Teaching Critical Thinking

by
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The expression 'critical thinking' has become a popular one, so much so that people who couldn't agree on most of the important things in life are likely to claim both that they're thinking critically and their adversaries are not. Because different people might mean quite different things by 'critical thinking', it is probably a good idea to spend a little time going over some of these different meanings.

In his book *The God Delusion* Richard Dawkins mentions the motto on the website of Bryan College, a Christian Bible College named after William Jennings Bryan: ***think Critically and Biblically***. I wonder what the folks at Bryan would think of a secular college that advised students to ***think Critically and Naturalistically***.

We can get a good sense of what the folks at Bryan mean by 'critical thinking' by looking at how they describe their **Center for Critical Thought**:

> Bryan College is committed to helping students develop a biblical worldview, and as part of a Christ centered education, offers several programs toward this end. Central to the center's work and mission is the development of exciting academic seminars in which Christian scholars who compete at the highest levels of scholarly inquiry address topics which are at the center of critical national issues. Topics include natural law, the federal judiciary system, education, taxation, science, athletics, the fine arts, and a wide range of other critical cultural concerns.

> Through the presentation of four seminars annually, the Center enables our academic departments on a regular multiyear basis to discuss in depth a relevant cultural issue of significance stemming from their own disciplines.

It seems that what the folks at Bryan mean by 'critical thinking' is thinking about issues that are of critical concern to them in their mission to promote a biblical worldview and thinking about them in ways that are in accord with how they understand that worldview.

They're not the only ones who understand 'critical thinking' in this way. For example, this is also what the school board in Cobb Country, Georgia, meant when it said that it was trying to encourage *critical thinking* by requiring a warning sticker to be placed on all biology texts. What they wanted to encourage was doubting a view they considered contrary to their understanding of the Bible. In their view, if you can encourage students to doubt a whole area of science that conflicts with a biblical worldview, you are encouraging critical thinking.

This view of critical thinking is not the one that has dominated the thinking of the majority of people who teach critical thinking, who study it and write theoretical papers about it, who produce textbooks on the subject, and the like. The consensus of that group is that critical thinking requires *open-mindedness*. You're not encouraging an attitude of open-mindedness by telling students that what they are about to study should not be taken as fact even though the consensus of the scientific community is that it is fact. You're not encouraging open-mindedness when you advise students to think critically *and* biblically.

Furthermore, critical thinking requires a fair-minded consideration of alternative viewpoints, but the Cobb county school board was *discouraging* rather than encouraging fair-minded inquiry. It was mainly interested in raising doubts about evolution, which it presumably thought would enhance its own creationist beliefs. The board was not encouraging the legitimate investigation and study of various alternative evolutionary mechanisms. It was not interested in advancing inquiry but in advancing its own religious beliefs. It was specifically endorsing a false dichotomy: that any criticism of evolution implies the "only" alternative, creationism.

Using critical thinking skills to support your beliefs and to undermine opposing viewpoints is certainly legitimate, but it is a mistake to identify critical thinking with these two activities. The catalogue description for the Liberal Arts Program at Bryan college specifies that thinking critically will enable the students to "relate ideas historically and logically and compare and contrast competing views." That sounds promising, since the disposition to be open-minded enough to take seriously viewpoints that contrast with one's own is essential to being a critical thinker. But I wonder how seriously the teachers and the students at Bryan College take the viewpoints of people like Darwin, Dennett, or Dawkins. Bryan college is located in Dayton, Tennessee, where, in 1925 William Jennings Bryan successfully defended a Tennessee state law that made it illegal to teach in a state school "any theory that denies the story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animals." Would the professors of biology at Bryan College encourage

their students to consider that their biblical worldview might be wrong and that the theory of natural selection might be correct? This is an important question because critical thinking is much more than a set of logical skills that one uses to defend one's beliefs and refute the opposition. In fact, critical thinking is antithetical to using logical and argumentative skill to promote a particular worldview *that itself is considered immune from scrutiny*.

One of the key elements of critical thinking is the recognition that one's worldview can be a major hindrance to being fair-minded. A minimum requirement of fair-mindedness is a willingness to take seriously viewpoints opposed to your own. In other words, you have to be willing to admit that you might be wrong. To exempt one's own worldview from critical evaluation is common enough, but if we want to teach our students to think critically we must teach them to try to understand how one's worldview is likely to be embedded with prejudices, biases, and false notions. We have to remind our students that everything we experience or remember is filtered through that set of beliefs and values that make up one's worldview. To think critically is to be willing to examine conflicting positions in a fair-minded way and to accept that even beliefs you've held all your life might be wrong. If you can't do that, you might still be able to develop some critical skills like comparing and contrasting ideas or comparing ideals with practices, and you would be a critical thinker but only in the sense of being able to apply one or more of the standards of critical thinking in a skilful way. In some quarters, this is called the 'weak sense' of critical thinking, where the strong sense requires that the thinker have a certain *disposition* as well as a

recognition of the many affective, cognitive, and perceptual biases that inhibit and distort our judgment.

The following Strategies Sheet builds off the work of Richard Paul and others; it tries to illustrate the difference between the weak and the strong senses of critical thinking.

