

Introduction to Psychology



IUPUI, Department of Psychology

WORTH
PUBLISHERS



Copyright © 2013 by Trustees of Indiana University
Copyright © 2013 by Hayden-McNeil, LLC on illustrations provided
Photos provided by Hayden-McNeil, LLC are owned or used under license

All rights reserved.

Permission in writing must be obtained from the publisher before any part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system.

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

Hayden-McNeil Publishing
14903 Pilot Drive
Plymouth, MI 48170
www.hmpublishing.com

Contino 4817-8 F12

Acknowledgements

This Introduction to Psychology project began with a germ of an idea. Two years later, after careful cultivation and creative collaboration, it has become a viable organism, with a name. B110 is now ready to interact with students who are beginning their foray into the scientific study of behavior and mental processes.

I am grateful to the following people for their contributions to this project.

John Kremer, on whose shoulders I stand.

Gerald Nosich, for lighting and sustaining the flame of critical thinking.

Kathy Johnson, for believing in the project and giving it legs.

Jane Williams, for maintaining the momentum of the project.

Gayle Yamazaki, for seeing the vision before it was clear.

Bethany Neal-Beliveau, for tireless editing and fearless championing.

Scott Comer, for genius computer programming and being a kind human.

Lisa LaRew, for managing the project with supreme patience and skill.

The authors of the eBook have something special in common, and that is their connection to the Department of Psychology at Indiana University-Purdue University Indianapolis (IUPUI). Each author is (or was) on the faculty or received his/her doctoral training in the department. Working with this group of people has been the most gratifying and enjoyable experience of my professional life. They like teaching, they like students, and moreover, they like thinking about how to teach Psychology.

Leslie Ashburn-Nardo, Ph.D., Experimental (Social) Psychology

Amy Bracken, Ph.D., Neuroscience

Kikuko Campbell, Ph.D., Clinical Psychology, MPH, Public Health

Lisa Contino, Ph.D., Clinical Psychology, MS, Education

Nicholas Grahame, Ph.D., Behavioral Neuroscience

Michele Hansen, Ph.D., Social Psychology

Debora S. Herold, Ph.D., Cognitive and Developmental Psychology

Shenan Kroupa, Ph.D., Developmental Psychology

Jennifer Lydon-Lam, Ph.D., Clinical Psychology

Bethany-Neal Beliveau, Ph.D., Pharmacology

Kevin L. Rand, Ph.D., Clinical Psychology

And finally, a collective thank you to all Psychology students, past, present, and to come, who continue to teach us more than we can ever teach them. Our work is never done.

Lisa Contino

May 2012

Chapter 1

Introduction to Psychology: Thinking Through the Themes

Why and How Do We Study Behavior?



Lisa Contino, Ph.D.

1.1. INTRODUCTION

You are about to embark on an excursion into the science of behavior and the mind. You signed up, without knowing where you were going, how you would get there, or what you would be doing along the way. You may not even know why you signed up. What have you brought with you? Ironically, you've brought the very things we will be studying—your own behavior and mental processes, your assumptions about the causes of behavior, your ability to observe the behavior of others, and most importantly, your ability and willingness to observe yourself. So, do you have everything you need? Actually, you do: self, others, the content of Psychology delivered in the course materials, and guides in the form of your instructor, teaching assistant, and peer mentor. Your instructor has been on this trip many times, and therefore, knows what to expect along the way. Let's go.

1.1.1. What Is This Course About?

You may know more about Psychology than you think you do. You already know something about behavior because you've been engaged in it all your life. Furthermore, you've been *observing* it in yourself and others, and that means you've begun to think about it, maybe even wonder about it. You may have even tried to understand and solve a psychological problem or two. In doing so, you were acting like a behavioral scientist, a detective of sorts, although you may not have been aware of it at the time. You made observations and gathered information as you developed your own ideas about the reasons people think, feel, and act as they do.

Students who are new to the study of Psychology are filled with questions. Why do I have to take this course? What does Psychology have to do with other majors and professions, like Biology, Nursing, Business, Education, or Criminal Justice? How are we going to approach Psychology—will we take a macro view or a micro view? Will there be more of an emphasis on how the field developed into what it is today, or will we learn how Psychology applies to everyday life? Is it about how people behave or is it about what brain cells are doing? Many students are interested in the connection between mind and body, such as the effect of nutrition and exercise on mood and wellbeing. Others want to be able to recognize when a person is psychologically unstable, or know more about the causes and solutions to destructive behaviors like violence and alcohol abuse. You may wonder how Psychology is used in advertising, sales, and law enforcement, or if this course will help you be a better person, partner, or parent. In a nutshell, Psychology is about behavior—describing it, explaining it, predicting it, changing it.

Psychology is the scientific study of behavior and mental processes. You are going to study **behavior** and **mental processes** in **scientific** ways. Let's break that down. **Behavior** is an observable action emitted by an organism. **Mental processes**, though more difficult to observe directly, include thoughts, feelings, and beliefs. If our ways of studying something are **scientific**, they are based on systematic observation, and their goals are to describe, explain, predict, and change. So you know *what* you will be studying and *how* you will be studying it—you will come to know the content of the field of Psychology *through* its systematic, scientific ways of thinking about behavior. Introductory Psychology is just that—a *first* exposure to an entire discipline. The goal of this course is to familiarize you with the logic of the discipline of Psychology so that you will begin to *think* like a psychologist about anything and everything related to behavior and mental processes. As you develop this skill, you will notice that you are using it and applying it wherever you are in the world.

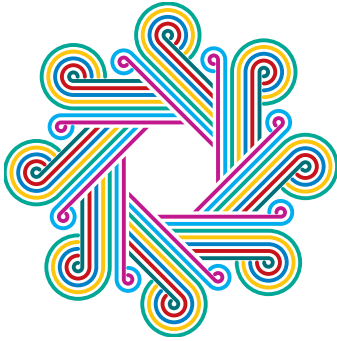
Take a Moment to Reflect and Write

What do you want to know?

Take a moment now to formulate some questions you have about behavior. Reflect on yourself, then others; people you know well and those you don't; people who matter the most to you and those who are not as important; people next door and on the other side of the globe; people whose behavior looks a lot like yours and people who are different. What do you want to know? What do you want to get out of this course?

