**Chapter 1**

**Introduction to Cognitive Psychology**

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**Fundamental Ideas in Cognitive Psychology**

Empirical data and theories are both important.

Cognition is generally adaptive, but not in all specific instances.

Cognitive processes interact with each other and with noncognitive processes.

Cognition needs to be studied through a variety of scientific methods.

All basic research in cognitive psychology may lead to applications, and all applied research may lead to basic understandings.

**Key Themes in Cognitive Psychology**

Nature versus nurture

Rationalism versus empiricism

Structures versus processes

Domain generality versus domain specificity

Validity of causal inferences versus ecological validity

Applied versus basic research

Biological versus behavioral methods

**Supplemental Activities**

**A. In-Class Activity**

## 1. A Survey to Identify a Student’s Bias in Psychology

Early in the semester, students are typically overwhelmed by all the opposing views and different schools of psychology. Whereas the difference between the psychoanalytic and behavioral schools seems obvious to us, to beginning students these distinctions are barely more than empty terms that they need to memorize for an upcoming test.

The following classroom demonstration (based on Fernald and Fernald, 1978) enables students to express their opinion about a variety of topics. The pattern of their responses, then, can determine the extent to which their worldview is consistent with views in the psychoanalytic school, the behavioral school, and the humanistic school. When students learn their view is consistent with one of the perspectives they are learning about, they will become further interested in discovering more about them.

The handout on the following page includes a number of general statements that espouse various points of view associated with the major approaches to psychology. Have students fill it out as quickly as possible (it should only take around five minutes). When they are finished, they can calculate the subscore for the psychoanalytic school by adding together their responses to questions 3, 4, 8, and 10. They can calculate the behavioral subscore by adding together their responses for questions 2, 5, 9, and 11. Finally, a humanistic subscore is obtained by adding together responses for questions 1, 6, 7, and 12.

A variant of this exercise that might help students to learn the schools of psychology would be to put them into small groups and ask them to fill out the questionnaire as if they were behaviorists, Freudians, etc. This exercise provides a deeper familiarity with the different perspectives of each school.

*Written by Nancy Jo Melucci, Santa Monica College*

#### Determining Your School of Psychology

Please indicate how you feel about each of the following statements, using the following scale:

|-------|-------|-------|-------|-------|-------|-------|

1

Strongly

Agree

7

Strongly

Disagree

2

3

4

6

5

1. \_\_\_\_ People are free spirits, and science will never be able to really understand what causes their behavior.
2. \_\_\_\_ Basically, our personalities are shaped and determined by the things that happen to us during our lives.
3. \_\_\_\_ Most of the time, we do what we do in order to defend ourselves from threats that come from within.
4. \_\_\_\_ Most people’s personalities are set by the time they are 5 or 6 years old. Typically, people don’t change much after that.
5. \_\_\_\_ All that talk of deep-rooted forces sounds like bunk to me. We should just worry about what people actually do.
6. \_\_\_\_ Science makes a mistake when it tries to take everything apart. If you want to understand a person, you have to look at him or her as a whole.
7. \_\_\_\_ The best thing about people is that we are free to make choices and direct our own lives.
8. \_\_\_\_ Strong drives, such as sex, cause people to behave in certain ways.
9. \_\_\_\_ I think anyone could grow up to be a criminal if he or she was raised in the wrong environment.
10. \_\_\_\_ I think people are not really fully conscious of the kind of forces that direct their behavior.
11. \_\_\_\_ Someday, we will be able to explain behavior in the same way that we can explain events in biology and chemistry.
12. \_\_\_\_ Thinking and feeling are the most important causes of behavior.

\_\_\_\_\_\_\_\_\_\_ Psychoanalytic \_\_\_\_\_\_\_\_\_\_ Behavioral \_\_\_\_\_\_\_\_\_\_Humanistic

*Written by Nancy Jo Melucci, Santa Monica College*

## 2. Identifying Quotes from Various Antecedents to Cognitive Psychology

Use the following quotes to help demonstrate some of the differences between the various schools of thought. Present the quotes to the class and see if they can identify the quote with the school of thought. There are any number of websites from which you can find quotes.

Rationalist “Science is nothing but perception.” – Plato

“We do not learn; and what we call learning is only a process of recollection.”