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Strategies Sheet

Critical Thinking and the Critical Thinker

Critical thinking: thinking that is clear, accurate, knowledgeable, reflective, and fair in deciding what to believe or do.
(For a more detailed definition (650 words) see
http://www.criticalthinking.org/aboutCT/definingCT.shtml)

The Critical Thinker
(strong sense)

1. **Attitude/disposition**: **openminded; skeptical; fair-minded; tentative**

   - **Intellectual humility**: a willingness to admit error, change beliefs when warranted, or suspend judgment
   - **Confidence in reason**: a willingness to go wherever the evidence leads
   - **Intellectual curiosity**: a love of exploring new topics, learning new things, gaining knowledge
   - **Intellectual independence**: a willingness to examine honestly and fairly the positions of those you disagree with, and a willingness to question authority, tradition, and majority opinion

The critical thinking attitude is unnatural and must be cultivated. To understand this requires a few insights into how we acquire beliefs and make decisions

2. Insights

- a recognition of tendencies to **affective**, **cognitive, and perceptual biases** and how they affect interpretations of experience, testimony, and other evidence

    i. Sense perception, memory, worldviews
    ii. Apophenia, ideomotor effect, inattentional blindness, magical thinking, pareidolia, selective thinking
    iii. confirmation bias
    iv. self-deception and wishful thinking; egocentrism; worldview assumptions, biases, and prejudices
    v. communal reinforcement, ethnocentrism
    vi. law of truly large numbers (coincidences)

- a recognition that there are **alternative explanations** for experiences and that selecting from among them requires consideration of the consequences and implications of the alternative explanations as well as an awareness of the assumptions they are built on

Critical Thinking
(weak sense)

3. Standards

- Clarity
- Accuracy
- Relevance
- Completeness
- Significance
- Fairness
- Sufficiency of evidence
- Consilience
- Logic: coherence, contradiction, and validity

4. Skills

- Abuses of language: doublespeak; understanding vagueness, ambiguity, obscurity; effective use of definitions
- Recognizing assumptions and implications
- Evaluating sources of information
- Evaluating claims and arguments
- Common fallacies: of assumption, of relevance, of omission, of insufficient evidence
- Evaluating inductive reasoning: simple sampling and analogical reasoning
- Evaluating explanations and causal reasoning
- Evaluating scientific and conceptual theories
- Applying the hypothetico-deductive model and argument to the best explanation

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Many people, perhaps most people, when they think of critical thinking are thinking of standards and skills like those listed above. You will find plenty of critical thinking textbooks, for example, that seem to identify critical thinking with standards and skills. Now maybe that's all we should realistically hope for: teaching critical thinking in the weak sense of teaching a few skills like how to recognize valid inferences, how to clarify ideas, or how to evaluate causal claims. I consider it a small victory if my students can leave my classes being able to read a newspaper article or listen to a newscast without being misled by stories that suggest causal connections where there probably aren't any. For example, in one recent class I passed out copies of a news article to the students. Here's a summary of the article:

> When Ann Dey's dog had a stroke in July, one side of his face became paralyzed so severely he couldn't blink. She knew she needed to do something before the 13-year-old pug, Jimmy, lost his eye to infection.
> "I was open to anything that would help," Dey said.
> At Pets Unlimited, a nonprofit animal hospital that was San Francisco's first all-holistic veterinary medical clinic, Jimmy received acupuncture for a month. Now, his face is fine.

I asked the students to identify the implied causal claim being made and to evaluate it. The article suggests that the acupuncture eliminated the paralysis in the dog's face. All Ann Dey knows for sure, though, is that after the dog was treated with acupuncture, his face got better. So, the reasoning here commits the

post hoc fallacy. Some students recognized this, but others didn't. One, for example, commented that since acupuncture works on humans, it probably works on dogs, too. So, the dog probably did get better because of the acupuncture. This then led to a discussion on what it means to say "acupuncture works on humans" and what evidence there is for this claim. It also led to a discussion of whether it was reasonable to infer that *if* a treatment like acupuncture were known to be effective in treating human facial paralysis, would it be reasonable to infer by analogy that the treatment would probably work for dogs?

All would agree that the ability to recognize fallacies is an essential critical thinking skill. But if critical thinking were restricted to the study of standards and skills, there would probably be little objection to teaching critical thinking at the elementary school level. However, not far from where I live in northern California, there is a group that calls itself The Church of the Divide and they have been very vocal about not wanting their children to be taught critical thinking. Why? Because they recognize that it would encourage children to disagree with their parents. This group may be overprotective of their children but they certainly understand what critical thinking in the strong sense means. Some teachers also know what it means to teach critical thinking in the strong sense and they won't do it because they don't want their students questioning them about fundamental matters. So, perhaps restricting ourselves to teaching only skills and standards like those in the causal exercise discussed above is the most we should hope for in most schools, at least at the elementary and junior high school level. Some

parents who have no religious axe to grind might also get quite upset if their

children's teachers encourage them to be critical thinkers in the strong sense.

But high school and college students should at least be made aware of what it

means to think critically in the strong sense, in the Socratic sense where the

unexamined life is not worth living and where reflection includes reflection on the

processes of thinking, feeling, and perceiving.