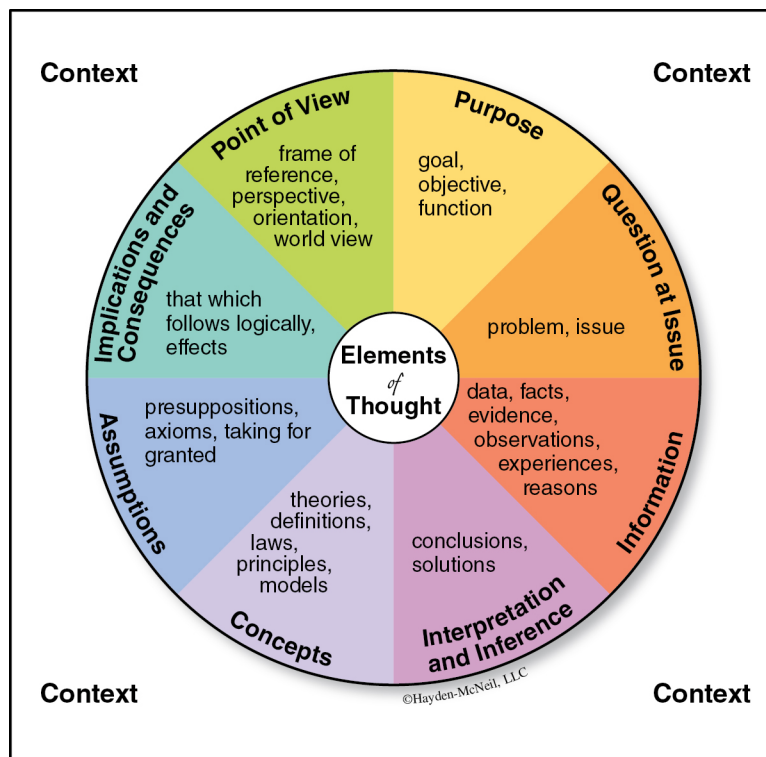
1.1.2 How Am I Going to Learn Psychology?

—by *thinking critically* about the content of Psychology



Let's start with thinking...critically...about anything. You have most certainly heard about critical thinking, as it is often stated as a learning objective in college-level courses. You may even think that the critical thinking you do in your Physics class is not the same critical thinking that you do in your Psychology class. And in a way, you are right. However, I challenge you to broaden your idea of critical thinking, beyond specific courses, even beyond areas of study, to include everything you think about—from the most mundane decisions you make to the weightiest ones. The critical thinking model that we will use in this course is one that allows you to

do just that. Developed by Richard Paul and Linda Elder (2006), the model has eight elements of reasoning that, together, capture the essence of the *thinking critically*—the process of analyzing and assessing thinking with a view to improving it. Let's analyze the structure of thinking.



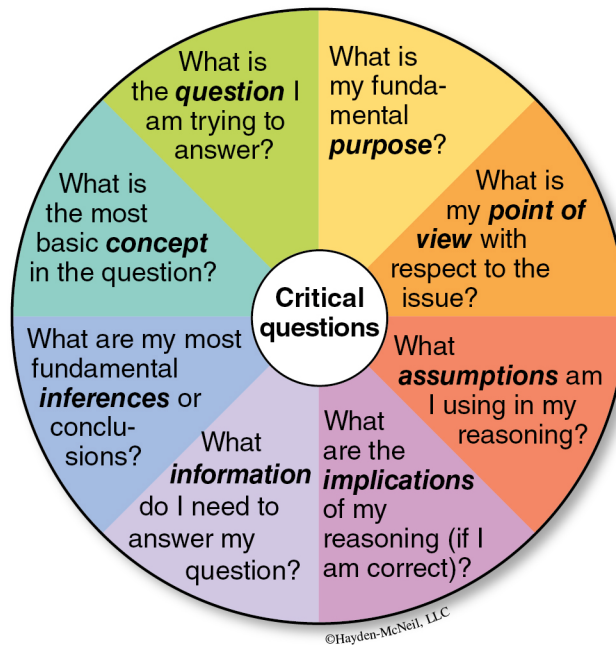
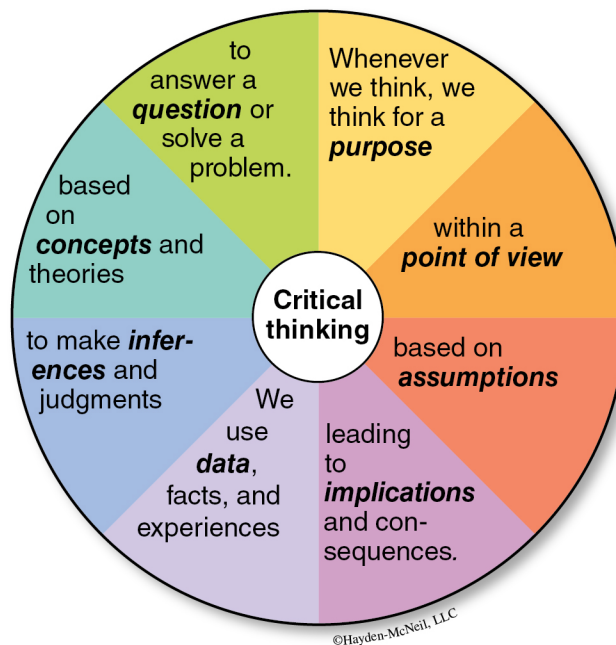
Source: Elder, L., and Paul, R. (2010). *The thinker's guide to analytic thinking*. Foundation for Critical Thinking. www.criticalthinking.org

For practice, let's use these elements to think critically about a decision facing many students at some point in their college career—whether or not to stay in school. Although we can start anywhere on the circle, and we don't have to go in any particular order, let's start with Purpose. I've asked the questions; you answer them. With practice, you'll ask yourself the questions (and answer them too!).

Table 1.1 *Should I Stay in School?*

ELEMENT OF THOUGHT	QUESTION POSED BY ELEMENT OF THOUGHT
Purpose	Q: What is the purpose of going to college? A:
Question at Issue	Q: What is my main question? A:
Assumptions	Q: What assumptions am I making about going to college? A:
Implications and Consequences	Q: What are the implications and consequences of staying in college? Of leaving college? A:
Information	Q: What information do I need to make this decision? A:
Concepts	Q: What concepts (ideas, beliefs) do I use when I think about college? A:
Interpretation, Conclusions	Q: What conclusions am I drawing? A:
Point of View	Q: Whose point of view am I considering? Are there other points of view I might consider? A:

Critical Thinking: Elements and Questions



Source: Elder, L., and Paul, R. (2010). *The thinker's guide to analytic thinking*. Foundation for Critical Thinking. www.criticalthinking.org

The process we just used to think about a real-life, personal issue, is the same process we will use to think about Psychology throughout this course. With deliberate practice, and over time, you can become increasingly aware of your own thinking process, even as it is occurring. The elements of thought are like a dynamic, powerful engine that will move your thinking to another level.

Thinking in the Discipline

Have you ever noticed that different areas of study (also called disciplines) seem to have distinctly different ways of thinking? Well of course, you say—because each subject is about a different thing. *Human Anatomy and Physiology* is about the human body, *History* is about the past, and *English Composition* is about writing. Okay, I respond, you have a point, and that's a good place to start, but let's keep going. What makes this so challenging is not that each course is about a different topic, but that the central questions of their fields are so different. *Human Anatomy and Physiology*—How is the human body put together, and how does it work? *History*—Why do past events matter now? *English Composition*—How can I communicate effectively in writing? To answer each of these *essential course questions* and answer them well, you need to learn and master three different languages, including their vocabulary and rules. As you might imagine, this takes practice, persistence, and patience.

