

To: Dr. Jerry Casway
From: Jim Bell (writer) for the Psychology Department
Re: *Assessing Critical Thinking In General Psychology at Howard Community College: An Outcomes Assessment Project (1995-1999)*
Date: May 18, 2000

We have completed Phase III of the Outcomes Assessment Process. This report is an update and expansion of our July 1997 Report: *Focus On Critical Thinking*. Resources on Outcomes Assessment have increased in the past two years while the resources on critical thinking have dramatically increased. Only a few of these new books and articles will be listed since they do not change the focus on this project. Some of the major sources on the Internet will also be listed.

Overview

One of the major goals of a college education is to improve the thinking of students. Critical thinking is one of the major types of thinking useful in college and after college. To be able to teach critical thinking we had to become clear on what critical thinking is, how psychologists define critical thinking, how critical thinking can be taught, and how critical thinking can be assessed. We chose a challenging topic and have learned from the challenge. This report details our thinking and the results of our outcomes assessment.

Introduction

“Although critical thinking has often been urged as a goal of education throughout most of this century. . . , not a great deal has been done about it. Since the early 1980s, however, attention to critical thinking instruction has increased significantly -- with some spillover to critical thinking assessment, an area that has been neglected even more than critical thinking instruction.” (Ennis, R. 1993, Summer. Critical thinking assessment. *Theory Into Practice*, 32(3), 179-186)

The faculty teaching General Psychology at Howard Community College believe that teaching students to critically think is one of the most important goals for General Psychology. Our approach in psychology is built in part on the report of a conference of psychology professors who were sponsored by the American Psychological Association. The report edited by McGovern is entitled: *Handbook for Enhancing Undergraduate Education in Psychology* (1993) which was designed for use by psychology departments in planning curriculum.

How do we want our students to change as a result of their education? We identified three ways in which successful psychology students change as a result of their undergraduate education. First, they accumulate a body of knowledge. Second, they master intellectual skills that enable them to use their knowledge wisely. These skills include the ability to think critically, to express themselves clearly in writing and speaking, to reason empirically, and to demonstrate ethical judgment and sensitivity to other people and cultures.

Teaching students to critically think is very challenging according to both the research evidence and our teaching experiences. To help us better teach critical thinking, it was decided to do an outcomes assessment on critical thinking. This is our report on assessing critical thinking.

This Report is divided into five sections:

- I. **An Overview of the Outcomes Assessment Project for PSYC-101 on Critical Thinking**
- II. **What is critical thinking?** This section is based on a review of the critical thinking literature and a review of general psychology textbooks and psychology books on critical thinking.
- III. **What we did.**
- IV. **Results of the Outcomes Assessment in PSYC-101, Conclusions, and Recommendations .**
- V. **Appendixes:** The Critical Thinking Test, The Answers for the Test, Sources, Report of the Expert on Outcomes Assessment. A copy of the test is available from Jim Bell.

I. An Overview of the Outcomes Assessment Project for PSYC-101 on Critical Thinking

A. Step 1: Determining the goals for PSYC-101 (General Psychology).

The goals for PSYC-101 were developed in the 1970s and have been reviewed regularly. These goals are based on major reports on the psychology curriculum, higher education books, articles on the issues of teaching psychology, and conversations with other college teachers.

Our goals have been influenced by the major reports in psychology on the psychology curriculum. Periodically groups of psychologists have considered the psychology curriculum and made reports with recommendations. After a review of the psychology curriculum Wolfe, Buxton, Cofer, Gustard, MacLeod and McKeachie published in 1952 the first report entitled *Improving Undergraduate Instruction in Psychology*. In 1961 McKeachie and Milholland edited *Undergraduate Curricula in Psychology*. In 1973 Kulik, Brown, Vestewig, and Wright reported on several surveys of the psychology curriculum in *Undergraduate Education in Psychology*. The most recent review of the psychology curriculum is *Handbook for Enhancing Undergraduate Education in Psychology* that was edited by McGovern (1992).

The yearly bibliography of sources in teaching psychology published in the December issue of *Teaching of Psychology* has been reviewed for relevant articles. A listing of resources for psychology teachers was put together by Jim Bell and distributed at the recent update psychology conference at Prince Georges Community College and is entitled *A Guide To Teaching Psychology* (1997).

Because most students taking General Psychology will not major in psychology or even take more psychology courses, it has been important to review higher education books for updating of societal needs and concerns relevant to General Psychology. Here are some of the most useful books reviewed: Angelo and Cross (1993) *Classroom Assessment Techniques*; Bean (1996) *Engaging Ideas: The Professor's Guide To Integrating Writing, Critical Thinking, and Active Learning in the Classroom*; Chickering and Gamson (1991) *Applying the Seven Principles for Good Practice in Undergraduate Education*; Grasha (1995) *Teaching With Style*; Halpern (1994) *Changing College Classrooms*; McKeachie (1999) *Teaching Tips*; Menges, Weimer and Associates (1995) *Teaching On Solid Ground*; Rogers (1983) *Freedom To Learn in the 1980s*; and Skinner (1968) *The Technology of Teaching*.

In addition, course goals have been influenced by the faculty development workshops at HCC, discussions surrounding accreditation reports and recommendations, periodic reports on general education at HCC, discussions with HCC faculty and administrators, outcomes assessment reports (moving to smaller classes and increasing the emphasis on writing), discussions with faculty at other community colleges, and discussions with administrators and faculty at the four year colleges in Maryland where our students transfer.

We have also attempted to use the results of educational research in our setting of course goals and the methods we use to help students learn. The fields of educational psychology, behavioristic psychology, cognitive psychology, learning, memory, social psychology, and humanistic psychology have been reviewed for ideas to help in our teaching.

An in-depth review of course goals and concepts occurred seven years ago when more HCC staff started teaching PSYC-101. We decided then that PSYC-101 students should be able to take a secondary source in psychology and critically evaluate it. Since 1990, there has been an increased emphasis on critical thinking in nationally published materials for use when teaching PSYC-101.

During the past two years the literature of psychology has further supported the approach that we have followed. For example, the journal *Teaching of Psychology* has four articles on critical thinking in the last issues of 1998. Griggs, Jackson, Marek, and Christopher in one of these articles entitled "Critical thinking in introductory psychology texts and supplements" (pp. 254-266) describe and then replicated my 1997 study and found similar results. They go on

to say: “If a teacher intends to supplement textbook material with an emphasis on the general skills of evaluating arguments, there are two workbooks and an auditory tape from which to choose. Of the three, the Bell workbook is directed more specifically at evaluating articles written in scientific format.” (p. 264) In a second article entitled “Supplementary books on critical thinking” Marek, Jackson, Griggs, and Christopher (pp. 266-269) reviewed the same books that were analyzed in the earlier 1997 report by our team.

Step 2: Being clear on the purposes of assessment.

What are our purposes in assessing critical thinking skills in PSYC-101?

(1) The major purpose is to improve our teaching of critical thinking. Although critical thinking has been an important part of PSYC-101 for many years, the primary result of the outcomes assessments is for us to use to improve our teaching. (2) Another purpose is to help us determine what critical thinking skills our students enter General Psychology with so we can build on what they bring to the course. (3) Another purpose is to help us during the teaching of critical thinking to provide more useful feedback to students. (4) Another purpose is to provide the college with evidence about how well our students are learning to critically think in PSYC-101.

Step 3: Deciding how to best assess critical thinking.

We believe that a performance assessment where students can use their resources to evaluate a brief article, not previously seen on a psychological topic, is the best approach. Currently, there are no national tests of critical thinking for psychology courses (See Ennis, 1995; McTighe’s 1996 consultant’s report in the Appendix). In everyday life, students have to decide what to believe and need to be able to use a variety of resources available to them. Testing recall of information about critical thinking is less important than being able to have students apply their knowledge of critical thinking to information they encounter. Application of thinking skills is a very important outcome of college, but research suggests it is difficult to accomplish (See Halpern, 1996, pp. 8-10).

Robert Ennis has developed more critical thinking tests than any other person. Our test has a format similar to his Ennis-Weir essay test (1985). He reviewed what we had done and make several suggestions during the summer of 1999. We thought his ideas of giving partial credit and changing the scoring system were useful and made those changes.

All sections of PSYC-101 used Bell’s (1995) *Evaluating Psychological Information* (2nd edition) for the 1997 report. Based on extensive discussions with our faculty and ideas from other psychology faculty, a third edition was produced (1999). Currently, few of the other psychology supplements have moved to a third edition. The 1995 instructor’s manual had a sample outcomes assessment tool. We modified that assessment tool to make it more consistent

with what is taught at HCC. An answer key was developed by the PSYC-101 faculty for use across all tests. When the answer key was used with two readers, the scores were similar. Two readers evaluated all tests near the cut off to insure reliability for determining who passed and who did not pass.

Each semester our team reviewed the test soon after scoring the tests at the end of the semester. Changes were made to improve the test each semester. Giving partial credit, improving items, and providing credit for each item correct were the major changes in the test itself.

Step 4: Reporting our findings.

Helping students develop their thinking skills is one of the most important goals of college. In May 1996, December 1996, and May 1997 the PSYC-101 faculty assessed the critical thinking abilities of our students. Our written results are included here. We have also included recommendations for the future.

II. The Importance of Critical Thinking During College

A. Major Goal of a College Education - Learning to Learn

The fundamental goal of college is to help students learn how to learn. Increasingly there is too much information for learners to mainly focus on learning and recalling that information. In *Teaching Introductory Psychology* (1997) which is edited by Sternberg and written by ten introductory psychology textbook authors, several of the authors specifically mention that recall of isolated definitions and facts will be quickly forgotten and that emphasis should be on ideas, issues, applications, and critical thinking skills. Computers are increasingly putting information at our fingertips. Learning for many adults has become a life long challenge. "It is strange that we expect students to learn yet seldom teach them about learning. We expect students to solve problems yet seldom teach them about problem solving. And, similarly, we sometimes require students to remember a considerable body of material yet seldom teach them the art of memory." (Norman, D., 1980, *Teaching Learning Strategies*, San Diego, CA: University of California.)

B. One of the Major Goals of a College Education - Critical Thinking

Critical thinking is an important component of learning to learn and a major goal of a college education. "A college catalog that failed to praise critical thinking or to pledge that graduates will think more critically when they leave than when they arrive would be an anomaly." (Brown, M. 1986, Preconditions for encouraging critical thinking on the campus. *International Journal of Social*

Education, 3, 18-27.) “We insist that the most essential goal of the undergraduate experience is to help all students think critically and become proficient in the written and the spoken word.” (Boyer, E. 1989, Keynote address delivered at the 2nd National Conference on the Training and Employment of Teaching Assistants entitled *Preparing the Professoriate of Tomorrow for Teaching: Enhancing the TA Experience*. University of Washington, Seattle, November 16, 1989). “. . . it is not surprising that many colleges in the United States and other places throughout the world now require all students to take a course in critical thinking as part of their general education program. There is virtually no disagreement over the need to help college students improve how they think.” (Halpern, D., 1998, Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. *American Psychologist*, 53, 449-455).

“A major objective of social studies education is the development of critical thinking. Critical thinking is essential in refining and interpreting the vast scope of the social studies content base.” (Firth, G., 1983, May. A major objective of social studies. *The Clearing House*, 408-410)

“Almost all college and university teachers advocate critical thinking as a fundamental goal of education . . . However, evidence is sparse that many teachers are successfully implementing critical thinking in their classrooms or that large numbers of students are developing critical thinking skills. In fact, the literature suggests that most classrooms are greatly lacking in critical thinking activity (Ellner and Barnes, 1983, Perkins, 1985).”

“While America’s colleges and universities have as a primary part of their mission the transmission of subject matter knowledge in a variety of areas and the development of certain academic skills (typically verbal and quantitative), there appears to be widespread agreement that students’ critical thinking ability is among the most important cognitive skills for college students to develop. Nowhere are the centrality and important of developing students’ critical thinking skills more apparent than in Goal 5.5 of the National Education Goals, agreed to in 1989 by President George Bush and the nation’s governors at the Charlottesville, VA Education Summit. Those goals have since been made a matter of statutory law by the Clinton administration in the form of “Goals 2000: The Educate America Act.’ Specifically, Goal 5.5 states that “The proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially’ (*National Education Goals Panel*, 1991, p. 5). (Keeley, S., Shemberg, K., Cowell, B., & Zinnbauer, 1995, Fall???)

Critical thinking has been defined and measured in a variety of ways, but Pascarella and Terenzini (1991) have noted that it “typically involves the individual’s ability to do some or all of the following: identify central issues, make correct inferences from data, deduce conclusions from the information or data provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority’ (p. 118).

“However defined, critical thinking ability is probably also the most extensively studied of the higher-order thinking abilities.” (Terenzini, T., Springer, L., Pascarella, E., & Nora, A. 1994. *The Multiple Influences of College on Students’ Critical Thinking Skills*. Paper presented at the meeting of the Association for the Study of Higher Education, Tucson, AZ, November 1994)

“Goals, stated on the opening pages of a community college catalog, vary little from one community college to the next . . . Goals of the community college are to assist the student in

- ! Becoming a contributing member of society,
- ! Developing a sense of self-worth
- ! Developing critical thinking skills,
- ! Developing values consistent with those of our democratic society.” (Kellough, R., 1990, *A Resource Guide for Effective Teaching in Postsecondary Education*, NY: University Press of America)

“A major paradigm shift has occurred in higher education around the country. Over the last several decades the focus of education has changed from curriculum content to curricular outcomes, with a major emphasis on helping students learn to think critically.” (Rane-Szostak, D., and Robertson, J. 1996, Jan. Issues in measuring critical thinking. *Journal of Nursing Education*, 35(1), 5).

