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Critical Thinking (CT) and a Review of Selected CT Student Books

Paul Tanner

"Critical thought is of the first importance in the conception and organization of educational activities."
Israel Scheffler (cited in Palmer142)

Critical thinking (CT) and the teaching of CT skills continue to be in the news. In Japan, the Ministry of Education, Science, Sports and Culture has designated Temple University Japan a "Foreign University Japan Campus," putting Temple on equal footing with other Japanese universities. Temple's Dean, Kirk Patterson, believes that one of the reasons Temple has achieved this status is that Temple teaches CT and international communication skills, which university graduates in Japan generally lack (Kawasaki). In the United States, the Scholastic Aptitude Test (SAT), the most commonly used university entrance examination, underwent a revision in 2005. According to the College Board, the sponsors of the SAT, the new test is designed to "focus on the CT skills needed in college" ("New SAT"). The test has added a critical reading section which tests "verbal reasoning abilities" and "higher reasoning abilities" according to the Educational Testing Service (ETS), maker of the SAT (Robinson 34). The test has also added a writing task "designed to measure a student's ability to think critically and develop ideas in a thoughtful, cogent, and coherent essay" ("New SAT"). These are just two examples illustrating the importance of CT skills in modern society and student intellectual development.

This paper will give a brief history and update of CT thought, provide some definitions of the term, and review five student textbooks that are designed to teach some aspects of CT.

CT from Socrates to deBono (and back)

Although the term 'critical thinking' is a 20th century coinage, the roots of CT go back to Socrates 2,500 years ago. He established the method of asking questions that probe thinking before accepting ideas as worthy of belief. "Socratic questioning" is still the best known CT teaching strategy. Plato, Aristotle, and the Greek skeptics continued to focus on the idea of "living an examined life" (Scriven and Paul). The tradition of CT was carried out by Thomas Aquinas in the 13th century. In his *Sumna Theologia*, he systematically stated, considered, and answered all criticisms of his ideas as necessary stages in developing them. In the Renaissance, many European scholars began to think critically about religion, art, society,

human nature, law, and freedom. Francis Bacon wrote one of the earliest CT texts in *The Advancement of Learning* (1605), in which he argued that the world needs to be studied empirically. Another early CT work was Rene Descartes' *Rules for the Direction of the Mind* (1629). Descarte argued that the mind needs a systematic discipline for guidance. Every part of thinking should be questioned, doubted and tested. In *Utopia* (1516), Thomas More developed a model of a new social order in which every domain of the present world was subject to critique. Niccolo Machiavelli's *The Prince* (1513) critically assessed the politics of the day and laid the foundation for modern political thought (Paul, Elder and Bartell).

The spirit of intellectual freedom and critical thought influenced such critical thinkers as Thomas Hobbes and John Locke in the 16th and 17th centuries. Adam Smith, Thomas Jefferson and Immanuel Kant used CT in the fields of economics, politics, and philosophy. Robert Boyle, Isaac Newton, Nicolaus Copernicus, Galileo Galilei, Johann Kepler and Francesco Redi all made scientific use of CT to question traditionally held views.

By the 19th century, CT had spread to many areas of intellectual thought and scholarship. Karl Marx and Charles Darwin were just two examples of critical thinkers to make breakthroughs in their fields. In the 20th century, CT has been used and defined more specifically (Paul, Elder, and Bartell). However, until late in the millennium, the ideas of CT were housed under various headings. For example, Jean Piaget gave what could be a definition of CT in his explanation of the aim of intellectual education: "learning to gain the truth by oneself at the risk of losing a lot of time and energy going through all the roundabout ways that are inherent in real activity" (Piaget 106).

While the ideas of CT are gaining attention in business and education around the world, there is still no one definition of CT. As the reader will see in the following CT works, many authors writing about CT make their own definition. Following are three definitions that choose slightly different ways to explain CT. Representing the National Council for Excellence in Critical Thinking, Michael Scriven and Richard Paul define CT as "that mode of thinking—about any subject, content, or problem—in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards on them" (Scriven and Paul). In an article for The Critical Thinking Company, Robert Ennis offers a more streamlined definition: "CT is reasonable reflective thinking focused on deciding what to believe or do" (Ennis). Cherry Campbell's defines CT differently: "Instead of referring to a negative frame of mind, the notion relates to the type of reasoning that involves evaluation, critique, and the juxtaposition of values, standards, or attitudes" (Campbell 82). Edward deBono uses the term "thinking outside the box" to describe the juxtapositon that Campbell refers to. DeBono has gone within the concept of CT to define two subgroups. Lateral thinking is defined as "an unorthodox approach to problem-solving after looking at a problem from the other 'sides' rather than head on" (*Webster's new*