When you use the vocabulary of a discipline to answer its essential questions, you are *thinking in the discipline*. Already, you know something about what psychologists think about and how they think about it. They think *scientifically* and *systematically* about behavior and the mind. Will you be able to do this after just one course in Psychology? Yes. You will *begin* to think like a psychologist, but only if you know what questions to ask *and* you use the vocabulary of Psychology to answer the questions you asked, over and over again. The biggest challenge (and greatest satisfaction) in learning a new subject is to think and communicate in the language of that discipline. Once you can do this, the vocabulary of a discipline all fits together and makes sense.

Essential Questions

What exactly do we mean by an *essential question*? Let's see if we can figure it out by completing an exercise known as **SEEI** (Nosich, 2012). We will be using this exercise throughout the course, as it is an excellent thinking tool that helps us know how well we know something. We start with a term or concept—in this case, the concept is *essential question for a course*.

S is a **STATEMENT**: A clear, concise, correct definition of the term.
E is an **ELABORATION**: Another way of saying it, using your own words.
E is an **EXAMPLE**: A good one, one that is correct and actually works.
I is an **ILLUSTRATION**: A metaphor, image, or comparison, e.g., the term is like a ...

Concept: **essential question** [for a course]

- S:** An essential question for a course is a basic, indispensable, and necessary question that an entire course answers.
- E:** In other words, an essential question for a course is a question that is at the center of the whole course, that *all* parts of the course are concerned with answering.
- E:** An example of an essential question for a course is, for History, why do past events matter now?
- I:** An essential question for a course is like the sun—all the planets (course concepts) revolve around it and are illuminated by it.

Take a Moment to Reflect and Write

Can you come up with an essential question for Introductory Psychology? This would be the central question that the entire course addresses.

Fundamental and Powerful (f&p) Concepts

Not all concepts are created equal. Some are fundamental. Some are powerful. A select few are both *fundamental and powerful*. What exactly do we mean by this? Let's turn to the SEEI exercise again to help us think this through.

Try the first one by yourself.

Concept: **fundamental**

- S:** Fundamental means ...
- E:** In other words, if something is fundamental, it ...
- E:** An example of a fundamental concept is ...
- I:** A fundamental concept is like ...

I took a stab at it. What do you think? Does it work for you? If not, why not?

Concept: **fundamental**

- S:** Fundamental means foundational.
- E:** In other words, if something is fundamental, it is the basis for supporting something else.
- E:** An example of a fundamental concept in basketball is ball handling, because dribbling, passing, and shooting depend on it.
- I:** A fundamental concept is like the base of a pyramid—everything else is built on top of it.

It's not important for your ideas to mirror mine. What is important is that you evaluate your own thinking process.

Now, let's do it for powerful. You first.

Concept: **powerful**

- S:** Powerful means ...
- E:** In other words, if something is powerful, it ...
- E:** An example of a powerful concept is—because ...
- I:** A powerful concept is like a ...

Okay, my turn. Give me your feedback.

Concept: **powerful**

- S:** Powerful means strong and influential.
- E:** In other words, powerful means having great impact.
- E:** An example of a powerful concept is gravity, because it explains many other phenomena.
- I:** A powerful concept is like a Swiss Army knife—if has lots of uses.

Why are concepts that are fundamental and powerful (f&p) so important, useful, and valuable to you as a thinker? These special kinds of concepts connect the entire vocabulary of a discipline into a cohesive network. They serve as hubs, large activity centers for processing vocabulary and essential questions. Without f&p concepts, vocabulary and essential questions don't talk to each other. In his book, *Learning to Think Things Through*, Gerald Nosich defines a fundamental and powerful concept as "one that can be used to explain or think out a huge body of questions, problems, information, and situations" (2012, p. 101).

Vocabulary

You have a question now, am I right? You may be wondering how vocabulary differs from f&p concepts. For every f&p concept in a course, there are probably hundreds of *vocabulary* terms. Relatively speaking, there are very few f&p concepts in a chapter, and even fewer in a course. So what is the implication of having so few f&p concepts? How does this affect your learning? The framework of this course will teach you to maintain an awareness of f&p concepts whenever you are learning or quizzing yourself on vocabulary, to connect vocabulary to f&p concepts, and vice versa. Each time you make a connection, your understanding of both the f&p concept and the vocabulary strengthens and deepens. Rote memorization of the vocabulary is unnecessary because the meaningful connections you've made will facilitate recall.



While this relationship between f&p concepts and vocabulary may not be clear to you at this point, it will become clearer as you work your way through this course. You will learn the vocabulary of each chapter by making connections through fundamental and powerful concepts on your way to answering the essential questions of that chapter. I call it "*taking the stairs*." Compared with elevators and escalators, stairs are slow. They require more effort and more time, more endurance and more persistence. To learn a new content area, or a new skill, you must take the stairs and continue to take them as you become even more knowledgeable. While the stairs *are* the vocabulary of the course, the landings are the fundamental and powerful concepts. Landings are bigger and broader than stairs. They connect staircases and they are the entry point into other areas of the building. They are places to stop and breathe and think—should I turn around and go back down, should I keep going, should I enter? Taking the stairs builds strength and stamina as a

thinker. You may want to think about a course (or a discipline) as a multi-level structure or building, with numerous staircases. Each course you are taking has its own building, and it is your task to explore and get to know that building. You will be given assignments that are specifically designed to require climbing and exploring. Throughout the course and at the end, you will have opportunities to demonstrate what you have learned and are still learning.

1.2. UNDERSTANDING BEHAVIOR THROUGH THE THEMES

1.2.1 How Can I Best Understand Behavior?

—through the themes

The purpose of a theme, whether in Music or Writing or Psychology, is to unify seemingly disparate or conflicting parts into a whole. As you will learn in the next 10 chapters, the scope of Psychology is both broad and focused. Though the common object of our thinking is behavior, we approach it from various points of view. For example, social psychologists try to understand behavior by looking at how groups function, and neuroscientists try to understand behavior by looking at how neurons function. You might wonder what in the world they have in common, until you understand the themes, and then you will know. The themes serve as a common thread of familiarity that is woven through all chapters. Like fundamental and powerful concepts on steroids, the themes will become a part of your thinking about the scientific study of behavior and the mind.

There are four themes around which this Introductory Psychology course was created:

1. Psychology is a science; its goals are to describe, explain, predict, and change behavior.
2. $B = f(P + E + PE)$. Behavior is influenced by P (Person) and E (Environment) and the interaction of Person and Environment.
3. Psychology has evolved in a socio-historical context, and its major theoretical perspectives reflect this phenomenon.
4. Socio-cultural context influences how psychological concepts are understood and applied.

Let's take a look at them, one at a time.

Theme 1: *Goals of Psychology (and other sciences)*



Psychology uses scientific methods to study behavior. Some areas of study are also interested in behavior, but they do not use scientific methods. Other areas of study use scientific methods, but they are not interested in behavior. Psychology is at the intersection of science and behavior, and as such, its goals are to describe, explain, predict, and change (or control) behavior.

