TOPICAL ARTICLES

Teaching Critical Thinking by Examining Assumptions

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We describe how instructors can integrate the critical thinking skill of examining theoretical assumptions (e.g., determinism and materialism) and implications into psychology courses. In this instructional approach, students formulate questions that help them identify assumptions and implications, use those questions to identify and examine the assumptions and implications of theories being studied, and develop defensible positions on the tenability of various theoretical assumptions. We suggest that this instructional approach fits within extant critical thinking proposals, such as those formulated by King (1995) and Halonen (1995).

Psychologists have equated critical thinking largely with methodological concerns such as assessing evidence, evaluating the quality of research design, and examining logic and reasoning (e.g., Benjafield, 1994; Bensley, 1998; Halpern, 1984; Levy, 1997; Meltzoff, 1998; Stanovich, 1998; Zechmeister & Johnson, 1992). The purpose of this article is to demonstrate the role that another aspect of critical thinking—the examination of theoretical assumptions and implications—can play in psychology education.

As several theorists have shown, assumptions in general are centrally important because they provide the foundation of thought, action, and arguments (e.g., Bensley, 1998; Brookfield, 1987; Slife & Williams, 1995). We suggest that thinking critically about a broad range of theoretical assumptions in psychology is essential because these assumptions provide the foundation for scientific theories and thus heavily influence the perspective and work of psychologists (for more on the ubiquity of theoretical assumptions in psychology, see Burgess-Limerick, Abernethy, & Limerick, 1994; O'Donohue, 1989; Sappington, 1994; Slife & Williams, 1995).

In using the phrase *theoretical assumptions* (also known as meta-assumptions; see Sappington, 1994), we refer to often taken-for-granted ideas—for example, determinism and materialism—that provide the intellectual background for contemporary theories. Theoretical assumptions differ from theories per se in that they give shape to a theory and the variables it invokes, but, strictly speaking, are not testable in the traditional empirical sense (Sappington, 1994). For example, empirical methods cannot test the assumption that an independent reality exists or that only physical matter is real. Psychologists assume such ideas in the formation of a theory, but can evaluate them only indirectly as they empirically test hypotheses derived from theories. We suggest a more direct, nonempirical test of these assumptions to accompany empirical work and broaden the scope of critical thinking.

Although several authors have discussed related issues such as personal biases and preconceptions about scientific psychology (Halonen, 1995; Halpern, 1998; Keely, Ali, & Gebing, 1998; Sheldon, 1999; R. A. Smith, 1995) and a few others have focused on a narrow set of theoretical assumptions (Bensley, 1998; Tavris, 2001; Underwood & Wald, 1995; Viney & Woody, 1995; Wade, 1995), none has focused explicitly on the strong connection between underlying assumptions and theories in general or discussed the need to think critically about a broader range of theoretical assumptions relevant to psychology. We present an instructional approach that addresses these issues and facilitates the critical examination of assumptions and implications in psychology courses.

Teaching Students to Critically Examine Theoretical Assumptions

The general approach that we describe—helping students critically examine theoretical assumptions and implications in the normal course of instruction—is particularly useful in classes beyond the introductory course that deal with a variety of theoretical perspectives, such as learning, personality, development, motivation, and history and systems. When implementing this approach, we recommend an experiential, question-asking strategy. The value of this general approach comes partly from empirical evidence suggesting that question-asking strategies facilitate critical thinking and comprehension (e.g., Carroll, 2001; Gray, 1993; Keely et al., 1998; King, 1995) and partly from the emphasis that it places on student experience and reasoning.

Our approach includes the following steps:

1. Providing experiences that facilitate student desire to engage in critical thinking, particularly the examination of theoretical assumptions.
2. Forming a generic set of critical thinking questions that enables students to identify theoretical assumptions and discern their practical implications.
3. Identifying theoretical assumptions of theories being studied, via the critical thinking questions.
4. Identifying the practical implications (e.g., scientific, social, educational, medical, legal, ethical) that follow from the assumptions.
5. Having each student formulate a position on the validity or utility of various theories being studied, in light of the theories' assumptions and implications.