Millenium Dictionary). DeBono invented the term in 1967 and has made a cottage industry of lateral thinking and parallel thinking proponency. He invented the term 'parallel thinking' to contrast with the adversarial thinking established by Socrates, Plato, and Aristotle, which deBono believes "lacks a creative or design element." With parallel thinking, all parties are thinking in parallel in the same direction, leading to co-operative and co-ordinated thinking (deBono). With millions of books in print, and sponsoring training seminars to businesses and the curious, deBono could well be the most popular influential proponent of CT in the world today.

A Review of CT Student Books

While there are many CT books being written, it is more difficult to find student books appropriate for the EFL or ESL student. Higher reasoning concepts such as CT are generally not written about in second language texts for university level students. While using CT in the title is a recent trend, texts that actually and consistently teach or use CT are still a rarity. All of the following CT texts have some merit for university level EFL students, but do not completely manage the balancing act of using or illustrating CT in language appropriate for this level. All of the books share a brevity: none is more than 100 pages.

Critical Thinking: Language Skills for Clear Communication by David Greene and Lawrence Hunter. Asahi Press, 2002.

The text is composed of six chapters covering the six language genres the authors feel are required to express critical thinking in English. The book emphasizes performing authentic tasks, as opposed to linguistic tasks. The text is aimed at ESL/EFL learners at the level of Japanese high school graduates. Brief Japanese explanations of the introduction, content and key words are included.

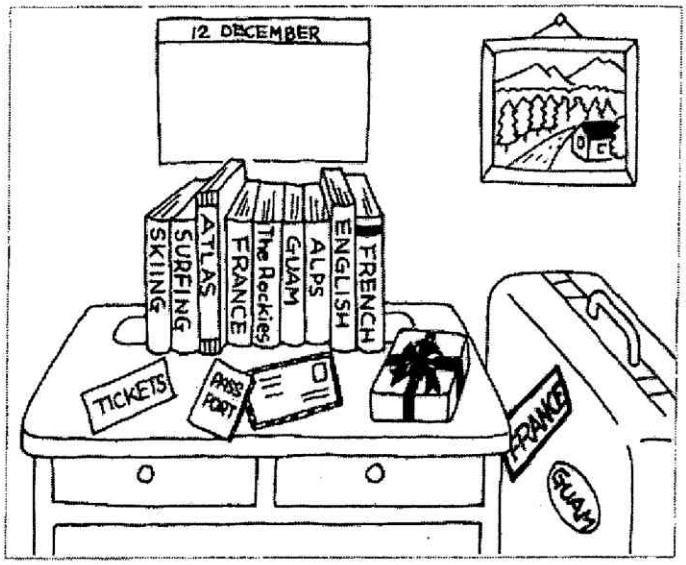
Pedagogically, the text takes a 4-step approach for each unit, consisting of input, usage, practice (tasks using vocabulary and phrases), authentic task and expression.

The six chapters are listed below, along with some comments on each unit.

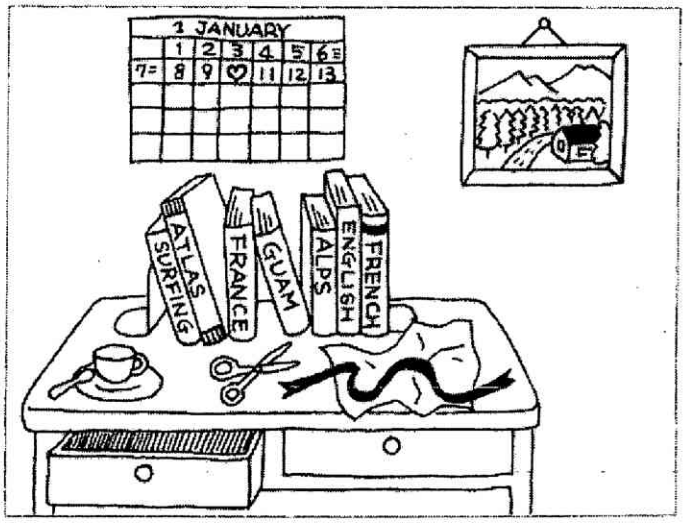
1. Description and classification. Contains practice in being more concrete by describing things in terms of their categories, functions and appearance. Some of the charts are too complex or specialized for students to comprehend. A tree diagram explaining animal classification confused this author.
2. Sequence. Particularly useful is an explanation comparing writings on the differences between instructions and narrations.