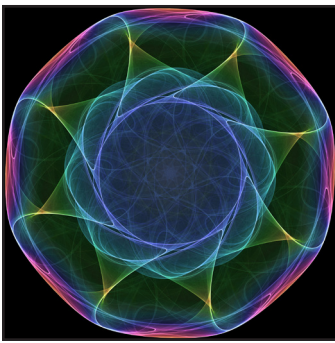
Describe. To describe something scientifically, it must first be *observed*. The term for this is *empiricism*, and it is the hallmark of science. In Psychology, we describe behavior and mental processes, i.e., we convey their characteristics using words. Complete, reliable, and accurate descriptions allow us to address the *what* of behavior. *What* am I observing? *What* is he doing? *What* am I thinking? *What* does a neuron look like? *What* are those kids doing to that other kid?

Explain. To explain behavior and mental processes, we build on observation and description to address the *how* and *why* of behavior. In other words, we are stating what we believe to be the mechanisms and/or the causes. *Why* is this happening? *Why* is he doing that? *How* does that neuron work? *Why* are those kids doing that?

Predict. To predict behavior and mental processes, we are drawing upon our observations, descriptions, and explanations to state what we think will happen in the future. This is the essence of hypothesis testing in experiments as well as projected outcomes based on previous knowledge. Our predictions are only as good as our science. Prediction addresses the *what if* of behavior. *What* is likely to happen *if* we don't change a thing? *What* is likely to happen *if* we intervene?

Change. To change (or control) behavior and mental processes, we must first have the knowledge and ability to predict behavioral outcomes, and then we must make a decision to *apply* our knowledge—whether under the more controlled conditions of the laboratory or the less controlled conditions of the real world. Change consists of altering the course of behavior, even the course of history. As you can imagine, having the power to control or change behavior is an awesome responsibility that bridges the world of science with the world of ethics.

Theme 2: $B = f(P + E + PE)$



Having just read *how* psychologists do science, we're ready to examine their point of view on the determinants of behavior. In other words, where should we look for the causes of behavior? *Why* and *how* does behavior occur? Did you just think about the goal of Psychology that addresses this? If you connected this theme to the second goal—to explain behavior—you are already well on your way to thinking like a psychologist. Let's put the formula into words: **Behavior** is a function of things about the **Person** *plus* things about the **Environment** *plus* **Person** *times* **Environment**.

You might be asking how human behavior can be reduced to a formula. Isn't that too simplistic? You make a good point. The behavior of human beings is mysteriously complex. We behave as individuals and also as members of groups or categories. Our behavior is most certainly determined by many factors, and our individual behavior is notoriously difficult to predict. By shining our flashlight on each part of the formula, we can artificially separate the determinants of behavior in order to describe them and explain how they work. Ultimately, we consider human behavior in its totality.

B. Behavior. In this formula, it refers to the behavior of a person, but it could be any organism. Behavior is broadly defined as any action an organism emits, and for human organisms, that includes thoughts and feelings in addition to overtly observable actions.

f. Is a function of. In other words, is a result of, or works by way of.

P. Person. To explain the causes and mechanisms of behavior, we'll start with P, the person. Already, it's difficult to consider things about a person without thinking about his/her environment. For now, resist that temptation and focus only on things about the person, things internal to him/her, things s/he carries around wherever s/he goes. If you'd like to use the viewpoint of Psychology to explain your dog's behavior, or the behavior of a cell, simply exchange the P for another letter that stands for the organism you are studying. [Yes, behavioral neuroscientists study the behavior of cells and the people made up of those cells.]

Take a Moment to Think and Write

Make a list of things you think every person has within him/her that influence his/her behavior.

What did you come up with? When psychologists look at things about the person that influence behavior, they may consider the following: personality traits, genes, thoughts and beliefs, neurotransmitters, temperament, health, emotions, abilities, the unconscious mind, and attitudes. To what extent do our lists overlap?

E. Environment. Another important place to look for the determinants of behavior is the environment. If we were to draw a line around the person, environment would include everything outside the line.

Take a Moment to Think and Write

Make a list of things outside the person that you think influence his/her behavior.

What did you come up with? When psychologists look at things about the environment that influence behavior, they may consider the following: family, working and living conditions, parenting, social and religious institutions, economic status, teachers, events, access to resources, friends, and social support. To what extent do our lists overlap?

PE. Person X Environment. Until this point, we've made an arbitrary distinction between inside and outside, of a person no less, as if there really is a line that indicates where the inside ends and the outside begins. Like so many things in nature and the physical world, insides and outsides are connected. Sometimes the connecting place is readily apparent, like a door or window. Other times, it's less obvious, like the semi-permeable membrane of a cell. Psychologists want to know how things inside and things outside affect each other. They even have a specific name for the process—an interaction. Think about what happens when you interact with someone—there is an exchange wherein each of you has an effect on the other. How does this happen between people and environments?

Take a Moment to Think and Write

Describe a personality characteristic or trait of yours. It could be something like introversion or extroversion, or something less universal, like a tendency to seek thrills.

Explain how an environment you've been in has had an effect on this characteristic. Now, explain how this characteristic has had an effect on the environment. Note: the environment includes other people.

Interesting, isn't it? The *interaction* of person and environment seems like a magic place where there is great potential to explain and change behavior. In fact, our understanding of behavior would be incomplete without knowledge of the dynamic relation between person and environment. Environmental conditions do not affect all people in the same way; it depends on what each person brings to the equation. Further, people tend to seek out environments where their needs and desires can be expressed and fulfilled. This self-selecting tendency only serves to strengthen existing characteristics. Imagine the implications! Interactions of person and environment are so complex, and can take so many different forms, is it any wonder that it is so difficult to predict human behavior? There are infinite combinations of P + E + PE.

Theme 3: *Socio-Historical Context*



History is context for everything that develops over time. Psychology as a discipline has grown and changed over time in much the same way that an individual person develops across his/her lifespan. From its “birth” in a laboratory in 1879, Psychology has both shaped history and been shaped by it. Even its birth was a result of the timely confluence of physiology and philosophy. Since that time, psychologists have influenced such diverse practices as the parenting of young children and NFL team owners’ selection of football players. Conversely, historical events have influenced both the research activities and therapeutic interventions of psycholo-

gists. For example, post-war periods have called upon the skills of psychologists to solve problems and address pressing needs, such as identifying and selecting soldiers for specific tasks, or diagnosing and treating psychological effects of witnessing trauma. These activities have, in turn, resulted in the growth of certain specialty areas of research and practice, such as Psychology in the workplace (Industrial/Organizational Psychology) and the treatment of stress-related disorders (Health Psychology). Much like the interaction of person and environment, Psychology has interacted with society across time, and both have been affected.