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Teaching critical thinking in the strong sense. It is important to reflect on the

effects of *egocentrism* and *ethnocentrism* on our ability to think critically. Each of

us evaluates what we perceive, read, or hear through the filter of our worldview

and most of us tend to measure anything new by what we already believe and

feel. We tend to think that we understand our own experience better than anyone

else ever could. However, because of emotional biases, desires, wishful thinking,

and lack of knowledge we often deceive ourselves and interpret our experiences

in a way that is consistent with our worldview rather than open ourselves to other

possibilities that other, less interested and less biased people, might see. A very

profound personal experience—like a near-death experience or that of a

mysterious unseen presence, for example—might be very difficult to evaluate

objectively.

We also have naïve faith in *sense perception* and *memory*, but unless we

have an understanding of how perception and memory work, we won't be able to

understand why we can't blindly trust either. This instruction should include more

than the usual epistemological lesson of demonstrating our proneness to error

and fallibility. Our students should understand the *constructive* nature of sense perception and memory, that neither sense perception nor memory work like video or audio recorders. We construct our perceptions and memories out of bits of data that have been filtered, organized, and completed by our brains. The process is heavily affected by our worldviews, our interests, expectations, and purposes. We're not truth-seeking machines by nature, as psychologist Jim Alcock once put it.

To illustrate a point and to generate some discussion about how the brain works in filtering out potential sense data and constructing a coherent visual image, I show my students a clip of Jerry Andrus and one of his creations. The clip is available for download at

http://www.skepdic.com/refuge/ctlessons/illusion.wmv

It beautifully illustrates how the brain constructs perception. At first, the brain puts the data together to see a fence around Jerry. When he "walks through" the fence, the brain has to scramble and readjust its perception. I ask the students: What did you see? What was actually there? How are the two related? What is there is not what you see. What you see is a construction generated by the brain and projected onto the external world. Now what does that tell you about any information you derive from sense perception? You can't assume that the world is as you perceive it to be.

I also use a DVD called "Surprising Studies on Visual Awareness," available from Viscog Productions, Inc.

(http://www.viscog.com/surprising_studies.html) for a fee. The videos on this

DVD illustrate such things as how we can fail to see something that is right in front of us if we are concentrating intently on something in our visual field. They're fun and provide a great way to get a discussion going about the nature of sense perception.

Another way to illustrate the constructive nature of perception is by discussing backmasking. What sounds like gibberish suddenly makes sense when somebody tells you what to listen for. Also, a person with a strong emotional motivation might hear what sounds like her deceased grandmother saying "I love you" through the static of a cross-wired phone message. Why is that? Can suggestions or desires really affect what we hear or what we see? They can and they do. Whatever we do, our students should leave our classes understanding that we can't assume the world is as we perceive it to be. Thus, any inferences we draw from sense perception must be evaluated very carefully and with some skepticism. Likewise, any testimony from others based on sense perception must also be treated with some skepticism. We should remind our students that there is no scientific study linking eyewitness confidence with accuracy of testimony. A critical thinker must know the limitations of eyewitness testimony.

Memories are also constructions and there are all kinds of things that can go wrong in reconstructing the past. Cases of mistaken identity can be dramatic illustrations of this point, especially if they involve things like a memory expert being identified by a rape victim as her attacker even though he was in another city doing a live television interview at the time of the rape. (She had watched the

interview on television shortly before she was attacked and had confused the television face with the face of her attacker.) You can't just assume a memory is accurate, even if it seems clear and vivid and comes with a feeling of subjective certainty.

In addition to providing our students with some insights into the nature of perception, we should also help them examine the role of worldviews in perception and thinking. If we encourage our students to accept their worldviews as yardsticks against which to measure every idea and value they come upon, we are not teaching them to think critically. Most of us who aspire to critical thinking in the strong sense see Socrates as a model. We're especially fond of quoting the famous line that "the unexamined life is not worth living." When we think of the examined life, we think of a life that does not exempt anything from scrutiny. Anyone who teaches that critical thinking is learning how to argue from a particular worldview, which itself is immune from critical scrutiny, is by that very fact not qualified to teach critical thinking. Of course, it's true that even someone who unquestionably accepts the inerrancy of the Bible or the Koran might be able to infer valid inferences from premises, compare different interpretations of passages, and argue intelligibly and intelligently why one interpretation is superior to another, and perform a number of other tasks that are usually identified as demonstrating critical thinking skills. Even so, critical thinking is not just a set of skills you can turn on or off as you please, depending on what the topic is.

I was first introduced to the notion of critical thinking in the strong sense by Richard Paul, a philosopher at Sonoma State University. Paul considers critical thinking a way of life, one that is devoted to finding out the truth in a fair-minded and open way. Critical thinking is a disposition to use our critical thinking skills all the time for any subject, including religion. To Paul, critical thinking is a kind of reflective thinking that includes subjecting one's own worldview to the same kind of scrutiny and critical analysis that many of us are willing and able to do for the worldviews of those who don't think like we do. In 1981, I think it was, Paul and a few like-minded folks at Sonoma State University sponsored an international conference on critical thinking. I attended that conference and a few more at Sonoma State in the ensuing years, where I heard talks by or about several important thinkers who have come to influence my own thinking about critical thinking. One of those I heard was Robert Ennis, a philosopher of education at the University of Illinois at Urbana-Champaign, who defined critical thinking as "reasonable reflective thinking that is concerned with what to do or believe." This definition, like most definitions of critical thinking, should be seen as scaffolding (to use Paul's expression) on which to build our theories and curricula, rather than as the one and only specific goal we aim to achieve. I've moved through several definitions of critical thinking over the years, but all of them have stayed close to the core of Ennis's notion of reflective thinking that is concerned with beliefs and actions. I'll return to this definition below.