Writing Inferences (51, 52)

Ms. Takeda has gone on vacation. The pictures show her desk the night before she left, And the day after. Look at the pictures carefully. Infer answers to the questions on page 52, and give reasons for your answers.



Before Ms. takeda left



After Ms.Takeda left

Where do you think Ms Takeda went on vacation?

Why do you think so?

When (what time of year) do you think she went on vacation?

Why do you think so?

What do you think she did the night before she went on vacation?

Why do you think so?

When will Ms. Takeda be back from her vacation?

Why do you think so?

3. Comparison. Contains much information on reading and making different types of graphs. This is a very practical unit.
4. Inference. This unit teaches inductive and deductive reasoning. See the sample page (51) from Chapter Four in this article.
5. Cause and Effect. The unit contains a practical list of probability language. A fine example of differences in point of view is used in the authentic task of examining the cause of a traffic accident.
6. Pro and Con. This chapter is set up for debates. One example highlighted is Environmentalists vs. Developers.

Authors Greene and Hunter are university teachers in Japan. One assumes they wrote the text because they could not find an appropriate book that addressed practical critical thinking tasks at a level appropriate for university level EFL learners. In this respect, they have filled the gap nicely.

The presentation is clear and the activities interesting. They integrate reading, writing, and speaking tasks well. At 89 pages, there is an absence of clutter or excess. The pedagogical approach is consistent and easy for students to follow. The units are self-contained but have no follow-up or extension activities. The authors do not go into detail about definitions of critical thinking, or varieties of critical thinking. In the introduction, they simply state that, "using these six genres can equip the learner to express his / her reasoning in English and also to analyze the reasoning of others." (vi). Students using this book will sharpen their critical thinking skills without being caught up in an exact definition of what critical thinking is or is not. Nonetheless, since critical thinking is the title of the book, Greene and Hunter could have included at least a cursory explanation of critical thinking and its value.

Creative Thinking Puzzlers: Creative Problem-solving Fun by John H. Doolittle.
Pacific Grove CA: Critical Thinking Books and Software, 2003.

Geared towards the native English high school student (or higher), *Creative Thinking Puzzlers* involves word play activities that are "fun" but also help "to produce fluent, flexible problem solvers." (ii) The puzzles are designed to encourage students to generate a variety of different solutions, and to develop thinking skills (ii). The instructions for each exercise are clear, the layout is simple, and the text features large print.

The book is divided into seven different categories of puzzles. Most prevalent are Word Morph puzzles, in which the student must change one or two letters in a word to produce a new one. Dooriddles consist of a four-line riddle in poem form. Codeword Clusters consist of a sentence with one coded clue. There are four sentences from which student must unscramble the code. Secret Word Puzzles contain a list

of clue words to find a four-letter solution word. Telephone Code Puzzle involves decoding words from a telephone dial code. The clues rely on abstract thinking, but the clues are too difficult for most ESL students. In fact, the clues require a higher level of fluency than most Japanese university level students possess.

The Line Puzzle and Shape Puzzle could be useful and challenging for inquisitive EFL students. The Line Puzzles are analytical puzzles that require the student to piece together assorted details in order to solve the puzzle.

Line Puzzle (7)

Use the clues to solve the puzzle. More hints are on page 43.

a . Three houses (101, 103, and 105), which are painted, in no particular order (INPO), green Blue, and yellow, are located along Oak Street, which runs west (lower numbers) to east (higher numbers). Alicia, Salicia, and Janica each live in one of these three houses, and each owns (INPO) a different pet (a cat, a dog, and a turtle).

1 . Salicia, who live in the blue house, lives somewhere west of Alicia, who doesn't Own a turtle.

2 . The cat lives in the yellow house, which is next to the blue house.

3 . Janicia lives in the middle house.

Which of these charming ladies lives in which house and owns which pet?

The Shape Puzzle is similar to the Line Puzzle, but provides a diagram, which the student must complete to solve the puzzle.

Shape Puzzle (15)

Using the clues given, write the name of each person on the line indicating where he or She is seated. For more information, see page 42.

