Chapter: Psychology: Its Nature and Nurture

What Is Psychology?

"Ahm gowa gega ped dawp."
"Ahm ink thasa dawp's ta on."
"Eir, dawpy, dawpy, lokame."
"Es, dissa ma ped dawp na."
What's going on here? Does this speech reflect logical behavior?

As you read the unfamiliar syllables in the paragraph above, you exhibited certain behaviors. You may have made a quick decision: that part of this book is written in a foreign language. Or you may have decided that psychology was more complex than you'd thought. Or perhaps you looked at the quotations and realized that they fit the normal rules for language. The "words" seemed to occur in logical order. In short, you have decided that this material reflected some sort of normal human behavior, but you just didn't know the rules. In any case you began to wonder about the nature of psychology.

Now, as part of your introduction to this subject, explore the following statements about psychology. Which ones are true? After you've quizzed yourself, you might discuss them with another student and then try again. You may know more about psychology than you think. Information about each of these topics appears throughout this book.

WHAT YOU ALWAYS THOUGHT YOU KNEW ABOUT PSYCHOLOGY:

Following are some beliefs people have that are related to the field of psychology. With which ones do you agree? Think about each of them. After each statement is a reference to the chapter that will give the facts.

1. It is very easy to demonstrate your "body sense" even with your eyes shut. (Answer in Sensation and Perception chapter.)
2. People are either introverted (inward looking) or extroverted (outgoing). (Answer in Personality Theories chapter.)
3. After you learn something you forget more of it in the next few hours than in the next several days. (Answer in Remembering chapter.)
4. The main factor determining whom a teenager is likely to ask for a first date is the person's physical attractiveness. (Answer in You and Groups chapter.)
5. If you must punish a child, it is best to do it immediately after the misdeed. (Answer in Learning chapter.)
6. All people in America are born equal in capacity for achievement. (Answer in Testing chapter.)
7. Teaching a child to roller skate very early in life will give the child a permanent advantage in this skill. (Answer in Early Development chapter.)
8. The number of people in mental hospitals, per 100,000 population, has been declining steadily since 1946. (Answer in Personality Therapies chapter.)
9. Animals lower than humans are not able to reason. (Answer in Language and Communications chapter.)
10. Modern psychologists don't study animals. (Answer in Psychology: Nature and Nurture chapter.)

11. One of the major reasons you turn and face the front when you get on an elevator is that the other riders have already done so. (Answer in Social Behavior of Groups chapter.)

Having considered this list of beliefs, you may be thinking that psychology covers a very broad range of topics. To understand why this is in fact the case, we need to actually define psychology a bit more thoroughly for you. Once you have mastered the definition of psychology, it will be useful for you to understand a bit about the history of psychology. This will broaden your appreciation of the problems and methods that characterize psychology today and the research goals of psychologists. Mastering the methods and goals of psychologists provides a context within which to consider the central issues of psychology.

Psychology: Its Nature and Nurture

WHAT'S THE ANSWER?

Are psychologists today interested in studying the "mind"?

"Intelligence is what an intelligence test measures."

Does this make sense?

Will psychologists learn how to control behavior? If they do, will they have too much power over our lives?

We all constantly observe behavior, assuming that human and animal behavior follows certain psychological "laws." Psychology is the science of human and animal behavior and experience. The word "science" may be used to mean a frame of reference, a procedure, or knowledge that is already known. Historically, five distinct "schools" of psychological thought emerged in the 50-60 years after the first psychological laboratory was founded in 1879. During the 1800s, the structuralists tried to break experience down into its parts, while the functionalists were concerned with *why* behavior occurred. In the 1900s the behaviorists studied only observable behavior and ignored internal processes. The Gestaltists and psychoanalysts were more generous in the effects and behaviors

they would study -- including "mind" and the unconscious. Since about 1950 psychology as a whole can be described as eclectic.

It qualifies as a science especially because of its reliance on the methods of science. As such, it relies heavily on operational definitions of its terms and procedures. Psychologists seeks to discover functional relationships between independent and dependent variables. Intervening variables are a concept invented for what must be occurring inside a participant. They identify relations between independent and dependent variables. Any experiment requires a control group, which is a group exposed to exactly the same conditions as the experimental group except for the independent variable. Creating a good control group is one of the skills required for running a good experiment. Data are usually collected in psychological experiments through the experimental methods, naturalistic observations, or case histories (interviews).

