Psychology From Inquiry to Understanding Canadian 2nd Edition Lilienfeld Solutions Manual
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1/ PSYCHOLOGY AND SCIENTIFIC THINKING: A FRAMEWORK FOR EVERYDAY LIFE

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- Misconceptions About Psychology
- Are Psychologists Scientists?
- Can Science Answer This Question?

Web Resources

- Amoeba Web: http://vanguard.edu/faculty/ddegelman/amoebaweb/
- Centre for Psychology Resources: http://psych.athabascau.ca/html/aupr/psycres.shtml
- Psych Web: http://www.psychwww.com
- Psychology Central: http://psychcentral.com/
- Social Psychology Network: http://www.socialpsychology.org/
- Tests, Tests, Tests: http://www.queendom.com/tests

A. Psychology and Levels of Analysis

1. Psychology is difficult to define. In this text, we'll refer to **psychology** as what scientific psychologists do—study the mind, brain, and behaviour.
2. There are many **levels of analysis** within the psychology discipline. These include biological and sociocultural explanations for behaviour (**Figure 1.1, text p. 5**).
3. Each level of explanation tells us something different about the mind, brain, and behaviour. This text avoids emphasizing the extremes.

B. What Makes Psychology Challenging—And Fascinating

1. This text covers five challenges that psychologists face:
    a. Almost all actions are **multiply determined**, produced by many factors.
        i. We should be skeptical of **single-variable explanations** of behaviour.
    b. Psychological influences are rarely independent of each other.
    c. **Individual differences** help to explain why we respond differently to the same objective situation. This makes it difficult to develop explanations that apply to everyone.
    d. **Reciprocal determinism**: The fact that people mutually influence each others' behaviour.
    e. Behaviour is often shaped by culture.

C. Why We Can't Always Trust Our Common Sense

1. The way that we intuitively understand the world is frequently incorrect. Common sense is not always right!
    a. The adage "There's safety in numbers" is actually disproven by psychological research that shows that the more people present in an emergency, the less likely it is that people will help (Darley & Latané, 1968a, Latané & Nida, 1981, see Chapter 13).
    b. Common sense can lead us to believe things that, when examined together, appear contradictory.
        i. Birds of a feather flock together/Opposites attract.
        ii. Two heads are better than one/Too many cooks spoil the broth.
        iii. Actions speak louder than words/The pen is mightier than the sword.

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2. Naïve Realism: Is Seeing Believing?
    a. **Naïve realism** is the mistaken belief that we see the world as it really is (Ross & Ward, 1996).
    b. Our perceptions are not always wrong, but appearance can be deceiving.
        i. The Earth seems flat.
        ii. The sun seems to revolve around the Earth (**Figure 1.2, text p. 8)**.
    c. People who don't share our political views are biased, whereas we are objective. Research shows that we all tend to evaluate political issues with bias (Pronin, Gilvich, & Ross, 2004).
3. When Our Common Sense Is Right
    a. Our intuition can also be quite accurate (Gigerenzer, 2007; Gladwell, 2005; Meyers, 2002).
        i. Our snap judgments on the trustworthiness of someone we watched on a videotape are right more often than would be expected by chance (Fowler, Lilienfeld, & Patrick, 2007).
    b. Common sense can help us to generate hypotheses that scientists can later test rigorously (Redding, 1998).
    c. Learning to think scientifically teaches us when to trust our common sense and when not to. This helps us become better consumers of popular psychology and make better decisions in the real world.

D. Psychology as a Science

1. Science isn't a body of knowledge.
    a. Science is an *approach* to evidence, designed to prevent us from fooling ourselves.
2. What is a Scientific Theory?
    a. **Scientific Theory**—Explanation for a large number of findings in the natural world.
        i. Offers an account that ties multiple findings together.
        ii. Good theories do more than account for existing data. They generate predictions regarding new data not yet observed.
        iii. Testable predictions are termed **hypotheses**.
        iv. Testing hypotheses can lead scientists to provisionally accept the theory that generated the hypothesis, reject the theory outright, or revise it.
3. Science as a Safeguard against Bias: Protecting Us from Ourselves
    a. The best scientists are aware of their biases, or at least aware they have them.
    b. They also know that because of personal investment, they may bias the results unintentionally to make them turn out they way they want.
    c. **Confirmation Bias** is the tendency to seek out evidence that supports our hypotheses and neglect or distort evidence that contradicts them (i.e., *Seek and ye shall find*).
        i. Our preconceptions often lead us to focus on evidence that supports our beliefs, resulting in psychological tunnel vision.
            a. e.g., the Wason selection task (Wason, 1966) (**Figure 1.3, text p. 10**)
    d. Confirmation bias is the "mother of all biases."
        i. It can easily fool us into seeing what we want to see.
        ii. It is the most crucial bias scientists need to counteract.
        iii. Scientists differ from nonscientists in that the former use systematic safeguards to protect against confirmation bias, whereas the latter don't.

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e. Belief Perseverance.
    i. **Belief Perseverance** is the tendency to stick to our initial beliefs even when evidence contradicts them.
    ii. "Don't confuse me with the facts" effect.
    iii. Because none of us wants to believe we're wrong, we're usually reluctant to give up our beliefs.

E. Metaphysical Claims: The Boundaries of Science

1. **Metaphysical claims**—assertions about the world that are unfalsifiable.
    a. These claims include assertions about the existence of God, the afterlife.
2. This is not to say that metaphysical claims are wrong or unimportant.
    a. Many scholars believe questions concerning the existence of God are more significant than scientific questions.
    b. It is important to treat these questions with profound respect, regardless of our beliefs about religion.
    c. Testable claims fall within the province of science; untestable claims don't (**Figure 1.4, text p. 11**).

F. Recognizing That We Might Be Wrong

1. Good psychological scientists understand that they might be mistaken.
    a. Initial scientific conclusions are often wrong or off-base.
    b. Scientific knowledge is tentative and potentially open to revision.
    c. Continually revising and updating findings is a key process in science.

II. PSYCHOLOGICAL PSEUDOSCIENCE: IMPOSTERS OF SCIENCE (Text p. 12)

A. The Amazing Growth of Popular Psychology

1. On the positive side, the public has unprecedented access to psychological knowledge.
2. However, on the negative side, this increased popularity has led to a *misinformation explosion* because there's little quality control over what the industry produces.
3. Self-Help and Media
    a. There are approximately 3,500 self-help books published every year (Arkowitz & Lilienfeld, 2006).
        i. But 95% of those books targeting psychological problems remain untested (Gould & Clum, 1993; Gregory, Canning, Lee, & Wise, 2004; Rosen, 1993).
        ii. Still, other self-help books may actually make certain psychological conditions worse (Haeffel, 2010; Rosen, 1993; Salerno, 2005).
    b. Fortunately, there are accurate sources of scientific information about human behaviour.
        i. Some books base their recommendations on solid psychological research; there are excellent media outlets that present high-quality information (e.g., *Scientific American Mind*; *Discover* magazine).
        ii. There are many websites that provide remarkable helpful information about a variety of topics related to psychology. (**Table 1.1, text p. 14**).

B. What Is Pseudoscience?

1. **Pseudoscience**—a set of claims that seems scientific but isn't.
    a. Pseudoscience lacks the safeguards against confirmation bias and belief perseverance that characterize science.
    b. It is troubling that many believe that pseudoscientific claims are correct even though scientific evidence for them is weak or essentially nonexistent.

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2. Many popular psychology claims are pseudoscientific. These include assertions regarding aliens, ghosts, and reincarnation.
    a. However, proponents of these claims don't follow the rules of science.
3. **Warning Signs of Pseudoscience**
    a. Several warning signs can help us distinguish science from pseudoscience (**see Table 1.3, text p. 15**).
        i. Exaggerated claims
        ii. Overreliance on anecdotes
        iii. Absence of connectivity to other research
        iv. Lack of review by other scholars or replication by independent lab
        v. Lack of self-correction when contrary evidence is published
        vi. Meaningless "psychobabble" that uses fancy scientific-sounding terms that don't make sense
        vii. Talk of "proof" instead of "evidence"
    b. The more of these signs that are present, the more skeptical of these claims we should become.
4. **Why Are We Drawn to Pseudoscience?**
    a. Our brains are predisposed to make order out of disorder and find sense out of nonsense.
        i. This is generally adaptive because it helps us simplify an overwhelming world.
        ii. But this tendency can also be misleading because we perceive meaningful patterns when they're not there.
    b. The Search for Meaningful Connections
        i. **Apophenia**—perceiving meaningful connections among unrelated phenomena.
            a. We might overlook the probability of two events happening at the same time (e.g., receiving a phone call from a friend right after you thought about him or her).
        ii. **Pareidolia**—seeing meaningful images in meaningless visual stimuli.
    c. Finding Comfort in Our Beliefs
        i. Many pseudoscientific claims give us comfort because they offer control over an unpredictable world.
        ii. According to terror management theory, the awareness of our inevitable death leaves many with an underlying sense of terror.
            a. Advocates of this theory propose that we cope with this fear by adopting cultural worldviews that reassure us that life possesses a broader meaning and purpose.
5. Thinking Clearly: An Antidote Against Pseudoscience
    a. To avoid being seduced by the charms of pseudoscience, we must learn to avoid commonplace pitfalls in reasoning.
    b. For a list of common logical fallacies—traps in thinking that lead to mistaken conclusions—see Table 1.4 (**text 19**).
    c. Three important logical fallacies:
        i. Emotional reasoning fallacy—error of using our emotions as guides for evaluating the validity of a claim.
        ii. Bandwagon fallacy—error of assuming that a claim is correct just because many people believe it.
        iii. Not me fallacy—error of believing that we are immune to errors in thinking.

C. The Dangers of Pseudoscience: Why Should We Care?

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1. Three major reasons we should be concerned:
    a. Opportunity Cost: What We Give Up
        i. Opportunity cost—investment of time, energy, and effort in a questionable treatment that can lead people to forfeit chances to obtain effective treatment.
    b. Direct Harm—pseudoscientific treatments occasionally do direct and dreadful harm to those who receive them.
    c. Inability to Think Critically as Citizens—An inability to think critically about a seemingly unimportant domain, such as astrology, can easily spill over to an inability to think critically about issues like global warming, genetic engineering, and stem cell research.
2. Pseudoscience matters. While not foolproof, scientific thinking is our best safeguard against human error.

III. SCIENTIFIC THINKING: DISTINGUISHING FACT FROM FICTION (Text p. 21)

Lecture Launchers

- Correlations and Causal Relationships

Classroom Activities, Demonstrations, and Exercises

- Can Science Answer This Question?
- Critical Thinking

A. Scientific Skepticism

1. **Scientific skepticism** is an approach of evaluating all claims with an open mind but insisting on persuasive evidence before accepting them.
    a. Scientific skeptics must adopt two seemingly contradictory attitudes.
        i. *First*, a willingness to keep an open mind to all claims;
        ii. *Second*, a willingness to accept these claims only after researchers have subjected them to careful scientific tests.

