student's reaction might reasonably focus on something other than unclarity in the selection. If, to avoid this, we direct the student to consider clarity, then the disposition to do so is not assessed.

The expense problem is exacerbated by the fact that there are a number of dispositions in which we are interested, possibly ranging from, say, twenty to seventy in the Perkins-Jay-Tishman conception, or twelve to fifteen in my conception.

Secondly, the disposition might not be evidenced at all, even if present, given the limited amount of time the observer might have. Thirdly, even if it is evidenced, there might well be only one appearance of evidence of this disposition. The evidence might be very instance-specific (or subject specific), requiring either a leap of faith, if we hope for transfer, or being satisfied with no evidence of generality. Hence we should be concerned about consistency from one instance to another in performance assessment. Linn and Burton (1994) have raised this generalization issue about performance-based assessment in an effective informative way.

These difficulties with performance assessment hold for large scale and for research-oriented assessment. They hold to a considerably lesser extent for assessment by instructors in medium-size-class teaching situations, since such instructors have extensive regular access to their students.

In sum, performance-based assessment by an outsider invites high expense and neglect of important dispositions. It is also vulnerable to instance and subject-specificity weaknesses. Performance assessment by teachers is a possible exception to these difficulties, assuming that the teachers themselves are familiar with a set of critical thinking dispositions and with their students, that they remember or record their judgments, and that they are not biased.

Guided Open-Ended Opportunities for the Evidencing of a Disposition

In order to reduce the expense and to secure focus on particular dispositions, Stephen Norris (1992) and we at the Illinois Critical Thinking Project have independently been exploring techniques for assessing critical thinking dispositions that are open-ended, but focused. Norris provides students with a problem situation, a search for living creatures on another planet, Zed, and some information, asking them “what you are thinking and what you plan to do” (1992, p. 161). “The initial instructions are designed to be nonleading” (p. 161). He examines what they write, trying to see whether they consider alternative interpretations, plans, conclusions, and hypotheses when they are presented with information, such as their finding “brownish objects which look like broken pieces of large eggshells” (p. 161). He feels that the situations he presents call for the students to seek alternatives, but he does not tell them to do so. He then feels it necessary to interview them in order to check to see whether the impressions he gets from reading what they say are consistent with the impressions from the interview, thus affording a consistency check. Norris’ approach seems promising. I look forward to more information about it.

The approach we are exploring in the Illinois Critical Thinking Project is a recent offshoot of a guided open-ended approach to general critical thinking assessment on which we have been working for several years. For this guided open-ended approach, we took twenty multiple-choice items from the *Cornell Critical Thinking Test, Level X* (Ennis & Millman, 1985), and asked students to provide a brief justification of their multiple-choice answers, provisionally labeling the resulting twenty-item test, *Cornell Critical Thinking Test, Level WJX* (“WJ” meaning “Written Justification”). The test has four sections: induction, credibility of sources, deduction, and assumption identification. The grading is of the justifications, and allows full credit for a good justification of an unkeyed answer. This approach, which includes a detailed guide for the grader, compensates for differences in background knowledge and interpretation of the items. We have achieved reasonably high inter-rater total-score correlations (.98, .99, .83, .90, and .94), varying with training, and are optimistic about its prospects as a critical thinking test. This test, the grading of which takes six to eight minutes of a trained scorer’s time, does not currently provide a critical thinking disposition score.

For the “offshoot” to which I referred, we are now reviewing some of these items for their disposition-revealing possibilities. One of the items is former Item 24, given above, plus the request for the student’s reason for choosing his or her answer. It has become Item #8 in Level WJX. This item, by including the request for a student’s reason for selecting A, B, or C, provides students with the opportunity to exhibit a disposition to seek and be open to alternative hypotheses, but it also provides them with the opportunity to exhibit going beyond the data and drawing too firm a conclusion when there are alternative explanations of the smoke (thus not exhibiting the disposition to seek and be open to alternatives).

In responding to the request for their reason, some students say that this evidence goes against the hypothesis because it means that “there might be humans who have

made the fire.” Some others say that it goes against the hypothesis because “it shows that they are alive.” Still others have said, “This is irrelevant.” There are other kinds of answers given, but for this discussion I will consider only these three. The first answer appears to evidence the disposition to seek and be open to alternative hypotheses. The second answer, in apparently going beyond the data and drawing too firm a conclusion, we take as evidence that the student is lacking in this disposition. The third answer gives us no basis to judge. Disposition scoring for the item is either “+” (evidences a critical thinking disposition), “0” (no basis to judge), or “-” (evidences lack of the disposition).