Historically speaking, Psychology is a young science. Prior to the late 1800s, the mind and its activities were the speculation of everyday people and the study of philosophers and physiologists. Imagine how these two disciplines approached the mind, what their essential questions were, and how they differed. A philosopher might have asked, what is the nature of the mind? A physiologist, however, might have asked, how does the physical world become the mental world? Psychology was born from the union of these two seemingly disparate disciplines. In 1879, at the University of Leipzig in Germany, Wilhelm Wundt established the first Psychology laboratory. He was a physician and physiologist who wanted to create a distinct discipline that studied both mind and body and how they interacted. More importantly, this new discipline of Psychology would study mind and body scientifically, using the methods of other sciences of the day. Between then and now, Psychology has grown, changed, and evolved into a behavioral science that addresses human needs and problems. Although you were probably not familiar with the work of Wilhelm Wundt, you have likely heard of introspection, consciousness, psychoanalysis, defense mechanisms, behavior modification, self-concept, information processing, cognitive-behavior therapy, serotonin, mindfulness meditation, and evolution. These 11 terms reflect the chronology of Psychology, from 1879 to the present. They represent a variety of perspectives that have shaped and continue to shape the discipline—what we study and how we study it. You will become more familiar with these perspectives as the course unfolds.

Theme 4: *Socio-Cultural Context*



How does socio-cultural context differ from socio-historical context? And why does it matter to Psychology? Think once again about the interaction of person and environment. Cultural influences are both pervasive and specific. They include beliefs, values, norms, and practices that are shared by an entire society or a smaller social group within the society. You and I and everyone else grew up in a culture, actually more than one culture. While cultural context can include ethnic background, religious affiliation, and family practices, it can also be more covert, or hidden, as

in the unspoken attitudes or beliefs we all hold. As a beginning Psychology student, where would you place culture—more with person or more with environment? If you are having difficulty deciding, you are right where you should be. Culture is a bridge between person and environment, and is therefore a critical determinant of behavior, including the behavior of the discipline. What psychologists study, how we study it, and how we interpret the findings are all influenced by culture—our own and the culture of those we study. We must always keep cultural influences in mind.

1.3. THE METHODS OF PSYCHOLOGY

1.3.1 How Do Psychologists Study Behavior?

—well, that depends on whether their purpose is to describe, explain, predict, or change it



This introduction to research methods in Psychology is intended to do just that—introduce you to the ways psychologists study behavior. Although more than half of psychologists are engaged in applied practice (i.e., changing behavior), the evidence that guides their interventions is the result of behavioral research. Psychologists are scientists searching for answers to questions and solutions to problems. Research methods are the indispensable tools of their investigations. Like any skilled worker who uses tools in his/her profession, psychologists know which tool to use for the job at hand. If you can organize the psychologist's toolbox in three tiers

(paradigms, methods, statistics), you will be more likely to know which methods answer which questions.

Ways of Thinking About Doing Science—Paradigms

Paradigms are the first thing you see when you open the toolbox. There's a reason you find them just under the lid at the top level. To know the reason, you need to know what a paradigm is. Any idea? What if I told you that your family has a paradigm, would you believe me? How about large corporations, small not-for-profits, medium sized places of worship? A **paradigm** is a set of beliefs or assumptions that is shared by a group. The beliefs don't even have to be written down for everyone in the group to know them and act in accordance with them.

Psychology is guided by two prevailing paradigms for doing science: **constructivism** and **logical positivism**. It is very likely that you carried out some type of a science project during your middle school or high school years. You didn't know it at the time, but you were operating from the point of view of one of these two science paradigms. Let's look at them one at a time.

Constructivists believe that our knowledge about anything is built (constructed) as we go, and is therefore a part of our experience. There is no single truth that applies to everyone's experience because each person's reality is uniquely his/her truth. The role of scientists is to observe behavioral phenomena as they unfold, and to describe it and the experience of it. The process of making observations is bound to be subjective, inasmuch as the scientist is a part of the process. Which goal of Psychology does the constructivist paradigm address?

Logical Positivists believe that behavioral phenomena exist independent of the observer, and can therefore be studied objectively. The purpose of science is to discover the truth—the laws of reality that operate independently of our observations of them. Logical positivists test hypotheses by designing experiments that seek to separate the effects of causal factors from extraneous ones, lest the truth be concealed or distorted. Other researchers try to replicate the findings, which is further evidence of the truth. The process starts with an existing theory or idea, makes predictions based on theory, designs a study, tests hypotheses by gathering and analyzing data, and draws conclusions based on statistical findings. The results are then shared with the scientific community and the world. This process should sound familiar to you—it is the **scientific method**. Which goals of Psychology does the positivist paradigm address?

Can you imagine that the methods of inquiry would depend on the guiding paradigm? Let's look at the next level of the toolbox—you will find three main methods there.

Ways of Doing Science—Research Methods

Methods of doing anything, from singing to surgery, are techniques that, if used properly, achieve the desired goal. Methods are not ends in and of themselves, but rather, they are means to ends. What are the implications of that statement? If the person using the method has not asked what his/her goal is for using the method, the outcome is often bad or “junk” science. So often, methods become more important than their reason for being, and that can be said for Introductory Psychology as well. At this point in your education, what is most important is that you understand why we have different methods, what each method can accomplish, and how it does that. As you learn about **research methods**, think about the goals of Psychology and connect each method with its goal.

Descriptive Methods. There are three common descriptive methods: naturalistic observation, case study, and survey.

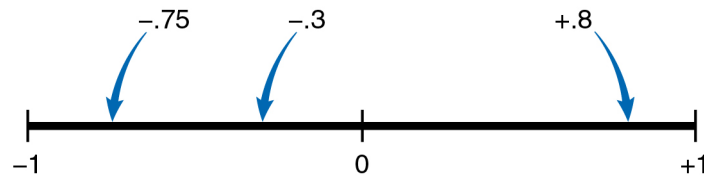
- **Naturalistic observation** is a research method that places the researcher/observer in the natural habitat of the observed, which provides an opportunity to witness and record the behavior directly, without interacting with the observed. It is, however, difficult to observe behavior without actually affecting the behavior by your very presence. The lifelong work of Jane Goodall exemplifies this research method and the challenges it poses when studying (and becoming a part of) the social interactions of chimpanzees in the wild.
- **Case study** is a research method whereby the researcher gathers a great deal of information about one person through a combination of techniques, including interview, history, and review of records. Usually, the subject of the case study is a person who exhibits behaviors that are of interest to the researcher. Though much can be learned about the behavior of one individual through case study, the findings cannot be extended or applied to other individuals. Despite its drawbacks, Freud relied exclusively on the case study, and even today, much of the practice of medicine is influenced by case studies.
- **Survey** methods are able to gather a lot of information about a lot of people by asking them to respond to questions about their behavioral practices, beliefs, or opinions. Surveys conducted on samples of a population have the ability to make predictions about the larger group, but only if the survey items are well constructed and the sample is representative.