– Plato

Empiricist “What we have to learn to do, we learn by doing.” – Aristotle

“Lack of experience diminishes our power of taking a comprehensive view of the admitted facts. Hence those who dwell in intimate association with nature and its phenomena grow more and more able to formulate, as the foundations of their theories, principles such as to admit of a wide and coherent development: while those whom devotion to abstract discussions has rendered unobservant of the facts are too ready to dogmatize on the basis of a few observations.” – Aristotle

Associationist “Ideas which have been developed simultaneously or in immediate succession in the same mind mutually reproduce each other, and do this with greater ease in the direction of the original succession and with a certainty proportional to the frequency with which they were together.” – Hermann Ebbinghaus

“No matter how thoroughly a person may have learned the Greek alphabet, he will never be in a condition to repeat it backwards without further training.” – Hermann Ebbinghaus

Gestalt “Only a few psychologists are still convinced that the main subject matter of psychology is our direct experience. ... Most of us realize that, regarded as events, the facts and sequences of our direct experience do not, taken by themselves, represent complete wholes; they are, on the contrary, merely parts of larger functional contexts. ... I regard it as a necessity of psychological method that we make the attempt to develop a theory of ‘the larger physiological context,’ upon which all our experiences depend, on the basis of the fundamental principles of physics.” – Wolfgang Köhler

Behaviorist “Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I’ll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for many thousands of years.”

– John Watson

*Written by Michael Bendele, Indiana University-Purdue University Fort Wayne*

**3. Student Presentations Relating to the Cognitive Revolution**

Understanding the cognitive revolution affords an opportunity for your students to hone their research skills and presentation skills by giving short presentations on the impact of important contributions to the cognitive revolution. Give each team or student a name or theme from the following list and have them prepare a short five minute presentation for the next class about its impact on the development of cognitive psychology. For their presentation, each team must describe the essence of the work or idea and how it contributed to the cognitive revolution in a five minute powerpoint presentation.

Karl Lashley

George Miller

Black Box

Noam Chomsky

Jerome Bruner

Frederick Bartlett

Jean Piaget

David Ausubel

Herbert Simon

Impact of Computers

Edward Tolman

Ulric Neisser

Jerrold A. Fodor

Human Factors Engineering during WWII

Donald Hebb

Alan Turing

Information Processing Approach

Bandura

B.F. Skinner

*Written by Donna J. Dahlgren, Indiana University Southeast*

## 4. Consciousness

Consciousness is a major topic for a number of areas including philosophy, psychology, and artificial intelligence. We process a limited amount of information from the environment at any point in time. This information provides a view of the world that is disjoined and fragmented based upon the limited information from the world that was just processed. How is it that our experience of the word is presented in a unified conscious field? That is, with everything that is going on (e.g., eye blinks), what allows for us to see a continuous world?

**Some general questions about consciousness:**

You can view the following questions as an overview of some of the major issues with in the area of consciousness. Questions that we would like to know the answers to.

* Where is consciousness located in the brain? (Or what are the neurobiological correlates of conscious states (NCC)?)
* Are there neurons devoted to consciousness?
* Is consciousness due to a large number of neurons interacting with each other?
* Is consciousness an emergent property? The idea behind emergent property is that consciousness arises through the interactions of the various parts of the brain – that is looking at the individual parts one could not predict the outcome. If this is the case, will computers with sufficient computation power eventually have consciousness?

**Discussion questions/topics:**

Each topic/issue listed below challenges our notion of what is consciousness. For the following topics, you could have students or groups look up information related to each topic. Students could then present the information, and as a group you can then discuss how this influences our view of consciousness.

1: Split-brain patients: These individuals have had their corpus callosum severed, and research has found that the two hemispheres of the brain operate independently of each other. Each hemisphere can respond to information (left hemisphere through verbal, right hemisphere through spatial). A number of individuals, after the split-brain procedure, reported difficulties with certain tasks given that each hemisphere was trying to accomplish a different goal. Do these individuals now have a consciousness for each hemisphere?

2. Blindsight: With blindsight a person reports that s/he is unable to see part of his/her visual field. Interestingly however, the person can often report the location of different stimuli that is located in that part of visual field. What does this say about different levels of consciousness?