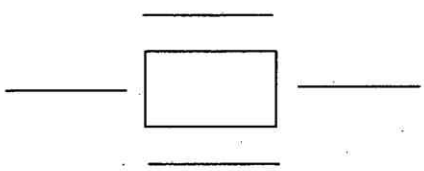
a . Anya, her father, her husband, and her daughter sat around a square table drinking (INPO) coffee, cola, tea, and orange juice.

1 . The cola drinker sat to the left of the coffee drinker's daughter.

2 . The person to the left of the cola drinker sat to the right of the tea drinker's father.

3 . The coffee drinker sat opposite the tea drinker.

Where did each person sit?



Creative Thinking Puzzlers as well as *A Case of Red Herrings* are published by The Critical Thinking Company, whose website features definitions of CT, characteristics of good critical thinkers, articles on the importance of CT, and other items of interest concerning CT, in addition to a catalogue of CT books of various skill levels.

Great Critical Thinking Puzzles by Michael A. DiSpezio. New York: Sterling Publishing Co., Inc., 1997.

This book consists of 83 puzzles, formulated to boost and engage critical thinking skills. It is designed as a self-paced, solo activity for the intrinsic pleasure of solving puzzles, combined with the knowledge that the puzzle solver is using critical thinking skills to exercise his or her mental mettle.

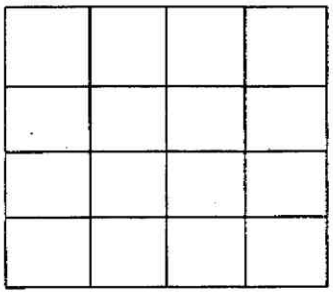
DiSpezio defines critical thinking skills as "a variety of higher-level thinking strategies that can be used to analyze, solve, and evaluate all sorts of things, such as facts, theories, statements, and of course puzzles." (p. 5) In solving the puzzles, a reader will have to "uncover assumptions, solve by analogy, sequence events, generalize, and discover all sorts of patterns." Once creative possibilities are generated, "novel possibilities need to be analyzed to see if they work." (5)

The puzzles are all very short, with none taking up more than a page. In some cases, DiSpezio includes interesting background material. See "Breaking Up is Hard to Do" and "Palindrome." All of the answers are explained in the back of the text.

Breaking Up is Hard to Do (15)

How fast can you think? Faster than a speeding bullet? Faster than electricity?
For most of us, thoughts race around in our brains between 3 to 300mph. Who knows, this puzzle may bread your brain's speed record.

The square encloses a 4 x 4 grid. There are five different ways this grid can be divided into identical quarters. Each way uses a different shape. Can you uncover the layout of all five patterns?



Palindrome (22, 23)

A palindrome is a word or number that reads the same backwards as it does forward. Numbers Such as 606 and 4334 are palindromes.

While driving his car, Bob (so much of a palindrome lover that he changed his name from John to Bob) observes that the odometer reading forms a palindrome. It displays the mileage 13, 931.

Bob keeps driving. Two hours later, he looks at the odometer again and, to his surprise, it displays a different palindrome!

What is the most likely speed that Bob is traveling?

The book is designed for the native speaker of English. However, the language used is simple, and many of the clues use visual hints, which allow for use by non-native speakers of English. The puzzles do not require special background knowledge or high levels of math or science, despite DiSpezio's background in those fields. He is a former mathematics, physics, and chemistry teacher, and is the author of 18 science textbooks.

The puzzles are interesting, varied, challenging and fun. This author enjoyed numerous hours pondering them. Though limited in scope compared to some CT books, DiSpezio's text does what the title states, it presents CT puzzles.

While the text may be difficult to use or apply to an EFL classroom situation, it does present an excellent individual challenge. An engaging instructor could present a puzzle orally to challenge students, exercise CT skills, and check students' listening comprehension. Perhaps if students were to explain how they arrived at their answers, or had to write or orally present extra hints or clues to other students, the puzzles could be adapted for use in a conversation classroom.

A Case of Red Herrings: Solving Mysteries through Critical Questioning *(B1)*, by Thomas Camilli. Pacific Grove CA: Critical Books and Software, 1992.