The following sections describe these steps in more detail; the examples within each step provide concrete suggestions on how to foster this critical thinking ability in the classroom.

Introducing the Critical Thinking Strategy

At the beginning of the course, the instructor should provide experiences that increase students' desire to examine assumptions and implications. We recommend presenting students with interesting scenarios or case studies that will make a connection with their experience and arouse curiosity (for more on the contribution of case study pedagogy to critical thinking, see McDade, 1995).

For example, the instructor could ask how students would respond to a friend who was rude or insulting to them (and provide vivid details as desired). As Slife and Williams (1995) suggested when framing this particular scenario, students' responses to this situation would surely vary. To consider just two possibilities, one student might hold the friend responsible for her actions and seek to confront her about the incident, whereas another might not hold her responsible. Next, the instructor could ask students to consider a more psychologically interesting question, namely, why their responses differed. Although many factors would surely influence students' answers to the second question, one prominent factor would be assumptions regarding human nature (Slife & Williams, 1995). For example, the student who would not hold the friend responsible might feel this way because he assumes that her rude behavior is determined and that the friend could not have acted any other way. On the other hand, the student who would seek a confrontation might assume that the friend freely chose her actions and that they must discuss the matter if they are to remain friends. In any case, such a discussion can help students see the important role that assumptions play in interpreting and responding to the behavior of others.

Students will also be interested in examples from psychology. As they ask about the assumptions of well-known theories and models, a brief glance into the history of psychology can reveal that all theories, despite their variance at many levels, are founded on assumptions regarding what actually exists, the causes of behavior, the relation between mind and brain, the influence of nature and nurture, and so on. Indeed, many psychological theorists drew their founding assumptions from explicitly theoretical and philosophical sources: Hull borrowed from logical positivism (e.g., Hull, 1943), Skinner borrowed from Francis Bacon (L. D. Smith, 1992), Piaget (Rychlak, 1981) and Kohlberg (Kohlberg, Levine, & Hewer, 1983) borrowed from Kant, Rogers borrowed from phenomenology (Spiegelberg, 1972), and so on.

The point of this preliminary discussion is for students, largely through their curiosity and insight, to realize that the assumptions that undergird a theory give rise to the unique perspective it offers on scientific questions. For example, the assumption that only physical matter exists will accommodate certain kinds of theories and rule out others, such as dualistic explanations. For this reason, assumptions are necessarily important to the theory construction and research of psychological scientists. One advantage of examining assumptions, then, is that this procedure clarifies ideas by situating them in their broader historical and philosophical context and allows for an awareness of the intellectual foundation, purpose, and limitations of various theoretical approaches. Indeed, in the spirit of critical thinking, it is difficult to see how a theory could be fully examined without understanding this context.

After students understand the nature of assumptions, the instructor can begin a discussion of practical implications, demonstrating that they are not merely academic, but rather can have significant influence in the lives of people in a variety of real-world settings. Instructors can foster this discussion in several ways. First, the instructor could show that the students' responses to the scenarios and cases previously discussed actually are the implications of their assumptions. For example, one implication of a deterministic outlook on a friend's rude behavior would be that the friend should not be blamed because he could not have behaved differently. Second, the instructor could ask students to consider one of their assumptions and how it influences their behavior. For instance, one student might ignore elections and fail to vote because she assumes that voting will not make any difference. Another might be willing to experiment with various drugs because he assumes that he does not have an "addictive personality." In the class discussion that follows, students could share their experiences and come to see the inescapability of implications. Third, students could consider examples from psychology that demonstrate the implications of theoretical assumptions—for example, that the deterministic assumptions of radical behaviorism have implications for society (Skinner, 1971; Slife, Yanchar, & Williams, 1999), or that the constructivist assumptions of Piaget have implications for education (e.g., Slavin, 2003).

At this point, a challenge may come from some students who bring fairly rigid assumptions into the class and who are less than willing to think critically about them; that is, some students may consider their assumptions to be reality. Indeed, this is why critical thinking at this level should be stressed and alternative assumptions examined—because students will often come into a class with unexamined presuppositions that are, in fact, theoretical positions with implications.