B. A Basic Framework for Scientific Thinking

1. Scientific skepticism is characterized by **critical thinking.**
    a. Critical thinking—a set of skills for evaluating all claims in an open-minded and careful fashion.
    b. This text emphasizes *six* principles of critical thinking.
    c. Throughout the text, whenever one principle arises in the discussion, a flag will be displayed in the margin to remind you of the principle (**Figure 1.7, text p. 23**).
2. Scientific Thinking Principle #1: *Ruling Out Rival Hypotheses.*
    a. Whenever we evaluate a psychological claim, we should ask ourselves whether we've excluded other plausible explanations for this claim.
3. Scientific Thinking Principle #2: *Correlation Isn't Causation.*
    a. One of the most crucial principles in this book—*correlations don't permit causal inferences*, or, in other words, *correlation isn't causation.*
    b. **Correlation-causation fallacy—**error of assuming that because one thing is associated with another, it must cause the other.
    c. **Variable—**anything that can *vary* across people, such as height, IQ, or extroversion.
    d. If two variables, A and B, are correlated, three major explanations can be given for this correlation.
        i. A -> B. First, it's possible that variable A causes variable B

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ii. B -> A. Second, it's possible that variable B causes variable A; here the "causal arrow" (the arrow connecting the two variables) is reversed.
iii. C -> A and B. In this third scenario, there's a third variable, C, that causes *both* A and B.
a. Third variable problem—a case in which a third variable causes the correlation between two other variables.
b. It's a "problem" because it can lead us to conclude mistakenly that A and B are causally related to each other when they're not.
c. Making matters worse, we may never have thought to measure "third variable" C in our study.

e. For example, in a recent study, researchers found that teenagers who listened to music with lots of sexual lyrics had sexual intercourse considerably more often than teenagers who listened to music with far tamer lyrics (Martino et al., 2006); in other words, listening to sexual lyrics is *correlated* with sexual behaviour.
i. It's indeed possible that music with sexual lyrics (A) causes sexual behaviour (B).
ii. It's possible that sexual behaviour (B) causes teens to listen to music with sexual lyrics (B).
iii. It's also possible that a third variable, like impulsivity (C), both causes teens to listen to music with sexual lyrics *and* to engage in sexual behaviour.

f. *The bottom line*: We should remember that a correlation between two things doesn't demonstrate a causal connection between them.

4. Scientific Thinking Principle #3: *Falsifiability.*
a. Philosopher of science Sir Karl Popper (1965) observed that for a claim to be meaningful, it must be **falsifiable,** that is, capable of being disproved.
b. For a theory to be meaningful, it *could* be proved wrong if there were certain types of evidence against it.
c. For a claim to be falsifiable, the proponent of the claim must state clearly *in advance,* not after the fact, which findings would count as evidence for and against the claim.
d. A key implication of the falsifiability principle is that a theory that can account for every conceivable outcome actually explains nothing.
e. A good scientific theory must predict only certain outcomes, but not others.
f. *The bottom line:* Whenever we evaluate a psychological claim, we should ask ourselves whether one could in principle disprove it or whether it's consistent with any conceivable body of evidence.

5. Scientific Thinking Principle #4: *Replicability.*
a. **Replicability—**the idea that a study's findings can be duplicated consistently; if they can't be duplicated, it's possible that the original findings were due to chance.
b. *We shouldn't place too much stock in a psychological finding until it's been replicated.*
c. The media are more likely to report initial positive findings than failures to replicate.
i. The literature on ESP offers an excellent example of why replicability is so essential (see Chapter 4).
a. Occasionally, a researcher reports a finding that seemingly

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confirms the existence of ESP, which inevitably garners media publicity.
b. Yet time and again, independent researchers haven't been able to replicate these tantalizing results (Gilovich, 1991; Hyman, 1989; Lilienfeld, 1999a).

d. *The bottom line:* Whenever we evaluate a psychological claim, we should ask ourselves whether the independent investigators have replicated the findings that support this claim; otherwise, the findings might be a one-time-only fluke.

6. Scientific Thinking Principle #5: *Extraordinary Claims Require Extraordinary Evidence.*
   a. According to Scottish philosopher David Hume, the more a claim contradicts what we already know, the more persuasive the evidence for this claim must be before we should accept it.
      i. e.g., a few scientists believe that some people are being lifted out of their beds, brought aboard flying saucers, and experimented upon by aliens, only to be returned safely to their beds hours later.
      ii. While alien abduction proponents *might* be right, and we shouldn't dismiss their claims out of hand, their claims are extraordinary and require substantial evidence.
      iii. Thus far, however, all that alien abduction proponents have to show for their claims are the self-critical reports of supposed abductees.
   b. *The bottom line:* Whenever we evaluate a psychological claim, we should ask ourselves whether this claim runs counter to many things that we know already and, if it does, whether the evidence is as extraordinary as the claim is.
7. Scientific Thinking Principle #6: *Occam's Razor*
   a. Also called the "principle of parsimony" (*parsimony means logical simplicity*).
   b. Occam's Razor—if two explanations account for a phenomenon equally well, we should generally select the more parsimonious one. Some scientists refer to Occam's Razor as the principle of KISS: Keep it simple, stupid!
   c. Occasionally the best explanation for a phenomenon is the most complex, not the simplest; but Occam's razor is a helpful rule of thumb, as it's right far more often than wrong.
      i. e.g., crop circles; thought by some to be created by aliens, were actually created by human pranksters.
   d. *The bottom line:* Whenever we evaluate a psychological claim, we should ask ourselves whether it is the simplest explanation that accounts for the data, or whether simpler explanations can account for the data equally well.

IV. PSYCHOLOGY'S PAST AND PRESENT: WHAT A LONG, STRANGE TRIP IT'S BEEN (Text p. 28)

Lecture Launchers

- Biographical Profiles
- Scandal in Psychology—John Watson's Fall from the Throne
- There Are Other Psychologies in the World
- Psychologists and Prescription Privileges
- Careers in Psychology

Classroom Activities, Demonstrations, and Exercises

- Psychologists' Twenty Questions

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Web Resources

- Archives of the History of American Psychology: http://www.uakron.edu/ahap
- Classics in the History of Psychology: http://psychclassics.yorku.ca/
- Today in the History of Psychology: http://www.cwu.edu/~warren/today.html
- APA—American Psychological Association: http://www.apa.org
- APS—Association for Psychological Science: http://www.psychologicalscience.org
- Division 3 of the American Psychological Association: http://www.apa.org/divisions/div3/
- Division 7 of the American Psychological Association: http://ecp.fiu.edu/APA/div7/
- Experimental Psychology Society: http://www.eps.ac.uk/
- Jean Piaget Society: http://www.piaget.org/
- Philosophy of Science Association: http://philsci.org/
- Psychonomic Society: http://www.psychonomic.org/
- Society of Clinical Psychology: http://www.div12.org/
- Society of Counseling Psychology: http://www.div17.org/
- Society of Experimental Social Psychology (SESP): http://www.sesp.org/
- Society for Personality and Social Psychology: http://www.spsp.org/
- Society for Psychological Study of Social Issues: http://www.spssi.org/
- Society for Research in Child Development: http://www.srcd.org/
- About Psychoanalysis: http://www.apsa.org/
- Mind and Body: Rene Descartes to William James: http://serendip.brynmawr.edu/Mind/Table.html
- *The Varieties of Religious Experience:* http://www.psychwww.com/psyrelig/james/toc.htm

A. Psychology's Early History

1. The section presents a description of psychology's road from nonscience to science (**Figure 1.8, text p. 29**).
2. For centuries, the field of psychology was difficult to distinguish from philosophy.
3. In the 1800s, the landscape of psychology changed dramatically.
    a. Wilhelm Wundt developed the first psychological laboratory in Germany.
    b. Wundt used a technique called **introspection**, which required trained observers to reflect and report on their mental experiences.

B. The Great Theoretical Frameworks of Psychology

1. Five major theoretical perspectives have played an important role in shaping contemporary psychology—structuralism, functionalism, behaviourism, psychoanalysis, and cognitivism.
    a. Each perspective consists of valuable contributions to psychology, and each has limitations (**Table 1.5, text p. 30**).
2. Structuralism: The Elements of The Mind
    a. Edward Bradford Titchener (1867–1927), a student of Wilhelm Wundt, founded structuralism.
    b. **Structuralism**—school of psychology that aimed to identify the basic elements, or "structures," of psychological experience.
    c. Using Wundt's method of introspection, structuralists dreamed of creating a comprehensive map of the elements of consciousness.
    d. Two major problems with structuralism emerged.
        i. First, highly trained introspectionists often disagreed on their subjective reports.
        ii. Second, Oswald Kulpe showed that subjects asked to solve certain mental problems engage in *imageless thought*—thinking unaccompanied by conscious experience.

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        a. This dealt a serious blow to structuralism because it demonstrated that some important aspects of human psychology lie outside of conscious awareness.
    e. Structuralism emphasized the importance of systematic observation to study the conscious experience.
3. Functionalism: Psychology Meets Darwin
    a. **Functionalism**—school of psychology that aimed to understand the adaptive purposes of psychological characteristics.
    b. Founded by William James, who rejected structuralists' approach and methods. James coined the term "stream of consciousness," to describe the ever-changing elements of consciousness identified using the structuralist approach.
    c. Functionalists were influenced by Darwin's theory of natural selection, which emphasized that many physical characteristics evolved because they were useful for organisms.
    d. Functionalists believed that this theory applied to psychological characteristics as well.
    e. This school of thought maintained that psychologists should act as "detectives," figuring out the evolved functions that psychological characteristics serve for organisms.
    f. Functionalism does not exist in its original form, but has been gradually absorbed into mainstream scientific psychology.
4. Behaviourism: The Laws of Learning
    a. **Behaviourism**—school of psychology founded by John B. Watson that focused on uncovering the general principles of learning underlying human and animal behaviour.
        i. For Watson, the proper subject matter of psychology was observable behaviour. Subjective reports of conscious experience should play no part in psychology.
        ii. Watson believed that all behaviours were products of a handful of basic learning principles (see Chapter 6).
        iii. Watson believed that behaviour can be comprehended by exclusively focusing outside of the organism, rewards and punishments delivered by the environment.
    b. Traditional behaviourists see the human mind as a *black box*—we know what goes into it and what comes out of it, but we needn't worry about what happens between the inputs and outputs.
    c. Behaviourism has left a long-lasting stamp on scientific psychology.
        i. By identifying the fundamental laws of learning that help explain human and animal behaviour, behaviourists placed psychology on firmer scientific footing.
5. Cognitivism: Opening the Black Box
    a. **Cognition**—mental processes involved in different aspects of thinking.
    b. Cognitivists argued that our thinking affects our behaviour in significant ways.
        i. Jean Piaget argued that children conceptualize the world quite differently than do adults (see Chapter 10).
        ii. Ulric Neisser led the argument that thinking is so central to psychology that it merits its own separate discipline.
    c. Cognitivists believe focusing solely on rewards and punishments from the environment is inadequate in explaining human behaviour because that approach neglects our *interpretation* of those reinforcers.

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i. It is important to understand how people evaluate information to understand the causes of their behaviour.
ii. Humans also learn by *insight*—grasping the underlying nature of problems (see Chapter 8).

d. Cognitive psychology is a thriving approach.
i. Its reach addresses a variety of domains, including language, problem solving, concept formation, intelligence, memory, and psychotherapy.
ii. This approach has also helped us to better understand the physiological bases of thinking, memory, and other key mental functions.

6. Psychoanalysis: The Depths of the Unconscious
a. Founded by Viennese neurologist Sigmund Freud, **psychoanalysis** focuses on internal psychological processes, especially impulses, thoughts, and memories of which we are unaware.
i. Freud argued that the primary influences on behaviour are unconscious drives, especially sexuality and aggression.
b. Psychoanalysts suggest that our everyday psychological lives are filled with symbols—things that represent other things.
i. The goal of psychoanalysis is to decode the symbolic meaning of our dreams, psychological symptoms, and slips of the tongue—also known as *Freudian slips*.
ii. Psychoanalysts also put considerable emphasis on the role of early experience. They believe that core of personality is molded in the first few years of life.
c. The controversy surrounding psychoanalysis:
i. Some critics insist that psychoanalysis slowed the progress of scientific psychology because it focused on unconscious processes that are nearly impossible to verify.
ii. On the other hand, some psychoanalytic claims, like the assertion that a great deal of mental processing occurs outside of our conscious awareness, have been supported by scientific research.

C. The Multifaceted World of Modern Psychology

1. The Growth of a Field
a. There are approximately 500,000 psychologists worldwide. There are many thousands in Canada alone.
i. The Canadian Psychological Association (CPA), founded in 1939, is Canada's largest association of psychologists. CPA has more 6,000 members today.