Psychologists have two major goals in studying behavior. They want to understand it -- meaning identify/describe it, measure it, and explain it. They also wish to utilize that understanding to predict and control behavior. The study of behavior has long dealt with four major issues. The mind-body problem concerns the relationship between the mind and the brain. The nature-nurture issue involves whether human behavior is inherited or learned. The level of explanation concerns how far we must reduce a phenomenon to simpler units to say we have explained it. Theoretical views of modern psychology include learning, psychoanalytic, cognitive, and humanistic theories. Differences between research psychologists and those seeking practical applications are limited to differing needs for immediate answers.

Finally, there are those who stress that being an effective psychologist -- whether in their conduct of therapy or experiments -- also involves a degree of artistry. Nevertheless, psychologists always seek to qualify scientifically conclusions we might have made about behavior through our use of everyday common sense.

Definition of psychology

Perhaps you're impressed (or worried?) by the wide range of topics that may be studied by psychologists. In fact, while the topics are many, they all involve behavior. Psychology is defined as the science of human and animal behavior and experience.

Let's discuss each part of that definition. First, consider the word science. When we refer to psychology as a science, what do we mean? The term "science" is really used in three different ways. It may simply identify a frame of reference -- a set of values, customs, and attitudes that make up a certain approach. In this sense it is only one way to study the events of nature. Religion would be another. Philosophy might be a third. Sometimes "science" identifies procedure. Scientific methods, or sets of established procedures, can be used when studying or trying to prove a theory. Lastly, "science" sometimes refers to everything we've already learned by applying scientific methods. Thus science is also a body of organized knowledge that has already been confirmed. In studying behavior, psychologists use science as a frame of reference, as a procedure, and as a way to accumulate and apply knowledge.

Now, consider the words human and animal in our definition of psychology. It is true that psychologists study both humans and animals. We study humans to understand our behavior. But why study animals? For several reasons. Obviously, animals also behave, and they are interesting in their own right. But, more importantly, processes such as motivation and learning may be easier to study in lower animals. Moreover, there are some experiments that can't be performed on humans -- for instance, studies of the long-term effects of hunger on behavior.

Perhaps the most important word in the definition is behavior. We all "behave," but what do we mean by that? In order to interest a psychologist, behavior must be observable. How to make behavior publicly observable is a problem all psychologists face. Behavior is the molar activity of an intact individual organism.

Finally, experience. Even when you are absolutely still, not moving anything, you may still be experiencing dreams (or nightmares!), itches, and urges. Whereas some psychologists once discouraged the study of internal experience, today many examine the total mental processes involved in any given activity. This last statement should help you solve the challenge in the Think About It.

Think About It

The question: In the opening section of the chapter are these words: "Ahm gowa gega ped dawp." *That doesn't seem to make any sense, but what's going on here? Is the "conversation" from which this is drawn a logical one?*

The answer: The answer to the first question is that what's occurring is communications -- as you suspected. Your own past experience probably led you to think that a logical conversation was taking place. More than likely you assumed that the behavior was logical, but that you simply didn't understand the rules of the language. However, for those who did, it was intelligible.

You probably assumed that since you're reading a psychology text, we must be demonstrating something about human behavior. You also may have assumed, since books usually explain what they're about, that we're going to explain to you exactly what we are demonstrating. No such luck. We discuss this demonstration in our discussion of perception, of language and communication, and of person perception be able to translate this "foreign language" into understandable English.

For now, simply rest assured that some of your assumptions about our purposes are correct. Take our word for it: Both *your* assumptions *and* the conversation are logical. As you read the book, you'll find out why.

These, then, are aspects of psychology as a science. Psychology was only formalized as a scientific discipline a little more than 100 years ago -- in the late 1870s. However, many of the topics and concerns of psychology have been of interest to thinking humans for centuries. What are some of the early roots of the subject? What are the historical origins of the existing trends and theories we study with today's scientific methods? And finally, how much art is there to psychology? These issues all help to define the nature and nurture of psychology as a scientific discipline.