We realize that our interpretation of any individual response by a student might be incorrect. There are sometimes other possible explanations of the responses the students provided. Validation of this technique must be supplemented by interviews and more discussion and critique. But one error in interpretation, though serious, is not a disaster. As with any multiple-item test, a mistake on any particular item does not make an overwhelming difference in the ultimate score. But it does make a difference, so we must proceed with great caution.

Incidentally, on our first try with this item (#8), we have achieved an interrater correlation of .90 ($N = 34$, disadvantaged undergraduates).

We have also employed similar dispositional scoring for Item # 2 (shown here in the way it is offered to students in WJX). It is presented to students after the discovery that the first two huts are covered by a thick layer of dust:

Remember to mark as follows:

- A. This fact **gives at least some support** for the health officer’s idea that they are all dead.
 - B. This fact **goes against** the health officer’s idea.
 - C. This fact **neither supports nor goes against** the health officer’s idea.
2. You go into the third hut. There is no dust on the cookstove.

Circle one: A B C

Your Reason: _____

The answer, B, defended by the comment, “This shows that they are alive, because they must be doing some cooking,” receives a minus. The answer, B, defended by the comment, “They might be alive and be cooking, which could explain why there is no dust,” would receive a plus.

The inter-rater correlation for Item #2 in the same situation ($N=34$) was .98. Our combined dispositional scoring of these two items (#8 vs. #2) yielded a correlation

of .27 between the items. These correlational results are somewhat encouraging. But there is much more exploratory and developmental work to do.

Since we were able to do this dispositional grading at the rate of two tests per minute for both items, other people might find it feasible to develop similar items for testing dispositions, or might like to use our test and procedures on an experimental basis. We invite inquiries. One probable caveat is that students must know only that they are being tested for critical thinking, and not be told that they are being tested for the disposition to seek and be open to alternatives.

Our procedures are still in the very early exploratory state, but I am optimistic. At reasonable cost, we could be on the way to securing a focused assessment of an important critical thinking disposition. I invite others to try this approach for themselves and share their results.

SUMMARY

Assuming a disposition to be a tendency to do something, given certain conditions, I have examined in an assessment context several disposition lists, including the Perkins, Jay, & Tishman triadic analysis of critical thinking dispositions. I have urged that the presence of a disposition does not necessarily imply the presence of an associated sensitivity and an associated ability.

In considering approaches to critical thinking dispositions, I assumed six criteria, given the instructional and assessment context. They are simplicity, comprehensiveness, value, comprehensibility, conformity of its language to our everyday language, and the fitting of subordinates under superordinates. I abandoned the potential criterion, mutual exclusiveness, because its use in my experience interferes with the others and because it seems less important in the specified contexts. I have made a careful study of the Perkins-Jay-Tishman list and concluded that it satisfies the third, and very important criterion, value. Although their list might appear at first glance to satisfy the criterion of comprehensibility, it does not because they sometimes do not use language in standard ways. This situation will confuse people in the practical contexts we have in mind.

I have offered a simpler set of dispositions than theirs. It seems to satisfy all of the six criteria. Furthermore, gender bias and subject-specificity challenges seem at first glance manageable, given a detailed examination of the overall situation, but do require considerable further investigation.

The basic problems in disposition assessment, assuming that the previous issues are settled, is that we are testing for traits that are unobservable, and that we want students to evidence them without their realizing that we want them to exhibit the trait. For if they do realize it, they can often fake it, assuming that they have the ability and the sensitivity.

Multiple-choice disposition assessment seems inadequate to the task of assessing critical thinking dispositions. Items with obvious face-validity do not work in

high, medium, and even low stakes situations because they are easily answered correctly by testwise people who do not have the disposition but have been taught that they should have it. However, the approach could be useful for self-analysis, for consciousness-raising, and for anonymously-supplied research information. The use of items that are not obviously face-valid, but are selected through some factor analysis procedure, leaves us without a reason to call the items valid.

Performance-based assessment, though attractive, has problems of expense, neglect of focus, and possible situation and subject specificity, the more realistic the performance, the more difficult the problem.

We are exploring the use of focused, open-ended, multiple-item assessment of critical thinking dispositions. The approach has promise. I invite others to try it, and share the results.

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