“Literature within our disciplines and in education in general continues to admonish us to teach our students how to think. As worthy a goal and strongly endorsed as critical thinking is, many of us struggle at the level of implementation-How?” (Teach your students to think. 1991, February. *The Teaching Professor*, 5, 1.

“In talking to teachers about thinking, we have found that one truism seems always to hold, no matter who the audience is, where it is addressed, or when the address is presented: Virtually all teachers believe that they teach for thinking. When we have asked them whether they believe that their students are learning to thinking, however, most of them shrug their shoulders or otherwise convey an indefinite response.” (Sternberg, R., and Martin, M. 1988, Summer. When teaching thinking does not work, what goes wrong? *Teachers College Record*, 89(4), 557)

“It is imperative that citizens of the 20th and 21st centuries think critically, yet recent tests have shown that only 25% of first-year college students have the skills needed for logical thought. The need for critical thinking skills has been identified as a national and international priority.” (Halpern, D. 1996, *Thought and Knowledge*. Mahway, NJ: Lawrence Erlbaum, p. 32)

C. Goals From HCC’s Catalogue 1995-1996

1. Growth in knowledge, attitudes, and skills

“College Mission. The mission of Howard Community College is to offer all residents of its service area equal access to high-quality instruction that results in a growth in knowledge, attitudes and skills necessary to function successfully as a transfer students, in a career and as a citizen.” (p. 2)

2. Accountability

“Howard Community College is committed to the philosophy of educational accountability. In order to determine that students are attaining the knowledge and skills appropriate to various courses and programs, regular and planned assessment activities occur.

“The assessment activities may take diverse forms including standardized assessments, placement tests, faculty-developed evaluations, focus sessions, and surveys. The college believes that such input is vital to its responsibility to maintain quality instruction . . .” (p. 15)

3. The Psychology Curriculum in the Arts and Sciences

Quoted from *Howard Community College's Catalogue 1995-96* (p. 71)

“Curricula -- Transfer Programs

Arts and Sciences - Psychology

ASSOCIATE IN ARTS DEGREE

This curriculum is designed as a guide to students planning to transfer to a four-year institution to complete a bachelor's degree in psychology. There are many diversified fields in psychology including social psychology, developmental psychology, individual differences, counseling, clinical psychology, industrial psychology, experimental psychology, and physiological psychology. This psychology curriculum emphasizes an **understanding** of the major theories, concepts, and facts of psychology. Students are encouraged **to apply** their learning to a better understanding of their own experiences. Students will also develop the **writing and thinking skills** which are necessary for success at four-year institutions. Completion of courses in this transfer curriculum will lead to the award of the associate in arts degree (arts emphasis).” (p. 71, bold added)

4. Course Goals for PSYC-101 Related to Critical Thinking

First two goals of PSYC-101

- a. When given an article on a psychological topic to read, you will be able to summarize the article by describing the central idea and key points, analyze important definitions, and identify psychological evidence (critical evaluative reading).
- b. You will develop the skills involved in learning how to think like a psychologist to be able to notice, understand, analyze, and evaluate psychological information in the mass media (critical evaluative thinking).

Goal: To learn how to use critical thinking skills.

- Step 1 - Identify the source you are evaluating.
- Step 2 - Read to understand the author's central idea and key points by summarizing.
- Step 3 - Analyze the article for key terms noting if clear definitions are given and if propaganda techniques are avoided.
- Step 4 - Identify the research evidence.
- Step 5 - Evaluate the research evidence.
- Step 6 - Evaluate the other evidence and the reasoning within the source. Students are encouraged to decide what to believe after having critically evaluated information.

Goal: To learn how to use critical thinking skills. (1999 changes).

- Step 1 - Identify the source.
- Step 2 - Read to understand.
- Step 3 - Identify the research evidence.
- Step 4 - Evaluate the research evidence.

III: What is critical thinking as used in education?

Currently there is not a consensus on defining critical thinking.

- A. “First, there is no generally agreed-on definition of critical thinking.” (p. 7) (Cooper, J., 1995, February. Cooperative learning and critical thinking. *Teaching of Psychology*, 22, 1, 7-9.)
- B. “To start, we must recognize that there is no simple definition of critical thinking or its components.... Frequently, critical thinking and problem solving are used synonymously, but when I use the term *problem solving*, I am referring to a specific sequential model that involves moving successfully from an initial state to a goal state. (Pellegrino, J., 1995, February. Technology in support of critical thinking. *Teaching of Psychology*, 22, 11-12.)
- C. “The concept of critical thinking is quite broad, and the literature is extremely heterogeneous.” (p. 37). (McBurney, D., 1995, February. The problem method of teaching research methods. *Teaching of Psychology*, 22, 36-38.)
- D. “If there is a single goal on which most educators agree, it is that we seek to teach students skills in critical thinking. . . . psychologists and educators agree much less about exactly how critical thinking should be defined.” (pp. 17-18). (Underwood, M., & Wald, R., 1995, February. Conference-style learning: A method for fostering critical thinking with heart. *Teaching of Psychology*, 22, 17-21.)

- E. The definition of critical thinking which occurs most often focuses on critical thinking as a thinking skill useful when evaluating psychological evidence and reasoning.
 “Critical thinking is deciding what to believe and how to act after a careful evaluation of the evidence and reasoning in a communication.” (Bell, 1995, *Evaluation Psychological Information: Sharpening Your Critical Thinking Skills*, p. 1)
1. This definition was developed by Bell for the 1991 edition of his workbook entitled *Evaluating Psychological Information* after (1) a survey of faculty who teach critical thinking, (2) discussions with writers of critical thinking materials, and (3) a review of the literature on the subject of critical thinking outside of psychology. There were very few discussions by psychologists and none in the textbooks. The resulting 132-page report on critical thinking entitled *A Guide to Critical Thinking for Maryland Social Scientists* (August 1988) was sent to all Maryland colleges and universities and is a part of the ERIC collection of teaching materials.
 2. In 1991, Knight edited *Teaching Critical Thinking in the Social Sciences: An Introduction to Techniques and Resources* which built on and expanded the information included in Bell’s 1988 guide. Knight (1991, p. 21) in her section on definition cites Ennis (1985) *Goals for a Critical Thinking Curriculum* which includes his working definition of critical thinking: “Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do.”
 3. Bell (1995) used Ennis’s definition and then further defined the components of critical thinking using a six-step procedure:
 - Step 1 Identify the source you are evaluating.
 - Step 2 Read to understand the author’s central idea and key points by summarizing.
 - Step 3 Analyze the article for key terms noting if clear definitions are given and if propaganda techniques are avoided.
 - Step 4 Identify the research evidence.
 - Step 5 Evaluate the research evidence.
 - Step 6 Evaluate the other evidence and the reasoning within the source.
- F. Four useful sources which focus on teaching thinking skills conclude the following:
1. Beyer, Barry. (1987). *Practical Strategies for the Teaching of Thinking*. “The term critical thinking is one of the most abused terms in our thinking vocabulary. Generally it means whatever its users stipulate it to mean. In some circles critical thinking is used to mean all thinking operations. . . . Experts in the field of critical thinking have for some years been rather specific about what they mean by the term. Critical thinking, according to

them and as used here, means judging the authenticity, worth, or accuracy of something.” (pp. 32-33)

2. Marzano, Robert et al. (1988). *Dimensions of Thinking: A Framework for Curriculum and Instruction*. Alexandria, VA: ASCD.
“Critical thinking is sometimes defined narrowly (‘assessing the accuracy of statements’) and sometimes more globally. Ennis (1985), who at one time preferred the narrower meaning, now defines critical thinking as “reasonable reflective thinking that is focused on deciding what to believe or do.’ (p. 54). . . . The goal of teaching critical thinking is to develop people who are fair-minded, objective, and committed to clarity and accuracy.” (p. 18)
3. Ruggiero, Vincent. (1988). *Teaching Thinking Across the Curriculum*.
“Creative thinking produces ideas. Critical thinking evaluates those ideas, as well as the ideas we encounter in such activities as reading and listening, testing them for usefulness and/or soundness, and refining them as necessary.” (p. 28)
4. Swartz, Robert, and Perkins, David. (1990). *Teaching Thinking: Issues and Approaches*. Pacific Grove, CA: Midwest Publications.
“We interpret critical thinking to concern the critical examination and evaluation--actual and potential--of beliefs and courses of action. . . . in critical thinking we aim at critical judgment about what to accept as reasonable and/or to do, use standards that themselves are the results of critical reflection in making these judgments:

employ various organized strategies of reasoning and arguments in determining and applying these standards; and

seek and gather reliable information to use as evidence or reasons in supporting these judgments.

The term ‘critical thinking’ is sometimes interpreted in a broader sense than this. Critical thinking has become a banner word for many educators: ‘We need to teach critical thinking in the schools.’ Given its popularity, many educators and scholars prefer to include in critical thinking all good thinking.” (pp. 37-38)

IV: Do psychologists believe critical thinking should be included in the undergraduate psychology curriculum?

The American Psychological Association approved "The Principles for Quality Undergraduate Psychology Programs" in August 1994. "In quality undergraduate programs: 1. The curriculum enables students a. to think scientifically about behavior and mental processes. . . 2. The curriculum is based on clear and rigorous goals. These include. . . d . . . critically evaluating the empirical support for various theories and findings." (APA Education Directorate News, *Trends in Education*, Winter 1995, II, 1, 10-11).

Rathus, in his textbook entitled *Essentials of Psychology* (1994), writes that "Higher education is a broadening experience not only because of exposure to intellectual disciplines and human diversity, but also because it encourages students to learn to think critically. By thinking critically, people can challenge widely accepted but erroneous beliefs, including some of their own most cherished beliefs. Critical thinking helps make us into active, astute judges of other people and their points of view, rather than passive recipients of the latest intellectual fads and tyrannies. . . .

"Psychologists have been working with the Association of American Colleges to establish goals and guidelines for undergraduate education. One psychology task force listed several goals for undergraduate education in psychology (McGovern, 1989). The first was to foster a knowledge base consisting of important psychological theories, research findings, and issues. This goal seems obvious enough. But the second goal was to promote skills in critical thinking and reasoning. These thinking skills involved:

- "Development of skepticism about explanations and conclusions
- The ability to inquire about causes and effects
- Refinement of curiosity about behavior
- Knowledge of research methods
- The ability to critically analyze arguments

"The emphasis on critical thinking reflects the widespread belief that your college education is intended to do more than provide you with a data bank of useful knowledge. It is also meant to supply intellectual tools that allow you to analyze information independently. With these tools, you can continue to educate yourself for the rest of your life." (pp. 26-27) "As noted by the educator Robert M. Hutchins, 'The object of education is to prepare the young to educate themselves throughout their lives.' One of the primary ways of educating yourself is through critical thinking." (p. 29)

Huffman et al. (1994) in their General Psychology textbook *Psychology in Action* point out that "critical thinking has received considerable attention from education specialists and textbook authors. Unfortunately, many texts that advocate critical thinking do little more than exhort students to "think critically.'" "Think critically" is vague. Students need to be taught the key questions to ask of a source to decide what to believe.

A useful handbook for teachers of psychology is McGovern's *Handbook for Enhancing Undergraduate Education in Psychology* (1993) which summarizes the consensus of a conference of psychology teachers:

“How do we want our students to change as a result of their education? We identified three ways in which successful psychology students changes as a result of their undergraduate education. First, they accumulate a body of knowledge. Second, they master intellectual skills that enable them to use their knowledge wisely. These skills include the ability to think critically, to express themselves clearly in writing and speaking, to reason empirically, and to demonstrate ethical judgment and sensitivity to other people and cultures. Third, psychology students acquire or strengthen personal characteristics such as maturity, rigor, tolerance, flexibility, high ethical standards, and a positive attitude toward lifelong learning.” (McGovern, 1993, pp. 27, 29).

“The fundamental goal of education in psychology, from which all the others follow, is to teach students to think as scientists about behavior...

“The first element of scientific thinking that students should master is the empirical criterion of truth. They should learn that the final authority for factual statements in psychology is evidence and not affect; how they feel about a topic has no bearing on its truth. Their understanding of the empirical approach should include a recognition of the distinction between facts and inferences drawn from facts. . . They should understand that naming is not explaining . . . The person who understands these things is an informed consumer and evaluator of the psychological and quasi-psychological information reported in the media and a knowledgeable and independent decision maker on problems that involve behavior.” (McGovern, 1993, pp. 168-169).

In the June 1991 issue of the *American Psychologist* McGovern et al. in their article “Liberal Education, Study in Depth, and the Arts and Sciences Major – Psychology” listed eight goals for the psychology curriculum. The first goal was labeled knowledge base. The second was labeled thinking skills. Here is what they said about thinking skills.