Another speaker at one of the International Conferences on Critical Thinking who influenced me profoundly was Neil Postman. Before I heard him

speak, I'd read his book *Teaching as a Subversive Activity*. He later wrote a book called *Teaching as a Conserving Activity*. According to Postman, the teacher's job is not to reflect the status quo or the currently popular worldview. The teacher's job is to inspire students to think critically about that worldview. As I understood Postman, he was *not* advising teachers to challenge traditional algebra or geometry; nor was he advising teachers to introduce their students to crackpot scientific theories as if they constituted a serious challenge to consensus science. I don't think he would have approved what teacher Chris Helphinstine did during his first week on the job at Sisters High School in Sisters, Oregon. The new teacher was supposed to be teaching biology, but he passed out an essay by young earth creationist Ken Ham, who runs the website Answers in Genesis. Helphinstine also showed a PowerPoint presentation that connected evolution to eugenics experiments practiced by Nazi doctors during WWII. The new teacher said he was "hoping to encourage critical thinking in his biology class" (*The Oregonian*, 3/21/2007.) He was fired. I think Postman would have agreed that whatever else this teacher was doing, he wasn't encouraging critical thinking. He was trying to get his students to reject a consensus view in science in favor of a particular religious worldview. As I understood Postman, he was trying to get teachers in the humanities and social sciences to provide their students with alternatives to current dominating trends in those fields. He wasn't advising math and science teachers to provide junk science as an alternative to real science. If Mr. Helphinstine wanted to go outside the curriculum to teach critical thinking, he might have taught his students about *consilience*. Theories

that have strong supportive evidence from several distinct fields are thereby strengthened. When facts from embryology, structural anatomy, genetics, paleontology, psychology, and other fields converge to support evolutionary biology, that latter discipline's foundation is mightily strengthened.

In any case, as far as I was concerned, Postman was preaching to the choir I had already joined, thanks to Howard Kahane's book *Logic and Contemporary Rhetoric-The Use of Reason in Everyday Life*. I was fortunate to have read Kahane's book in my first year of full-time teaching. It's now in its 10th edition (2006, Wadsworth). Nobody called it a critical thinking text in 1971, when the book was first published. (At that time, two other expressions were vying for primacy: 'informal logic' and 'practical logic'.) The publisher now has a blurb for the book that notes that it "puts critical thinking skills into a context that students will retain and use throughout their lives." A blurb about the author notes that Kahane was one of the founders of the "critical thinking" movement. Kahane, who had already published a popular formal logic text, included no formal logic at all in the new text. No Aristotle. No Venn diagrams. No truth tables. No Sentential or Predicate Logic. No tedious exercises trying to symbolize ordinary language arguments. Instead, there are chapters on *advertising* and *textbooks* and the *mass media* and how they affect our thinking. There is a great chapter on language that focuses on how language can be used to mislead and deceive us. Traditional logic texts focus on *uses* of language; Kahane focuses on *abuses* of language. He has several chapters on *fallacies in reasoning*, the kinds of

fallacies it was not too difficult to find examples of in daily life, many of them supplied by advertisers or by public figures, especially politicians.

Kahane was the first of the textbook writers, as far as I know, to introduce the study of doublespeak into a logic text. I find it interesting that a recent Briefing Paper from Timothy Lynch of the Cato Institute applied the same kind of analysis to language that was advocated by Kahane more than thirty years ago and which I think should be included in every general course on critical thinking. Language has become so mucked up that the President of the United States can, with a straight face and with bipartisan support, claim to be defending freedom *and* liberty while instituting secretive subpoenas, secretive arrests, secretive detentions, and secretive trials. Our government now tortures people but we call it *debriefing* and admit that sometimes it's *inhumane.* We admit we deprive people of sleep, make them go naked for long periods, frighten them with vicious dogs, dunk them in water, and who knows what else, but we just shake our heads and say those things aren't torture. Why not? Because *we're* doing them and *we* don't torture. As former CIA director Porter Goss put it: "*we don't torture, we do debriefings.* Torture doesn't get results. We get results with our methods." Therefore, by this logic, since we get results and torture doesn't, whatever we're doing, it isn't torture. It also isn't very good thinking and it is our job as teachers to encourage our students to see such language for what it is: deceptive and manipulative. [See http://www.cato.org/pubs/bp/bp98.pdf.]

For most of my teaching career I have been sympathetic to the view that critical thinking instruction should be about more than just skills like recognizing

contradictions and evaluating arguments. I've tried to encourage my students to

develop a *disposition* to critically examine the presuppositions of their own

culture as expressed in textbooks, TV news, daily newspapers, political

speeches and policies, religions, and in the personal values and beliefs they've

accumulated over the years. Paul, Kahane, Postman, and others of similar ilk

inspired me to want to teach critical thinking in the strong sense.

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Generally, teachers cannot count on the media or political leaders or

family members of students to reinforce the importance of learning how to think

critically. So when someone like Oprah Winfrey does a program that promotes

critical thinking, we should be grateful. I know she's not the person most of us

would think of when trying to imagine a good role model for critical thinkers but

let's give credit where credit's due. Last October she did a program called "Truth

in America," which featured N.Y. Times writer Frank Rich defending his book

The Greatest Story Ever Sold: The Decline and Fall of Truth from 9/11 to Katrina.