2. Types of Psychologists: Fact and Fiction
a. **Table 1.6** (**text p. 34**) describes a few of the most important types of psychologists whose work is described in this book.
b. Though the field is broad and remarkably diverse, most psychologists rely on the scientific method to generate new findings in basic or applied research.

D. The Great Debates of Psychology

1. The Nature–Nurture Debate
a. The Nature–Nurture debate asks the following: *Are our behaviours attributable mostly to our genes (nature) or to our rearing environments (nurture)?*
i. This debate is especially controversial in the domains of intelligence, personality, or psychopathology.

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ii. Early thinkers like John Locke (1632–1704) likened the human mind at birth to a blank sheet of paper.
    b. Later thinkers referred to the mind as a *tabula rasa*—a blank slate.
    c. Locke and followers thought that we're shaped exclusively by our environment.
    d. For much of the 20th century, psychologists assumed all behaviour was a product of learning.
iii. Research by *behaviour geneticists* shows that most psychological traits, including intelligence, interests, personality, and mental illnesses, are influenced substantially by genes.

b. Current Status of the Nature–Nurture Debate
    i. Most agree that both genes and the environment play a crucial role in most human behaviour.
    ii. There is still a great deal to learn about how much nature or nurture contributes to different behaviours and how the two work together.
    iii. Nature and nurture sometimes interact in complex and surprising ways.

c. Evolutionary Psychology
    i. **Evolutionary psychology**, also called sociobiology, is a discipline that applies Darwin's theory of natural selection to human and animal behaviour.
        a. William James and other functionalists believed that many human psychological systems, like memory, emotion, and personality, serve key adaptive functions—to help the organism survive and reproduce.
        b. Believed that, based on principles forwarded by Darwin, natural selection favored certain mental traits.
        c. Fitness—the extent to which a trait increases the chances that organisms that possess this trait will survive and reproduce at a higher rate than competitors who lack it.
            1. By surviving and reproducing at higher rates than others, more fit organisms pass on their genes more successfully to later generations.
            2. Early humans with some degree of anxiety probably survived at higher rates than those who lacked it, because anxiety is essential: It warns of us impending danger.
        d. Criticisms of evolutionary psychology
            1. Theories are difficult to test because behaviours don't leave fossils.
            2. Theories are difficult to falsify, even when testable.
        e. Evolutionary psychology has the potential to be an important unifying framework for psychology.

2. The Free Will–Determinism Debate
    a. The free will–determinism debate asks: *to what extent are our behaviours freely selected rather than caused by factors outside of our control?*
        i. Most of us believe that we are free to do what we want whenever we want.
        ii. Many psychologists suggest that free will is a powerful illusion.

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a. B.F. Skinner argues that our sense of free will stems from the fact that we aren't consciously aware of the thousands of subtle environmental influences impinging on our behaviour at any given moment.

E. How Psychology Affects our lives (Text p. 37)

1. Basic versus Applied Research
    a. **Basic research** examines how the mind works, whereas applied research examines how to use basic research to solve real-world problems.
        i. In most large psychology departments, there is a healthy mix of investigators whose work ranges from the study of the human brain and learning to helping people cope with the psychological burden of cancer.
2. Applications of Psychological Research
    a. Psychological research affects our everyday lives.
        i. New fire trucks are often the colour lime-yellow because psychological researchers found that lime-yellow objects are easier to detect in the dark (American Psychological Association, 2003; Solomon & King, 1995).
3. Thinking Scientifically: It's a Way of Life
    a. Learning to think scientifically will help you make better decisions.
    b. The scientific thinking skills learned in this chapter can assist you in successfully navigating the bewildering world of popular psychology and popular culture.
    c. Throughout this text and in life, "Insist on evidence."

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CHAPTER 1

Learning Objectives

On completion of this chapter, students should be able to

1.1 explain why psychology is more than just common sense (text p. 6);

1.2 explain the importance of science as a set of safeguards against biases (text p. 9);

1.3 describe psychological pseudoscience and distinguish it from psychological science (text p. 13);

1.4 identify reasons we are drawn to pseudoscience (text p. 16);

1.5 identify the key features of scientific skepticism (text p. 21);

1.6 identify and explain the text's six key principles of scientific thinking (text p. 23);

1.7 identify the major theoretical frameworks of psychology (text p. 30);

1.8 describe different types of psychologists and identify what each of them does (text p. 34);

1.9 describe the two great debates that have shaped the field of psychology (text p. 35);

1.10 describe how psychological research affects our daily lives (text p. 37).

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Chapter 1: Rapid Review

Popular psychology makes many assumptions regarding human behaviour. Despite the popular acceptance of various assumptions, they are quite often refuted by scientific literature. Often our common assumptions are the result of naïve realism or the belief that the world is at it appears. This **naïve realism** is further exasperated by the exponential growth of psychological issues in the media (books, magazines, the internet) wherein it is becoming increasingly difficult to differentiate proper scientific findings from misinformation. It is important, therefore, to take a scientific approach when evaluating information, to think critically and guard against pseudoscientific claims.

Science is an approach we use to find answers and not simply a collection of facts. In general, scientists should approach research with a willingness to share information with other scientists and to objectively evaluate the evidence. Scientists may intentionally, or unintentionally, design, distort, or interpret the evidence of their research to confirm their own beliefs. This could extend into belief perseverance wherein beliefs are upheld despite evidence contradicting the belief. Key to preventing these biases is a perspective that no research finding is permanent and that the results are often revised, updated, or proven incorrect.

Given the increasing amount of popular psychology information available to us, critical thinking skills are essential to evaluating the validity of various psychological claims being made. Attitudes of scientific skepticism rely on the insistence of persuasive evidence to be given before a claim is accepted. In evaluating, or being skeptical of, psychological claims, six principles of critical thinking are elucidated in the chapter. The first is to be critical of extraordinary claims. The more counter-intuitive the claim, the greater the evidence is required to support the claim. The second is **falsifiability,** the concept that all claims should be capable of being disproved. The third principle, **Occam's Razor,** simply states that the simplest explanation amongst many is often the correct one. The fourth principle, **replicability,** states that an independent researcher following comparable methodologies to the original claim should duplicate the findings. The fifth principle entails the ruling out of alternative, rival, hypotheses. It is not enough to find support to our hypotheses. We also have to insure that there are no other plausible or even better explanations than our own. The final principle is that correlational findings are not explanations with predictive power. The skeptic must be vigilant regarding third variable explanations.

Also, scientific findings can be obfuscated by pseudoscientific and metaphysical claims. Pseudoscience is when a set of claims seems scientific but in fact is not. Metaphysical claims are unfalsifiable assertions. There are several warning signs of pseudoscientific claims. When (1) evidence critical of a claim is explained away by loopholes or excuses *(ad hoc immunizing hypotheses*), or (2) there is overwhelming evidence that a claim is false and yet it continues to remain, (3) when there are grossly exaggerated claims, (4) when anecdotes rather than evidence is provided, (5) when there isn't a rigorous peer review process as is common amongst scientific papers, (6) when there is a tenuous or complete disconnect between the claim and the existing scientific literature and, lastly, (7) when there is an abundance of 'psychobabble' wherein a lot of obtuse, confusing language is used to explain the details of a claim.

Despite the various ways in which we can guard against pseudoscientific beliefs, most of us are drawn to some of these beliefs. It is suggested that it is a reliance upon our default system of experiential thinking (i.e. intuitive, gut-level judgments) over our rational (i.e. careful reasoning and objective analysis) thinking. We especially fall prey to pseudoscience when we are feeling a sense of existential anxiety and alleviate it by being lured into accepting supernatural forces (Transcendental temptation) that offer promises and explanations to comfort us. Underlying acceptance of pseudoscientific beliefs is a general lack of public knowledge on rudimentary scientific facts. Additionally, several cognitive factors contribute to these beliefs. Gazzaniga (2002) contends that our left hemisphere functions as an interpreter whose job it is to find meaning in random data. We often have a tendency to see meaningful images amongst meaningful stimuli (pareidolia) and to see meaningful connections amongst related phenomena (apophenia). Several logical fallacies in psychological thinking also predispose us to psychoscientific beliefs. We often use our emotions to evaluate whether a claim is true. If a claim is congruent with our

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beliefs, we feel happy; conversely, when a claim is incongruent we feel angry and may refute it. We believe claims that are popularly supported are more likely to be true. We can frame a claim to be binary, that is, to be either one thing or another. By oversimplifying an issue it negates alternate, often competing, explanations. Lastly, there is a common perceptual error that we feel we are immune to biases and errors in reasoning and therefore can accurately assess the validity of a claim without further inquiry.

A lack of vigilance toward pseudoscientific claims can have dangerous repercussions. Individuals suffering from a mental health disorder and receiving treatments based on pseudoscientific claims over scientifically proven results may deprive themselves of necessary and efficacious treatment. Animals can also be affected by fallacious claims just as much as humans. Public ignorance of pseudoscientific claims about animals may result in needless over-hunting of these animals with little benefit to the human. At times pseudoscientific claims can have direct and lethal harm to individuals who fall prey to treatments that are grossly inaccurate and unsubstantiated by proper scientific research.

Given the damage that pseudoscientific claims can have on individuals, it is important to take a scientific approach when evaluating information, to think critically about the information we receive and guard against pseudoscientific claims despite our tendency to buy into these ideas.

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▼LECTURE LAUNCHERS AND DISCUSSION TOPICS

- How Do We Know What We Know?
- Pseudopsychology and the Mozart Effect
- Biographical Profiles
- Scandal in Psychology—John Watson's Fall from the Throne
- There Are Other Psychologies in the World
- Psychologists and Prescription Privileges
- Careers in Psychology

Lecture/Discussion: How Do We Know What We Know?

How do you know that
John A. MacDonald was the first prime minister of Canada?
You really have a stomach?

Dependence on observation is one of the hallmarks of science, but it is not the only way humans acquire knowledge. There are, in fact, many questions that cannot be answered by scientific methods and for which other means of acquiring knowledge are more appropriate. Begin by asking the following questions.

- How do you know that John A. MacDonald was the first prime minister of Canada?
- How do you know that you really have a stomach?
- What makes you so sure the sun will rise tomorrow?
- How do you know the colour of the shirt I'm wearing?
- How can you be sure that there aren't little creatures inside computers that are responsible for the things computers do?
- Are you sure you don't have a big hole in the back of your pants or skirt?

Authority is one source of knowledge. We know, or believe, that MacDonald was the first prime minister because we trust the authority of historians and history books. During the centuries that Western civilization was dominated by the Church, the authority of holy writings was believed to be the only dependable way of knowing.

Reason was considered by Renaissance scholars to be the most reliable source of knowledge. If you say, "All humans have stomachs; I am human; therefore, I have a stomach," you have used deductive reasoning. If you say, "The sun rose today, yesterday, the day before yesterday, and for as long as I or anyone can remember; therefore, it will rise tomorrow," you are using inductive reasoning.

Observation is still another way of acquiring knowledge. You know the colour of my shirt because you can see the shirt. You assume that you do not have a hole in the posterior of your clothing because you have not observed stares and giggles.

One might use any of these ways of knowing to deny the existence of little creatures in computers. People you perceive to be authorities about computer innards may have told you how they work. You may have reasoned that creatures need nourishment and there is no food supply inside microprocessors. Or you may have looked inside a computer and failed to see little creatures waiting to solve your problems. But there is no way one can absolutely refute the computer-creature hypothesis; so if you want to keep your computer running, maybe you should find out what the little creatures eat.

All these ways of knowing—authority, reason, and observation—are used by scientists, but observation

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must be the basis for knowledge that is scientific. Science puts greater emphasis on evidence provided by the senses than on authority of others or reasoning. Science relies on empirical evidence.