“Advanced work in the discipline requires skills in learning, critical thinking, and reasoning -- skills that come in part from working with quantitative information in statistics or experimental methods courses and from critical thinking of original texts in all courses. Psychology students also need to gain familiarity with qualitative methods and to develop a disciplined curiosity about human behavior and experience. **Even at the introductory level, students should be able to inquire about behavioral antecedents and consequences and to view with amiable skepticism the explanations and conclusions in popular media reports on psychology and other social sciences.** As they advance, psychology students should learn to think critically about themselves, including their difference and their similarities with others; to evaluate their attitudes about people who are different from themselves; and to know how gender, race, ethnicity, culture and class affect all human perspectives and experiences.” (p. 601) [Emphasis in bold added.]

V: Do psychologists assess the outcomes of their psychology majors?

The recent psychological literature has produced a few articles on assessing psychology majors outcomes. This topic was not the focus on this project but I did look to see if General Psychology courses were being assessed.

Here are some of the ways that outcomes could be assessed according to the Department of Psychology at Augusta State University (no author, no date): “course grades, portfolio, senior exit examinations (ETS Major Field Test), exist interviews, self reports, survey of employers, alumni surveys, employment and graduate school success, student evaluation of courses and instruction. . .” Listed below are the sources I have found on assessing departments and psychology majors.

Bickes, M., Whittlesey, V., & Noble, L. (1997). Using senior exit surveys and alumni surveys to assess the quality of an undergraduate psychology degree program. *Psi Chi Journal of Undergraduate Research*, 2, 140-146.

Graham, S. (1998). Developing student outcomes for the psychology major: An assessment-as-learning framework. *Current Directions in Psychological Science*, 7, 165-170.

Lawson, T. (1999). Assessing psychological critical thinking as a learning outcome for psychology majors. *Teaching of Psychology*, 26, 207-209.

Pusateri, T. (1997). No title. Paper on the results of using the ETS Major Field Test in Psychology from 1991-1996. 17 pages.

Whittlesey, V. (1999). *Assessing departmental effectiveness*. Excerpts from a paper presented at the Southeastern Teaching of Psychology Conference in February 1999 at Kennesaw State University. 18 sources are cited.

VI: Do psychologists assess critical thinking in General Psychology courses?

We have not found any books, articles, or Internet sources which indicate that critical thinking is being assessed as a part of outcomes assessment in General Psychology. We have written, called, and e mailed national leaders in psychology education and have not found General Psychology courses which assess critical thinking. Alverno College appears to assess critical thinking in their courses but we have not yet found a report on their General Psychology course.

VII. Do psychology writers agree on what critical thinking is?

1. “First, there is no generally agreed-on definition of critical thinking.” (Cooper, J., 1995, February. Cooperative learning and critical thinking. *Teaching of Psychology*, 22(1), 7-9).
2. “What is *critical thinking*? Despite years of debate, no single definition is widely accepted.” (Angelo, T., 1995, February, Classroom assessment for critical thinking. *Teaching of Psychology*, 22, 6.
3. “The concept of critical thinking is quite broad, and the literature is extremely heterogeneous.” (McBurney, D., 1995, February. The problem method of teaching research methods. *Teaching of Psychology*, 22, 36-38.)
4. “Ask 12 psychology faculty members to define the term critical thinking, and you may receive 12 overlapping but distinct definitions. The abundance of approaches to the meaning of critical thinking is a product of the vast amount of discussion in academic circles on this important issue. No one definition is widely accepted; but, as teachers, we often presume that we know what is meant by critical thinking.” (Halonen, J., 1995, February, Demystifying critical thinking. *Teaching of Psychology* 22, 75)
5. “Why should it be necessary for college teachers, including psychologists, to have to ‘make the case’ for teaching critical thinking? Has not the teaching of critical thinking always been central to our mission as educators? . . . Although such a ready acceptance of teaching critical thinking has a long history among educators, what has changed more recently is the understanding that learning to think critically is not an inevitable outcome of instruction.” (Nummedal, S., and Halpern, D., 1995, February, Introduction: Making the case for ‘Psychologists teach critical thinking’. *Teaching of Psychology*, 22, 4.
6. “To start, we must recognize that there is no simple definition of critical thinking or its components. . . . Frequently, critical thinking and problem solving are used synonymously, but when I use the term *problem solving*, I am referring to a specific sequential model that involves moving successfully from an initial state to a goal state. (Pellegrino, J., 1995, February. Technology in support of critical thinking. *Teaching of Psychology*, 22, 11-12.)
7. “Perhaps the second most frequently asked question about critical thinking (after ‘What is it?’) is ‘How, exactly, do you get students to do it?’ Although there is no magical formula that will answer this question, I concluded, after many years of experimenting with different approaches, that writing is an essential ingredient in critical thinking instruction.”

(Wade, C., 1995, Using writing to develop and assess critical thinking. *Teaching of Psychology*, 22, 24)

VIII. How do introductory psychology authors deal with critical thinking?

Critical thinking as a topic started moving into General Psychology textbooks in the late 1980s. By 1994 11% of a sample of 28 general psychology textbooks listed critical thinking in both the index and the glossary. That percent jumped to 29% by 1996 in a sample of 35 textbooks. Another 37% had critical thinking listed in the index, or defined in the glossary, or was mentioned in the first two chapters. 31% of the textbooks do not seem to mention critical thinking but most of those textbooks do indicate that supplementary booklets on critical thinking or study guides are available. Here are the results of my recent checking. My sample for sections A., B., and C. are 1993 through 1997 are introductory psychology textbooks sent to Howard Community College (N=35).

A. **Critical thinking is not listed in the glossary, or the index, or in the first two chapters of the introductory psychology textbooks. N = 11**

Thirty-one percent of the textbooks do not list critical thinking in either the glossary or index or discuss critical thinking in the first two chapters. However, some of these textbooks indicate that an accompanying book just on critical thinking is available. Others include critical thinking in the study guide to the textbook. Here are the sources which mentioned critical thinking.

Huffman, Karen, et al. (1994). *Psychology in action*.

“Although the ability to think critically has always been important, it is now imperative. . . . Critical thinking has many meanings. . . . Critical thinking. . . is defined as thinking about and evaluating our thoughts, feelings, and behaviors so that we can clarify and improve them. . . . Critical thinking is a process. . . . You can develop your critical thinking skills.” (Prologue) This text presents in two pages the affective components, cognitive components, and behavior components of the critical thinking process. (Prologue)

“Critical thinking has received considerable attention from education specialists and textbooks authors. Unfortunately, many texts that advocate critical thinking do little more than exhort students to ‘think critically’ In every chapter we include an exercise called ‘Critical Thinking in Action.’” (Preface)

Kalat, James (1996). *Introduction to psychology*. Indicates that Smith’s (1995) book on critical thinking is available.

Lahey, Benjamin. (1995). *Psychology*.

“It is important that students not passively absorb new information, but rather critically evaluate and ponder what they are learning.” (p. xxiii) “Like most college courses, the goal of this course is to teach you a great deal of new

information. But, there is a second goal even more important than the first--to teach you to think critically about human beings...Psychology provides an excellent vehicle for teaching critical thinking skills...Psychological research is critical thinking in practice. . . a major goal of this course is to encourage you to improve your own critical thinking skills. . . .

“What is critical thinking?. . . try the following steps: 1. What is the evidence?. . . 2. How good is the evidence?. . . 3. What are the alternative interpretations of the evidence?. . . Critical thinking is not only an academic exercise--it is part of living. The thinking and evaluative skills that you develop in this and other courses will also serve you well as you solve problems and confront the challenges of daily life.” (pp. xxxii-xxxiii)

Weiten, Wayne. (1995). *Psychology*. p. 2

“Another element of psychology’s appeal for me is that it represents a way of thinking. We are all exposed to claims about psychological issues. . . . As a science, psychology demands that researchers ask precise questions about such issues and that they test their ideas through systematic observation. Psychology’s commitment to testing ideas encourages a healthy brand of critical thinking. In the long run, this means that psychology provides a way of building knowledge that is relatively accurate and dependable. . . . The more you learn about psychology as a way of thinking, the better able you will be to evaluate the psychological assertions you encounter in daily life.” (p. 2)

“Psychologists’ commitment to empiricism [the premise that knowledge should be acquired through observation] means that they must learn to think critically about generalizations concerning behavior. . . . Their skeptical attitude means that psychologists are trained to ask ‘Where’s the evidence? How do you know?’ If psychology’s empirical orientation rubs off on you (and I hope it does), you will be asking similar questions by the time you finish this book.” (p. 22)

“. . . familiarity with the logic of the empirical approach should improve your ability to think critically about research. This skepticism is important because you heard about research findings nearly every day.” (p. 37)

The book *Challenging Your Preconceptions* by Smith (1995) on critical thinking is available with the text.

Zimbardo, P., & Gerrig, R. (1996). *Psychology and life*.

“To be a critical thinker is to go beyond the information as given and to delve beneath slick appearances, with the goal of understanding the substance without being seduced solely by style and image. . . . Studying psychology will help you make wiser decisions based on evidence gathered either by you or by others.” (pp 52-53) Eleven ideas are given to help guide students to be critical consumers of psychological information. “Becoming a wise research consumer involves learning how to think critically and knowing how to evaluate claims about what research shows.” (p. 54)

B. Critical thinking is mentioned in either the glossary, index, or the first two chapters. N = 13

Davis, Stephen, & Palladino, J. (1995). *Psychology*.

“Critical thinking is the reasoning we do in order to determine whether a claim is true’ (Gray, 1991, p. 1). We want you to be able to evaluate critically the information you read and hear in the media and elsewhere. . . . How do you know what to believe? How do you separate sense from nonsense?

“The following are some guidelines you can use in evaluating a claim:

1. What is the claim and who is making it?. . . .
2. Is the claim based on scientific observations?. . . .
3. What do statistics reveal?. . . .
4. Could the relation be explained by other factors?” (pp. 8-12, 42)

Feldman, R. (1996). *Understanding psychology*. pp. 274-275.

In a section entitled “The Informed Consumer of Psychology: Thinking Critically About Research” the author says: “Because the field of psychology is based on an accumulated body of research, it is crucial to scrutinize the methods, results, and claims of researchers thoroughly. Yet it is not just psychologists who need to know how to critically evaluate research; all of us are constantly exposed to the claims of others. Knowing how to approach research and data can be helpful in areas far beyond the realm of psychology. What are the foundations of the research?. . . . How well was the study conducted?. . . . What are the assumptions that lie behind the presentation of the results of the study. . . . These basic principles can help you assess the validity of research findings that you come across--both within and outside the field of psychology. The more you know how to evaluate research in general, the better you will be able to assess what the field of psychology has to offer.” (pp. 53-54)

Lefton, Lester. (1994). *Psychology*. pp. 32-33, 256. Cites Bell (1991).

“Critical thinking means evaluating evidence, shifting through choices, assessing outcomes, and deciding whether conclusions make sense. When you think critically, you are being evaluative. You are not accepting glib generalizations; instead you are determining the relevancy of facts and looking for biases and imbalances, as well as for objectivity and testable, repeatable results. A critical thinker identifies central issues and is careful not to read cause and effect conclusions from correlations.

“When you think critically about research, you become a detective sorting through facts. You look objectively at the facts, question the hypotheses and conclusions, avoid oversimplifications and consider all of the arguments, objections and counter arguments. You revise your opinions when the data and conclusions call for revisions. . . . A key to thinking critically about research is to be evaluative, to question all aspects of the study.” (pp. 32-33)

Morris, Charles. (1996). *Psychology*. pp. xvi-xvii, 7.

“What exactly is critical thinking? It is the process of examining the information we have and then, based on this inquiry, make judgments and decisions. When we think critically, we define problems, examine evidence,

analyze assumptions--ours as well as those of others--consider alternatives, and ultimately find reasons to support or reject an argument.” (p. 7)

Sdorow, Lester. (1995). *Psychology*. pp. 36-37.

“Skepticism is the basis of critical thinking -- the systematic evaluation of claims.” Three steps are suggested: (1) Is the claim based on empirical evidence? (2) How strong is the evidence that supports the claim? (3) Are there other explanations for the claim?

Westin, Drew. (1996). *Psychology*. pp 56-59.

“Having explored the major research designs, we now turn to the question of how to be an informed consumer of research. . . . To evaluate a study critically, the reader must examine the research carefully and attempt to answer several questions.

1. Does the theoretical framework make sense?
2. Is the sample adequate and appropriate?
3. Were the measures and procedures adequate?
4. Are the data conclusive?
5. Are the broader conclusions warranted?
6. Does the study say anything meaningful?
7. Is the study ethical?” (pp. 56-58, 62)

Wood, S., & Wood, E. (1996). *The world of psychology*. p. 34 Cites Bell (1995).

“And unless you know how to think critically, you may be consuming a great deal of false information and accepting it as factual. How can you shift through all of the information you encounter, pick out the true and useful, discard the false and misleading, and make intelligent decisions? In short, how can you learn to use critical thinking?

“Critical thinkers...share some important characteristics.

They are independent thinkers. . . .

They are willing to suspend judgment

They are willing to modify or abandon prior judgments, including deeply held beliefs. . . .

Critical thinkers consider not only the content of information, but its source as well.” (p. 34)

Zimbardo, Philip, & Weber, Ann. (1994). *Psychology*. pp. 21, 30-31.