3: Effects of alcohol on consciousness: Alcohol has an effect on our perceptions of the world (e.g. distorted sense of time). Here we can see the effects of the physical (brain) on consciousness.

4: Phantom Limbs: A person who loses a limb, say an arm, may still have the perception of sensation coming from that arm. What does this say about the brain creating our reality?

5. Somatoform disorders: For this class of disorders, it appears that the illness is psychological in origin. This brings up the issue of the impact that the brain can have on the body.

*Written by Michael Bendele, Indiana University-Purdue University Fort Wayne*

**B. Promoting Discussion**

**1. Historical Approaches to Psychology: Pick a Favorite**

A good way to get students to think critically about the various approaches to psychology (both historical and current) is to have them consider which they would pick as a favorite, or one that seems most in line with their own beliefs. First have the students answer these questions. You might divide them into small groups and assign one school to each group.

What does a psychologist from this school identify as the primary source or motivator of human thought, feeling and behavior?

What does a psychologist from this school believe is the root cause of psychological distress and behavioral disorder?

Does a psychologist from this school believe it is possible to alleviate distress and improve behavior? What steps or strategies would he or she propose to help a person with a psychological difficulty?

After all the groups have presented the answers to these questions, you can ask the students to answer the last one:

Which historical approach to psychology do you think was the most useful in its approach to examining psychological issues, and why? Which do you think was least useful, and why?

### *Written by Nancy Jo Melucci, Santa Monica College*

### 2. Take Apart an Experiment

In their 1983 article in the Journal of Psychology titled “Popular horoscopes and the ‘Barnum Effect,’” Fichten and Sunerton tested the perceived validity of horoscopes in two ways. In the first test, participants rated to what extent “astrologically based personality descriptions” described them. For the second, participants rated to what extent they thought the information from the previous day’s horoscope would have been useful.

**Method:**

Personality Descriptions: All participants received 13 different descriptions, 12 of these were personality descriptions for the various zodiac signs while the 13th one was the Barnum paragraph. The Barnum paragraph is a personality description designed to “describe” anyone. It is constructed by making general statements on topics that have a high rate of occurrence in the general population. Half the participants receive the 13 personality descriptions with information about which zodiac sign it came from. The Barnum description was presented as a description of an average college student.

The remaining participants received the same 13 personality descriptions, but in this case they were not informed of which zodiac sign the information came from. The task, for all the participants, was to read the descriptions and rate on a 10-point scale to what extent the description was “not at all like me” to “very much like me.”

Usefulness: All participants received the 12 horoscope forecasts from the previous day and were to rate each one on a 10-point scale on the extent to which the information would have been useful. Participants were divided into two groups. One group received the forecast with the zodiac information provided while the other half received no information on which sign the forecast came from.

**Results:**

Participants, informed of which zodiac sign the various personality description paragraphs came from, rated the paragraph from their own sign and the Barnum paragraph as personally more accurate than the descriptions for the others signs. Participants not informed of which zodiac sign the personality descriptions came from, rated the description from their zodiac sign no more useful than the descriptions from the other signs. The Barnum paragraph, however, was rated as being more like their personality.

Participants, informed of which sign the forecast came from, rated the forecast from their sign as personally more useful than the forecast from the other signs. Participants, not informed of which sign the forecast came from, rated the forecast from their sign no more helpful than the forecasts from the other signs. (The results are less clear-cut than they seem—in actuality, there were two different stimuli listed and they did find a significant effect for one list in which those who did not know which sign the forecast came from rated their own more than other signs as helpful.)

**Discussion Issues:**

1. Have students identify the following from the experiment:

a. experimental group

b. control group

c. independent variable

d. dependent variable

2. What are some potentially extraneous or confounding variables for this experiment?

3. What is the difference between the experimenters and the people writing the horoscopes?

4. What is one of the difficulties with people knowing which sign the information came from?

1. What other way might you measure the dependent variable?
2. This particular experiment was selected for its topic which provides an opportunity to contrast science with pseudoscience. Potential issues/questions to discuss are listed below.

a. What are the key features of science?

b. Issues of reliability. Do various astrologers make the same predictions for the same sign on the same day? How might one test this? (The authors of the article did in fact look at this and found no reliability. However, the authors provide alternative explanations of what this may be the case (e.g., various astrologers may focus on different aspects of life).

c. Why would it matter whether the person was informed of which sign the information came from? This question provides an opportunity to talk about how people often look for confirming evidence but often fail to look for disconfirming evidence.

d. How do issues such as falsifiable, rigorously evaluated, revision, and predictions play a role in astrology?