An extension of this activity might involve a discussion of some of the following contradictory beliefs:

Birds of a feather flock together .....Opposites attract
Absence makes the heart grow fonder ..... Out of sight, out of mind
You can't teach an old dog new tricks.....Never too old to learn

Often students will have anecdotal stories about each belief. Ask students to think about their beliefs from an empirical point of view. You may want to facilitate discussion by providing students with the following questions:

Can you rely on one person's account to believe in a phenomenon?
How might each set of beliefs be tested empirically?
When will you "believe" in a certain phenomenon?

Lecture/Discussion: Pseudopsychology and the Mozart Effect

Before discussing pseudoscience, ask students about their impression of the so-called Mozart effect. Most students have heard of the general phenomenon and have seen advertisements and CDs of music "designed to increase your children's IQ." Bring in a magazine advertisement and read from it, touting the merits of the product. Ask students if they believe it, and if they would buy the product. Probe them by asking what "proof" they would need that the product actually works. Usually, students will begin to question the merits of the product, at which point you can discuss the actual psychological findings of this moneymaking gimmick by summarizing the work of Steele, Bass, and Crook (1999).

Pseudoscience quite literally means "false science." Its "claims [are] presented so that they appear scientific even though they lack the supporting evidence and plausibility" (Shermer, 1997, p. 33). Furthermore, pseudoscience appears to use scientific methods and tries to give that "science-y" impression. Some characteristics of Pseudoscience include the following:

(http://www.pseudoscience.org)

1. associates itself with true science
2. relies on and accepts anectdotal evidence
3. sidesteps disproof
   - any possible outcome is explained away
   - a theory is not a good theory if it can explain everything because it can never make specific predictions
4. dangerously reduces complexity to simplicity (to a consumer society)

Ask students why the Mozart effect would be considered pseudoscience based on the four aforementioned characteristics. Have students give other examples of possible pseudoscience such as graphology, palmistry, aromatherapy, and quite arguable Eye-Movement Desensitization and Reprocessing (EMDR).

There is an excellent video clip entitled "Paper Personality" by *Scientific American Frontiers* that shows the downfalls of graphology, and a companion website for teaching activities related to graphology:

http://www.pbs.org/safarchive/4_class/45_pguides/pguide_802/4482_paper.html

"Paper Personality" (Running time: 8:46). Chedd-Angier Productions (1997). *Scientific American Frontiers: Season VIII: Beyond Science?* Episode 2 of 5. [Television series episode]. Available to purchase: http://www.shop.pbs.org

View online: http://www.pbs.org/saf/archive.htm (Keyword: paper personality)

Steele, K.M., & Bass, K. E., & Crook, M. D. (1999). The mystery of the Mozart effect: Failure to replicate. *Psychological Science, 10*, 366–369.

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Shermer, M. (1997). *Why people believe weird things: Pseudoscience, superstition, and other confusions of our time.* New York: W. H. Freeman & Co.

Lecture/Discussion: Biographical Profiles

Wilhelm Wundt (1832–1920)

Born in Neckarau, Germany, Wilhelm Wundt was the fourth child of a Lutheran minister. Despite coming from a family that boasted numerous scholars, scientists, and physicians, Wundt initially was not a good student. After he dropped out of one high school, a teacher suggested that a reasonable goal for Wundt would be a career in the postal service. Wundt's scholastic abilities improved, however, and in 1855 he graduated at the top of his class in medical school. Wundt then went to Berlin to study physiology with Johannes Müller, and he subsequently decided to become an experimental physiologist himself. Wundt then returned to the University of Heidelberg, where he worked as an assistant for Herman von Helmholtz. It was at Heidelberg that Wundt taught his first course in psychology. The year was 1862.

In 1879, at the University of Leipzig, where he held a chair in philosophy, Wundt established the Institute for Experimental Psychology, the first laboratory whose formal purpose was the scientific investigation of the human mind. Wundt is one of the most prolific contributors to the field of psychology. It is estimated that between the years of 1853 and 1920, Wundt wrote 53,735 pages of text. Wundt was not only a voracious writer; he was also responsible for training numerous researchers, some of whom, such as Edward Titchener, brought versions of Wundt's psychology to America.

Sigmund Freud (1856–1939)

Sigmund Freud was born in Pribor, Czechoslovakia, in 1856. Although Freud was a gifted student, it took him eight years to finish his medical degree at the University of Vienna, partly because he was interested in so many topics. Freud first pursued a career as a neurologist, but financial concerns forced him into general medical practice. In cooperation with his friend Joseph Breuer, Freud began to treat hysterical women. This is unusual, because at the time there was no known cure for hysteria, which is now known as a conversion disorder. Through trial and error and feedback from their clients, Breuer and Freud developed the technique known as psychoanalysis. Its fundamental rule is honesty; clients must relay all thoughts and feelings uncensored to the analyst. Clients then follow their stream of thought wherever it may lead, a process known as free association. In the course of free association, clients often uncover traumatic events in the past, and, upon reliving these events, often experience relief from their symptoms. Freud's first major work, *The Interpretation of Dreams* (1900), detailed the process of dream interpretation, which he felt was the "royal road to the unconscious." Although it took six years to sell the first 600 copies printed, this work was reprinted eight times during Freud's lifetime.

Although the technique of psychoanalysis is perhaps Freud's most important legacy, he made many other substantial contributions to psychology. These include the recognition of the importance of sexuality and unconscious processes, a fully developed system of personality, and an appreciation for the conflict between individual desires and the constraints of society. His work has influenced so many aspects of our thinking that he is often not given full credit for the development of his ideas. Freud's many detractors are quick to point out that his theories are not based on empirical research. While this is true, just because they lack empirical evidence does not mean that they are wrong, only that they are less likely to be right. Because of the breadth of his intellectual contributions, he remains the most cited psychologist in *Psychology and Life, 16th Edition,* and most comparable texts.

William James (1842–1910)

William James, often considered the father of American psychology, was born in New York City, but spent much of his childhood traveling between the United States and Europe, where he attended several private schools. James' interest in such varied fields as philosophy, religion, and science were cultivated at home in an enriched environment shared with his brother Henry James, the famous author. William

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James struggled to find a vocation that mated his various interests, trying his hand at art (his paintings have appeared on the cover of recent editions of *American Psychologist),* chemistry, and, finally, medicine. He received his M.D. from Harvard in 1868.

In 1872, James began teaching physiology at Harvard but was preoccupied by his ongoing and deep interest in such philosophical issues as free will and determinism. Though James considered himself a temporary dabbler in the discipline of psychology, his two-volume textbook, *Principles of Psychology* (1890), stood as the field's definitive textbook through the first half of this century. It is still considered one of the best-written texts on psychology and a source of many original ideas. James' contributions to psychology include the notion of a stream of consciousness, the importance of habit and instinct, a complex theory of the self, a theory of emotion, and opening the boundaries of psychology to include topics such as religious beliefs.

B. F. Skinner (1904–1990)

Burrhus Frederic Skinner was born and raised in Susquehanna, Pennsylvania and received a bachelor's degree in English from Hamilton College in New York. Skinner enrolled in the experimental psychology program at Harvard and studied under E.G. Boring, earning his masters degree in 1930 and Ph.D. in 1931. In 1936, he began his academic career at the University of Minnesota; then, in 1945, he took a position as chairman of the psychology department at Indiana University. In 1948, however, Harvard offered him a position, which he accepted, and he remained there for the rest of his life. Skinner died of leukemia in 1990.

While Skinner was at Harvard, he was heavily influenced by the work of John B. Watson. From this influence, Skinner dedicated his life's work to studying the relationship between reinforcement and observable behaviour. Throughout his career, he insisted that psychology be a scientific, empirically driven discipline. He is considered by many to be one of the most important figures in twentieth century psychology, and his contribution to both clinical and experimental psychology is evident in the work of psychologists who followed his lead, and to this day, extend his work in associative learning research. The principles of reinforcement that he outlined were built on by clinical psychologists and applied to the conceptualization and treatment of mental disorders. The application of behaviourism to clinical psychology was not short-lived, as empirically supported treatments for anxiety disorders (e.g., panic disorder, simple phobia) and child conduct problems are based upon behavioural principles.

Lecture/Discussion: Scandal in Psychology—John Watson's Fall from the Throne

John B. Watson was a very famous man in his day—something many students never realize, as he usually gets only a few short paragraphs in introductory psychology texts. In fact, at the end of his career in psychology he was an esteemed professor at the world-renowned Johns Hopkins University in Baltimore, Maryland. At one time, he was recognized as an authority on caring for babies, much as Dr. Spock and Dr. Brazelton would later become household words. He was married, a father, and respected in his field.

All of that ended when he was fired over his affair with a beautiful and intelligent graduate student, Rosalie Rayner. Mary Watson, the wronged wife, insisted that the affair stop, as did Watson's employers. But neither Watson nor Rayner wanted the affair to end, and finally Johns Hopkins insisted that he resign. The subsequent divorce from Mary was front page news at the time.

Lecture/Discussion: There Are Other Psychologies in the World

While introductory psychology books have enough to cover without taking on the whole world, it is important to remember that Western Psychology is not the only game in town. All cultures have implicit

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or explicit psychological theories, theories of how the mind works, that have been developing for thousands of years. Some, like Mayan theories, were almost completely lost after their cultures were all but wiped out by European invaders. Others, like Tibetan Abhidharma, are written down, have continued to develop, and have found overlap with Western psychological traditions.

Tibetan Psychology
APA Monitor: http://www.apa.org/monitor/dec03/tibetan.html

Japanese Psychology
http://web-jpn.org/links/education/academic/psychology.html
http://www.todoinstitute.org/
Morita Therapy: http://www.morita-therapy.org/

Lecture/Discussion: Psychologists and Prescription Privileges

During discussions about the various mental health professions, I usually mention the great debate regarding prescription privileges for psychologists. Students are fascinated by the political and public dissention caused by this movement. They tend to understand the desire of the psychiatrists to "protect their turf," yet they also understand how prescription privileges could improve psychological services to clients. A detailed discussion of the topic is found in the APA Monitor article referenced below.
http://www.apa.org/monitor/apr02/newmexico.html

Lecture/Discussion: Careers in Psychology

In a mad rush to begin covering the tremendous amount of material in introductory psychology, many instructors overlook more practical issues that would be of interest to introductory students, especially those who think they might major in psychology. It's never too early to introduce students to psychology as a profession, and even students who do not major in psychology are bound to gain a greater understanding and appreciation for the field. After discussing the various subfields of psychology, devote some time (perhaps a class session) to issues pertaining to psychology as a career choice. There are a variety of activities and topics you could introduce, and several suggestions are given here.

Give your students the "straight dope" about graduate school—how to get in, what it's really like, and what opportunities it affords. Tell students how you got interested in your major field and what life in graduate school was like. Explain degree plans (including how many years it takes, what is expected in the way of course work and research), funding opportunities (many students are surprised that teaching and research assistantships actually cover most graduate school expenses), and research and teaching opportunities. Bring in the latest edition of APA's Guide to Graduate Study in Psychology and give an overview of its purpose. Briefly outline for students what they should be doing during each year of their undergraduate career if they are interested in going to graduate school (e.g., when to study and take the GRE, when to send for applications, when to get research experience, when to ask for letters of recommendation). Encourage students to seek out a close relationship with a faculty member whose research interests coincide with theirs.

Finally, discuss career opportunities in psychology. Show either of two excellent APA-produced videos, *Careers in Psychology: Your Options are Open* (a brief, 9-minute segment that features a panel of psychologists from different specialties discussing career opportunities) or *Career Encounters in Psychology* (a longer, 28-minute segment that provides an overview of the diverse specializations and careers in psychology through interviews with several different types of psychologists). Have someone from your career counseling center give a talk on opportunities for psychology majors (he or she may also

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have data on the current employment status of recent psychology graduates). Better yet, invite to class (a) a psychologist from an applied setting (e.g., a clinician in private practice, an industrial/organizational psychologist, a sports or forensic psychologist) and (b) a psychologist who works in an academic setting (this could be you, another faculty member at your college or university, or someone outside your institution) to talk about career opportunities and experiences.