The History of Psychology

Since the times of the ancient Greeks, the brain has been recognized as the seat or location of the mind. On the other hand, religious views maintain that humans have souls. "Mind" is a concept similar to that of "soul." And, like soul, it's not an easy concept to

isolate. One of the oldest arguments of the philosophers concerns what has been called the "mind-body" problem.

Part of the debate has concerned the question (still unresolved), How are the brain (body) and the mind related? One possibility is that they interact. They are separate, but equal. They may experience the same thing, but they are separate and distinct entities. A second possibility is that mind and brain are operating in parallel. Maybe they experience the same thing, but the brain is part of the physical world whereas the mind is part of another (separate, or dual) universe. A third possibility is that there is simply one underlying reality, or essential identity. Whatever the brain experiences, the mind also experiences.

In recent years the importance of this difficult issue has faded. Science today, including psychology, leans heavily toward physical explanations, which can be measured by scientific means, as we'll discuss later. While the mind-body problem hasn't gone away, the great increase in the types and varieties of problems studied by psychologists has directed their attentions elsewhere.

Rarely did the debates of the ancient philosophers question the importance or worth of the human being. However, by the late 1800s, humans' views of themselves had undergone two severe blows. First, over three centuries earlier, Copernicus had dared to suggest that the earth was not the center of the universe. We're hurtling through space, occupying a planet that is not even at the center. Second, in the latter half of the 1800s, the English naturalist Charles Darwin had suggested that humans might not even be the supreme beings they had thought they were. He suggested that humans were simply the latest in a continuing series of changing -- evolving -- organisms.

Although these advances in thought lowered human self-esteem, in the name of science all kinds of scientific efforts continued. By the late 1800s, biologists were busy developing a classification system for animals. Chemists were busy studying interactions among elements already discovered, and pushing toward the discovery of additional elements predicted to exist by their Periodic Table. Physicists were making great strides in their studies based on the atomic theory of matter.

But, also about this time, there were a number of interesting problems that were not being studied by any existing sciences. These included: (1) the old mind-body problem, (2) individual differences in abilities of humans, (3) reaction times of individual humans, and (4) the perception of sensory information such as light waves and sound waves. These problems were now taken over by a group of scientists, often trained in neurology (sometimes as part of medical training) or in philosophy.

Such developments gave rise, in the late 1800s, to the establishment of the first psychological laboratory. That effort began the discipline of modern psychology, even as it continued to be defined by researchers throughout most of the 1900s in moving toward its modern-day diversity of approaches to studying behavior and experience.

Psychology in the 1800s

Psychology is a relatively young science. It's history really begins in 1879, when Wilhelm Wundt established the first psychological laboratory at a university in Leipzig, Germany. 1879 is identified, then, as the year when psychology organized itself as a science. Over the next 50-60 years -- into the early 1900s -- a series of "schools" of psychology developed. These were not "schools" such as a college is a school. Rather, they were schools of thought. They were attempts to organize the problems being studied, the techniques of study being used, and the means of analyzing the experimental results. These schools began with the contrasting views of Structuralism and Functionalism, and each had a large impact on the development of psychology as a science.

From its beginnings as a laboratory science in 1879, psychology quickly adopted many of the characteristics of other scientific efforts underway in the 1800s. Thus the first school of thought in psychology resembled the other sciences in the reasons and ways it developed. Remember, biologists, chemists, and physicists were making advances by subdividing their subject matter into ever-smaller units. The biologists, for instance, used their ever more powerful microscopes to study smaller and smaller features of cells. The structuralists did the same for psychology. They relied on introspection. This is a technique in which a person (today called a participant in any psychological experiment) reports his or her thoughts. For example, in viewing a brick wall, the subject would be asked to analyze the experience. A report on the color of the wall would include an analysis of the basic colors apparently blending to

make the color perceived. The texture of the wall, the distance from it, its perceived size, and so forth would all be analyzed. The structuralists were interested in each part that combined to make the total experience. Do you see the parallel to the chemists' studies of elements?