The book is very critical of the American public and the mass media for not being

skeptical enough about the things we were being told by the Bush administration

and the mass media regarding alleged weapons of mass destruction in Iraq,

about Saddam Hussein's alleged connection with al Qaeda, and about the

government's response to the massive hurricane that destroyed a good part of

New Orleans and many other places as well. Oprah's website featured an

encouragement to "Start recognizing the truth in government and media with

seven ways to start thinking critically." Oprah didn't claim to have come up with

the seven tips herself. She had Dr. Roy Peter Clark of the Poynter Institute, a school for journalists and journalism students, provide the tips. Clark was also in the front row during the program to answer questions like "how can we get back to critical thinking?" Of course, such a question assumes we were once there and have lost our way. I'm not so sure we've ever been there, but in any case the tips from Dr. Clark are good tips. I realize that Oprah Winfrey is the master of the good story and the anecdote that substitutes for serious analysis. In less than an hour, she can turn a minor tale of something like "road rage" into a candidate for admission into the Diagnostic and Statistical Manual of Mental Disorders. She can help women win baseless lawsuits just by parading a few sick ladies across the screen and note that they all had breast implants. Of course, she is just one of many in the mass media who play on fear and use questionable authorities and statistics to back up allegations of plagues and epidemics of everything from road rage to internet addiction. But like I said, let's give credit where credit's due.

The focus of the Oprah show was on an important intellectual trait of a critical thinker: *being skeptical and inquisitive regarding claims made by government agents, the media, and corporations*. The critical thinker's worldview should include awareness that many people are trying to manipulate our thoughts and actions. It should also include awareness that all of us are prone to *self-deception*. I doubt that Oprah thinks of herself as a manipulator, but that's what she is on many of her shows. Like all of us, she doesn't like it when she's been manipulated, as she felt she was by James Frey who tried to pass off a work of fiction as an autobiography. As I said, I don't want to demean Oprah

because we're all manipulators and we're all self-deceived at times. We should be thankful for at least one or two programs where she is obviously hammering home the importance of getting the truth rather than some feel-good story about angels or spirits or some weepy story that arouses the amygdala without stimulating the frontal lobes.

Anyway, some of the tips she gave for thinking critically about politics are worth repeating. (I've reduced and modified the list for brevity's sake. E.g. Get active. Don't get your reality from TV.) For example:

1. Get multiple viewpoints. Read or listen to people on the right, the left, and in the middle.

2. Find a role model whom you trust and has a reputation for courage and honesty and isn't always toeing the party line.

3. Surround yourself with people who like vigorous conversation rather than shouting matches.

4. Don't be afraid to suspend judgment at times. You don't always have to have an opinion on every hot-button issue that comes down the pike. It's okay to say "I don't know."

5. Be a skeptic but not a cynic. Don't be afraid to doubt claims that are made without support. Ask questions. But don't stereotype politicians or journalists. Don't assume that they are all liars or intentionally biased. Don't be gullible. Make others provide reasons and evidence for their claims. The skeptic says, "That doesn't sound right to me. Show me the

evidence." The cynic says "you politicians and journalists are all liars. I

don't trust anything you say."

This advice is all well and good, but how much impact did it have? How much

impact *could* such a program have? You can't be a critical thinker for a day and

then move on or back to things as they used to be. If you don't follow up in a

relentless way, all will be forgotten when the next pack of celebrities or politicians

bursts into the spotlight.

On a follow-up program, Oprah read some email she'd received regarding

the show on Truth in America. Some thanked her for encouraging people to

question authority and some criticized her for not standing behind the President.

She then showed a clip of Fox commentator Bill O'Reilly describing Oprah as

having gone over to the dark side with the far-left liberal secular progressives for

encouraging people to be critical of the Bush administration and for promoting

Frank Rich's biased book. Oprah responded by inviting O'Reilly to be a guest on

her show. She said she was surprised he accepted. He said "I may be an idiot

but I'm not stupid." He made it clear that he was there to sell copies of his own

biased book. In his book, and on the Oprah show, O'Reilly claims that there are

two kinds of people in America: those like him who love and cherish the

traditional values of America and the "secular progressives." There would be no

discussion of critical thinking. It was back to Oprah as usual, which, I think we all

know, is what her audience wants. Even so, I think we should be thankful for

small favors and at least when Oprah talked about critical thinking, she was in

fact talking about *critical thinking*, not the promotion of her own spiritual or political worldview.

Overall, she covered a few lessons from Kahane's book, the ones on manipulation of the mass media by politicians, corporations, celebrities, and anybody else who might be in the news. She may have appeared to have contradicted her own advice about thinkers and screamers when she invited O'Reilly on the show, but the advice is still good advice. Can we really blame her for not encouraging her viewers to devote their lives to examining their basic assumptions and start questioning their own worldviews? How long would her show last if she repeatedly warned her audience that they might be wrong about almost everything they believe and exhorted them that until they're willing to subject their own basic beliefs and values to a thorough, fair-minded evaluation, they're not critical thinkers?