For instance, some students may be sensitive to the free will–determinism issue and implicitly assume that humans possess a free will that affords them the possibility to have done otherwise in a particular situation, all other things being equal (Slife & Fisher, 2000). Although this position is venerable and easily assumed, it can also be critically questioned. For example, an instructor might pose the question of how free will is possible when everything else in the universe seems to be determined by natural laws and when the very idea of determinism seems inextricably linked to science (e.g., Heiman, 1998). At the same time, however, it would also be the instructor's responsibility to be thorough and ask students to think critically about determinism. For example, an instructor might ask students how human behavior could be meaningful and moral in a universe determined solely by natural laws (e.g., James, 1897/1956). This question-and-answer dialectic can introduce students to arguments and assumptions they had not previously considered. Some students may revise their assumptions based on such a discussion, whereas others may not; in all cases, however, their assumptions can become explicit and appropriately challenged.

Formulating Critical Thinking Questions

After students have recognized the importance of assumptions, the instructor could challenge them to construct a set of generic critical thinking questions that will enable them to identify theoretical assumptions in course content—what we refer to as *assumption questions.* By answering these questions when studying each theory, students will have identified the underlying assumptions of each. The instructor could also challenge students to develop several questions that help identify the implications of those assumptions—what we refer to as *implication questions.*

As students develop assumption questions, they could focus on the kinds of theoretical assumptions that are most meaningful to them. For example, students might be particularly interested in the free will–determinism issue and formulate an assumption question such as: "According to ____'s theory, is human behavior determined by natural laws or do humans exercise some amount of free will?" Students need not have formal training in theory and philosophy to generate these questions; students must simply identify the fundamental issues that interest them, perhaps with assistance from the instructor, who can suggest some possibilities. Experience in other courses from many disciplines, including psychology, should give students suitable background on which to draw at this preliminary stage. In our experience, students are most interested in assumptions pertaining to human freedom (e.g., free will vs. determinism), developmental processes (e.g., nature vs. nurture), the nature of mind and knowledge (e.g., empiricism vs. rationalism), the nature of what fundamentally exists (e.g., materialism vs. mind–body split), and the nature of human conduct (e.g., basically good vs. basically evil).

Although the assumptions that students suggest will vary from course to course, a fairly standard and thorough organizational scheme would include assumptions falling into four classic philosophical categories—the nature of reality, knowledge, context, and morality. In a personality class that used this organizational scheme, for instance, these four kinds of assumptions could be targeted via the assumption questions as they manifest in specific personality theories. To continue this example, the following descriptions clarify these four kinds of assumptions.

Assumptions about *reality* provide theories with a particular view of the universe and human existence within it (for more on reality assumptions, see O'Donohue, 1989; Rakover, 1990; Slife & Williams, 1995; Valentine, 1992; Viney & King, 2003). They pertain to basic issues such as causation, universal laws or principles, and the processes or entities that are assumed to actually exist. Some example questions used to examine reality assumptions include: What is real according to this theory? Do minds exist, or is reality composed of nothing but physical matter? What causes operate in the universe? Is human behavior determined, or do humans possess free will?

Assumptions about *knowledge* provide theories with a particular view on the nature and limitations of knowledge, including issues such as intelligence, learning, and the structure and development of cognitive processes or behavior (for more on knowledge assumptions, see Rakover, 1990;

Robinson, 1986; Rychlak, 1981; Slife & Williams, 1995; Valentine, 1992). Some example questions used to examine knowledge assumptions include: Does the mind actively create knowledge or passively receive it? How does the mind develop? What is intelligence, and what are the roles of nature and nurture in determining it?

Assumptions about *context* provide theories with a particular view on the importance of the sociocultural context that surrounds psychological phenomena (for more on sociocultural context, see Gergen, Gulerce, Lock, & Misra, 1996; Kenrick & Funder, 1988; Triandis, 1994). Assumptions about context deal with issues such as individualism versus collectivism, the consistency of human behavior across situations, the universality of psychological constructs, and sociocultural factors that may affect psychological variables. Some example questions used to examine context assumptions include: Are personal characteristics (e.g., personality, motivation, self-esteem) affected by social context, or are they natively determined? Are cognitive processes relative to a culture or are they universal? Should people be viewed from an individualistic or collectivist perspective?