1. What would be a follow up experiment? How might you do the study differently? What about switching the labels on the personality descriptions (e.g., instead of putting Pisces put Gemini?) and have participants again judge the usefulness?

*Written by Michael Bendele, Indiana University-Purdue University Fort Wayne*

**3. Using YouTube to generate discussion on the Nature-Nurture Debate and “Crack” Babies**

To lead off discussion on nature versus nurture, show video that reviews the original fears about “crack” babies and what follow-up research has shown. What are the implications of attributing something to “nature” (e.g., prenatal exposure to drug causing permanent neurological and other physiological differences) as opposed to nurture (and thus modifiable)?

<https://www.youtube.com/watch?v=cWtLAfw1Ses>

**Useful Websites**

**A. Websites related to Psychology**

15 of Psychology’s Greatest Masterpieces

<https://www.psychologytoday.com/blog/fulfillment-any-age/201310/15-psychology-s-greatest-masterpieces>

Consider how psychological constructs like cognition, neuroscience and sensation and perception, can be captured in art.

TED Ideas worth spreading [www.ted.com](http://www.ted.com)

Steven Pinker’s book *The Blank Slate* argues that all humans are born with some innate traits. Here, Pinker talks about his thesis, and why some people found it incredibly upsetting.

<http://www.ted.com/talks/lang/eng/steven_pinker_chalks_it_up_to_the_blank_slate.html>

GeekPop

GeekPop commissions, curates and releases music by science-inspired artists and makes a monthly geek music podcast as well as producing live events in the UK.

<http://geekpop.co.uk/>

Dance Your Dissertation

This annual contest allows newly-minted PhDs to explain their dissertations to the general public using interpretive dance. Psychology is in the “Social” category.

<http://gonzolabs.org/dance/videos/>

Classics in the History of Psychology

Read many of the classic research and other articles from throughout the history of psychology.

<http://psychclassics.yorku.ca/index.htm>

**B. Websites related to the History of Psychology**

Chomsky’s review of Skinners book on verbal behavior

<http://chomsky.info/articles/1967----.htm>

History of Psychology archives maintained by Muskingum College

Short historical reviews of important figures in the history of psychology.

<http://www.muskingum.edu/~psych/psycweb/history.htm>

Many different views of intelligence

<http://www.personalityresearch.org/intelligence.html>

B.F. Skinner Foundation – Biography for Skinner

<http://www.bfskinner.org/archives/biographical-information/>

This site provides a biography of Skinner’s life and links to other resources, and includes an archive with a number of pictures, a video, and a list of publications.

John Watson Biography

<http://facweb.furman.edu/~einstein/watson/watson1.htm>

The site provides a biography of Watson’s private and professional life, and also includes a number of pictures of Watson.

Wolfgang Kohler

<http://faculty.frostburg.edu/mbradley/psyography/wolfgangkohler.html>

A website providing a basic biography of Kohler.

Abraham Maslow Biography

<http://webspace.ship.edu/cgboer/maslow.html>

This website has a detailed biography of Maslow and a thorough description of his humanistic perspective as it applies to motivation and personality theory.

**C. Websites related to Research Methods**

About.com: Psychology

<http://psychology.about.com/od/researchmethods/>

This website has links to descriptions of a number of issues related to research. Some links include: “Steps in Psychology Research,” “Introduction to Research Methods,” “The Simple Experiment,” and “Correlational Studies”

# D. Cognitive Analysis and Brain Imaging Laboratory (CABIL)

<http://www.ucdmc.ucdavis.edu/mindinstitute/research/cabil/>

This website is the home of The MIND Institute’s Cognitive Analysis and Brain Imaging Laboratory (CABIL, pronounced “cable”) is directed by Dr. Tony J. Simon and funded by the National Institutes of Health. CABIL’s mission is to investigate, explain and eventually treat the impairments in cognitive function experienced by children with neurodevelopmental disorders.