"Questions are the creative acts of intelligence." Frank Kingdon (cited in Gross 129)

Red Herrings is comprised of 32 separate mysteries. The mysteries are part of a longer untold story, which students must deduce from clues derived from answers to their questions. After hearing the mystery, students must then ask "yes" or "no" questions. After asking enough questions and putting the pertinent answers together, students will be able to explain the story behind the mystery. There is no set time limit or limit on the number of questions students may ask, although the instructor may impose them.

The puzzles are designed to improve students' problem-solving skills and refine their ability to apply logical deductive reasoning. The 32 mysteries are ordered according to their degree of difficulty with the easiest being first. These puzzles are written for native speakers from grade 7 to adult, but are adaptable to the EFL classroom from the high school level on up.

The stories are short, without a lot of difficult vocabulary, although sometimes the key point in solving the puzzle is based on multiple meanings of words (stroke, shoot, etc). The instructor may need to give some hints about this.

Camilli provides a thorough explanation of how to set up and work through the mysteries, offering tips, hints, suggestions for setting up, keeping the activity going, alternatives, guided practice, extension activities, and a sample of the questioning. This makes the text easier to use. Also useful is the fact that the answers are given in the back of the book. The mysteries themselves are written in large print and are photocopiable.

Not every story is worthwhile for a class exercise. Some are too dependent on corny puns (Spike wasn't able to play cards on a ship because "someone was always standing on the deck" in number 28). Others won't work because somewhat obscure knowledge of American culture is required (George Washington throwing a silver dollar across the Potomac River). Some puzzles rely on oblique or off-the-wall information (hemophilia, daylight savings time), or are just plain silly.

This author estimates that less than half of the mysteries would be worthwhile activities for an EFL college level classroom. The best mysteries would work as excellent warm-up activities. In using these lateral thinking stories, this author has found that students become much quicker at solving the mysteries and ask fewer irrelevant questions the more practiced they become.

An excellent extension activity would be for students to write their own stories. The best stories could be used in a later class. The questioning format of putting the puzzles together is also a useful tool. More interesting or pertinent mysteries would much improve a valuable concept.

The mysteries in *Red Herring* are useful for communicating ideas and developing logical reasoning skills. The low price and ease of use make this text a useful, interesting way to spice up a class and add a critical thinking component.

Mystery number 31 (31)

At first readers were disturbed by the headline, "Hunter rewarded for shooting rare and endangered animals," but after reading the article they understood the hunter's motives.

Drawing Conclusions and ***Making Inferences.*** The Jamestown Comprehension Skills Series, Third Edition, 2000.

Jamestown's Comprehension Skills series focuses on ten reading comprehension skills at three different levels. The three levels are Introductory; Middle, for native speaking junior high school students; and Advanced, for high school students. Most Japanese university students could work from the Middle Level, and many would find the advanced level appropriate. The text titles are: *Understanding the Main Idea, Making Judgments, Understanding Character, Recognizing Tone, Understanding Literary Forms, Understanding Organization, Understanding Significant Details, Understanding Vocabulary, Drawing Conclusions, and Making Inferences.*

Each of the texts isolates once important critical reading skill. This review examines *Drawing Conclusions* and *Making Inferences*. The texts are designed "to help students develop specific reading comprehension skills". At 65 pages, the books are short and focused. Each book is divided into five parts. They naturally begin with an explanation, which defines, explains, and illustrates the target skill. Second is instruction, which features a preview quiz, followed by a lesson. Third are some sample exercises with questions, followed by the answers and a step-by-step analysis of why one answer is correct, and why the others are not. Part four consists of 20 practice exercises with questions, which cover a wide range of difficulty. (See the example from *Drawing Conclusions*). Part Five contains six writing activities, which are applications of the skills presented earlier in the book. The last few pages contain answers to the practice exercises.

The presentation is direct and to-the-point, and contains no verbosity. Strengths of the texts are many. The explanation section in part one presents the topic clearly and succinctly, while providing numerous examples and the reasoning behind the ideas. The practice exercises contain interesting and varied reading selections from a spectrum of academic subjects. The questions following each practice exercise focus on the target skill. The degree of difficulty is such that the target skill is the focus, rather than new vocabulary or reading structures. The writing topics also provide excellent practice in the target skill. The writing activities are more varied in format than the reading practice exercises.

This author has a few suggestions for improvement. Either more variety or asking open-ended questions in the reading examples would be better than the current three multiple choice questions and one underlined section ("Find the section that shows / supports / implies...") The writing activities are excellent, but more than six different topics would provide a better selection. The Jamestown Comprehension Skills Series contains 10 separate reading comprehension skills. Adding comprehensive critical reading skills in one volume would be an excellent review and provide for diagnostic evaluation.