The structuralists formalized the split from physiology and philosophy. They introduced scientific methods to the study of human behavior, and used them as a procedure and a way to accumulate knowledge. This contrasted markedly from the approach of the functionalists, who became the structuralists' primary competition in psychological thought.

The historic beginnings of psychology as a laboratory science in the 1800s fostered the development of two contrasting schools of thought and emphasis. Unlike the emphasis of the structuralists, the functionalists tolerated introspection, but were more concerned with what experimental subjects were introspecting about. They felt the internal nature of the experience was not nearly so important as the purpose being served by the experience. Why was the organism behaving as it was? What was the function, the purpose, or the goal of the behavior?

The functionalists broke down some of the early restrictions on what could be studied. They increased the emphasis on directly studying behavior itself. Their early concern with the goals of behavior led to the interest we have today in applying psychology to everyday experiences.

The value of these early schools was not in the rightness of their assumptions. Rather, they presented their views in such a way that others could see the problems and offer better theories or explanations. That's the advantage of a stated or published theory. These schools of thought were also a hallmark of many of the movements in psychology that developed in the early 1900s as psychology continued its move toward its modern-day diversity.

Psychology in the 1900s

By 1900 psychology had established itself as a separate discipline. It had made a couple of theoretical attempts to organize itself, but much work remained. Whereas the first two

schools followed one another, the next three schools developed more or less at the same time. These included the behaviorism of John B. Watson, the German school of Gestalt psychology, and Sigmund Freud's psychoanalytic approach. By the middle of the 20th century psychology's schools of thought gave way to a much more diverse or eclectic approach.

Psychology began to mature as a science in the 1900s. No study of the history of psychology would be complete without recognizing contributions by Freud, the Gestaltists, and John B. Watson.

Watson was an American psychologist who followed through on a trend started by the functionalists. Watson threw out all the introspective data; he eliminated any concern with "consciousness" and "mind," insisting that they were only products of behavior. To Watson, the only thing to be studied by psychologists was behavior.

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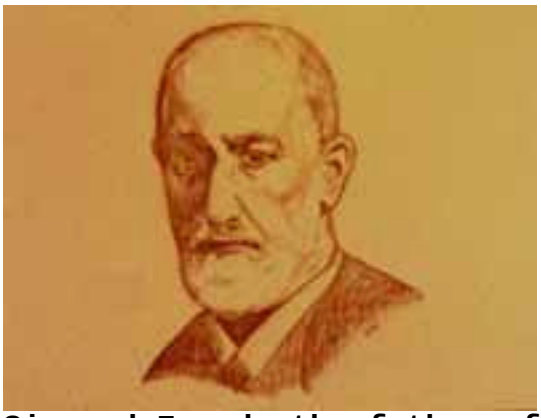
The behaviorists further increased the variety of behaviors that could be studied by psychologists since they included animals as well as humans. They also narrowed the field of study to include only behavior that could be observed, and they simplified the subject matter.

Another major movement in the history of psychology's development in the early 1900s was Gestaltism. Along with behaviorism, another approach was developing -- that of Gestaltism. A demonstration of Gestalt principles is seen in the Figure. The Gestaltists basically were concerned with perception.

They didn’t analyze things into smaller and smaller parts. Instead, they concentrated on how the brain achieves a "whole" (the "Gestalt," or pattern) from all the bits of information the senses perceive. Gestaltists provided many challenging problems for the other theoretical views, but offered little by way of explanation themselves. It was Sigmund Freud's psychoanalytic approach that placed the most emphasis on the dynamics of how unconscious processes effected conscious thought and actions.



Sigmund Freud, the father of Psychoanalysis.

From the late 1800s onward into the 1900s, another intellectual movement was gathering force. This movement grew from the thinking of Sigmund Freud, a Viennese neurologist who started treating abnormal personal behaviors he found in his patients. What evolved was viewed by some as the third great challenge to the self-centered views we humans tend to hold of ourselves. We discuss psychoanalysis in more detail in chapter on Personality Therapies. For now let's just note that the psychoanalysts continued to study unconscious behavior even though the behaviorists attempted to throw out such concerns. Freud awakened interest in sex and in the developmental processes of childhood in understanding adult behavior. Perhaps most important of all, Freud called attention to the newly developing discipline of psychology. He caused controversy, and that gained attention, which ultimately popularized psychology. He challenged humans' views of themselves. He suggested that we may not be aware of some of the forces influencing our behavior.