“How can you tell the difference between a deceptive claim and a genuine breakthrough? You must become an informed consumer of psychological research. Our society is rich in information, and we are surrounded by claims of truth, false ‘common sense’ myths, and biased conclusions that serve special interests. To be a responsible citizen you must hone your critical thinking skills and assess the believability of claims made about what research shows.” (p. 30)

“You can improve your critical thinking skills by learning how to ask the right questions about behavior and how to evaluate the answers you find.” 12 general rules are given to help students become “a more sophisticated shopper in the supermarket of knowledge.” (pp. 30-31) Here are a few of the guidelines reworded from pp. 30-31.

Be alert to arguments where correlation is assumed to be causation.

Be sure the key terms are defined precisely.

Be cautious when testimonials and case studies are used as evidence because of their lack of control.

Consider alternative ways to explain the results besides the interpretation given.

Be alert to your own biases when interpreting evidence.

When comparisons are made, be sure the comparison is relevant.

Ask experts and authorities for the evidence that supports their informed opinion.

C. Critical thinking is found in both the glossary and index.

In a survey of 18 introductory psychology textbooks published during 1990-1992, there were 2 of 18 (11%) which had critical thinking in both the glossary and index. For 1994-1996 there are 11 of 35 (31%).

Baron, R. (1995). *Psychology*. pp. 2,40-41, G3. Cites Bell (1995).

Critical Thinking – “Careful assessment of available evidence in order to evaluate claims and statements in an objective and well-reasoned manner.”

(p. G3) index - pp. 2, 40-41

“...critical thinking -- the ability to make objective judgments about statements and claims, judgments based on careful reasoning, and close scrutiny of available facts...critical thinking is an essential ingredient in psychology, and learning to think like a psychologist (at least here questions about behavior are concerned) is one of the most important benefits you will gain from this text and from your first course in this field.” (p. 2)

“Practice in Critical Thinking: The Hidden Bonus in Introductory Psychology... Not only will you acquire facts about psychology, you will also learn to think critically about human behavior...Critical thinking...is the ability to cast a skeptical mental eye on claims, assertions, and arguments until they are carefully assessed and objectively examined. In other words, critical thinking means the ability to resist being stampeded, emotionally or otherwise, into accepting statements or arguments that are not actually supported by the facts.” (p. 40)

“But what, specifically, does introductory psychology have to do with development of the capacity for critical thinking? In fact, a great deal. First, such critical thinking is part and parcel of the scientific approach in our field. Time and time again in this text, we’ll consider instances in which common sense suggests a simple answer to an important question about behavior--an answer which is then shown to be false by systematic research. In the absence of science-based critical thinking, the common sense conclusion, false as it is, might well persist. Indeed, the question of its accuracy might never even be raised. Therefore, many

examples of critical, scientific thinking will appear in later chapters.... As you will see, your first course in psychology will provide you with much practice in critical thinking. And this is definitely a skill you will take with you--and use--long after the course, and this book, are just memories of days long past.” (p. 41)

Bernstein, D., et al. (1997). *Psychology*. pp. 26-29, 45, 274.

Each chapter has a section Thinking Critically.

“Critical thinking is the process of assessing claims and making judgments on the basis of well-supported evidence.” (pp. 27) “One strategy for applying critical thinking to this or any other topic is to ask the following five questions.

1. What am I being asked to believe or accept? . . .
2. What evidence is available to support the assertion? . . .
3. Are there alternative ways of interpreting the evidence? . . .
4. What additional evidence would help to evaluate the alternatives? . . .
5. What conclusions are most reasonable?” (p. 28)

“Critical thinking sometimes does seem indecisive because conclusions must be tempered by the evidence available. But critical thinking also opens the way to understanding.: (p. 20)

Coon, D. (1995). *Introduction to psychology*. pp. 27-28, 46-50.

“. . . learning to think critically is one of the last benefits of a college education. Critical thinking is an ability to evaluate, compare, analyze, critique, and synthesize information. Critical thinkers are willing to ask the hard questions, including those that challenge conventional wisdom. . . . The core of critical thinking is a willingness to take an active role in evaluating ideas. It is, in a sense, the ability to stand outside yourself and reflect on the quality of your own thoughts. Critical thinkers are able to evaluate the quality of the evidence supporting their beliefs and to probe for weaknesses in their reasoning. They recognize that knowledge is not just a static collection of facts. True knowledge is built on thinking skills that allow us to continuously revise and enlarge our understanding of the world. Critical thinking is built upon four basic principles...

1. Few truths transcend the need for empirical testing. . . .
2. Evidence varies in quality. . . .
3. Authority or claimed expertise does not automatically make an idea true...
4. Critical thinking requires an open mind.” (pp. 27-28)

“Here are some suggestions for separating high quality information from misleading fiction.

1. Suggestion 1: Be skeptical. . . .
2. Suggestion 2: Consider the source of information. . . .
3. Suggestion 3: Ask yourself if there was a control group. . . .
4. Suggestion 4: Look for errors in distinguishing between correlation and causation.
5. Suggestion 5: Be sure to distinguish between observation and inference.
6. Suggestion 6: Be aware of over-simplifications, especially those motivated by monetary gain. . . .

7. Suggestion 7: Remember, ‘for example’ is no proof.” (pp. 48-50). . . .
“Critical thinking will help you cut through the misinformation.” (p. 54)

Halonen, J., & Santrock, J. (1996). *Psychology*. p. 256 plus other pages

The authors have a section on critical thinking in the chapter on Thinking, which is rare.

The authors use the term “critical thinking” throughout each chapter several times. They use critical thinking to cover effective thinking, critical thinking, problem solving, clear reasoning, and attitudes dealing with effective thinking. “Although today’s definitions of critical thinking vary, they have in common the notion of grasping the deeper meaning of problems, of keeping an open mind about different approaches, and of deciding for oneself what to believe or do. Another, often implicit, assumption is that critical thinking is a very important aspect of everyday reasoning. Critical thinking can and should be used, not just in the classroom but outside it as well.” (p. 256).

From the Preface: “Another important change in the book is the dramatic increase in emphasis on critical thinking.” (p. xix).

Kassin, S. (1995). *Psychology*. pp. 13, 288-289, 291, G-3.

“. . . the process of solving problems and making decisions through a careful evaluation of evidence.” (p. G-3, glossary) “Thinking critically involves maintaining a skeptical attitude, probing underlying assumptions, and considering alternative arguments.” (p. 291)

“The first step is to adopt an attitude of healthy skepticism. Most of us are not in the habit of probing for logical flaws in arguments, especially in the claims we make to ourselves. . . . So, thinking critically requires conscious effort. The next step is to identify the assumptions that are quietly made in an argument and consider whether they should be challenged. . . Next, open your mind, step out of your mental set, and try to imagine and evaluate alternative arguments. . . . Critical thinking is as much an attitude as it is a skill. (p. 289)

Matlin, M. (1995). *Psychology*. pp. 22-23, 661. Cite Bell (1991).

“Thinking that involves deciding what to believe and how to act after carefully evaluating the evidence and reasoning in a situation.”
p. 661 (in the glossary)

“An understanding of research methods can also help you become a more effective critical thinker. When you use critical thinking, you decide what to believe and how to act after you carefully evaluate the evidence and the reasoning in a situation. Several years from now, you probably will not recall much of the specific information in this textbook, but if you have improved your critical thinking, you will still be able to use the basic principles of methodology to help you evaluate psychological claims.” (p. 22)

“An understanding of research methods can also help you apply your critical thinking skills when you read advertisement and summaries of psychological studies, often found in the popular media.” (p. 23)

Myers, D. (1995). *Psychology*. pp. 9-37.

“Thinking that does not blindly accept arguments and conclusions. Rather it examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions.” (p. G-2 in the glossary)

Santrock, J. (1994). *Psychology*.

“The notion of grasping the deeper meaning of problems, of keeping an open mind about different approaches and perspectives, and of deciding for oneself what to believe or do.” (p. GLO-4) index L-17, L-19, M-17--M19, L-14, M-20.

Sternberg, R. (1995). *In search for the human mind*. pp. G-11, 330

“The conscious direction of mental processes toward representing and processing information, usually in order to find thoughtful solutions to problems.” (p. G-11, glossary)

“Critical thinking can be viewed both in terms of analysis and synthesis and in terms of divergent thinking and convergent thinking.” (p. 330)

This textbook “teaches students not only the facts and ideas they need to be psychologists but also how to think critically about these facts. This book’s higher order thinking approach is much broader and far more useful than those of other textbooks.” (Preface, p. vii)

Note: This textbook mentions critical thinking in the chapter on Thinking but does not include the concept in the chapter summary. On p. 330 where critical thinking is mentioned there are no citations to other sources. The definition in this textbook is not like the definition in any other General Psychology textbook that I analyzed.

Tavris, C., & Wade, C. (1995). *Psychology in perspective*. 7-13, 265, 268, 496, A1, A3

“We believe that one of the greatest benefits of studying psychology is that you learn not only how the brain works in general but how to use yours in particular--by thinking critically. Critical thinking is the ability and willingness to assess claims and make objective judgments on the basis of well-supported reasons. It is the ability to look for flaws in arguments and resist claims that have no supporting evidence...to be creative and constructive in explaining events.” (p. 7)

“You can apply critical thinking to any subject you study or problem you encounter. But it is particularly relevant to psychology for three reasons. First, the field itself includes the study of reasoning, problem solving, creativity, and curiosity and so by its very nature fosters critical and creative thinking. Second, psychology also includes the study of barriers to clear thinking, such as the human

propensity for rationalization, self-deception, and biases in perception. Third, the field of psychology generates many competing findings on topics of personal and social relevance--such as the nature of addiction and memory--and people need to be able to evaluate these findings and their implications. Critical thinking can help you separate psychology from the psychobabble that clutters the airwaves and

Wade, C., & Tavris, Carol. (1996). *Psychology*.

Critical thinking – “. . . the ability and willingness to assess claims and make objective judgments on the basis of well-supported reasons. It is the ability to look for flaws in arguments and resist claims that have no supporting evidence. It is the ability to defend a conclusion as reasonable or plausible. . . . It also fosters the ability to be creative and constructive: to come up with various explanations for events, think of implications of research findings, and apply new knowledge to a broad range of social and personal problems.” (p. 28) index - pp. 28-35, 39, 295-299, 537.

IX. What do books which focus primarily on critical thinking in psychology report?

Bell, J. (1999). *Evaluating psychological information: Sharpening your critical thinking skills* (3rd ed.). Boston: Allyn and Bacon.

“Critical thinking is deciding what to believe and how to use information after a careful evaluation of the evidence and reasoning in a communication.” (p. 2). A four-step procedure is used: Identify the source. Read to understand. Identify the research evidence. Evaluate the research evidence. (p. 2).

Coats, E., Feldman, R., & Schwartzberg, S. (1994). *Critical thinking: General principles and case studies*. NY: McGraw-Hill.

“Whether evaluating a scientific research experiment or figuring out what might be wrong with a broken home appliance, critical thinking is an important and common tool of everyday life...What characterizes critical thinking? People who think critically scrutinize the assumptions that underlie their decisions, beliefs, and actions. When presented with a new idea or a persuasive argument, they carefully evaluate it, checking for logical consistency and listening for tacit assumptions that may distort the central point. They pay attention to the context in which ideas or actions are implemented.” (p. 5)

“To learn to think critically, you need to familiarize yourself with four fundamental principles that characterize the process....1) identifying and challenging underlying assumptions; 2) check for factual accuracy and logical consistency; 3) accounting for the importance of context; and 4) imagining and exploring alternatives.” (p. 13)

Halonen, J. (1995). *The critical thinking companion for introductory psychology*. NY: Worth.

Critical thinking “means the special kind of thinking skills that promote conscious, purposeful, and active involvement of the thinker with new ideas.” (p. 1). Six categories of critical thinking are explained: pattern recognition, practical problem solving, creative

problem solving, scientific problem solving, psychological reasoning, and perspective taking. (pp. 2-3).

Halpern, D. (1996). *Thought and knowledge: An introduction to critical thinking*. Mahwah, NJ: Lawrence Erlbaum.

“Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed--the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task.” (p. 5)

McBurney, D. (1996). *How to think like a psychologist: Critical thinking in psychology*. Upper Saddle River, NJ: Prentice Hall.

“Too many books, and too many students, appear to treat science in general, and introductory science courses in particular, as a collection of facts to be mastered for an exam. To be sure, one of the essential tasks of an introductory psychology course is to introduce students to a wide variety of technical terms, research paradigms, and empirical data. But the main goal of a psychology course should be to get students to think like psychologists; to apply the same critical skills to human behavior that scientists do.

“Critical thinking is a very large umbrella for a number of skills and attitudes that educators attempt to instill in their students. Instructors have had these same goals from time immemorial. Recently, however, research in cognitive psychology applied to the learning process...demonstrates two principles that are significant to teaching critical thinking in psychology. (1) Critical thinking is not learned in the abstract, but in the specific subject matters of the various disciplines and (2) the skills needed for critical thinking vary from discipline to discipline.” (pp. vii-viii) “...the book models the process of critical thinking and encourages the student to engage in it.” (p. viii) “The attitude of reflective skepticism is one that is insufficiently encouraged in our educational system.” (p. viii)

“What is critical thinking? As popular as this concept is, there seems to be little agreement about its definition. I believe that critical thinking is primarily an attitude of asking why--why is that so; why did that happen; why should I believe that claim?” (p. 2)

“How does one teach critical thinking? Years ago, educators emphasized general principles of thinking that could be applied to any area of study.... Today, however, there is broad agreement that critical thinking skills are best learned in the context of a particular discipline rather than in the abstract.” (p. 2)

Mayer, R., & Goodchild, F. (1994). *The critical thinker: Thinking and learning strategies for psychology students*. Dubuque, Iowa: W. C. Browne.