Correlational Methods. Whenever we go beyond the first goal of science, which is to describe behavior, we are venturing into the realm of explanation, wherein we can focus on *how* something works or even *why* it happens. Descriptive methods shed light on the *what* of behavior, and in the process, may lead the researcher to seek additional information that would explain *how* two things

are related. If these “things” vary along some dimension, scientists refer to them as variables. Correlational research methods allow us to answer this important question—how are two variables related? This seemingly simple question is a powerful one because, even though it goes only so far in explaining behavior, it opens the door to many other questions and methods that have the ability to answer *why*. In a way, correlational methods have a foot in each paradigm, and as such, serve as a bridge connecting them. Before we get too far ahead of ourselves, let’s think about the ways in which “things that vary” can be related. As we do, consider just a few of the many variables in the lives of college students, from the most mundane to the most significant: mood, study, sleep, attentiveness in class, friends, tardiness, alcohol, employment, and exams. For the purposes of explaining and illustrating how correlation works, choose any two. Back to the question at issue: In what ways can these (and any) two variables be related to each other?

1. They can vary in the *same direction*. Say you chose alcohol use and tardiness. Each of these variables varies along many dimensions, so we’ll use just one for each—alcohol use varies in frequency of use, and tardiness varies on how often it occurs. Let’s say we conducted a research project to investigate the relation between alcohol use and tardiness. We asked hundreds of college students to record their frequency of alcohol use over the course of several weeks. During the same period, they also recorded their tardiness to class and work. We found that, as alcohol use increased, tardiness also increased. This is known as a **positive correlation**—the variables are changing together *in the same direction*. Let’s try another two variables, this time sleep and attentiveness in class. For this research project, we asked students to self-report their hours of sleep over the course of several weeks, and we also observed and recorded their attentiveness in class over the same period. We found that, as hours of sleep decreased, attentiveness decreased. What type of a correlation do you think this is? Are the variables changing together in the same direction? Yes, they are. Therefore, it is a **positive correlation**. Don’t let it throw you if the variables are *decreasing* together. Decreasing together and increasing together are both positive correlations.
2. They can vary in *opposite directions*. Say you chose student employment and exam scores. Each of these variables varies along many dimensions, so we’ll use just one for each—student employment varies in the number of hours worked per week, and exam scores vary in the percentage of items correct. Let’s say we conducted a research project to investigate the relation between hours worked per week and exam scores in all courses. We collected data from hundreds of college students and we found that as hours worked per week increased, exams scores decreased. Are the variables changing together in the same direction (either both up or both down)? No. Are they changing in opposite directions? Yes, they are. Therefore, it is a **negative correlation**.
3. They can vary in *no particular pattern*, which means they are not correlated. Say you chose studying and friends. Each of these variables varies along many dimensions, so we’ll use just one for each—studying can vary in how much (time), and friends can vary in how many. Let’s say we conducted a research study to investigate the relation between how much time college students spend studying and the number of friends they have. We collected data from hundreds of college students and found there to be no relation between time spent studying and number of friends. The absence of a pattern simply means that there are just as many students who study a lot and have lots of friends as there are students who study little and have lots of friends. Similarly, there are students with few friends who study a lot and students with few friends who study little. A **zero correlation** indicates that two variables are not related. It does not shed any light on *how* two things are related, except to say, they’re not.

If you are thinking that positive, negative, and zero correlations seem to be mathematical, you are right, and as such, there is a numerical way to express them. Imagine a number line that starts at -1 on the far left and ends at $+1$ on the far right. Zero is in the middle. Correlations are expressed by a **correlation coefficient**, which is a point on the number line.



What does it mean if the number is closer to $+1$, such as $+0.8$? What does it mean if it's closer to zero, such as -0.3 ? And what does it mean if it's closer to -1 , such as -0.75 ? The most obvious indicator is the sign, plus or minus, which corresponds directly to the number line and says whether the correlation is positive, negative, or zero. It is important to note that the sign of the correlation coefficient has nothing to do with how strong the correlation is. It merely indicates the direction of the relationship (positive or negative). The actual number tells us how strong or weak the relation is between the variables. The correlation is stronger as it approaches the extremes on the number line; it gets weaker as it approaches zero. Hence, a correlation of -0.80 is stronger than a correlation of $+0.55$.

Is there a visual way to depict correlation? Yes. Check out this scatterplot exercise.



Concepts in Action: Positive and Negative Correlations—To view this material, refer to eBook.

What does the knowledge of how two variables are related allow us to do? Correlation coefficients allow us to make predictions (with varying degrees of certainty) about one behavior if we have information about the other. For example, a positive correlation between frequency of alcohol use and tardiness tells us three things: that the variables *are* related, *how* they are related, and that we can use one to *predict* the other. That's a lot, but that's all. As tempting as it is, we cannot use the results of our correlational study to say that the tardiness is *caused* by the frequency of alcohol use, even if there is a theory or model that says it should be. Although it *is* possible that increasing frequency of alcohol use actually causes tardiness, it is also possible that being late a lot causes people to drink more often. There is yet a third possibility, and that is a third variable, such as personality, that causes both drinking and tardiness. What would have to happen in order to say why tardiness occurs or why it correlates with alcohol use?

Experimental Methods. Experiments explain. They do so because they contain elements of control that do not exist in any other research method. By using experimental methods, psychologists can go beyond the *what* and *how* questions, and establish a causal path from one variable to another. In the real world, behavior has multiple determinants that exist in Person (P), Environment (E), and their interaction (PE), making it difficult to isolate causes. **Experimental methods** attempt to isolate cause by manipulating a variable that is hypothesized to be the cause of another variable.

Psychologists who use experimental methods have built upon previous descriptive and correlational research in their areas of interest. Scientists who operate in the positivist paradigm are part of a larger community of scholars who rely on each other's research endeavors to advance knowledge systematically by "answering the next question." A psychologist interested in this question would have carefully reviewed all of the relevant scientific literature published on this topic before designing an experiment.

What do experiments have to offer that other research methods do not? They have the power to determine cause and effect. The experimenter controls certain elements of the process in order to isolate the cause and separate it from other possible reasons for the effect. The purpose of an experiment is to answer a basic question: What is the effect of one variable on another variable? In order to answer it, we start with a theory or model that explains behavior. A psychologist might use a theory that explains how violent video games cause aggressive behavior. The theory predicts that the people who play violent video games will behave more aggressively than people who do not. This prediction is also referred to as the *hypothesis*. An experiment could be designed where some people played violent video games and some people played non-violent video games. All participants would then be observed for aggressive behavior.

Let's stop for a moment to introduce the vocabulary of an experiment.



Concepts in Action: The Language of Experiments—To view this material, refer to eBook.

Now, let's go back to the video game study. As in every experiment, there is a dependent variable and an independent variable. A ***dependent variable*** is the outcome variable. It is the predicted effect. The entire experiment is designed to learn what happens to this variable. In our example, what is the dependent variable? It is aggressive behavior. The ***independent variable*** is the one that the experimenter has control of and actually manipulates. This usually involves changing the amount or level of something, in this case, the violence in the video game. The group that participates in the "treatment" condition is called the ***experimental group***, and the group that participates in the "treatment absent" condition is called the ***control group***. Participants in the study must be randomly assigned to the groups to make sure the groups are not different in any way other than the treatment condition. ***Random assignment*** controls for variables (other than the independent variable) that could affect the dependent variable. In this video, the researchers talk about their study on violence.