Psychology Becomes Eclectic

By the mid-1930s the major schools of psychology that defined the history of psychology's development in the 1800s and continuing into the early 1900s were well established. Their principles dictated what could be studied and what could not. Data were interpreted in terms of these theories. But the golden era of master explanations passed gradually. By 1960 psychology could best be described as an eclectic field -- with no one dominant school of thought. A theory was chosen mainly

in terms of how well it explained the particular behavior at hand.

With the arrival of the 1990s, several more new trends had developed. First, the mind, rejected from psychology since the early days of John Watson, suddenly became a topic of interest again. Behavior was no longer regarded as the simple phenomenon the behaviorist thought it was. Second, as research machinery became more complex and sophisticated, studies of the brain and the physiological bases of human behavior increased markedly in importance. Third, humanistic psychology kept growing in popularity, even though it was of relatively little interest to the major research centers. Humanistic psychology emphasizes growth, with the goal of helping individuals achieve the fullest measure of their human potential.

So as psychology enters the 2000s it is not blessed with a single overriding theory or principle that could integrate its many different findings. Yet it remains a very popular discipline. One former president of the American Psychological Association suggested that psychology is popular because of the questions it asks, not because of the answers it has so far offered. Keep that in "mind" as you read this book. We have studied some very interesting questions, but we have a long way to go toward providing all the answers. Now try the Think About It.

Think About It

The question: Are psychologists today interested in studying the "mind"?

The answer: In the early 1900s -- even up until about 1930 -- they were. Between 1930 (as Freud's influence began to decline) and 1970 they were not. In fact, during the heydays of behaviorism the mind was essentially ignored and, to some extent, so was the brain. Psychologists simply behavior without worrying about what went on in the brain. Since 1970 physiological psychologists and linguists have begun making intellectual breakthroughs in the study of the brain and brain functions. This has led to some renewed interest in the mind, even though the mind is not directly observable. New experimental procedures have markedly increased the range of behaviors and phenomena that psychologists can study.

Problems and Methods in Psychology Today

As you've seen, psychology started with the study of a limited set of problems. It has grown to become the science of

human and animal behavior and experience. In discussing the scientific methods in this chapter, we consider the importance of operational definitions in guiding research, as well as the types of variables involved. The need for control in the collection of scientific data is also a very important consideration, whether researchers use experiments, naturalistic observation, or case histories as their method of investigation. In all of these research approaches, the primary goal remains that of understanding and applications.

Nevertheless, there are certain conceptual issues which remain central to psychological research even today. A researcher must choose a level for analysis. This is often guided by the scientist's theoretical views or possibly intent to do only basic research or applied research. In any case, whether behavior and experience is more influenced by nature (i.e., biological processes) or nurture (i.e., experience) remains a pervasive issue.

Operational Definitions

It is very important to all scientists that their work be objective, and that events being studied be observable -- by you, by me, by anyone else who's interested. It makes it easier to specify what is being studied and how. These observed events must also be repeatable which assures that you can study such events whenever you want. Events must also be testable and measurable. These criteria are important for assuring that the methods for study in psychology, and every other science, are scientific.

The easiest way to achieve all this is to define events operationally. An operational definition means simply that any concept is identical to the operations used in measuring the concept. For example, if you talk about the length of your father's mustache, how are we going to measure it? To find the length of an object we must perform certain physical operations with a tape measure or yard-stick. The concept of length is thus fixed when we specify the operations by which length is measured. If we use a yard-stick, we know your father's mustache will be measured in inches, feet, or yards. If we use a meter stick, it will be measured in centimeters, decimeters, or meters -- assuming he'll let you get close enough to measure it. This seems trivial, but it's an important matter in defining variables for study. Explore Feature 1 on operationalizing a definition to discover some suggested uses of operational definitions.