“We define critical thinking as an active and systematic attempt to understand and evaluate arguments.” (p. 4)

Smith, R. (1995). *Challenging your preconceptions: Thinking critically about psychology*. Pacific Grove, CA: Brooks/Cole.

Critical thinking is “a logical and rational process of avoiding one’s preconceptions by gathering evidence, contemplating and evaluating alternatives, and coming to a conclusion” (p. 2) Seven guidelines for critical thinking are described: 1. “Critical thinkers are flexible--they can tolerate ambiguity and uncertainty. 2. Critical thinkers identify inherent biases and assumptions. 3. Critical thinkers maintain an air of skepticism. 4. Critical thinkers separate facts from opinions. 5. Critical thinkers don't oversimplify. 6. Critical thinkers use logical inference processes. 7. Critical thinkers examine available evidence before drawing conclusions. (pp. 2-5)

Stanovich, K. (1996). *How to think straight about psychology*. (4th ed.). NY: HarperCollins. “The general public is unsure about what is and is not psychology and is unable to evaluate independently claims about human behavior.... Psychology, probably more than any other science, requires critical thinking skills that enable students to separate the wheat from the chaff that accumulates around all sciences. These are the critical thinking skills that students will need to become independent evaluators of psychological information. Years after students have forgotten the content of an introductory psychology course, they will still use the fundamental principles covered in this book to evaluate psychological claims.” (From the Preface, p. xii)

Tavris, C. (1995). *Psychobabble and biobunk: Using psychology to think critically about issues in the news*. NY: HarperCollins.

“Critical thinking, for us, means the ability and willingness to assess claims and make judgments on the basis of well-supported reasons. . . . The critical thinker identifies reasons to support or reject an argument or belief.” (pp. v, vii)

Wade, C., & Tavris, C. (1993). *Critical & creative thinking: The case of love and war*. NY: HarperCollins.

“Critical thinking is the ability and willingness to assess claims and make objective judgments on the basis of well-supported reasons. It is the ability to look for flaws in arguments and resist claims that have no supporting evidence.” (pp. 4-5)

Zechmeister, E., & Johnson, J. (1992). *Critical thinking: A functional approach*. Pacific Grove, CA: Brooks/Cole.

“Good thinking, or what we will term critical thinking, is, as one observer wryly comments, different from the kind of thinking that most of us habitually do...” (p. 4)

X. What do social psychology textbooks report which mention critical thinking? Very few social psychology textbooks list or mention critical thinking. Here are four that do.

Aronson, E., Wilson, T., & Akert, R. (1994). *Social psychology*.

“There’s been a great hullabaloo about ‘critical thinking’ in higher education over the past few years. What does critical thinking mean to us? We want our students to be active consumers of information, not passive ones; we want our students to go beyond the role of consumers to that of producer. We

want our students to question, challenge, and engage in the material. In short, we want students to think and not memorize mindlessly. . . .

“Critical thinking involves questioning; it involves thinking for yourself. . . . critical thinking doesn't just mean critiquing what one reads. It also refers to a style of thinking that is systematic and analytical.” (pp. xxiv-xxv)

Baron, R., & Byrne, D. (1994). *Social psychology*. Boston: Allyn and Bacon.
“Critical thinking/Essay Questions center on provoking thought rather than just promoting reproduction of information contained in the text. These questions often ask students to apply what they have learned from their readings.” (p. IS-xxix)

Brehm, S., & Kassin, S. (1996). *Social psychology*. Boston: Houghton Mifflin.
“A good teacher uses specific material to develop students' more general skills. Consider, for example, the eight areas that Thomas McGovern and his colleagues (1991) identified as fundamental aspects of an undergraduate education in psychology: . . . thinking skills, information gathering and synthesis skills.”

Taylor, S., Peplau, L., & Sears, D. (1994). *Social psychology*.
“To help students learn to ‘think like social psychologists,’ we have included throughout the text detailed discussions of a few key research studies, describing the research process and the decisions researchers made.” (p. ix)

XI. What do educational psychology textbooks report which mention critical thinking? Some educational psychology textbooks list or mention critical thinking. Here are four that do.

Gage, N., & Berliner, D. (1992). *Educational psychology*. Boston: Houghton Mifflin.
“We believe that small-group teaching is useful in fostering the ability to think critically. It forces students to learn to support their opinions with reasoning based on facts, definitions, concepts, and principles.” (p. 420) Critical thinking is one of the higher order thinking skills. (p. 44).

Kaplan, Paul. (1990). *Educational psychology for tomorrow's teachers*. St. Paul. West.
“Critical thinking. Thinking that involves analyzing and focusing on what to believe or do in a particular situation.” (p. 111)

Slavin, Robert. (1991). *Educational psychology*. Englewood Cliffs, NJ: Prentice Hall.
“One key objective of schooling is enhancing students' abilities to think critically, to make rational decisions about what to do or what to believe. Examples of critical thinking include identifying misleading advertisements, weighing competing evidence, and identifying assumptions or fallacies in arguments.... Perhaps most important, the goal of teaching critical thinking is to create a critical spirit, which encourages students to question what they hear and to examine their own thinking for logical inconsistencies or fallacies...” (p. 191)

Woolfolk, A. (1995). *Educational psychology*. Boston: Allyn and Bacon.

“Critical thinking skills are useful in almost every life situation—even in evaluating the media ads that constantly bombard us. To evaluate the claim that 99 out of 100 dentists prefer a particular brand of toothpaste, you must consider such questions as: Which dentists were polled? How were they chosen? Was the toothpaste company involved in the polling process? If so, how could this bias the results of the poll? . . . Psychologists have not been able to agree on the skills that constitute critical thinking.” (p. 312)

XII: What do books with critical thinking in the title say about critical thinking?

Cederblom, J., & Paulsen, D. (1991). *Critical reasoning*. Belmont, CA: Wadsworth.

“When you read a book or a newspaper or listen to someone speak, or even when you are thinking by yourself, you face a decision about what to believe...Critical reasoning --the subject of this book-- is a collection of procedures that will help you make decision concerning what to believe. . . .

“But in evaluating what appears to be ‘information’ on these subjects and in judging whether this information justifies taking a particular position on the issue, critical reasoning should play a crucial role.” (p. 1)

“Critical Reasoning. In contrast to a mere disagreement, a procedure for understanding and evaluating the support given for a point of view.” (p. 370)

Diestler, S. (1994). *Becoming a critical thinker*. NY: Macmillan.

“We live in what has been called the Age of Information because of the many messages that we receive daily from newspapers, magazines, radio, television, and books.

“. . . in a democratic society, in which the people are asked to vote on candidates and political propositions, we also need to use print and electronic sources to help us make decisions about the direction our community, state, and nation will take.

“We need to know how to understand the evaluate the information that comes our way...A critical thinker is someone who uses careful and objective reasoning to evaluate claims and made decisions.” (pp. 1-2)

Ennis, R. (1996). *Critical thinking*. Upper Saddle River, NJ: Prentice Hall.

“Critical thinking is reasonable reflective thinking that is focused on deciding what to believe or do.” (p. 396) “Critical thinking is a process, the goal of which is to make reasonable decisions about what to believe and what to do.” (p. xvii)

Fisher, A., & Scriven, M. (1997). *Critical thinking: Its definition and assessment*. CA: Edgepress.

“There is a great deal of interest in critical thinking today, but some confusion about what it is and how to assess it.” (p. 1)

“Critical thinking is skilled and active interpretation and evaluation of observations and communication, information and argumentation.” (p. 21)

McWhorter, K. (1988). *Study and thinking skills in college*. Boston:Scott, Foresman.

“Critical thinking is the careful and deliberate evaluation of ideas or information for the purpose of making a judgment about their worth or value.” (p. 97).

“Evaluating statements involves distinguishing fact from opinion, and distinguishing both fact and opinion from informed opinion. Evaluating differing viewpoints on a particular topic is also necessary. Generalizations -- reasoned statements about an entire group or class -- must be carefully evaluated. Hypotheses. . . require critical evaluation as well. For each statement, a critical thinker weighs the level and quality of the supporting evidence that is provided before deciding whether to accept it.” (pp. 110-111)

Moore, B., & Parker, R. (1995). *Critical thinking*. Mountain View, CA: Mayfield.

“Critical thinking is the careful, deliberate determination of whether we should accept, reject, or suspend judgment about a claim -- and of the degree of confidence with which we accept or reject it.” (p. 4)

Ruggiero, Vincent. (1995). *Beyond feelings: A guide to critical thinking* (4th ed.). Mountain View, CA: Mayfield.

“Critical thinking is the process of evaluating ideas. More specifically, it is testing the accuracy of statements and the soundness of the reasoning that leads to conclusions. Critical thinking helps us interpret complex ideas, appraise the evidence offered in support of arguments, and distinguish between reasonableness and unreasonableness. Both problem solving and decision making depend on critical thinking, as does the analysis and discussion of controversial issues.” (p. 16)

Waller, Bruce. (1994). *Critical thinking*. Englewood Cliffs, NJ:Prentice Hall.

“You evaluate arguments and assertions every day: when choosing your breakfast cereal, evaluating reports on the effects of the caffeine in your coffee, reading your morning paper, deciding who to vote for. . . .

“Every day you are bombarded with advertisements, and to find any helpful substance in them you will have to critically winnow out masses of chaff. You are a citizen in a democratic society, and thus it is your responsibility to carefully and rationally evaluate the policies and programs of your local, state, and federal government and to vote intelligently for the candidates you consider most capable. You encounter advertisements, the evening news, news magazines, opinion journals, scientific reports, editorials, textbooks--all making claims

(sometimes contradictory) and sometimes slanting the material presented. Sorting these out, distinguishing fact from speculation, weighing competing theories and interpretations requires the same reasoning skills that are required of an effective and responsible juror.” (pp. 1-2)

XIII. Our Conclusions On Defining Critical Thinking:

- a. Currently, higher education writers use many differing definitions of critical thinking.** The following list covers almost all of the ways that critical thinking has been used in higher education.

critical thinking is:
thinking

clear thinking, effective thinking, good reasoning, good thinking, thinking straight, intelligent thinking, smart thinking, practical reasoning, good judgment, reflective judgment, productive thinking

higher order thinking, higher cognitive skills, higher order thinking skills
complex thinking, complex thinking skills
Bloom’s higher levels of educational objectives

reasoning (reasoning abilities)
problem solving (creative problem solving)
assessing the reasons for making decisions, making informed decisions,

assessing the validity of arguments
critical evaluation, critical analysis, evaluative thinking
dealing with controversy
assessing evidence
assessing the evidence and reasons in a communication

raising questions, raising good questions, asking intelligent questions

informal reasoning, informal logic

critical reading, reading critically, reading beyond the lines

involves only skills (abilities)
involves skills plus dispositions (attitudes, tendencies)
involves knowledge, skills, and dispositions

involves the attitude of skepticism (reflective skepticism)

metacognition (metacognitive thinking - thinking about thinking)

discovering the weaknesses in the ideas, reasoning, and evidence of others
discovering the weaknesses in our own ideas, reasoning, and evidence;
being self critical, self correcting, self assessing, self evaluating

Critical Thinking = critical evaluation, critical reasoning

syn: assess, judge, gauge, appraise, weigh, rank, measure, grade, examine,
inspect, classify, scrutinize

Jobs which require critical thinking - expert, authority, critic, judge, inspector,
editor, reporter, lawyer, doctor, professor, researcher, teacher.

- b. 75% of the introductory psychology textbooks and 75% of the books devoted to critical thinking in psychology agree that evaluating evidence and reasoning is the focus of critical thinking.**

XIV. Sources (References)

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Bloom, B. S., and others. (1956). *Taxonomy of educational objectives: Cognitive domain*. NY: David McKay.

Green, C. (1986). *Guidelines and resources for assessing your sociology program*. Washington, DC: American Sociological Association. LB3051.G73

Halpern, D. (1996). *Thought and knowledge: An introduction to critical thinking*. Mahwah, NJ: Lawrence Erlbaum Associates.

Halpern, D. (1998). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. *American Psychologist*, 53, 449-455.

Knight, C. (Ed.). (1991). *Teaching critical thinking in the social sciences*. VA: Virginia Community College System.

Stiggins, R., Tubel, E., & Quellmalz, E. (1986). *Measuring thinking skills in the classroom*. Washington, DC: National Education Association. LB1590.3.S78

XV. Sources On Outcomes Assessment

American Association of Higher Education Assessment Forum. (1992). *Principles of good practice for assessing student learning*. Washington, DC: Author.

Angelo, T. (1995). Reassessing assessment. *American Association for Higher Education Bulletin*, 47, 10-13.

Angelo, T., & Cross, K. (1993). *Classroom assessment techniques*. San Francisco: Jossey-Bass.