Still, I would have liked to have seen her use the opportunity to encourage her viewers to reflect on some fundamental issues in critical thinking. For example, she might have brought up the issue of groupthink, the fact that decision makers often make bad decisions when they surround themselves with people who are afraid to rock the boat by bringing in information and ideas that might conflict with what they think the boss wants or what they think the group closest to the boss wants. Decision making has a moral dimension: the more important the decision and the more people it affects, the more moral responsibility the ones making the decision have to make sure they make the best decision possible under the circumstances. The decision to go to war or not

is monumental and requires the highest of fair-minded and reflective thinking on the best evidence available. Making a decision and sticking with it is not nearly as important as making sure that the decision is justifiable, especially if the decision impacts the lives of thousand of others. All views, even those that contradict the consensus view, should be heard.

I would have liked to have seen Oprah or Dr. Clark bring up the issue of evaluating evidence, especially eyewitness testimony and photographic evidence. They might have reviewed the dangers of accepting either at face value. Eyewitnesses are not always reliable. Some of them might have ulterior motives in reporting what they do. They might be mistaken in their interpretations of events. Their intentions might be good, but their intelligence might be faulty. Photos might be interpreted in multiple ways.

They might have brought up *wishful thinking* and *self-deception* and how those two psychological factors affect all of us and have to be constantly guarded against, lest they lead us to disastrous decisions that have to be rationalized again and again after our original justification has been shown to be flimsy and unsubstantial.

At the end of the day, however, we have to realize that Oprah's job is entertainment, not education. At least on this one show her heart was in the right place. She was encouraging people to be *independent* thinkers. She was encouraging them to not just follow the party line or accept what politicians, the national press, or celebrities say. She encouraged her audience to be fair-minded and get a variety of viewpoints on issues. She advised them not to reject

outright views that don't jibe with their own. There are, of course, other things of interest besides politics, but these strategies would apply to many other fields. Those of us who teach critical thinking should be grateful that at least for one day Oprah made our jobs a little easier.

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As I mentioned above, I developed a definition of critical thinking based on Robert Ennis's definition. Mine goes like this: ***Critical thinking is thinking that is clear, accurate, knowledgeable, reflective, and fair in deciding what to believe or do.***

The definition and the strategies mentioned earlier can be applied in many subject areas for developing curricula aimed at teaching critical thinking. I've applied this model of teaching critical thinking to three kinds of classes at the college level: in introductory philosophy courses where I use Socratic dialogue as the main teaching tool, the general course in logic and critical thinking, and a content-focused class that applies critical thinking to scientific studies of the paranormal.

I didn't know it when I started my teaching career but I was teaching critical thinking in my introduction to philosophy course and in my introduction to logic course. I didn't know it because the expression was not in vogue in 1974. It became a popular buzz word in California after November 1, 1980, when Glen Dumke, the Chancellor of the California State University and Colleges (as they were then called), issued an executive order regarding General Education-Breadth graduation requirements for the CSU system. It ordered that graduates

"will have achieved the ability to think clearly and logically [and] to critically examine information…." Dumke made it clear that he meant a lot more by the expression "critical thinking" than just "being critical" or identifying common fallacies in reasoning. Dumke wrote:

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

Similar requirements quickly followed for the California Community Colleges. Philosophy departments were ecstatic. This looked like a Full-Employment for Philosophers Act, since the requirements it laid out are the core topics in logic and other philosophy courses. Community college philosophy departments would benefit because many of our students transfer to the state universities. Our introduction to philosophy course and our introduction to logic course were both immediately accepted by the CSU campuses as satisfying the new critical thinking requirement.

Even though our intro to logic course fit the definition of critical thinking that the CSU Chancellor had presented, that definition would not hold the center. Faculty in many departments began meeting and reflecting on "critical thinking" and its relation to their courses. Sonoma State University, in addition to sponsoring several international conferences on critical thinking, set up The Center for Critical Thinking. A movement had begun, textbooks were rewritten and several new texts came out that identified themselves as critical thinking texts. New courses were designed and old courses were redesigned. It was either adapt or die for our intro to logic course. It gradually became a critical thinking course and is now called Logic and Critical Reasoning instead of Introduction to Logic.

Basic introductory courses in philosophy allow me to explore with my students some interesting topics in areas like metaphysics, epistemology, ethics, philosophy of religion, and philosophy of science. Since I consider Socrates to be a model critical thinker, it is natural for me to use the Socratic method when exploring issues like free will and determinism or the existence of God. Students quickly learn that I'm not interested in *what* they think or what their *opinion* is on anything. Anybody can think and have an opinion, but what matters to me as a teacher of critical thinking is *what reasons you have for thinking what you do* and *can those reasons stand up to scrutiny?* If a student tells me that she really likes the argument from design, I'll ask her why. And when she tells me that it *just makes sense to her* or that *she can't believe that everything just happened randomly and that there's no rhyme or reason to anything and our lives are*

meaningless, she is not going to be allowed to sit down with a smile on her face to the accepting nods of the other students, all of them content with their belief having been eloquently stated by their comrade. It's my job to ask her questions that might prod her into thinking critically about the problem before us: we've got this universe and it seems to be governed by what we call laws of nature and we're wondering how it got here, how it got to be the way it is, and what our place in the scheme of things might be. One possibility is that it was designed by some sort of powerful creator for some reason known perhaps only to the creator-being. The student thinks that the alternative to this possibility is that the universe came into being randomly and has no purpose and neither does her life or that of anyone else. It's my job to ask her questions that attempt to get her to realize that the alternative isn't a totally "random" universe (there are laws of nature, after all) and that living a meaningful life is not necessarily connected to whether the universe as a whole has any purpose. I must ask her questions to try to get her to clarify her concept of this designer. I'm not there to affirm her worldview nor am I there to bust it up. I'm there to try to get her to examine it and clarify it and understand it better so that she has a more rational understanding of what it is she's saying. Ultimately, I want her to be able to rationally defend whatever philosophical position she takes. As a human being, I care what beliefs my students have. But as a critical thinking teacher, I don't care what their positions are. What I care about is how they defend them.