Drawing Conclusions (37)

Practice Exercise 11

The next time you have to take medicine but don't like the taste, try this: first chill the inside of your mouth by placing an ice cube in it. You won't taste the medicine at all.

Very hot and very cold foods can change your sense of taste. Heat, of course, increases your ability to taste. You can taste very small amounts of sugar in hot coffee. But a lot more sugar is needed to make ice cream and other cold foods taste sweet.

Your sense of smell is another thing that can change your sense of taste. You can prove this by drinking chocolate while holding your nose. You'll find that it doesn't taste much like chocolate. If you really want a surprise, hold your nose and close your eyes while somebody gives you a bite of onion and a bite of apple. You won't be able to taste the difference.

1. According to this selection, a person trying to lose weight may find that the most damaging foods are
   a. cold desserts.
   b. hot drinks.
   c. breads.
   d. warm puddings.

2. When the sense of smell is blocked,
   a. foods taste sour.
   b. foods taste somewhat hotter.
   c. foods taste very sweet.
   d. different foods may taste the same.

3. The reader can conclude that
   a. the sense of sight is most important in the enjoyment of food.
   b. most people do not like foods that are too hot.
   c. several senses are used to enjoy food.
   d. onions have the strongest flavor of any food.

4. Underline the sentence that supports the conclusion drawn in number 1.

Jamestown Education also sponsors an informative educational web site, which features information about Jamestown's purpose and methods of using and teaching the company's texts. In addition there are many links to research studies, online journals, reading links, and professional organization web sites.

Bibliography

Camilli, Thomas. *A Case of Red Herrings: Solving Mysteries Through Critical Questioning (B1).* Pacific Grove CA: Critical Books and Software, 1992.

Campbell, Cherry. *Teaching Second Language Writing*. Boston: Heinle and Heinle Publishers, 1998.

DeBono, Edward. "Lateral Thinking and Parallel Thinking." *Edward deBono's Web.* Internet. Available: www.edwdebono.com/debono/lateral.html Accessed Janaury 1, 2005.

DiSpezio, Michael A. *Great Critical Thinking Puzzles*. New York: Sterling Publishing Co. Inc., 1997.

Doolittle, John. H. *Creative Thinking Puzzlers: Creative Problem-Solving Fun.* PacificGrove CA: Critical Thinking Books and Software, 2003.

Drawing Conclusions. The Jamestown Comprehension Skills Series, Third Edition, 2000.

Ennis, Robert. "A Super Streamlined Conception of Critical Thinking." Internet. Available: www.criticalthinking.com/articles.html. Accessed January 1, 2005.

Greene, David, and Lawrence Hunter. *Critical Thinking: Language Skills for Clear Communication.* Asahi Press, 2002.

Gross, Ronald. Peak Learning. New York: Penguin / Putnam, 1991.

Karasaki, Taro. "Open Education needed to draw foreign investment." *The Asahi Shimbun*, April 18, 2005: 21.

"Lateral Thinking." *Webster's New Millenium Dictionary of English, Preview Edition.* Lexico Publishing Group LLC, 2003, 2004. Internet. Available: http://dictionary reference.com Accessed May 13, 2004.

Making Inferences. The Jamestown Comprehension Skills Series, Third Edition, 2000.

"New SAT for the Press: Frequently Asked Questions." College Board.com. Internet. Available: Collegeboard.com/about/news_info/sat/faqs.html Accessed May 6, 2005.

Palmer, Joy A., ed. Fifty *Modern Thinkers on Education*. New York: Routledge, 2003.

Paul, Richard, Linda Elder and Ted Bartell. "A Brief History of the Idea of Critical Thinking."Internet. Available: www.Criticalthinking.org/aboutCT/brief-HistoryCTshtml. Accessed May 15, 2005.

Piaget, Jean. *To Understand is to Invent.* London: Penguin, 1976.

Robinson, Adam, John Katzman, and the Princeton Review Staff. *Cracking the New SAT*, 2005 Edition.New York: Random House, 2005.

Scriven, Michael, and Richard Paul. "Our Concept of Critical Thinking." The Critical Thinking Community. Internet. Available: www.criticalthinking.org/about CT/OurConceptCT.shtml. Accessed May 11, 2005.