Baker, E., O'Neil, H., & Linn, R. (1993). Policy and validity prospects for performance-based assessment. *American Psychologist*, 48, 1210-1218.

Ball State University. (1992, Fall). *Academic assessment plan*. Muncie, IN: Ball State University.

Banta, T. (Ed.). (1993). *Making a difference*. San Francisco: Jossey-Bass. LA227.4.M35

Burger, D. (Winter 1995). Designing a sustainable standards-based assessment system. *What's noteworthy on learners, learning, schooling* (pp. 38-42). Aurora, CO: Mid-continent Regional Educational Laboratory (McREL).

Costa, A., & Kallick, B. (1995). *Assessment in the learning organization: Shifting the paradigm*. Alexandria, VA: ASCD.

Ennis, R. (1993). Critical thinking assessment. *Theory into Practice*, 32, 179-186.

Erwin, T. (1991). *Assessing student learning and development*. San Francisco: Jossey-Bass. LB2822.75.E78

Ewell, P. (1991). To capture the ineffable: New forms of assessment in higher education. *Review of Research in Education*, 17, 75-125.

Farmer, D. (1988). *Enhancing student learning: Emphasizing essential competencies in academic programs*. Wilkes-Barre, PA: King's College.

Gaither, G. (Ed.). (1995). *Assessing performance in an age of accountability: Case studies*. San Francisco: Jossey-Bass. New Directions For Higher Education, No. 91.

Greenwood, a. (Ed.). (1993). *National assessment of college student learning: Getting started*. National Center for Education Statistics. Washington, DC: U. S. Government Printing Office. [I have a copy of this document.]

Johnson, B. (1996). *The performance assessment handbook: Volume 1*. Princeton, NJ: Eye On Education.

Johnson, B. (1996). *The performance assessment handbook: Volume 2*. Princeton, NJ: Eye On Education

Light, R. (1990). *The Harvard assessment seminars. First Report*. Cambridge, MA: Harvard University Graduate School of Education and Kennedy School of Government.

Light, R. (1992). *The Harvard assessment seminars. Second Report*. Cambridge, MA: Harvard University Graduate School of Education and Kennedy School of Government.

Mayhew, L., Ford, P., & Hubbard, D. (1990). *The quest for quality: The challenge for undergraduate education in the 1990s*. San Francisco: Jossey-Bass. LA227.4.M39

McTighe, J. (1995). *Developing performance assessment tasks: Templates for designers*. Frederick, MD: Maryland Assessment Consortium.

McTighe, J., & Ferrara, S. (1996). *Assessing learning in the classroom*. Washington, DC: National Education Association.

Miller, R. (Ed.). (1988). *Evaluating major components of two-year colleges*. Washington, DC: College and University Personnel Association. LB2328.M544

Palomba, C., & Associates. (1992). *Assessment workbook*. Muncie, IN: Ball State University.

Paul, R., & Nosich, G. (1991). *a model for the national assessment of higher order thinking*. Santa Rosa, CA: The Foundation for Critical Thinking.

Perrone, V. (Ed.). (1991). *Expanding student assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Ratcliff, J., & Associates. (1995). *Realizing the potential: Improving postsecondary teaching, learning, and assessment*. University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment.

Walvoord, B., & McCarthy, L. (1990). *Thinking and writing in college*. Urbana, IL: National Council of Teachers of English. LB2395.35.T47

Weimer, M. (Ed.). (1999, April). National trends in assessment. *The Teaching Professor*, pp. 1, 4.

Whitaker, U. (1989). *Assessing learning: Standards, principles, & procedures*. Philadelphia: Council for Adult and Experiential Learning. LB2331.W5472

White, E. (1993). Assessing higher-order thinking and communication in college graduates through writing. *Journal of General Education*, 42, 105-122.

Wingspread Group on Higher Education. (1993). *An American imperative: Higher expectations for higher education*. USA: The Johnson Foundation.

Note: Sources on Outcomes Assessment are appearing on the Internet.

XVI. Articles on Teaching and Assessing Critical Thinking

Browne, M. Neil. (1986). Preconditions for encouraging critical thinking on the campus. *International Journal of Social Education*, 31, 18-27.

“a college catalog that failed to praise critical thinking or to pledge that graduates will think more critically when they leave than when they entered would be an anomaly.”
(p. 18)

Ask question often.

Ask higher-level questions.

Teach students a variety of ways of looking at things.

Learning goes beyond college.

Fewer errors in the future can be due to more errors now if we learn from them.

There is little evidence that teachers try to teach critical thinking.

Use essay format for testing.

Browne, M., Haas, P., & Keeley, S. (1978, January). Measuring critical thinking skills in college. *The Educational Forum*, 43, 219-226.

Critical thinking skills:

1. “Identifying a controversy and conclusions,
2. Identifying major arguments pertaining to the controversy,
3. Identifying and analyzing implicit premises according to their level of abstraction,
4. Recognizing language difficulties (e.g., ambiguity, vagueness),
5. Evaluating the validity of individual arguments and truth of individual premises,
6. Formulating a conclusion from premises based on number 5,
7. Recognizing alternative inferences that could be drawn from premises supporting the conclusion, and
8. Suggesting a rudimentary technique for verifying these alternative inferences.”

Used Watson-Glaser Test at first, but did not correlate with student performance in the courses. In the test students are to recognize something rather than apply something. Students are given 10 pages of information on a topic that includes both pro and con information. Students are given two days to think about the material. Students then have up to four hours to write their exam using their critical thinking. Two people read each essay. 90% of scores were within one grade level of each other. Tests are scored using an explicit scoring rubric.

Brown, M., & Keeley, S. (1988, Spring). Do college students know how to think critically when they graduate? *Research Serving Teaching*, 1(9), Center for Teaching and Learning of Southeast Missouri State University.

“While the study indicated that most students are able to identify some flaws in statistical reasoning, they generally failed to recognize ambiguities, questionable assumptions, and value preferences, important components of critical evaluation.” (p. 1)

Ennis, R. (1993, Summer). Critical thinking assessment. *Theory Into Practice*, 32(3), 179-186.

“Although critical thinking has often been urged as a goal of education throughout most of this century..., not a great deal has been done about it. Since the early 1980s, however, attention to critical thinking instruction has increased significantly--with some spillover to critical thinking assessment, an area that has been neglected even more than critical thinking instruction.” p. 179

An Annotated List of Critical Thinking Tests - p. 183

“Regrettably, I can find no subject-specific critical thinking tests (that is, critical thinking tests whose primary purpose is to assess critical thinking in a subject matter area...”

p. 182

“In making your own test, it is probably better that it be at least somewhat open ended anyway, since making good multiple-choice tests is difficult and time consuming, and requires a series of revisions, tryouts, and more revisions.” p. 184

Ennis, R. (1996, Fall). Critical thinking dispositions: Their nature and accessibility. *Informal Logic*, 18 (2,3), 129-147.

Gray, P., & Banta, T. (Eds.). (1997, Winter). *The campus-level impact of assessment: Progress, problems, and possibilities*. San Francisco: Jossey-Bass.

Keeley, S., Ali, R., & Gebing, T. (1998). Beyond the sponge model: Encouraging students' questioning skills in abnormal psychology. *Teaching of Psychology*, 25, 270-274.

Keeley, S., & Browne, M. (1986). How college seniors operationalize critical thinking behavior. *College Student Journal*, 20, 389-395.

“We believe that a multiple choice test is not a valid indicator of a person's capacity to actively critically evaluate.” (p. 389) Students were given a 500-word essay and asked to critically evaluate it in two hours. Looks like they were paid per valid point made.

Keeley, S., Browne, M., & Kreutzner, J. (1982). A comparison of freshmen and seniors on general and specific essay tests of critical thinking. *Research in Higher Education*, 17, 139-154.

Kiah, C. (1993, Nov.). *a model for assessing critical thinking skills*. Paper presented at the Annual Student Assessment Conference of the Virginia Assessment Group and the State Council of Higher Education for Virginia. (ERIC Document Reproduction Service No. ED 367 400).

Decided to measure critical thinking by focusing on problem solving. Community college graduates were verbally interviewed. Report is very short with no specifics. No references listed.

Kuhn, L. (1988, Spring). *What reasoning skills are important in graduate school?* Research Serving Teaching, 1(10), 1-2. Center for Teaching and Learning of Southeast Missouri State University.

“Browne and Keeley (1986) provide evidence that critical thinking skills must be explicitly taught, further, they report that many graduating seniors lack important critical reasoning skills. Given the pattern of significant interdisciplinary differences in faculty perceptions reported by Powers and Enright (1987), it would seem especially important that individual faculty members incorporate into their classes those critical thinking activities most central in their discipline.” (p. 2)

Lehman, D., Lempert, R., & Nisbett, R. (1988, June). The effects of graduate training on reasoning: Formal discipline and thinking about everyday-life events. *American Psychologist*, 43(6), 431-442.

“Both psychology and medical training produced large effects on statistical and methodological reasoning, and psychology, medical, and law training produced effects on ability to reason about problems in the logic of the conditional. Chemistry training had no effect on any type of reasoning studied.” (p. 431) “The results are thus quite consistent with the view that reasoning can be taught and that different graduate disciplines teach different kinds of reasoning to different degrees.” (p. 438) “The truth is that we know very little about reasoning and how to teach it.” (p. 441)

Lehman, D., & Nisbett, R. (1990). a longitudinal study of the effects of undergraduate training on reasoning. *Developmental Psychology*, 26(6), 952-960.

“Social science training produced large effects on statistical and methodological reasoning” but little effect on conditional logic. (p. 952)

Matulich, L. (April, 1993). *Critical thinking or cony cozenage*. (Paper presented at a Symposium of the American Society for Engineering Education, Klamath Falls, OR, April 29, 1993). (ERIC Document Reproduction Service No. ED 373 824)

FIPSE Grant allowed faculty across four disciplines to share ideas on teaching critical thinking. Faculty shared course goals, course content, and ideas on teaching critical thinking. They also compiled resources and research on critical thinking. They focused on the problems of defining terms (Older children are bigger than younger children.), the problems of identifying the writer’s purpose, and the problems of unstated assumptions. No references listed.

Powers, D., & Enright, M. (1987). Analytical reasoning skills in graduate study. *Journal of Higher Education*, 58(6), 658-682.

Faculty in six different graduate programs listed and then rated the specific thinking skills of most importance. There were differences among the programs.

Presseisen, B. (1986). *Critical thinking and thinking skills: State of the art definitions and practice in public schools*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA on April 20, 1986.

She reviews the history of critical thinking: 1938 to 1960, 1961 to 1980, and current interests. She reviews the ideas of Glaser, Paul, and Ennis.

Wesp, R., & Montgomery, K. (1998). Developing critical thinking through the study of paranormal phenomena. *Teaching of Psychology*, 25, 275-278.

Wright, B. (1991, September). Discipline-based assessment: The case of sociology. *AAHE Bulletin*, 14-16.

“Mostly, when we talk about assessment, we mean assessment of the major; so far, we’ve done almost no assessment of the sociology or social-science component in general education.” p. 16

XVII. Outcomes Assessment in Psychology: Sources With Ideas

Allegretti, C., & Frederick, J. (1995, February). a model for thinking critically about ethical issues. *Teaching of Psychology*, 22, 46-48.

“Teaching students to think critically is a widely endorsed goal of higher education. Although writers disagree about the definition of critical thinking, many agree that its focus is the analysis and evaluation of claims. . . . Critical thinking has many functions, such as (a) evaluating the arguments of others, (b) evaluating and gaining confidence in one’s own arguments, (c) resolving conflicts, and (d) understanding and coming to a resolution in complex problems. . . . a primary objective in teaching students to think critically is for students to learn to use these skills beyond the classroom. One method to promote the transfer of these skills is to give students practical situations in which they apply the strategies and practice thinking critically.” (p. 46)

Angelo, T. (1995, February). Classroom assessment for critical thinking. *Teaching of Psychology*, 22, 6-7.

“What is critical thinking? Despite years of debate, no single definition is widely accepted.” (p. 6) The evidence suggests that critical thinking does not develop just as a result of maturing. Students do not find learning to think critically easy. “. . . most college faculty agree that critical-thinking skills are notoriously difficult to teach and develop.” p. 6 “There is wide agreement that college students learn more and better when they (a) are actively engaged and personally invested, (b) receive comprehensible and timely feedback, and (c) work cooperatively with peers and teachers.” (p. 6) Critical thinking can be improved by having students discuss the connections between prior and current learnings, explicitly teach the skills, include guided and regular practice, provide feedback, model critical thinking, teach metacognitive thinking, use brief classroom assessment techniques, and help students learn to self assess. (pp. 6-7)

Bensley, D., & Haynes, C. (1995, February). The acquisition of general purpose strategic knowledge for argumentation. *Teaching of Psychology*, 22, 41-45.

“Critical thinking was defined as the evaluation of evidence relevant to a claim so that a reasonable conclusion about the truth of the claim can be made. . . (a) identify the claim used in an argument; (b) evaluate the evidence relevant to the claim, comparing and weighing evidence both for and against the claim; and (c) draw a reasonable conclusion about the truth of the claim.” (p. 42) Students were asked to write an outline for a

persuasive essay, used the 3 steps above on an article on a topic, and wrote persuasive essays. The first two activities were used for research comparisons.