Video Resources: Experimental Design—To view this material, refer to eBook.

We have come to the bottom layer of the research toolkit—*statistics*. We began with the goals of science, which are the reason for having a toolbox in the first place. We connected the goals of science with paradigms on the top tier, and then we proceeded to the middle tier—research methods. We chose descriptive, correlational, or experimental methods, depending upon the questions we asked. Now that we have completed our data collection and obtained our results, we turn to statistics to help us express our findings or make inferences about them.

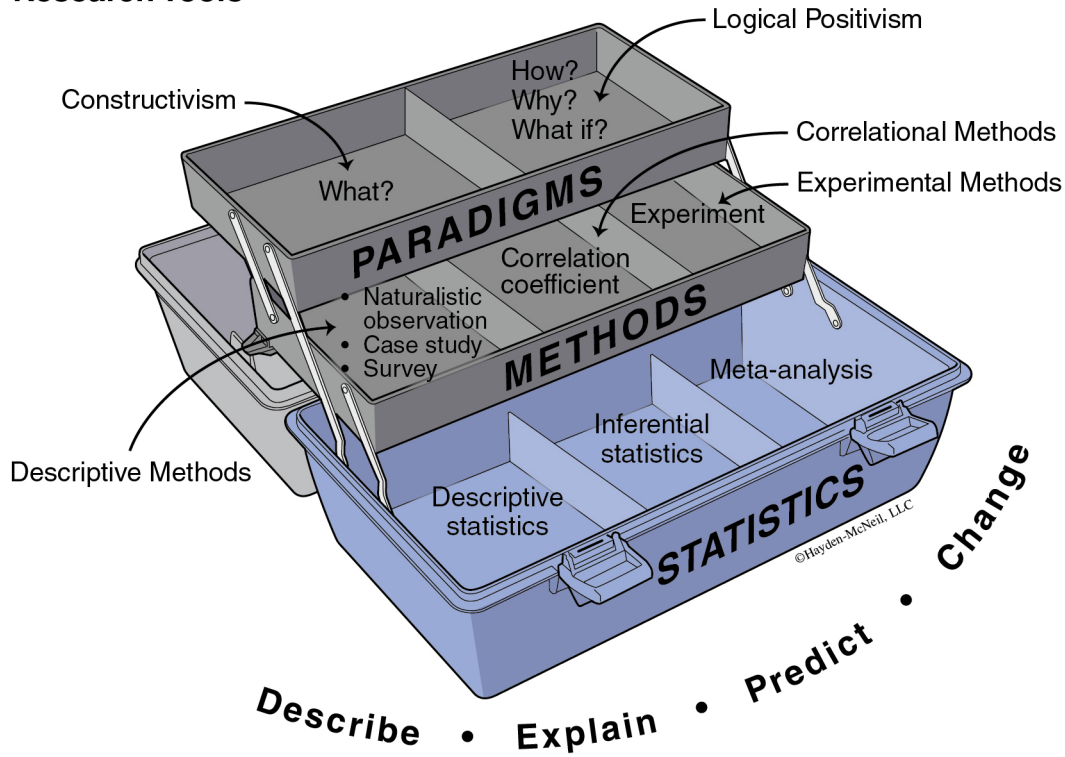
Statistics

Descriptive Statistics. Descriptive statistics do just that—describe observed information. When we describe an entire data set, we are looking for a way to efficiently and clearly express what we have. Numbers do this better than words. What do numbers describe? They tell us a lot about the data set, which is also called a distribution because data points form patterns according to how high or low they are. There are two basic descriptive characteristics of data, and each of them conveys something different. One important characteristic is how the data “gather together” around the middle of a distribution. The other important characteristic is how “spread out” the data are. The first is called *measures of central tendency*, and these include the *mean*, *median*, and *mode*. The second is called *measures of variability*, and these include the *range* and *standard deviation*. Measures of central tendency tell us the ways the data are gathering around the middle of the distribution. There are three ways data behave around the middle. The first measure is the mean, or arithmetic average. The second measure is the median, and that is the mid-point of the distribution—half of the scores are below and half are above. The third measure is the mode, and that is the most frequently occurring score in the distribution. Measures of variability tell us how spread out, or diverse the scores are in the distribution. The range is a relatively crude measure of this characteristic, as it just takes into consideration the highest and lowest scores. The standard deviation is a more sensitive characteristic that indicates the average distance of all scores from the mean. It is a tool researchers use to interpret and compare data.

Inferential Statistics. Inferential statistics do just that—allow inferences about the real world to be made based on the observed information. When we make an inference, we are making a judgment about whether our research findings are due to chance or are due to the manipulation of the independent variable. The level of probability that the findings are due to chance is usually set at .05 or lower for behavioral research. Put another way, inferential statistics allow us to say, with 95% confidence, that the difference between the experimental and control conditions on the dependent variable is due to the manipulation of the independent variable. In other words, the independent variable *caused* the dependent variable.

Meta-analysis. Wow. As if descriptive and inferential statistics weren’t enough. This sounds like some sort of super, uber statistical analysis, and it is. Sometimes, psychologists want to review the findings of a lot of experiments and combine them in order to draw a bigger conclusion than any single study. This is called meta-analysis. “Meta” means “beyond” in Greek; a meta-analysis is an analysis of many analyses, allowing researchers to synthesize multiple research findings into a coherent whole. Meta-analyses are becoming increasingly important in science because the amount of research information generated is growing exponentially every year.

Research Tools



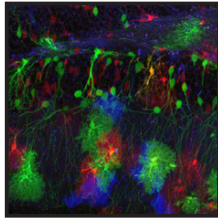
1.4. PSYCHOLOGY HERE AND NOW

1.4.1 What Do Psychologists Do Today and Where Do They Do It?

—almost everything, just about everywhere

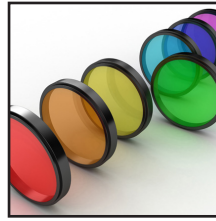
Psychology is a discipline that is grounded in science. It is a *research endeavor* as well as an *applied profession*. Some psychological scientists are interested in conducting research that advances our understanding of behavior, including what is happening, how and why it is happening, and what to do about it. Other psychological scientists are interested in applying what we know to change behavior, including interventions that can treat, and even prevent a wide variety of human problems. It might surprise you to know that Psychology includes so many different areas of research and practice. Each chapter in this course exposes you to a different core content area of Psychology, and each of these areas generates its own body of research. As you take a look at the chapter titles below, you will get a sense of the breadth of Psychology, and you will know what you will be studying in the next 10 chapters of this course. Notice that each chapter has its own essential question. Just imagine—when you complete this course, you will be able to answer them!

Chapters and Their Essential Questions



Chapter 2: Behavioral Neuroscience

How does my brain work?



Chapter 7: Personality

What is my personality and where does it come from?



Chapter 3: Sensation and Perception

How do we take in the world around us?