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▼CLASSROOM ACTIVITIES, DEMONSTRATIONS, AND EXERCISES

- Misconceptions About Psychology
- Can Science Answer This Question?
- Assignment: Critical Thinking (with sample syllabus and grading rubric)
- Psychologists' Twenty Questions

Activity: Misconceptions About Psychology

One of the most popular and venerable activities for the introductory course is the administration of a Test of Common Beliefs and subsequent discussion of misconceptions about psychology. Although a new 65-item multiple-choice test was developed by McCutcheon (1991), the most popular test is the Test of Common Beliefs developed by Vaughan (1977). Vaughan's test, however, has been criticized for the ambiguity of some of the items (Brown, 1984; Gardner & Dalsing, 1986; Ruble, 1986), the fact that all items have "false" as the correct response, which may lead to a response set tendency (Vaughan, 1977), and the finding that many of the items are not really misconceptions since they are often correctly answered (Gardner & Dalsing, 1986; Lamal, 1979). Griggs and Ransdell (1987) compared responses to Vaughan's Test of Common Beliefs from students that had taken an introductory psychology course in high school to those of several other studies (Lamal, 1979; Gardner & Dalsing, 1986; Vaughan, 1977). Using a criterion of at least a 50% error rate for an item (that is, they were answered as "true"), they identified 15 questions that met the criterion in at least two studies and had not been subject to earlier criticisms of ambiguity. These items are ordered from highest to lowest with respect to their average error rate. You can administer these items to your class and use the responses as a starting point for a discussion on common sense notions and misconceptions about psychology. You may want to note to your students that many of these items are also answered incorrectly by psychologists and other social scientists (see Gardner & Hund, 1983). You can also tell your students that the correct answers to many of these items are discussed in their textbook.

Brown, L. T. (1983). Some more misconceptions about psychology among introductory psychology students. *Teaching of Psychology, 10*, 207–210.
Brown, L. T. (1984). Misconceptions about psychology aren't always what they seem. *Teaching of Psychology, 11*, 75–78.
Gardner, R. M., & Dalsing, S. (1986). Misconceptions about psychology among college students. *Teaching of Psychology, 13*, 32–34.
Gardner, R. M., & Hund, R. M. (1983). Misconceptions of psychology among academicians. *Teaching of Psychology, 10*, 20–22.
Griggs, R. A., & Ransdell, S. E. (1987). Misconceptions tests or misconceived tests? *Teaching of Psychology, 14*, 210–214.
Lamal, P. A. (1979). College students' common beliefs about psychology. *Teaching of Psychology, 6*, 155–158.
McCutcheon, L. E. (1991). A new test of misconceptions about psychology. *Psychological Reports, 68*, 647–653.
Ruble, R. (1986). Ambiguous psychological misconceptions. *Teaching of Psychology, 13*, 34–36.
Vaughan, E. D. (1977). Misconceptions about psychology among introductory psychology students. *Teaching of Psychology, 4*, 138–141.
Reprinted from Hill, W. G. (1995). Instructor's resource manual for *Psychology* by S. F. Davis and J. J. Palladino. Englewood Cliffs, NJ: Prentice Hall.

Activity: Can Science Answer This Question?

Students are asked to identify whether specific questions can be addressed using the methods of science. The student handout is included as **Handout Master 1.1.** This is a good exercise to follow-up to the **Lecture Topic** in this chapter **How Do We Know What We Know?** Suggested answers and explanations are listed below.

1. No. The question as stated is vague and the terms are not defined. What does "bad" mean? (Good and bad are value judgments.) Who or what is "society"? Bad for whom? However, specific correlates and consequences of abortion can be studied.

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2. Yes. The independent variable would be "before or after eating" and the dependent variable would be talkativeness, which could be operationally defined (e.g., as the length of replies to questions).
3. Yes, so long as the variables are operationally defined. The independent variable would be jogging versus not jogging (or perhaps the frequency or duration of jogging); the dependent variable would be some measure of mental attitude, such as scores on a psychological test.
4. Yes. This question requires only the computation of a correlation between doctors' GPAs in medical school and their subsequent incomes. Such variables as "years in practice" would have to be controlled and a representative sample would have to be selected.
5. No, probably not; it would be a little like comparing apples and oranges. Physiological measures of emotional strength would not be useful because there is not always a relationship between physiological arousal and subjective experience, and because love tends to be a more enduring emotion than anger.
6. Yes. The independent variable would be "bottle-fed versus breast-fed." The dependent variable would be alertness, which would have to be operationally defined in behavioural terms. If babies were randomly assigned to the two groups, the study would be an experiment. If the researcher used babies whose mothers had already made the decision about feeding method, the study would be correlational, and inferences about cause and effect could not be made.
7. No. "Moral" is a broad, vague term that means different things to different people. Moreover, many unanticipated economic, political, and social developments could affect the outcome. Even if "moral" could be defined adequately, and projections from current trends and conditions could be made, the results might turn out to be meaningless, because definitions of morality change over time. What is "moral" in the 1990s might not be moral in 2020, and vice versa.
8. No. The subjects would be very uncooperative!

Assignment: Critical Thinking

Many instructors look for new ways to incorporate critical thinking into the classroom. The sample syllabus, addendum (see **Handout Master 1.2**) and rubric for grading (see **Handout Master 1.2 Part 2**) were produced by Dr. James Oliver at Henry Ford Community College. The materials provide a sample of how to incorporate a critical thinking assignment in an introductory psychology class.

Activity: Psychologists' Twenty Questions

Play the game, Twenty Questions, with your students to have them try to guess your specialization in psychology. They should be very close to your actual interests by the end of the game. Explain how and why you selected your particular field or specialty in psychology. You might also draw students' attention to the information in Chapter 1 about possible careers for psychology majors. You may also want to mention the need for more minorities and individuals from working class backgrounds in the field, if such information would be appropriate for your students. Encourage them to visit the APA website (http://www.apa.org) or the CPA website (http://www.cpa.ca).to find out more about psychology careers.

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▼HANDOUT MASTERS

- Handout Master 1.1 Can Science Answer This Question?
- Handout Master 1.2 Critical Thinking Exercise: Sample Syllabi
- Handout Master 1.2b Critical Thinking Exercise: Rubric

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Handout Master 1.1

Can Science Answer This Question?

Psychology is an empirical science; that is, its knowledge is obtained through observation, experimentation, and measurement. Some questions cannot be answered empirically and are, therefore, outside the realm of science.

Decide whether scientific research can answer the questions below and respond "yes" or "no" to each question. Do not try to answer the question itself. Just say whether or not scientific research can, in principle, address the question. Briefly explain why each question is, or is not, a good candidate for scientific inquiry.

For the questions that can be studied scientifically, identify what the independent and dependent variables would be in the experiment.

1. Is abortion on demand bad for society?

2. Do people talk more after they have eaten than they do when they are hungry?

3. Does jogging lead to a positive mental attitude?

4. Are the incomes of doctors related to the grades they make in medical school?

5. Which emotion is stronger, love or anger?

6. Are breast-fed babies more alert than bottle-fed babies?

7. Will people be more moral in the year 2020 than they are now?

8. Are people who commit suicide sorry after they have done it?

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Handout Master 1.2

SAMPLE SYLLABUS FOR INCLUSION OF CRITICAL THINKING COMPONENT

Introductory Psychology

Syllabus and Course Calendar, Winter Semester, 2006

INSTRUCTOR: James E. Oliver, Ph.D.; **OFFICE:** xxxx **PHONE:** xxxxxx
OFFICE HOURS: MWF xxxxxxx; TR 9xxxx
email: xxxxxxx

COURSE DESCRIPTION

The course description is presented in the current catalog as follows: "Introduces elementary concepts and principles related to the scientific study of behaviour and the mental processes of cognition and affective states. Variables examined include the history of psychology, the scientific method, theory, biological foundations, psychological processes related to cognition and affective states, developmental changes over time, and applications related to healthy and unhealthy personalities." There is no course prerequisite.

TEXT AND MATERIALS

Text: Lilienfeld, Scott O., et al., *Psychology: From Inquiry to Understanding*, Second Canadian Edition. Pearson Canada Inc., Toronto, Canada.

Paul, R. and Elder, Linda. *The Thinker's Guide for Students on How to Study and Learn a Discipline using Critical Thinking Concepts and Tools*. 2003, The Foundation for Critical Thinking, Dillon Beach, CA.

Paul, R. and Elder, Linda. *A Miniature Guide to the Foundations of Analytic Thinking*. 2003. The Foundation for Critical Thinking, Dillon Beach, CA.

Materials: Scripts, exercises or topics will be used as content for essay papers or class assignments. Video will be used to supplement the text. In this regard, a few students indicate a desire to view more video related material than can be presented in class. Two excellent series—one of eight, one-hour tapes entitled "The Brain," and another of nine, one-hour tapes entitled "The Mind," may be viewed in the Listening Center in the Library.

The major core course objectives are behaviour/performance demonstrations of knowledge in the cognitive and affective domains requiring each student to identify and/or think critically about a representative sample of the facts, concepts, theories, and applications of the text content presented in the course calendar below. The specific learning and assessment objectives for each chapter are presented in the text.

Students will write a critical thinking essay following the model presented by Paul and Elder in their many publications. The essay will be based on an exercise requiring each student to make a self-analysis of their three psychological domains in each of five variables related to academic achievement.

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ASSESSMENT OF ACADEMIC ACHIEVEMENT

A combination of grades on writing assignments, tests, critical thinking, and the final examination will be used to assess your total class performance.

A. Chapter Tests—(Maximum Value = 350 points): A multiple choice test will be given the last day, devoted to the study of each of the chapters. Each test will include 15 questions representing the major learning objectives for the current chapter and 12 additional questions from previous chapters. **Your lowest test score will be dropped. If you miss a test, that will be your lowest grade dropped. The maximum value of each test is 25 points. You must provide a scantron answer sheet and a No. 2 pencil.**

A "Makeup" test will be given on the first day of return to class and then only if the reason for absence is excusable. Questions for a makeup test will be computer generated by random selection from the total pool of items in the test bank and will generally be different from those given on the scheduled test date.

B. Critical Thinking Essay: (Total Maximum Value = 80 points): As described in the addendum to this syllabus, critical thinking and its expression in writing has become a very specific educational objective demanded by those who support our educational institutions by allocation of tax dollars and by those who provide accreditation required for Henry Ford Community College to function as an educational institution.

   The critical thinking essay is due XXXXX but may be submitted early. If submitted late, five points will be deducted for each class day of late submission.

C. Final Examination: (TOTAL MAXIMUM VALUE = 100 POINTS): The final examination will be comprehensive and the same for all students taking this course. One hundred multiple-choice questions will be presented with a maximum value of 100 points. Grades will be curved so the average score of my three classes will be 80.