Brewer, C. (1980). *On testing and evaluating*. Paper presented as a Faculty Seminar on Evaluation and Testing, Furman University, April 2, 1980.

“If a teacher can do anything important for the self-education of students (and self-education is the only kind of any consequence), it is to encourage them to go beyond mere facts.” (p. 7)

“. . . you must first decide upon objectives or goals for your course. . . . not all of your goals can be measured by a test. . . . concentrate on some of these goals. . . . if you want to emphasize certain higher-level processes. . . . then questions will be more difficult to write and to evaluate. In any case, it is important always to relate your test items to your objectives for the course.” (p. 7)

“Students can handle small chunks of material better than large chunks. . . . memory is aided by repetition and rehearsal. . . . knowledge of results is essential for learning to proceed. . . . give students as much feedback as possible.” (pp. 9-10)

Carlson, E. (1995, February). Evaluating the credibility of sources: A missing link in the teaching of critical thinking. *Teaching of Psychology*, 22, 39-41.

An area of critical thinking that is often overlooked is judging credibility of the source. Students need to be taught how to determine the credibility of a source. Seven criteria for evaluating the credibility of sources are listed.

Cooper, J. (1995, February). Cooperative learning and critical thinking. *Teaching of Psychology*, 22, 7-9.

“First, there is no generally agreed-on definition of critical thinking.” (p. 7)

Derry, S., Levin, J., & Schauble, L. (1995, February). Stimulating statistical thinking through situated simulations. *Teaching of Psychology*, 22, 51-57.

“We expect students enrolled in our course will improve their ability to comprehend, develop, and critique evidential arguments in general and statistical arguments in particular. They will improve their ability to read and analyze critically news reports of research. They will develop an ability to make effective persuasive presentations that are enhanced by statistical evidence and; graphical presentations of data. They will learn to distinguish between unexamined beliefs and those based on evidence. They will acquire new criteria for judging the quality of evidence and argument observed in presentations and in interactions of social groups.” (p. 56)

Graham, S. (1998). Developing student outcomes for the psychology major: An assessment-as-learning framework. *Current Directions in Psychological Science*, 7, 165-170.

Halpern, D. (1988). Assessing student outcomes for psychology majors. *Teaching of Psychology*, 15, 181-186.

Hirose, S. (1992, September). Critical thinking in community colleges. *ERIC Digest*, ED 348 128.

Critical thinking has become increasingly important in the community colleges. “Critical thinking has been defined as utilizing a number of cognitive processes and attitudes that undergird intelligent action in diverse situations and fields. Critical thinkers are able to discern the thought patterns and beliefs in the works of others, and to reflect upon their own beliefs, decisions, and actions.” (From the Abstract)

Hubbard, R., & Ritchie, K. (1995, February). The human subjects review procedure: An exercise in critical thinking for undergraduate experimental psychology students. *Teaching of Psychology, 22*, 64-65.

“Much critical thinking in psychology focuses on evaluating and analyzing research results used to support arguments made by theorists and researchers (Bell, 1991, Mayer and Goodchild, 1990).” (p. 64)

Jackson, S., & Griggs, R. (1995). Assessing the psychology major: A national survey of undergraduate programs. *Teaching of Psychology, 22*, 241-243.

Keyes, B., & Hogberg, D. (1990). Undergraduate psychology alumni: Gender and cohort differences in course usefulness, post baccalaureate education, and career paths. *Teaching of Psychology, 17*, 101-104.

King, A. (1995, February). Inquiring minds really do want to know: Using questioning to teach critical thinking. *Teaching of Psychology, 22*, 13-17.

“Simply put, good thinkers are good questioners....Good thinkers are always asking What does this mean?, Why is this happening?, What is the evidence for this?, and How can I be sure? Asking questions such as these and using them to understand the world is what characterizes critical thinking.” (p. 13) Without training students will ask questions that are mainly factual. With training students can ask critical thinking questions. Students are given a generic list of questions which are demonstrated by the teacher. Students practice alone, in pairs, and in small groups to generate questions that the students do not currently have answers for. After a lecture they create questions; after homework readings they create questions.

Koteskey, R. (1990, October). Assessing effectiveness of undergraduate instruction in psychology. *Teaching of Psychology, 17*, 195-196.

Comprehensive test of knowledge was given before PSYC-101, at the end, at the end of PY102, and for graduating seniors. “Existing comprehensive tests were prohibitively expensive and inappropriately normed.” (p. 195) Use items from test bank from the publisher of the textbook used for the course, random generated. Faculty do not see test before it is given each semester. 20 chapters are covered and 5 per chapter are randomly selected. Analysis can then be done by chapters. No discussion of the motivation of students taking the test at the start of the course. Students were given points for taking the tests after the pre-test. Looks like 24 students took the exit PSYC-101 exam. 11 took the exit PY102 exam.

Lawrence, G. (1996, January). *Assessment of the psychology program in a small state college*. Paper presented at the meeting of the 18th Annual National Institute on the Teaching of Psychology, St. Petersburg Beach, FL. 2 pages. No list of references.

Psychology majors were assessed just before graduation. There was a comprehensive content multiple choice test and a survey about student attitudes toward the psychology program. Students graded each psychology courses on an A-F scale on 7 criteria:

“(a) course subject was important for my major, (b) the course increased my understanding of psychology, (c) the course should be a required course, (d) the course was important to my future plans, (e) the material I learned helped me in my non-psychology courses, (f) the grade I give to the subject matter, and (g) the grade I give to the course instructor.”

Program Goals:

1. Comprehension of the facts, theories, and issues of the discipline of psychology to understand behavior.
2. Comprehension of research methods, statistical skills to demonstrate critical thinking and reasoning, and analytical skills.
3. Comprehension of the rules of writing in the style described by APA.

Lawson, T. (1999). Assessing psychological critical thinking as a learning outcome for psychology majors. *Teaching of Psychology*, 26, 207-209.

“One need not look far to find indications that critical thinking is an important skill for psychology students. There are numerous books designed to enhance this skill, (e.g., Bell, 1995 . . .). Because it is such an important skill, critical thinking should be evaluated as part of an overall outcomes assessment for psychology majors. . . However, surprisingly little has been published to help psychology faculty accomplish this important task. Although critical thinking tests have been developed for college students in general. . . , these tests do not measure types of critical thinking specific to psychology students. . .

Although there are almost as many definitions of critical thinking as there are authors who have written on the topic, several authors have indicated that the ability to evaluate claims is a central aspect of critical thinking.” (p. 207)

McBurney, D. (1995, February). The problem method of teaching research methods. *Teaching of Psychology*, 22, 36-38.

“The concept of critical thinking is quite broad, and the literature is extremely heterogeneous.” (p. 37)

Students are given a research problem to help them to critically think about research design. A week before class time will be used to discuss the problem all students are given the problem to think about. About 20% do a written evaluation of the problem to turn in. Students can work alone or in pairs. One class period is used to discuss the problem.

McGovern, T., & Carr, K. (1989). Carving out the niche: A review of alumni surveys on undergraduate psychology majors. *Teaching of Psychology*, 16, 52-57.

McKeachie, W., & Solomon, D. (1955?). Retention of general psychology. *The Journal of Educational Psychology*, ?, 110-112.

Students who had taken PSYC-101 were tested at the start of the next course a year later. A 40 item test was used. Items common to the previous PSYC-101 final and the test in the second course showed retention in the 80% range.

Morgan, B. (1997). Using a senior seminar for assessing the major. *Teaching of Psychology*, 24, 156-159.

Norcross, J., Gerrity, D., Hogan, E. (1993). Some outcomes and lessons from a cross-sectional evaluation of psychology undergraduates. *Teaching of Psychology*, 20, 93-96.

Pellegrino, J. (1995, February). Technology in support of critical thinking. *Teaching of Psychology*, 22, 11-12.

“To start, we must recognize that there is no simple definition of critical thinking or its components. . . . Frequently, critical thinking and problem solving are used synonymously, but when I use the term *problem solving*, I am referring to a specific sequential model that involves moving successfully from an initial state to a goal state.

Price, W., Wilmes, R., & Turmel, M. (1994). General education assessment in introductory psychology. *Journal of Excellence in College Teaching*, 5(2), 121-133.

General education competencies were specified and North Country Community College in NY decided to assess individual courses. Using a course-embedded assessment methodology, PSYC-101 assessed psychological knowledge, critical thinking, and writing ability. Students were both pre- and post-tested with an objective test and an essay question. The tests were created by their faculty. 90% of the students were full time. The college GPA was 2.46; the psychology students GPA was 2.55; and the mean psychology grade was 2.15. The multiple choice test was 36 items and the essay was a design a study to test a hypothesis on the effects of TV. Critical thinking was measured by the essay question. “We included the essay question because there has been greater support recently for having students write open-ended responses instead of taking multiple-choice exams.” (p. 125) “. . . standardized tests designed to measure critical thinking may not directly and effectively test for many significant aspects of critical thinking (Ennis, 1993). Also, the effectiveness of general instruments in measuring change in thinking skills within a particular course or over a relatively short period of time (one semester) requires further investigation (Chovan, 1991).” (pp. 128-129)

Pusateri, T. (1997). No title. Paper on the results of using the ETS Major Field Test in Psychology from 1991-1996. 17 pages.

Quereshi, M. (1988). Evaluation of an undergraduate psychology program: Occupational and personal benefits. *Teaching of Psychology*, 15, 119-123.

Reboy, L., & Semb, G. (1991, December). PSI and critical thinking: Compatibility or irreconcilable differences? *Teaching of Psychology*, 18, 212-215.

“PSI has been used successfully in many courses in which students learn complex material and use higher order cognitive skills.” (p. 213) “Transfer studies suggest that PSI students learn general skills that transfer to new situations.” (p. 213)

Sheehan, E. (1993). Assessment in the major: A model psychology program. *College Student Journal*, 27, 256-258.

Sheehan, E. (1994). A multi-method assessment of the psychology major. *Teaching of Psychology*, 21, 74-78.

Smith, P. (1995, February). Assessing writing and statistical competence in probability and statistics. *Teaching of Psychology*, 22, 49-50.

Students are asked to explain in writing their thinking on statistical problem. Is the source a good source? Why or why not? What is the evidence? Is opinion separated from data? Are clear definitions used? Is evidence presented? How much? What is its quality? Students are also taught how to self assess their written work.

Underwood, M., & Wald, R. (1995, February). Conference-style learning: A method for fostering critical thinking with heart. *Teaching of Psychology*, 22, 17-21.

“If there is a single goal on which most educators agree, it is that we seek to teach students skills in critical thinking. . . . psychologists and educators agree much less about exactly how critical thinking should be defined.” (pp. 17-18)

Wade, C. (1995, February). Using writing to develop and assess critical thinking. *Teaching of Psychology*, 22, 24-28.

“. . . writing is an essential ingredient in critical-thinking instruction. . . the ability and willingness to assess claims and make objective judgments on the basis of well-supported reasons. . . . we decided to focus on eight general activities that critical thinkers. . . should be able to perform. These activities ask students to

1. Ask questions and be willing to wonder,
2. Define problems clearly,
3. Examine the evidence,
4. Analyze assumptions and biases,
5. Avoid emotional reasoning,
6. Avoid oversimplification,
7. Consider alternative interpretations, and
8. Tolerate uncertainty. There are other valid and useful ways to divide up the critical thinking pie.” (pp. 24-25)

Six written assignments are required. They are read, receive feedback, but are not graded. Incomplete assignments can be redone so six are completed. After each chapter students are give two or three questions to think and write on. Each student picks the six topics they wish to write on. Each unit has a deadline for that written assignment. Good answers are read to the class.

Whittlesey, V. (1999). *Assessing departmental effectiveness*. Excerpts from a paper presented at the Southeastern Teaching of Psychology Conference in February 1999 at Kennesaw State University. 18 sources are cited.

XVIII. What We Did.

- A. We adopted the recommendation to teach critical thinking in General Psychology (PSYC-101) as put forth in the report edited by McGovern entitled *Handbook for Enhancing Undergraduate Education in Psychology* (1993). The report is published by the American Psychological Association and is designed for use by psychology departments in planning curriculum.
- B. Critical thinking is a major course objective for PSYC-101. *Evaluating Psychological Information* (1999) by Bell (now in its third edition of national publication) is the workbook we use. Faculty lecture on critical thinking, use videos, assign homework, use active learning often in small groups during class, and provide feedback to students.
- C. Near the end of the course we surveyed our students to see if they believed that General Psychology emphasized critical thinking. We used a national instrument called the IDEA system. It is a student assessment of courses and uses national comparisons. We also did a comparison to another social sciences introductory course at HCC.
- D. We surveyed students for their views after using *Evaluating Psychological Information*. How did they view the teaching materials? Ideas collected here were used to improve the teaching of critical thinking.
- E. We surveyed students concerning how much they believed they had learned in their General Psychology course. We used a local end of course student evaluation form which has been in use for psychology courses at Howard Community College for over 20 years.
- F. We developed with an outside expert and use a test of critical thinking (in class, 45 minutes, closed book). Our goal was to have our students understand critical thinking to a level so that they would pass a test of critical thinking with a score of 75% or better. This part of the outcomes assessment of their actual skills was first done during one of the two last weeks of the spring 1996 semester.
- G. We worked on improving student learning of critical thinking and made our final assessment during the Fall 1999 semester.