Chapter 8: Social Psychology

How do we view and affect one another?



Chapter 4: Learning and Memory

How do I learn and remember, and why do I forget?



Chapter 9: Stress and Health

How does stress affect my life?



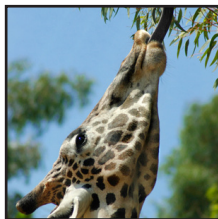
Chapter 5: Cognition

How do we think and communicate?



Chapter 10: Psychological Disorders and Treatment

How do we know when people have a disorder, and how can we help?



Chapter 6: Motivation and Emotion

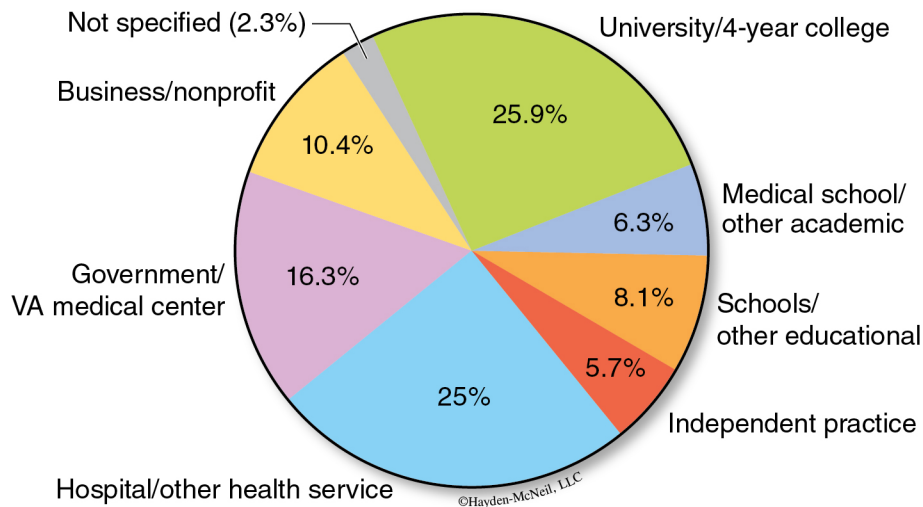
What moves our behavior?



Chapter 11: Lifespan Development

How do we develop throughout our lives?

Where do psychologists do their work? If I said everywhere, I would not be stretching the truth. Their work settings range from university laboratories to university classrooms, from Veterans Administration hospitals to community mental health centers, from corporations to elementary schools, from private practice to public service. Take a look at this chart, and you will see the many *places of work* where psychologists conduct research, teach, and practice.



Note: The chart represents employment settings for those with recent doctorates in Psychology. Totals amount to 97% due to rounding and exclusion of 17 “not specified” responses.

Source: Adapted from D. Michalski, J. Kohout, M. Wicherski & B. Hart (2011), *2009 Doctorate Employment Survey* (Table 3) (PDF, 33KB).

Mental health professionals can come from disciplines other than Psychology. Their education is different, as is the focus of the training. Nonetheless, they are skilled practitioners who work in a variety of settings to prevent and treat psychological problems. Often, psychologists work alongside of other mental health practitioners to provide an integrated treatment approach that considers the **P**erson, his/her **E**nvironment, and how that **P**erson functions in and is affected by the **E**nvironment. Sound familiar? Regardless of title and training, mental health practitioners must comply with the licensure standards of the state in which they practice. Your choice of a mental health professional depends on the nature of the problem you are seeking treatment for. Here are the most common *types of mental health practitioners*:

Clinical and Counseling Psychologist—doctoral degree (Ph.D. or Psy.D.)

- Although these two types of psychologists have different names and educational backgrounds, both diagnose and treat mental disorders. In general, clinical psychologists more often work with severe or acute psychological problems.

Clinical Social Worker—master’s degree (M.S.W.)

- Clinical social workers work with individuals, couples, families, and groups who are experiencing life changes and challenges. The client is viewed within the context of his/her environment.

Mental Health Counselor—master’s degree (M.A. or M.S.)

- Counselors work with people experiencing a variety of emotional problems and mental disorders, including marital/relationship issues, grief, and addiction.

Psychiatrist—medical degree (M.D. or D.O.)

- Psychiatrists are physicians who specialize in the diagnosis and treatment of mental disorders. Because of their medical training, they can prescribe medicine to treat the symptoms. Some psychiatrists also do psychotherapy.

Right here on our campus, Counseling and Psychological Services (CAPS) is a place where students, faculty, and staff can go for help with psychological problems. Whether a problem seems rather ordinary or very unusual, trained mental health professionals provide services at little or no cost. Centers such as this one are a common part of university settings across the United States. The transition to college life can be stressful, and mental health issues can make it difficult for college students to do their work. I urge you to take advantage of this service. <http://life.iupui.edu/caps/>

1.4.2 What Can I Do With a Degree in Psychology?

Whether this is your first Psychology class or not, you are probably curious, maybe even a bit anxious to know what this course in Introductory Psychology is like. You may even wonder if Psychology is for you. Many, if not most students new to college are not sure of their major. Even though this uncertainty can be uncomfortable, it is normal for young adults, and even older adults, to take time to explore their interests and ascertain their competencies. Even though most students who take Introductory Psychology do not go on to become Psychology majors, it is a requirement for many majors, and it satisfies a general education requirement for many others.

When you looked at the list of mental health professionals in the previous section, you may have thought that going on to graduate school was the only way to really use an undergraduate degree in Psychology. If this is what you thought, you couldn’t be farther from the truth. Allow me to insert my own point of view, which has been shaped by thousands of college students I have worked with over the years. The vast majority of undergraduates who major in Psychology do not become psychologists. To the extent that your financial constraints allow, I believe that college is a time of discovery and change. The first thing to discover, if you don’t already know it, is what you like to do or like to think about. The kind of *like* I am referring to is an intense like, maybe even love. It’s an interest in a subject or activity that energizes you and motivates you to ask more questions. The second thing to discover is what you’re good at. The kind of *good-at* I am referring to is a natural ability to excel, even if it requires a great deal of effort on your part. If you can merge the *like* with the *good-at*, and make a profession out of that activity, you will be gratified in your work and thrilled with the directions it will take you.

So what can you do with a major in Psychology? You can think well about behavior. This is your biggest asset and the most valuable commodity, and the best part about it is that you will use it anywhere you go. It will serve you and any employer who is smart enough to hire you. Although a list of job possibilities would be too long to publish, Psychology majors can be found in mental health services, research, social service, child development, sales, business, and non-profits. An undergraduate degree in Psychology is also a solid way to prepare for graduate school in a variety of related fields, such as law, social work, counseling, and higher education.

Thinking about majoring in Psychology? Want to talk about it with other students? Stop by the Psychology Department. We have a Psychology Advising Office staffed by Psychology majors who are knowledgeable and interested in talking with you about Psychology as both a major and a future. More information is available on the Psychology Department homepage. Here is the link: <http://www.psych.iupui.edu/Undergraduate/>.