D. Final Grade Determination: The final grade will be calculated as a percent of the total available points achieved as follows:

90% or more = A
80–89% = B
70–79% = C
60–69 % = D
59% or less = E

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COURSE CALENDAR

Deviation from the calendar presented below is not anticipated in the absence of extenuating circumstances requiring the cancellation of class:

DATES	CHAPTERS AND ASSIGNMENTS
January 9 **11, 13, 18, 20**	**Orientation** **A. <u>Psychology and Scientific Thinking and Research Methods</u>:** **1. Read article, "Why Should We Redefine Instruction." Read from text, "Introduction" and chapter major concepts, "What Is Psychology?" and "Psychology Then: The History of Psychology."** **2. Read major concepts, "Psychology Now: Modern Perspectives," and "Types of Psychological Professionals."** **3. Read major concepts, "Psychology: The Science."** **4. Read balance of chapter and begin Paul and Elder "Analytic Thinking."** **Complete parallel portions of the Study Guide for the text.**
23 **25, 27, 30**	**B. <u>The Biological Psychology</u>:** **1. Read text major concepts: "An Overview of the Nervous System" and "The Central Nervous System—The Central Processing Unit."** **2. "The Peripheral Nervous System—Nerves On the Edge" and "Peeking Inside the Brain."** **3. Read balance of chapter and continue with Paul and Elder's books.**
February 1, **3, 6, 8**	**C. Sensation and Perception**
10, 13, 15	**D. Learning**
17, 20, 22	**E. Memory**
24, 27, & March 1	**F. Memory**
March 3, 13,15	**G. Language, Thinking, and Intelligence**
17, 20, 22	**H. Human Development**
24, 27, 29	**I. Emotion and Motivation**
31 & April 3, 5	**J. Stress, Health, and Sleep**

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April 7, 10, 12	**K. Social Psychology**
14, 17, 19	**L. Personality**
21, 24, 26	**M. Psychological Disorders**
28 & May 1	**N. Psychological and Biological Treatments**

OTHER POLICIES:

A. Attendance: Attendance policy is presented in the College Catalogue. It states, in part, as follows:

> "No system of 'cuts' operates at Henry Ford Community College. Students are expected to attend all the sessions of the classes for which they are enrolled. Penalties may be imposed, at the discretion of the individual instructor, whenever absence or tardiness has affected the quality of the student's work. Students, as a matter of courtesy, should explain the reason for an absence to their instructor. Lack of attendance may affect the student's final grade."

B. Withdrawal/Drop: Policy related to Changes in Schedule is presented in the College Catalogue. It states, in part,

> "…A student may officially drop a class without penalty until the end of the tenth week during the fall and winter semesters and the fifth week during the spring and summer semesters. A DR will be recorded on the student's transcript. If a student stops attending a class without officially withdrawing from the class, the instructor may record either an E or DR grade." (Underline added). In accordance with this policy, I will give withdrawals after the tenth week a DRop grade, providing the student's cumulative grade is passing at the time of withdrawal; a grade of E if the cumulative grade is failing.

C. Dishonesty: A policy relating specifically to academic dishonesty is presented in the College Catalogue. Become familiar with the behaviours that may result in course failure.

ADDENDUM TO THE SYLLABUS: CRITICAL THINKING

INTRODUCTION

Historically, educators have emphasized the importance of critical thinking and have assumed with substantial certitude such thinking was a "natural outcome" of higher education. Today, we not only question the validity of this assumption but also believe teaching and learning can accelerate the frequency and quality of this assumed natural outcome. For this reason, emphasis on critical thinking as a specific learning objective is quite new, and efforts are being made nationally to incorporate it into essentially all formal educational curriculums.

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Teaching and learning about critical thinking is a required learning objective in this course. The design for the achievement of this learning objective incorporates three related purposes.

1. The first purpose is learning how to think critically by analyzing and assessing any content, subject, or domain.

2. The second purpose is to enable each student to generate and quantify information about the three psychological domains associated with five achievement-related variables. The resource for this purpose is attached as Exhibit A.

3. The third purpose is to apply the learning acquired in fulfilling the first purpose and to acquire personal insight by writing a critical thinking essay as an eight-part assessment of the content generated in fulfilling the second purpose.

Exhibit A is attached as a format for generating the total information or content to be used in writing the critical thinking essay. Part I is designed to enable you to generate observations about your three psychological domains—behaviour, cognition, and affective states—as they operate in five variables associated with achievement in the academic setting—study, motivation to complete college, selection of a college major and career goal, family responsibility and support, and support from instructors and counsellors. Part I is to be summarized quantitatively in Part II, enabling you to assess the relative strengths of the three domains and the five variables.

Psychological Domains: Most introductory texts present the definition of psychology as the "…scientific study of behaviour and mental processes." Behaviour is observable in what people do or say. Mental processes include cognition and affective states and can only be inferred by observations of behaviour.

- Behaviour occurs as a result of interaction of the mind and body and is observable in the threshold actions people take and in the sounds they make.
- Mental processes are divided into two broad categories—cognition and affect.

    - Cognition occurs when the brain and body interact to acquire, store, retrieve, and use information acquired from experience with the world. While the mental processes of cognition are not directly observable, they may be inferred from observable behaviour.
    - Affective states occur when the brain and body interact to produce feelings, moods, and emotions. Affect is also not directly observable, but inferred from behaviour.
        - Feeling is activated as a sensation only by the sense of touch. Other feelings are experienced as a broad range of psychological perceptions such as satisfaction, fear, anger, love, joy, guilt, suspicion, uncertainty, or sympathy.
        - Mood is used in the study of abnormal behaviour to refer to disordered thought of either a depressive or euphoric nature. In our daily lives, we think of mood as atypical of our usual overall feeling tone, such as, "I am having a great/bad day."
        - Emotion is produced when feelings activate involuntary changes in the body, enabling it to become more responsive to demands placed on it by a threat to life, or by other physiological or psychological stressors.

It is important to understand the three psychological domains do not operate in isolation. Each is part of a larger system and functions both individually and interactively to provide motivation. For example, someone was motivated to generate this assignment. As it was typed, the principal domain was psychomotor (behaviour). Yet, it was completed with feeling (affect) about the content and the rationale for developing it. Further, there was a necessity for knowledge (cognition) related to the subject of critical thinking, to

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sentence structure, spelling, and punctuation. We infrequently, if ever, function from a single domain. The three interact in some way.

Observations: As you complete Part I, Exhibit A, you are required to think like a researcher. You are to generate information introspectively and describe your most typical behaviour, cognition, and affective states related to each of the five achievement-related variables. You will be using the case study method with a sample of one for whom you are the world's expert observer. The following are examples of observations related to each of these domains for the variable "study."

+	–	
		Behaviour
(x)	( )	1. For each hour of class, I allocate two hours of time for study.
( )	(x)	2. I do not study. I just review summaries before exams.
		Cognition
( )	(x)	1. I often think attending college is a waste of time.
(x)	( )	2. I remember best when I focus total attention on my study.
		Affect
( )	(x)	1. I become depressed when there is too much studying to do.
(x)	( )	2. I am enthusiastic about the new ideas presented in my book.

These three sets of observations provide one effective (+) and one ineffective (–) statement as specified by the "x" in the parenthesis. As you record your introspective observations, use an "x" to indicate your assessment of each as either effective or ineffective. Both may be effective, both ineffective, or one of each.

Note: If you consistently present one "effective" and one "ineffective" statement, it will be assumed you are not generating valid information. For example, if you should say, "I enjoy studying," and follow with the statement, "I hate studying," it will be clear you are completing the assignment with meaningless simplicity. To assure domain clarity, underline the verb causing each observation to fall into the domain of behaviour, cognition, or affective state.

Quantitative Summary: Part II of Exhibit A enables you to enter a quantitative summary of the effectiveness or ineffectiveness of your observations. Each cell in the table provides space for entering the number of effective and ineffective statements you have made. Space is provided for totals to facilitate your comparative assessment of the relative effectiveness in each of your three psychological domains and the five variables associated with academic achievement.

BACKGROUND INFORMATION

Paul and Elder (2003) have provided brief historical background for critical thinking and a current dictionary definition.

> The concept of critical thinking is not only embedded in a core body of research over the last 30 to 50 years but is also derived from ancient Greek. The word 'critical' derives etymologically from two Greek roots: 'kriticos' (meaning discerning judgment) and 'kriterion' (meaning standards). Etymologically, then, critical thinking implies development of 'discerning judgment based on standards.'
>
> In *Webster's New World Dictionary*, the relevant entry reads, "characterized by careful analysis and judgment" and is followed by the gloss: "*critical, in its strictest sense, implies an attempt at objective judgment so as to determine both merits and faults."* Applied to thinking, then, we might

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> provisionally define critical thinking as thinking explicitly aimed at well-founded judgment and hence utilizing appropriate evaluative standards in the attempt to determine the true worth, merit, or value of something.

It should be clear criticism embraces meritorious as well as adverse assessment. In their miniature guide, "How to Study and Learn," Paul and Elder provide their own definition of critical thinking:

> Critical thinking is the kind of thinking—about any subject, content, or domain—that improves itself through disciplined analysis and assessment. Analysis requires knowledge of the elements of thought; assessment requires knowledge of the standards for thought.

- Knowledge for disciplined analysis requires understanding and use of eight different elements of thought—purpose, question or issue, concept, information, assumption, inference, implication, and point of view. We do analysis by the separate assessment of each of these elements.

- Knowledge for disciplined standards requires understanding and use of the nine standards of thought—clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness. We use standards to present intellectually responsible and clearly understandable assessments of the true worth, merit, or value of each element.

- Knowledge requiring understanding represents the highest level of knowledge—and such understanding causes an effect. When we truly understand, we can express thinking in a way enabling others to re-create our meaning; to understand what we meant to communicate.

The greatest limit placed on thinking is ignorance. However, knowledge may be minimal or maximal as described by the words—know, comprehend, and understand.

- To know is to be aware of something as a fact or truth—minimal knowledge.

- To comprehend is to know something thoroughly and to perceive its relationships to certain other ideas, facts, or information.

- To understand is to be fully aware not only of the meaning of something and its relationship to other ideas, facts, or information, but also its total implications and significance.

THINKING AND REASONING IN ASSESSMENT

Much of our thinking is extemporaneous and does not require reasoning and well-founded judgment to assess the true worth, merit, or value of a subject, content, or domain. Critical thinking does. Reasoning is the glue of critical thought; it is an independent or causative variable having the effect of shaping the rationale of assessment. A reason is a statement supporting the cause, the effect, or the motivation for any element of critical thinking. Descriptions of cause, effect, or motivation enable the reader or listener to place information into context, to re-create with greater precision the meaning intended by the speaker or author. It can often be enhanced by an example.

- Causative reasoning requires disclosure of thought underlying assessment of any content, subject, or domain as having merit or the lack of merit. It responds to the questions of what and why. This is true whether we are assessing our own or someone else's behaviour, cognition, or affective state. Remember, the three psychological domains are highly interactive; each may contribute to cause and description of it. "The reason I think this is…" "An example of this occurred last year when…"

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- Effect reasoning requires disclosure of the result or consequence, the power of ideation to produce anticipated or unanticipated results. For example, were your purposes(s) fulfilled by this assignment? If not, explain why.

- Motivational reasoning requires disclosure of change or anticipated change in thinking, feeling, or behaviour associated with analysis of new information.

Consider the First Two Elements: Purpose and Question or Issue:

- As you address the first element—purpose—any comment you make about your purpose for writing this essay must be supported by a reason if it is to have meaning to the reader.

    - The reason may be associated with cause (how or why it caused you to think about critical thinking, per se, about your psychological domains, or your achievement-related variables;
    - with effect (how it caused you to think new or different thoughts regarding these issues),
    - or with motivation (how it changed your feeling of "need" to think differently about critical thinking or the issues associated with this assignment).

- Without question, the major issues in critical thinking are "analysis" and "standards." Therefore, as you address Element 2, "Question or Issue," you must present your assessment of the following:

    - What causes us to feel a "need" for analysis (to break into separate parts) of any subject, content, or domain?
    - Why should we adhere to standards when we assess?
    - How does compliance with analysis and standards impact your motivation to speak or write in a way enabling others to better re-create your thought?

The description of cause, effect, and/or motivation places any element of critical thinking into context. The standards of thought about each of the eight elements will be met only when placed in context; when the listeners or readers are able to re-create the meaning intended by the speaker or author.

SOME MISCELLANEOUS THOUGHTS ABOUT THINKING

What Is, and What Limits Thinking? Thinking is not a novel idea. Although we do it all the time when we are awake, we probably think about thinking with low frequency. Thinking is an automatic biological activity of the brain providing us with consciousness or awareness. Our consciousness or awareness structures what we consider our personal reality. We think when we behave—what we do or say; we think when we engage in cognition—when we learn and when we use our learning; and we think when we engage in affective states—feelings, moods, and emotions. When we think about the analysis and assessment of thinking, it is like cutting a knife with a knife. Each of us uses our brain to decide and communicate what is happening in our brain.