Feature 1

OPERATIONALIZING A DEFINITION

The scene is a March Sunday morning in the Emergency Ward of the Massachusetts General Hospital. At 3 a.m. Ralph Tieball has staggered into the hospital to have a serious cut on his right arm treated. The smell of liquor is on his breath. When questioned by the doctors, he admits he fell ("No, I just tripped!") while walking near the hospital. All this is recorded on the Emergency Ward Admission Sheet that is filled out for each patient admitted for treatment.

All might have been forgotten, except Ralph happened to qualify for a study conducted several years later. Some psychologists were interested in whether or not alcoholics tend to be more isolated from society than other citizens. To study this the researchers sought the Emergency Ward log for MGH and collected a sample of 200 "alcoholics." How did they define an alcoholic? Very simply. If the word "alcohol" or "liquor" or any products normally associated with drinking ("whiskey," "bourbon," and so forth) appeared anywhere on the Emergency Ward Admission Sheet, that person was defined as an alcoholic.

In Ralph's case words qualifying him as an alcoholic appeared in two places. In the general observations section it was noted that "the smell of liquor could be detected on his breath" and later, "Patient admitted falling, apparently due to excessive alcohol consumed earlier in the evening."

For each of 200 people who qualified as "alcoholics," a number of additional facts were sought from that admission sheet. Did the patient have medical insurance? Who was listed as next-of-kin? Was the patient employed? Doing what? How did the patient come in—by self-admission or with a family member? By public authority, such as police or hospital ambulance? About 20 such facts were gathered for each of these "alcoholics."

When the data from the "alcoholics" were compared with similar data gathered from people admitted to the Emergency Ward whose record contained no mention of alcohol, some interesting differences showed up. For example, the "alcoholics" were much less likely to have medical insurance. They were less likely to list a parent or child as next-of-kin, and more likely to list an aunt or uncle or cousin, if they listed anyone at all. The "alcoholics" were less likely to have a job, and those who did tended to hold less important (lower-paying) jobs than the average job held by the other (nonalcoholic) group. Moreover,

the alcoholics were more likely to come by public means (police or ambulance), whereas the comparison group were more likely to be brought in by a member of their immediate family.

These researchers concluded that alcoholics (defined as they defined them: people admitted for treatment, and on whose Emergency Ward Admission Sheet the word "alcohol" appeared) were more likely to be socially isolated. You might quarrel with the operationally defined definition of "alcoholic," but once you agree with that you can't disagree with these researchers' conclusion. In short, once we've agreed on an operational definition, it's much easier to specify what it is we may still want to argue about. Operational definitions lend precision to research and scientific arguments based on that research.

What do you mean when you say "I love you" to your boyfriend or girlfriend? Many things are involved in that statement, but if a psychologist is to study "love," the term must be operationally defined. If you're in love, it is likely that (1) you will seek the company of that individual before anyone else, (2) you will give gifts, such as birthday presents or valentines, (3) you will date that person, and (4) you will do many other such things. Maybe this is just describing the obvious, but it should also be obvious that if those behaviors aren't there, you probably aren't in love. The operations by which we measure the concept, then, define the concept. Is “intelligence” what an intelligence test measures? Try the Think About It for an answer.

Think About It

The question: "Intelligence is what an intelligence test measures." *Is that a logical statement?*

The answer: Yes. Although you might argue about the nature of intelligence, that statement is an operational definition. It is not a circular definition. Someone who scores high on an intelligence test is considered to be "smart" or "very intelligent." But what determined how high that person would score on the test? The intelligence test itself! In the Testing Chapter we study such tests in detail, but at this point just realize that this may not be a bad definition. It *does* emphasize the *operations* that are performed in testing intelligence.

Variables of Interest

Let's suppose you're a psychologist and you're interested in answering a question that has been posed to humans all over North America (at least since an advertising agency created it): Is it true blondes have more fun? In order to collect some data on this matter, we might set up an experiment, which is a typical approach for investigating a problem of interest. For instance, we might decide to watch two types of humans -- blondes and non blondes. In your experiment you would then need to measure the fun had by all the people you were studying. But that's not so easy. What things usually happen when people are having fun? We could just assume that the more often these things happen, the more fun such a person is having. Thus, we could measure the number of smiles. Or, if we wanted to study people for a longer time, we could keep track of the number of dates they had, or the number of different people they talked with on the telephone each week, or the number of times they were invited to parties or other social affairs. But counting smiles is probably easiest.