Socrates made people clarify their claims and he asked questions that didn't just reveal flaws in those claims, such as contradictions or questionable

implications. He also raised the question as to what else is possible. He might get Euthyphro to say that piety is doing what pleases the gods and then get him to see that it's possible piety means something else altogether. Socrates represents the critical thinking disposition: he's *open-minded, inquisitive,* and *skeptical.* This disposition is essential to the ability to see and consider alternatives, one of the fundamental skills of a critical thinker.

Socrates is also a model for how critical thinkers are sometimes poorly received by the general public and those in power. People who question authority, who aren't afraid to say what's on their minds even if it's unpopular, who challenge traditional beliefs and customs, who rock the boat and don't go along with the crowd, are not usually popular figures. I think critical thinking teachers should try to get students to understand the value to society of people like Socrates, as well as the benefit that comes to the individual from being an independent thinker.

In addition to Socratic modeling, another useful technique for stimulating critical thinking is to pose outrageous scenarios for the students to reflect on. For example, after discussing various arguments regarding free will and determinism, I'll ask the students to consider the following: if you had the power to implant every person in society with a chip that would make it impossible for them to do evil, would you do it? You can define evil any way you want. Would you do it? Consider the consequences of your action and the assumptions you are making. What would society be like? What would human beings in your society be like? Would you do it? Remember, I tell them, we're always talking about getting rid of

evil, of stopping crime, of ending rape, child molestations, and war. You can do it with the flip of a chip. Would you do it? Defend your answer. As a critical thinking teacher, I don't really care what answers they give or how eloquently they express themselves. I care about the *reasons* they give for their answers. Can they justify whatever positions they take? (This exercise also serves to prepare them for the so-called 'problem of evil' when we get to arguments for and against believing in God.)

The general philosophy class is fun and it allows me to challenge students to think about their thinking, to analyze, evaluate, and advocate arguments. The Socratic method of demanding clarification and encouraging cross-examination can be used at many levels and in many different kinds of courses. Even so, I prefer teaching the Logic and Critical Reasoning course. If I had my way, students wouldn't be allowed to take introduction to philosophy or ethics or many other lower division classes until *after* they'd passed the logic and critical thinking course. In the general critical thinking course, students are taught the basics of argument evaluation. If they knew those basics, most of them would do a lot better in their philosophy courses. These basics can be taught in many content area classes, but they take time and the more time spent on such matters, the less time there is for covering the content of the course.

In the general critical thinking course, in addition to teaching various critical thinking skills and emphasizing the importance of the *attitude* or *disposition* of the critical thinker, I get to spend a good deal of time reviewing some of the major obstacles to critical thinking and some of the things that limit

our ability to be successful at fair-minded, reflective thinking about beliefs and actions. Many of these topics could be and are covered in psychology and other classes. I've written about many of these affective, cognitive, and perceptual biases and illusions on my website, The Skeptic's Dictionary. A list of them may be found in the entry on *hidden persuaders*

(*http://www.skepdic.com/hiddenpersuaders.html*).

It's important that students understand why they can't take experience at face value and why they should be open to alternative explanations for their own and other people's experiences. I'm able to bring this point home most effectively in my *critical thinking about the paranormal* course. In that course, we explore the nature of anecdotal evidence and why scientists have tried to study the paranormal under controlled conditions that are repeatable. We study the history of psi research (a short version of which I have published online at

http://www.skepdic.com/essays/psihistory.html) to discover errors and attempts at correcting those errors in research methods that have occurred over the past century and a half. We also examine what are considered the best scientific evidence for the paranormal: the ganzfeld telepathy studies and the PEAR micro-PK studies. We also examine the best of the healing prayer studies and Gary Schwartz's so-called *afterlife experiments*. (For a complete list of what we study, see the syllabus for the course, which is posted online at

http://www.skepdic.com/essays/phil322.html.)

In both the general critical thinking course and in the paranormal course the students learn the limitations of *anecdotal evidence* and the importance of

controlled studies. In the paranormal course, I spend an entire class period listening to anecdotes of the paranormal from students. To encourage them to be open-minded, in addition to having them read a number of entries from *The Skeptic's Dictionary,* I have them read Gary Schwartz's *The Afterlife Experiments* and Dean Radin's *The Conscious Universe,* which has a chapter with a number of vivid, detailed stories of paranormal experiences.