What Causes Thinking? The automatic biological activity we have named "thinking" is a response caused by either, or both, external or internal stimuli. The external cause of thinking is stimulation of the brain by the basic senses of sight, sound, touch, taste and smell. The senses translate physical and chemical energy from the environment into a form the brain can translate as a representation of our reality.

The internal causes of thinking are both sensory and self-stimulated. For example, some sensations are internal in nature—such as pain, our sense of orientation, and our sense of balance. Self-stimulated or automatic thinking is produced by mental manipulation focused on memories of the past, awareness of the

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present, or thought about the future. We think about not only what was, is, or could be, but also what could have been, may be now, or what might be in the future. The late Carl Sagan estimated the average adult possessed long-term memory equivalent to about 10 billion pages of encyclopedic information. Therefore, we have a profound resource for thinking about our life history; the activity, situation, or context of the moment; or about the immediate or distant future.

What Makes Thinking Critical? By their definition, Paul and Elder emphasize we may think critically about anything—any subject, content, or domain—provided our thinking is improved by disciplined analysis and assessment.

How Do We Discipline Analysis and Assessment? The concept of analysis requires the separation of any subject, content, or domain into its constituent building blocks or elements with an understanding of the relationships and differences between them. For example, the science of chemistry has allowed us to identify some 120 elements constituting the "matter" of our world. Few chemical elements exist in isolation. They are mixed or synthesized with other elements and called compounds. But we know how to separate compounds. For example, we know two parts of hydrogen and one part of oxygen (H_2O) synthesize to become water. We synthesize chemical elements in thousands of ways to make equally thousands of products.

The thinking inherent in the language constituting a subject, content, or domain is like a chemical compound. We must identify and assess each element of the compound if we are to fully re-create the meaning of the author or speaker. Elemental assessments are the component parts of critical thinking. Their integration not only explains the cause and effect relationship; they also influence the behavioural dynamic called motivation.

Unlike chemists, Paul and Elder have not used science, but have used creative thinking, to identify a "family" of eight elements whose sequential assessment of any subject, content, or domain is the spoken or written articulation of thought. We discipline thinking by analyzing the subject, content, or domain in a way revealing the full intentionality of the communication of the speaker or writer. The concept of assessment has the general meaning of officially estimating the value of property for purposes of sale or taxation. Assessments are arbitrary and of limited value in the absence of standards for evaluation or judging the meaning and the merit, or lack of merit, of content in any subject or domain. Paul and Elder have identified nine standards for excellence in the assessment of critical thinking. These standards include clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness. Use of these standards allows us to communicate meaning in such an effective way as to enable others to re-create our meaning when they hear what we have said or read what we have written.

So What? Critical thinking is not a global judgment; it is an assessment of multiple elements of the total communication of the speaker, writer, listener, or reader.

The concept of applying discipline to analysis and assessment for improvement requires the sequential use of the elements and continuous use of the standards of thought. Improvement is inherent in the way we utilize these elements and standards to guide us in examining in multiple ways (cause, effect and motivation) the content of our own or someone else's written or oral articulation. The omission of any one of the elements infers the author of the critical thought has presented an incomplete analysis of the information. The omission of any standard implies limitation in the quality of analysis or presentation.

When Should We Think Critically? It is most important to know there is a time to think and a time not to think in accord with the concepts of critical thinking. We say this because there is a spontaneity to life easily extinguished by the disciplined sequence of thought identified as elements and the quality of thought

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identified as standards. Fortunately, as we learn to think critically, we also learn what subject, content, and domains are appropriate for such discipline.

In summary, thinking defines our life as a person, as a student, as a member of a family or a community, and as a citizen. The noble purpose of education is to improve the quality of life by modifying thinking. Thinking not only allows us to learn the 3R's, it also allows us to make career decisions and acquire the knowledge required to become a doctor, a skilled-trade member, a teacher, a lawyer, a nurse, an auto mechanic, etc. So we think about everything in our lives; and if we think our lives are important, we need to learn how to use "disciplined analysis and assessment" for thinking in the acquisition and use of knowledge.

WRITING THE CRITICAL THINKING ESSAY

Writing the critical thinking essay requires the full use of your ability to communicate with elaboration your assessment of the information you have generated in Exhibit A. The following is an abbreviated list of the most basic requirements for writing the essay.

- You must understand the concepts of three psychological domains and five achievement-related variables to complete Exhibit A.
- You must understand the concepts of elements and standards prior to beginning the essay.
- Do not waste time or space in your essay defining or redefining each element you are assessing. Your instructor understands the elements and the criteria for adequate assessment of them. Please review the attached rubric.

- Write in the first person singular. This is an "I, me, my" essay.

    - "My purpose(s) for completing this assignment is/are..."
    - "The question(s) or issue(s) I have about the concept of critical thinking (or the observations I have made) are…")
    - "I think the concept of three psychological domains…" "I think the concept of five achievement related variables…" etc. for the concepts of Elements and Standards.
    - Use subheads generously. As you assess the information you generated in Exhibit A, insert a subhead for each of the five achievement-related variables. Assess each variable by elaboration on your observations in the psychological domains. Make meaning clear by describing:
        - What caused you to evaluate it as "effective" or "ineffective?"
        - How is it working for you? Is it producing the results you anticipated, or not?
        - Does your assessment of your observations motivate you to change in any of your psychological domains? If so, state those implications as a separate paragraph. Combining "Implications" with "Information" about each of the five variables will contribute to understanding for both you and the reader; it will also attenuate the assessment you make under the Element, "Implications."

The following headings must be used and serve as a constant reminder of the element you are assessing:

⇒ Assessment of Element #1—Purpose: All thinking and reasoning about content has or generates purpose(s).

Assess your purpose(s) for completing this assignment. To assess, you must not only state each purpose but also explain the reasons why it has caused you to think as you do about the subject of "critical thinking," the

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effect it has had on your thoughts about the advantages or disadvantages of critical thinking, or the way you have or have not been motivated to think differently about critical thinking in the future. Use a separate paragraph to describe each purpose.

In addition to a good understanding of the total content of the miniature guides, it is suggested you

- Reread pages 2, 3, 10, and 37 of the "Analytic Thinking" guide. Evaluate everything you write in terms of the nine intellectual standards presented in pages 6 and 7.
- From "How to Study and Learn" guide, reread the page inside the front cover and pages 4, 5, 22, 28 and 29.

⇒ Assessment of Element #2—Questions or Issues: All thinking and reasoning about content is an attempt to figure something out, to settle some question(s) or issue(s).

Assess whether or not you believe this assignment enables you to fulfill the issue of critical thinking as it is presented in the definition given by Paul and Elder. Describe the reasoning underlying your questions or issues. Cause—why do you have the question; effect—what would be the advantage of having the answer to this question or issue; motivation—how might the answer to this question or issue motivate you to behave, think or feel differently in the future.

- State any questions you may have about the content of the Paul and Elder miniature guides as an educational source for learning about the requirements for critical thinking and for optimal utilization of your intelligence in the educational process.
- Also, present any questions you may have about this addendum as a learning and instructional document.
- The second purpose of this assignment is related to your observations about yourself. Having made these observations, present any questions you have about the domains, the achievement-related variables, or questions emerging as a result of observations you have made of yourself in Exhibit A.
- Reread pages 11 and 38 of the "Analytic Thinking" guide. Though much larger in scope, you may get an idea by rereading pages 36 and 37 of the "How to Study and Learn" guide.

⇒ Assessment of Element 3—Concepts: All thinking and reasoning about content utilizes concepts and ideas.

- Assess the cause, effect, or motivation supporting the merit or lack of merit of the concept of elements and nine standards as the generic guidance for engaging in critical thinking.
- Assess the cause, effect, or motivation supporting the merit or lack of merit of examining the three psychological domains and the five achievement-related variables for students in this psychology course.
- Reread pages 46 and 47 of the miniature guide on "How to Study and Learn" and use "activated knowledge" as you complete assessment of this element.
- Review again the pages suggested for rereading in element 1 above.

⇒ Assessment of Element #4—Information: All thinking and reasoning about content is based on information, data, and evidence.

Assess the observations in Exhibit A by sequential review of each of the academic achievement-related variables. (You must place a subhead indicating each variable you are addressing, e.g., Study, Completion of College, etc.)

- First, consider the variable "study." Elaborate generously on the observations you have made. Communicate the deeper meaning of the abbreviated statements presented in Part I by mental

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manipulation of the information you have drawn from your own private cognitive domain. Mentally manipulate by addressing your reasoning in terms of cause, effect, and/or motivation. For example:

- If you state "I spend about one hour studying each chapter," describe the cause—why you do not spend more time studying; the effect—how well is this working for you; and your motivation for investing so little of yourself in the process we call "higher education."
- Your analysis will be most effective when written to "standards" allowing your intended meaning of each word, sentence or idea to be readily re-created by the reader.
- Conclude assessment of each achievement-related variable with a statement of the "Implications" it has for your future.
- Incorporate in your assessment the similarities and differences revealed by the totals in Part II, i.e., assess the relative strength and or weakness of the three domains and five variables. Use a subhead, "Quantitative Analysis."

- Reread pages 12 and 39 of the "Analytic Thinking" guide.

⇒ Assessment of Element #5—Assumptions: All thinking and reasoning about content is based assumption(s).

Since you will have written Part I of this assignment hours or days before addressing this element of critical thinking, reexamine what you have written for your integrity and honesty with yourself. Essentially all you have written is based on the assumption that you are a valid observer of your own psychological domains. Can you now find consistency between the behavioural, cognitive, and affective domains, or do you now consider any of your observations as unreasonable, questionable, misleading, or contradictory?

- Reread pages 13, 40 and 41 of the "Analytic Thinking" guide.

⇒ Assessment of Element # 6—Inferences: All thinking and reasoning about content requires/makes inferences.

Note: Paul and Elder state in the "Analytic Thinking" guide, (p. 45) that inferences follow from assumptions. They also state, "An inference is a step in the mind, by which one concludes that something is true based on something else being true, or appearing true." Since only behaviour can be observed directly, we make inferences about what is being thought (cognition) and felt (affect). We observe behaviour as "true evidence" and then make inferences about what is true in the thinking and feeling accompanying the behaviour.

Like assumptions, inferences must be made by reexamination of the information or data presented in Parts I and II. If you have identified any assumptions as unreasonable, questionable, misleading, or contradictory, take the next step and identify the new assumption(s) you would make based on the revised inference. Reread pages 13 and 40 of the "Analytic Thinking" guide.

⇒ Assessment of Element # 7—Implications: All thinking and reasoning about content leads somewhere and has implications and consequences.

Assuming you have stated "Implications" in assessing each achievement-related variable, now assess any additional behavioural, cognitive, or affective changes you consider desirable and describe the anticipated consequence of each change.

Assessment of Element 8—Point of View: All thinking and reasoning about content embodies a point of view.

This final element of critical thinking could be placed anywhere in the series of eight elements. Each of us has a past, a present, and a future. The past is history and has largely shaped us as the person we are. The

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present is an ever-fleeting moment. The future is a time period characterized by the pursuit of purposes, goals, or objectives. We use our encyclopedic memories and "what if" questions to metacognitively create meaning for our current and future behaviour, cognition, and affect. We are always trying to get from where we are to where we want to be. Change designed to improve the future must always be bridged from the past and to the future.

A point of view is somewhat akin to the concept of feeling in the affective domain. We have a feeling about almost everything. We also have a point of view about almost everything. Anyone who reads your paper will have an appreciation of your point of view toward many issues related to life, personal competence, relationships, and education. Perhaps you can best utilize this element as the final paragraph(s) of your essay to assess the assignment, and your reaction to the assignment as an initial approach to formal teaching and learning about critical thinking.