For test security purposes a copy is not included in this report. A copy can be obtained from Jim Bell -- jbell@howardcc.edu

XIX. Results of the Outcomes Assessment of Critical Thinking in PSYC-101 for Fall 1996 to Fall 1999.

A. Importance of critical thinking as a course objective.

How do our students rate the importance of applying thinking skills? HCC uses the IDEA Survey which is a national survey of student views. Item 23 says the following: "Learning to apply course material to improve rational thinking, problem-solving, and decision making." "...rate the progress you have made in this course compared with that made in other courses you have taken at this college.

Starting in F98 the question was reworded to the following: "Learning to analyze and critically evaluate ideas, arguments, and points of view." Starting in F98, the IDEA Report changed from percentiles to T scores.

In this course my progress

was low -	(lowest 10% of course I have taken here)
was low average -	(next 20% of courses)
was average -	(middle 40%)
was high average	(next 20%)
was high	(highest 10%).

Medians for all PSYC-101 sections

F93 - Median = 4.1
F94 - Median = 4.5
F95 - Median = 4.4
F96 - Median = 4.15
F97 - incomplete data
F98 - Median = 4.5
F99 - Median = 4.3

F99 Data using a 5-point scale on Critical Thinking

Average for all IDEA colleges =	3.5
Average for all HCC courses =	3.8
Average for all Social Science courses at HCC =	3.9
Average for 11 PSYC-101 sections =	4.3

Conclusion: For Fall 1999 PSYC-101 students reported they had improved their critical thinking skills more so than in other Social Science courses which were higher than all HCC courses which were higher than all of the IDEA norm group. The lowest section rated at the 70th percentile and 6 (more than half) were rated above the 90th percentile. Comparisons with previous years are difficult because the question wording was changed for F98 and the scoring was changed.

**B. Overall Amount Learned From Students' Perspective
Overall Evaluation on the 5 Relevant Objectives (how much was learned) (Percentile Rank)**

- F94 - Median = 69 percentile
- F95 - Median = 59 percentile
- F96 - Median = 52 percentile
- F97 - incomplete data
- F98 - Median of 61 = 80th percentile
- F99 - Median of 57 = 70th percentile

Fall 1999 Data Using Amount Learned on a 5-Point Scale

Percent of courses in the top 30% for all IDEA colleges =	30%
Percent of all HCC courses rated in the top 30% =	35%
Percent of HCC SS courses rated in the top 30% =	37%
Percent of PSYC-101 courses rated in the top 30% =	55%

Conclusion: Students reported learning more in their PSYC-101 courses even with our increased emphasis on critical thinking than HCC Social Sciences courses, all HCC courses, and the IDEA forming colleges.

C. Amount of reading for all PSYC-101 sections.

- F94 - Median = 66th percentile
- F95 - Median = 77th percentile
- F96 - Median = 87th percentile
- F97 - incomplete data
- F98 - Median of 61 = 80th percentile
- F99 - Median of 61 = 80th percentile

Conclusion: PSYC-101 courses are seen to require more reading than most other courses. Students report reading more than in other courses.

D. Amount of other work (non-reading) assigned

- F94 - Median = 53rd percentile
- F95 - Median = 53rd percentile
- F96 - Median = 65th percentile
- F97 - incomplete data
- F98 - Median of 53 = 60th percentile
- F99 - Median of 53 = 60th percentile

Conclusion: PSYC-101 courses were seen to require more non-reading homework than other courses.

E. Worked Hard

- F94 - Median = 39th percentile
- F95 - Median = 46th percentile
- F96 - Median = 50th percentile
- F97 - incomplete data
- F98 - Median of 3.5
- F99 - Median of 3.8

Conclusion: No comparison data is available.

F. Students Views About the Teaching Materials for Critical Thinking

Students in four sections were asked for their views on the workbook *Evaluating Psychological Information* (1995). Here are the questions and the percent is the median for the four sections for F95 and all sections for S97 (N = 169 students). This survey was repeated in Spring 2000 but the data have not yet been scored.

1. Were you clear on what you were to do with this book?

F95	S97
71% Yes	89%
29% No	11%

2. Do you think you need more practice on any steps?

F95	S97
40% Yes	34%
60% No	66%

3. Do you feel confident in identifying a source?

F95	S97
87% Yes	99%
13% No	1%

4. Do you feel confident in reading to understand?

F95	S97
90% Yes	96%
10% No	4%

5. Do you feel confident in analyzing an article for important definitions?

F95	S97
86% Yes	83%
14% No	17%

6. Do you feel confident in detecting propaganda techniques?
 F95 S97
 80% Yes 89%
 20% No 11%
7. Do you feel confident in identifying the psychological facts?
 F95 S97
 76% Yes 86%
 24% No 14%
8. Do you feel confident in identifying the incomplete research evidence?
 F95 S97
 70% Yes 80%
 30% No 20%
9. Do you feel confident in evaluating psychological facts?
 F95 S97
 75% Yes 86%
 25% No 14%

Conclusion: Students report being increasingly confident in doing the various component skills of critical thinking which is consistent with their actual test scores.

G. Students Views at the End of the Course

An end-of-course-evaluation is given to all students. Four questions relate to thinking and there is an overall evaluation. Average percents are used

1. **My thinking skills have**

	F96	F97	F98	F99
Gotten worse	4%	2%	0%	2%
Not changed	14%	8%	12%	6%
Improved Slightly	25%	19%	28%	17%
Improved moderately	29%	39%	27%	32%
Improved significantly	27%	30%	33%	41%

Conclusion: Students report their thinking skills have improved. Thinking skills were reported to have improved either moderately or significantly for 56% of F96 students and for 73% of F99 students.

2. **Have you been encouraged to think for yourself?**

	F96	F97	F98	F99
Not at all	2%	2%	0%	3%
Less than in other courses	4%	5%	1%	4%
About the same as other courses	24%	21%	28%	24%
More than in other courses	38%	50%	32%	42%
Much more than other courses	31%	21%	35%	25%

Conclusion: For F96 69% report that they have been encouraged to think for themselves more so or much more than in other courses. For F99 67% make the same claim.

3. **How important do you believe critical evaluative skills are?**

	F96	F97	F98	F99
Not at all important	1%	0%	4%	3%
Of minor importance	14%	12%	13%	10%
Same importance as other aspects of the course	40%	28%	33%	22%
Of major importance	46%	56%	49%	63%

Conclusion: 46% of PSYC-101 students in F96 reported that critical evaluation skills were of major importance while 63% made the same claim in F99. Increasing numbers of students rate critical evaluation skills of major importance.

4. **Compared to other college courses you have taken, how much do you feel you have learned from this course?**

	F96	F97	F98	F99
Considerable more	33%	28%	32%	43%
Somewhat more	35%	38%	28%	32%
About the same	23%	24%	28%	19%
Somewhat less	3%	5%	5%	2%
Considerably less	6%	2%	3%	0%

Conclusion: For F96 68% said they had learned considerably or somewhat more in PSYC-101 than in their other courses while in F99 75% made the same claim. Students at the end of the course say they have learned a lot in General Psychology.

5. **How would you rate this course?**

	F96	F97	F98	F99
Excellent or very good -	59%	61%	65%	66%

Conclusion: There has been a small increase in the percent of PSYC-101 students rating the course as either excellent or very good. A higher percent of students (7%) rated the course as excellent or very good in F99 than in F96.

H. How did General Psychology students do on the outcomes assessment of critical thinking?

A critical thinking test was devised, critiqued by an outside critical thinking expert, revised, and used each Fall with all PSYC-101 students. The test was revised each year to exclude ambiguous items.

Percent Passing :

What percent of students passed the test each fall? All sections were combined and an average score was calculated. The average scores are reported below.

S96 - 25% of the students (208 students) who took the outcomes assessment passed it (a score of 75% correct and above is used as the minimum passing score). Since critical thinking is a major course outcome, we believe that scores below 75% do not indicate that students have mastered those components of critical thinking we are teaching.

Range: The scores ranged from 10% to 97%.

F96 - 54% passed of the 168 who took the assessment.

Range: The scores ranged from 19% to 100%.

F97 - 54% passed of the 199 who took the assessment.

Range: The scores ranged from 31% to 97%.

F98 - 68% passed of the 179 who took the assessment.

Range: The scores ranged from 24% to 100%.

F99 - 90% passed of the 174 who took the assessment.

Range: The scores ranged from 19% to 100%.

Conclusion: 54% passed the critical thinking tests for both F96 and F97 while 90% passed for F99. As a PSYC-101 faculty we have increased the percent of students passing the test.

XX. Summary Results of Our Outcomes Assessment Project

A. Conclusion: For Fall 1999 PSYC-101 students reported they had improved their critical thinking skills (4.3 on a 5 point scale) more so than in other HCC courses

(3.8). Comparisons with previous years is difficult because the question wording was changed for Fall 1998 and additionally the scoring was changed.

- B. Conclusion:** Students reported learning more overall in their PSYC-101 courses, even with an increased emphasis on critical thinking.
- C. Conclusion:** PSYC-101 courses are seen to require more reading than most other courses.
- D. Conclusion:** Students report being increasingly confident in doing the various component skills of critical thinking.
- E. Conclusion:** At the end of the course students report their thinking skills have improved. Thinking skills were reported to have improved either moderately or significantly for 56% of F96 students and for 73% of F99 students.
- F. Conclusion:** : At the end of the course, 69% in F96 report that they have been encouraged to think for themselves more so or much more than in other courses. For F99 67% make the same claim. This item does not directly assess critical thinking growth and we do not see any change.
- G. Conclusion:** : At the end of the course, 46% of PSYC-101 students in F96 reported that critical evaluation skills were of major importance while 63% made the same claim in F99. Students are increasingly understanding the importance of critical thinking.
- H. Conclusion:** : At the end of the course, 68% in F96 said they had learned considerably or somewhat more in PSYC-101 than in their other courses, while in F99 75% made the same claim.
- I. Conclusion:** : There has been a small increase (7%) in the percent of PSYC-101 students rating the course as either excellent or very good.
- J. Conclusion:** 54% passed the critical thinking tests for both F96 and F97 while 90% passed for F99. This is the most important check on student learning Students are able to apply what they have learned to evaluate an article they have not seen before.

XXI. Recommendations

A. Ideas from F97 that We Tried.

1. Do more pilot testing of the test itself.
 - a. Give the test to other psychology students. Talk with them about their reasoning and understanding of what they are doing. We need to do more pilot testing to be sure the test is testing their thinking skills.

- b. Try verbal tests with some students and ask them to think aloud to help us follow the thinking processing they are using.
 - c. Do further testing of advanced psychology students to discover how they are thinking and how they learned.
 - d. Revise test to handle objections and spots that are unclear.
 - e. Review the scoring to increase reliability.
2. Clarify what is to be learned for each section of the test.
 - a. Write objectives for each section of the test. For future testing take a sub sample to focus on percent passing various sub skills.
 3. Work with faculty to develop better ways to convince students that critical thinking is important.
 4. Review the grading systems faculty use to determine if motivation is high enough to get students to do their best thinking.
 5. Work on ways to get students to do a better job of following directions. Exercises requiring following directions were added. During the course following directions was stressed.
 6. Come up with better ways to bring critical thinking to the attention of students throughout the course. Add in more examples of the value of critical thinking.
 7. Develop a set of exercises for all sections to use. Some students needed more practice. Added in more practice for Steps 4 and 5 of critical thinking during the course.
 8. Change the drug article assessment in the workbook so that the same testing procedure is use throughout the course.
 9. Develop more practice exercises which use the same format as the test.
 10. Add in specific exercises for those not doing well during the course.
 11. Consider using mastery learning with critical thinking in more sections.
 12. Look for good films and videos on critical thinking.
 13. Review what experts suggest when teaching thinking skills.
 14. Consider additional ways to measure critical thinking during and at the end of the course, such as: multiple choice questions, short answer, short exercises, classroom research.
 15. Consider giving more time for critical thinking. Over 60% in one section indicated they needed more time. Take out some of the extra examples of poor thinking and cut down on examples of the propaganda techniques.
 16. Add in more information on psychological facts during the course.
 17. We checked with a consultant with the K-12 grades for Maryland for their experiences with few passing the first times the tests were given. The state of Maryland is experiencing low passing rates as they are introducing performance based outcomes assessment.
 18. Revise the scoring so it is more objective and quicker.
 19. Use a sample of the tests to check in more detail so more useful feedback is available to improve teaching.
 20. Do the survey in all sections to collect ideas to improve the workbook.

21. Use a short survey (based on classroom research ideas) during the course to provide feedback to faculty as to what students think about their progress in learning critical thinking.

B. Recommendations from Fall 1999.

1. Continue to assess student critical thinking skills.
2. Watch for new videos dealing with critical thinking.
3. Add in more critical thinking exercises in the critical thinking workbook so faculty easily have on hand extra practice.
4. Collect additional ideas on teaching critical thinking.
5. Continue to think about how to infuse critical thinking into the rest of the course.
6. Design additional writing assignments that can be used by faculty to develop critical thinking skills.
7. Continue to survey students for ideas for improving our teaching of critical thinking.

XXII. Some of the Psychological Sources Consulted for This Outcomes Assessment Project

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