We review several anecdotes from Radin's text and from the students, who always have a few beauties of their own to share. I also share some of the stories people have shared with me over the years in response to my Skeptic's Dictionary website. We examine seemingly paranormal events and explore various alternative explanations. Yes, the event might be paranormal, but it might be *coincidence.* Or there might be some *physical* or *psychological* explanation for the event. Or there might be a *hoax* or *fraud* involved. For example, one student told the following story and we then discussed it in class. She and some friends were out for a drive in a car and they came to a stop behind another car. The group had been discussing the paranormal and one of them suggested they try to make the trunk on the car in front of them open up by using their minds to concentrate on making it happen. When the car in front of them started to move, to their surprise its trunk opened. One possibility is that they demonstrated psychokinetic powers. Another is that it was a coincidence, albeit a very unlikely one, that the trunk opened right after they had tried to open it with their mental intention. Another is that one of them consciously or unconsciously perceived that the trunk was open, which led her to consciously suggest that the group try

it. It would be farfetched, but it's possible that it was a hoax that involved either a conspiracy between one of the girls in the back car and somebody in the front car, or some sort of remote trunk opener operated by one of the girls in the car. It's also possible that the student telling the story made the whole thing up. After the students and I had discussed the various possibilities, I asked the one who told the story if she and her friends had tried it again on another car. If a second trunk had popped open when they concentrated on it, the coincidence probability diminishes to near zero and the hoax explanation gets much more complicated and less feasible. The psychological explanation in terms of unconscious perception gets pretty remote if the experiment is repeated soon after the initial test but on a different car. Had they tried it again and again, always with success, then the paranormal explanation would seem to move to the top of the list as the most plausible. Unfortunately, they didn't try it again. But a discussion of why they should have then led to a discussion of controlled experiments, why we do them, and how we might set one up to test psychokinetic powers.

One of my favorite activities in the paranormal course is pretending to be a scientist for a day. I wear a white lab coat, put signs on the classroom doors that say ESP EXPERIMENT GOING ON – PLEASE KEEP YOUR THOUGHTS TO YOURSELF, dim the lights, and recreate a pathetic version of the J. B. Rhine ESP card experiments.

Zener cards are easy to make. One deck consists of 25 cards, 5 of each of the following:
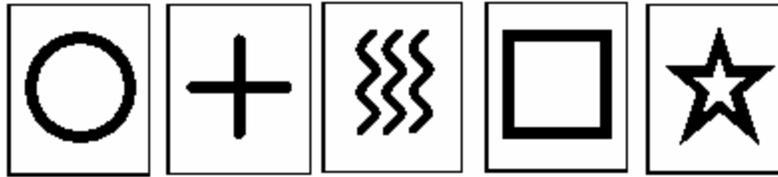
Here is a general description of the experiment:

The tests involve a sender and a receiver. The sender concentrates on the selected card while the receiver concentrates on trying to get information from the sender's mind (telepathy) or from the card itself (clairvoyance).

Things I ask the students to consider about setting up this experiment:

1. null hypothesis
2. physical layout
3. method of selecting cards to send, including randomization procedures
4. method of record keeping
5. number of trials
6. objective: what are we measuring and how are we going to measure it?
7. theoretical assumptions: concentration on sending and receiving data enhances psychic ability and scoring significantly greater than expected by chance (statistically) indicates ESP
8. problems: no way to distinguish clairvoyance from telepathy by this test; sensory leakage and cheating could also account for significant deviation from chance
9. documentation

Calculating chance odds:

With a deck of 25 cards, going through the deck with replacement (i.e., once a card has been selected it is returned to the deck), getting 5 correct (20%) would be about what we'd expect by chance. (We can't be *exactly* sure what would be expected by chance because pure chance is calculated by assuming an *infinite* number of tries.)

We predict that a group of people taking such a test would score at about chance level. For a run of 100 trials, we expect individual scores to range

between 12 and 28. (Here I bring in a colleague from the statistics department to explain why this is so.)

Our procedure:

We run two trials of 25 tries each, using a computer to generate the order of the cards the sender will concentrate on. I created 50 cards (out of ordinary 3 x 5 index cards and a black marker) to match the computer selections. We then ran two trials of 25 each with a Zener deck without replacement and without feedback (we just went right through the deck after shuffling them and did not tell the participants what cards were selected until the test was completed).

In one study, the results were: Overall, we had 22 participants who got a cumulative 431 correct out of 2,200 chances (19.6%). They got 15 more correct (3.5%) in the last 2 sets of trial (no computer).

The highest score was by a co-conspirator (an ethics teacher) who cheated her way to 56% correct. The highest score by a non-cheater was 25. The lowest was 14.

The cheater was signaled for three of the kinds of cards. Her score was 68% correct on three of the four trials. She could not see my signals in the third trial and only got 5 of 25 correct in that trial.

In our discussion session, we considered:

1. How might we explain the ethics teacher getting 56% when 20% was chance expectation?
2. How might we explain that one student got only 14% right and another got 25% right, if 20% is chance expectation?
3. What conclusion should we draw from our data?
4. How might we improve the design of the test?

§

Some might ask why we bother to teach critical thinking and why we care so much about encouraging rationality. Some might wonder why teachers of critical thinking sometimes act as if the future of civilization depended on rationality. Well, guess what? It does. As somebody—I think it was Stephen J. Gould—once said when asked if he realized that the forces of irrationality were winning: *maybe so, but imagine what it would be like if we did nothing.*

If *we* don't do it, who will?

If not now, when?

§

March 28, 2007

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§ Teaching critical thinking in the strong sense. It is important to reflect on the effects of egocentrism and ethnocentrism on our ability to think critically. Each of us evaluates what we perceive, read, or hear through the filter of our worldview and most of us tend to measure anything new by what we already believe and feel.