References:

Paul, R. and Elder, Linda. (2003) The thinker's guide for students on how to study and learn a discipline using critical thinking concepts and tools. Foundation for Critical Thinking, Dillon Beach, CA.

Paul, R. and Elder, Linda. (2003) A miniature guide for students and faculty in the foundations of analytic thinking. Foundation for Critical Thinking, Dillon Beach, CA

Paul, R., Elder, Linda and Bartell, T. (1997) California teacher preparation for instructions in critical thinking: research findings and policy recommendations. Foundation for Critical Thinking, Dillon Beach, Ca.

Sagan, C. Untitled and undated video

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Handout Master 1.2 Part 2

PSYCHOLOGY

Rubric for Grading Critical Thinking Assignment

A rubric is a scoring guide associating numerical values with verbal descriptions of the worthiness of any performance. Through analysis, the total performance is subdivided into component parts with both a numerical and verbal scale for evaluating or assessing each.

- Students find a rubric helpful since it provides advance knowledge of how their performance will be evaluated.

- Instructors find a rubric helpful as an instrument for increasing both intrapersonal and interpersonal reliability and uniformity of grading.

The rubric for the critical thinking assignment is modeled with substantial similarity to that used in grading the International Critical Thinking Essay Test (IAT), published by the International Center for the Assessment of Thinking.

Part I, Observation and Part II, Summary

In grading Parts I and II of the assignment, instructors will focus on the extent to which the student has followed directions, made rational, thoughtful observations, and summarized data. A maximum holistic value of eight points will be used with grade equivalents as follows:

8 points for excellent performance with a grade equivalent of "A"
6 points for above average performance with a grade equivalent of "B"
4 points for average performance with a grade equivalent of "C"
2 points for poor performance with a grade equivalent of "D"
0 points for nonperformance or exceedingly poor performance, grade equivalent of "E"

If less than all points are awarded, comments will be made to explain the rationale for grading.

Part III, Essay

Part III will be graded with a maximum value of "4" on each of the eight elements of critical thinking referenced in the publications of Paul and Elder and in the Addendum to the syllabus.

4 points will be assigned as an excellent evaluation (highly skilled)
3 points will be assigned as a commendable evaluation (good skill)
2 points will be assigned as a mid-level evaluation (average skill)
1 point will be assigned as a poor evaluation (almost total absence of skill)
0 points will be assigned as a total loss (total absence of skill)

A grading format is presented on the reverse side of this page. A copy will be attached to each student's returned paper. Instructors may allocate less than maximum points for any of the eight structures of thought without greater rationale than is provided in the rubric. However, if you have questions regarding your grade, please contact the instructor.

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Rubric For Grading Critical Thinking Assignment

STUDENT'S NAME:_____TOTAL POINTS:_____

PART I: Observations, and PART II, Summary of Observations—(Maximum grade = 8 points)

_____ A holistic assessment of pursuit of directions and clarity in describing and summarizing observations

PART III: Essay—(Maximum Score = 32 points)

Purpose(s):
4 points: Excellent. Identifies two or more (personally valuable) purposes for completing the assignment.
3 points: Commendable. Identifies one (personally valuable) purpose for completing the assignment.
2 points: Mid-level. Lacks clarity in statement of the personal value for completing the assignment.
1 point: Poor. States purpose(s) unrelated to instructions.

Questions:
4 points: Excellent. Distinct questions about each predefined purpose and each personal purpose.
3.points: Commendable. Distinct questions about either predefined or personal purposes, but not both.
2 points: Mid-level: Has few questions about purpose.
1 Point: Questions lack clear relationship to any purpose.

Concepts:
4 points: Excellent. Assess merit or lack of merit of "elements & standards:" "domains & variables."
3 points: Commendable. Provides less than full insight into the rationale for each of the four major concepts.
2 points: Mid-level. Limited description of relationships between major and subordinate concepts.
1 point: Poor. Assessment of the four major concepts has very limited meaning.

Information:
4 points: Excellent. Assesses the deeper meaning of observations in each achievement-related variable and totals.
3 points: Commendable. Assesses well for achievement-related variables, but not for quantitative totals.
2 points: Mid-level: Elaborations provide modest insight into the rationale for observations and totals.
1 point: Poor: Description is limited; does little to expand meaning of observations.

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Assumptions:
4 points: Excellent. Identifies in Part I two or more observations with less than complete "evidence."
3 points: Commendable. Identifies in Part I one observation with less than adequate "evidence."
2 points: Mid-level. Describes "assumptions" but does not identify any in Part I.
1 point: Poor. Non-specific comments identifying or explaining assumptions.

Inferences
4 points: Excellent. Identifies two or more specific inconsistencies between behaviour, cognitive, and affect statements in Part I
3 points: Commendable. Identifies one inconsistency between statements of behaviour, cognition, and affect.
2 points: Mid-level. Identifies one or more inferences in the "Information Element" presented (above).
1 point: Poor. Very limited identification of inference in Part I or previously presented information.

Implications:
4 points: Excellent. Identifies two or more behaviour changes needed for more effectiveness in achievement-related variables.
3 points: Commendable. Identifies the one most needed behaviour change needed for improvement.
2 points: Mid-level. Lacks clarity on specific need or advantage of change.
1 point: Poor. Limited recognition of implications, per se.

Point of View:
4 points: Excellent. Articulates the advantages or disadvantages of critical thinking and of this assignment.
3 points: Commendable. Articulates the specific advantages or disadvantages of this assignment only.
2 points: Mid-level. Description indicates a limited understanding of the "system" and the "assignment."
1 point: Poor. Acknowledges critical thinking as a learning objective, but does not indicate why.

Total possible points is 40. A grade of 36 or more is equivalent to a grade of "A"; 32–35 = "B"; 28–31 = "C"; and 24–27 = "D".

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WEB RESOURCES

General/comprehensive

Amoeba Web: http://vanguard.edu/faculty/ddegelman/amoebaweb/
A site containing nicely organized tables of links to web pages related to various topics in psychology.

Centre for Psychology Resources: http://psych.athabascau.ca/html/aupr/psycres.shtml
A site maintained by Athabasca University in Canada. Provides comprehensive information on a variety of psychology topics.

Psych Web: http://www.psychwww.com
A cornucopia of psychology-related links maintained by the Psychology Department at Georgia Southern University.

Psychology Central: http://www.psychcentral.com/
Web links and online resources for psychology students and faculty.

Social Psychology Network: http://www.socialpsychology.org/
Well-organized links related to topics in social psychology.

Tests, Tests, Tests: http://www.queendom.com/tests
A vast variety of psychological tests established and maintained by "Cyberia Shrink."

History of Psychology

Archives of the History of American Psychology: http://www.uakron.edu/ahap
Psychology's attic, maintained at the University of Akron.

Classics in the History of Psychology: http://psychclassics.yorku.ca/
This document repository, complete with a search engine, allows you to read excerpts from classic papers in psychology.

Today in the History of Psychology: http://www.cwu.edu/~warren/today.html
Warren R. Street, of the University of Central Washington, knows everything about who was born when, who died when, what got published when, and what happened where.

Major Professional Organizations

APA—American Psychological Association: http://www.apa.org
Information about the APA and links to other sites.

APS—Association for Psychological Science: http://www.psychologicalscience.org
Information about the APS and links to other sites.

CPA – Canadian Psychological Association: http://www.cpa.ca/
Information about the CPA and links to other sites.

Division 3 of the American Psychological Association: http://www.apa.org/divisions/div3/

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The Division of Experimental Psychology of the American Psychological Association was formed many years ago to represent the interests and concerns of psychologists whose principal area of study or research lies within the field of general experimental psychology.

Division 7 of the American Psychological Association: http://ecp.fiu.edu/APA/div7/
Division 7 was organized to (a) promote research in the field of Developmental Psychology; (b) foster the development of researchers through providing information about educational opportunities and recognizing outstanding contributions to the discipline; (c) facilitate exchange of scientific information about developmental psychology through publications such as the division's newsletter and through national and international meetings; and (d) promote high standards for the application of scientific knowledge on human development to public policy issues.

Experimental Psychology Society: http://www.eps.ac.uk/
The Experimental Psychology Society is for the furtherance of scientific inquiry within the field of Psychology and cognate subjects. It holds periodical meetings at which papers are read and discussions held. The Society also disseminates information and educational material made available as a consequence of psychological research, including the publication of the Quarterly Journal of Experimental Psychology (Section A: Human Experimental Psychology, and Section B: Comparative and Physiological Psychology).

Jean Piaget Society: http://www.piaget.org/
This site was created as an information resource for members of the Jean Piaget Society. The Jean Piaget Society, established in 1970, has an international, interdisciplinary membership of scholars, teachers and researchers interested in exploring the nature of the developmental construction of human knowledge.

Philosophy of Science Association: http://philsci.org/
The Philosophy of Science Association aims to further studies and free discussion from diverse standpoints in the field of philosophy of science. To this end, the PSA engages in activities such as: the publishing of periodicals, essays and monographs in this field; sponsoring conventions and meetings; and the awarding of prizes for distinguished work in the field.

Psychonomic Society: http://www.psychonomic.org/
One of the premier organizations of modern experimental psychology. The Psychonomic Society promotes the communication of scientific research in psychology and allied sciences.

Society of Clinical Psychology: http://www.div12.org/
This site is sponsored by Division 12 of APA and addresses a variety of research, theory, and practice issues associated with clinical psychology.

Society of Counseling Psychology: http://www.div17.org/
Division 17—Counseling Psychology was founded in 1946 to promote personal, educational, vocational, and group adjustment in a variety of settings. Presently, Division 17 brings together psychologists, students, and international and professional affiliates who are dedicated to promoting education and training, scientific investigation, practice, and diversity and public interest in professional psychology.

Society of Experimental Social Psychology (SESP): http://www.sesp.org/
SESP is a scientific organization dedicated to the advancement of social psychology.

Society for Personality and Social Psychology: http://www.spsp.org/

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Psychology From Inquiry to Understanding Canadian 2nd Edition Lilienfeld Solutions Manual
Full Download: https://alibabadownload.com/product/psychology-from-inquiry-to-understanding-canadian-2nd-edition-lilienfeld-s

With over 4,000 members, the Society is the largest organization of social and personality psychologists in the world. The goals of the Society are to further the generation and dissemination of research in personality and social psychology.

Society for Psychological Study of Social Issues: http://www.spssi.org/
SPSSI is an international group of over 3500 psychologists, allied scientists, students, and others who share a common interest in research on the psychological aspects of important social issues. In various ways, the Society seeks to bring theory and practice into focus on human problems of the group, the community, and nations, as well as the increasingly important problems that have no national boundaries.

Society for Research in Child Development: http://www.srcd.org/
The Society is a multidisciplinary, not-for-profit, professional association with a membership of approximately 5,500 researchers, practitioners, and human development professionals from over 50 countries.

The purposes of the Society are to promote multidisciplinary research in the field of human development, to foster the exchange of information among scientists and other professionals of various disciplines, and to encourage applications of research findings.

Psychological theories

About Psychoanalysis: http://www.apsa.org/
An article on this topic from the American Psychoanalytic Association.

Mind and Body: Rene Descartes to William James: http://serendip.brynmawr.edu/Mind/Table.html
Robert H. Wozniak, of Bryn Mawr College, presents this history of ideas.

B.F. Skinner Foundation: http://www.bfskinner.org/
Read a biography of the famous behaviourist, complete a training course on his theories, and visit a media archive replete with audio and video clips. The B.F. Skinner Foundation was established in 1987 to educate the public about B. F. Skinner's work, and to promote an understanding of the role of contingencies in human behaviour.

The Varieties of Religious Experience: http://www.psychwww.com/psyrelig/james/toc.htm
This work by William James is available in its entirety on the Web, courtesy of the folks at Georgia Southern University.

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