Assumptions about *morality* provide theories with a particular view on the highest good in humankind (for more on morality and ethics, see Robinson, 2002; Timmons, 2002; Wallach & Wallach, 1983). Morality may be construed broadly to cover various related topics such as moral development, ethics, and axiology (systems of values). Some example questions used to examine ethical assumptions include: What is the origin of morality? What counts as moral behavior? What is the highest good attainable by human beings? Is altruism possible?

After students have agreed on the types of assumptions they will search for—such as reality, knowledge, context, and morality—they should be able to formulate at least one assumption question per category. Because students can become overwhelmed when searching for a large number of assumptions, however, we recommend covering no more than three or four categories (i.e., kinds of assumptions) in a single course and formulating only one assumption question per category. Continuing the example of a personality class, and using the four categories already introduced, the assumption questions might respectively be: "According to ____'s theory: (a) Is human behavior determined or do humans exercise some amount of free will? (b) Does the mind actively create knowledge or passively receive it? (c) Is personality affected by context and environment? (d) Are human beings basically selfish or do they have the capacity for altruism (even if it is not always expressed)?"

Having formed the assumption questions, the students should then suggest some implication questions. For a personality class, such questions might include the following: If a given assumption were true, what would it suggest about personal responsibility? What would it suggest about therapy and change? What would it suggest about educational practices? Again, it is our experience that students should formulate no more than three or four implication questions. We have found that students are generally interested in the implications that theories hold for family relations, education, therapy, and the legal system (that generally assumes personal responsibility).

Examining Assumptions

After students have determined assumption and implication questions, they should be prepared to identify the assumptions of theories covered in ensuing class periods. It is possible to couch an entire course within the approach we describe, so that the instructor could first introduce a theory and then help the students examine its assumptions. For example, in a personality class, the instructor might cover various theoretical perspectives by having students analyze each one in light of the four assumption questions already established. Because students would ask the same questions about each theory, they would be able to identify, compare, and contrast the assumptions of these theories in a systematic way. Table 1 suggests a possible organization for this comparison and contrast that can help students become aware of how theories differ at this fundamental level.

To clarify the process of identifying assumptions, consider a brief example of how students might analyze four theoretical perspectives on personality: psychoanalysis, behaviorism, humanism, and a cognitive approach such as Kelly's (1955) personal constructs theory. Although varied interpretations of these theories exist in the literature (e.g., Rychlak, 1981; Slife, 1993; Wallach & Wallach, 1983), we present commonly accepted interpretations (e.g., Maddi, 1996; Ryckman, 2000) that students are likely to suggest. Regarding the free will–determinism issue, students might conclude that psychoanalysis and behaviorism are based on the assumption of determinism, whereas humanism and personal construct theory are based on the assumption of free will. Regarding the active–passive mind issue, students might conclude that behaviorism is based on the assumption of a passive mind, whereas the other three perspectives are based on the assumption of an active mind. Regarding context's influence on personality, students might conclude that all four perspectives acknowledge the importance of context in one way or another (students could also discuss the details). Regarding the selfishness–altruism issue, students might conclude that behaviorism and psychoanalysis are based on the assumption of fundamental selfishness, whereas humanism and personal construct theory are based on that assumption that altruism is possible, even though it is not always expressed (for more on hedonistic and altruistic assumptions, see Slife, 2000; Wallach & Wallach, 1983).

Students may not agree on the answers to these assumption questions, which provides an opportunity for class discussion and debate. Through the process of identifying assumptions, students will come to realize what most researchers and theorists already know—usually there are no univocal answers to complex theoretical and scientific questions. At the same time, students should be able to defend whatever interpretation they arrive at with support from textbooks, the primary literature, or argumentation.

Examining Implications

After students have identified the assumptions of a theory or a set of theories—perhaps through writing assignments, group work, and class discussion—students should be in a position to examine their implications. In the example personality class, students can ask the implication questions they have already established. Answers to these questions—again provided by the students and the instructor through discussion and other pedagogical strategies—can help fill in the "implications" rows of Table 1. Through this process, students can think critically about the assumptions of psychology; they can identify the often hidden or unexamined assumptions of theories, discern their practical implications, and engage in comparison and contrast, all of which can provide students with a deeper understanding of the theories being studied. Moreover, this analysis places students in a position to ponder the practical consequences of ideas that may have seemed academic at one time (discussed more in the next section).

As an example of discerning implications in a personality class, consider the assumption of determinism that, in one form or another, underlies the major behaviorist theories (e.g., Slife et al., 1999). After students have been able to identify the determinism inherent in this approach, the instructor can ask them to consider some of the consequences of this underlying assumption, which Sdorow (1998) described:

> If carried out to its logical extreme, the assumption of strict determinism would lead then to unpalatable conclusions—for example, that Mother Teresa does not deserve praise for her work among the poor and that Adolf Hitler did not deserve blame for his acts of genocide, because neither was free to choose otherwise. This also means that strict determinism is incompatible with the legal system, which assumes the existence of free will in order to hold criminals responsible for their actions. (p. 34)

Because these implications are provocative and contradict certain understandings of human activity (e.g., that of the legal system), they can provide rich subject matter for class consideration. Through reflection, class discussion, and de-

Table 1.   Example Comparison Chart for Theoretical Assumptions and Implications

Theory	Assumption: Determinism or Free Will?	Assumption: Active or Passive Mind?	Assumption: Affected or Unaffected by the Environment?	Assumption: Selfish or Altruistic?	Implications for Personal Responsibility	Implications for Therapy and Change	Implications for Education

bate, students can see that implications are inevitable and that a more complete approach to critical thinking requires that assumptions and implications be examined for their plausibility and practical utility.

Forming a Defensible Position

After students have identified the assumptions and implications of the theories being studied, they should be able to engage in some form of evaluation, such as determining which assumptions lead in desired directions and which foreclose on heuristic understandings of human health, functioning, and development. This process could occur periodically as the instructor introduces new theories (with possibly new assumptions) or once at the end of the course. In either case, it is important for students to understand that their position must be defensible, by virtue of careful analysis, argumentation, and perhaps an appeal to the literature.

An example assignment that asked students to develop their own position could address one or more theories. For example, an assignment in a personality class could focus on behaviorist and humanist personality theories and ask students to (a) contrast the assumptions of behaviorism and humanism, (b) contrast the implications of those assumptions, (c) explain which position they favor and why, and (d) anticipate how the position they favor (including its implications) could be criticized and suggest how they would respond to this criticism.

Although many theories are multifaceted and may accommodate several answers to the same question—which is to be expected because typically there are no simple, unanimous answers to theoretical or scientific questions—students should still be capable of answering them in a reasonable way and forming rational positions of their own. Extra readings, class discussions, homework exercises, debates, class presentations, and term papers can all help students think through the various positions on a given topic and formulate a defensible stance.

Conclusions

Instructors can integrate this critical thinking approach—which emphasizes the analysis, application, and evaluation of information, rather than mere memorization—into broader critical thinking frameworks or use it in conjunction with other critical thinking techniques. For instance, the model proposed by Halonen (1995) includes "identifying assumptions" (p. 79) as a critical thinking skill and seems generally consistent with our recommendation that theoretical assumptions in particular be addressed. However, Halonen did not clarify the process of examining theoretical assumptions. Moreover, empirical studies by King (for a brief review, see King, 1995) suggested that critical thinking ability can be enhanced by teaching students to ask thought-provoking questions, such as, "What are the implications of … ?" and "What is a counterargument for … ?" (King, 1995, p. 14). King did not specifically include questions about theoretical assumptions in her proposal, but they

would seem to fit with her general model of critical inquiry and research findings.

In any event, exposure to this aspect of critical thinking teaches students to think rigorously and deeply about ideas in general and has wide applicability to fields beyond psychology, including related social sciences and education. Although a number of course objectives and activities compete for class time in a normal semester, the rationale for the investigation of theoretical ideas—that they fundamentally inform psychological theory and applications—makes them worthy of classroom attention.

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Note