In order to keep it simple, you might decide to limit your study to 40 people, 20 blondes and 20 non blondes, with 10 of each sex in each of your two groups. And you would probably decide to collect all the data at the same time, maybe by finding 40 people (with the help of a lot of your friends!) at a Saturday night rock concert. For one hour -- say, from 9:30 to 10:30 -- you would simply count how many times each of the 40 people in your group smiled. At 10:30 you would eagerly start collecting the reports from your helpers, and you might get a series of numbers such as those listed in Table 1 on the next page.

Totaling the data in this table, you find that blondes smiled 843 times, or 42.15 times per person. The 20 non blondes smiled 831 times, or a total of 41.55 times apiece in that hour. You conclude that blondes do have more fun -- but not by any significant amount.

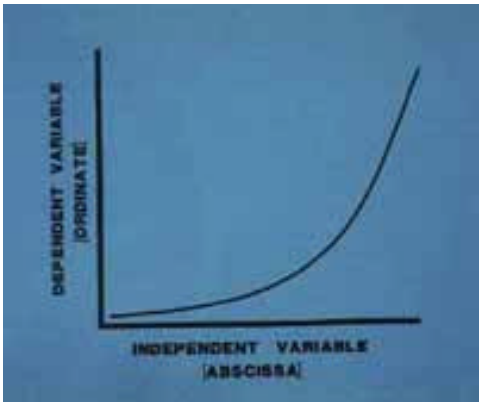
In conducting this experiment you've used a number of basic scientific procedures and concepts. One of the important concepts you've used is that of the independent variable. This is a factor that is selected by the experimenter. You chose to study blondes. The independent variable is changed or varied to find out what effects or behaviors it may be causing. You compared blondes with non blondes to see whether blondeness influenced how much fun people have.

Table 1

Number of Observed Smiles in One-hour Time Period

BLONDES					NON BLONDES				
1.	71	11	38		21.	25	31.	39	
2.	55	12.	20		22.	36	32.	56	
3.	60	13.	48		23.	57	33.	40	
4.	83	14.	22		24.	11	34.	43	
5.	51	15.	53		25.	47	35.	68	
6.	19	16.	46		26.	16	36.	18	
7.	47	17.	30		27.	62	37.	53	
8.	42	18.	37		28.	46	38.	48	
9.	59	19.	12		29.	71	39.	21	
10.	6	20.	44		30.	23	40.	51	

You also had a dependent variable, which is a factor that is also selected by the experimenter. However, the subject being studied determines the actual value of the dependent variable. Your dependent variable was smiling -- a response that you selected. But it was each of your subjects who decided how many times he or she would actually smile during the hour you were watching.



Finally, although you may not have known it, you also had an intervening variable. We invent this concept for what must be occurring inside our subjects. The intervening variable identifies any relation we find between our independent and our dependent variable. What is our intervening variable here? Fun! We assumed that blondes might have more fun. So we identified two levels of blondeness -- present and absent. Since we couldn't measure fun directly, we measured what we could see, namely smiles. In your experiment, smiles were used as the operational definition of fun. Anyone having fun would smile. What we've done is summarized in the accompanying drawing.

Using intervening variables may sound a bit confusing, but there are actually quite a number of intervening variables that

would fit our definition. Love is an intervening variable. Hunger is an intervening variable. As we'll see later, learning, personality, and intelligence are all intervening variables. For instance, we know many things that will cause you to be hungry -- you haven't eaten, you've been very active, or you're growing. All of these cause an internal state we call hunger. When people are hungry, we know what they'll do. They'll eat if food is given to them. They'd be willing to do some work for us if we'd give them food, and so forth. So intervening variables are really just scientific shorthand. They summarize a lot of relations that exist between independent variables (or causes) and dependent variables (or effects).

And why do we run experiments? Mainly to study functional relationships. An experiment is an organized attempt to establish or study a functional relationship between an independent and dependent variable. A functional relationship simply states how changes in an independent variable influence the value of a dependent variable. In the chapter on Methods and Numbers we'll talk more about functional relationships, especially how we demonstrate them statistically. For now, all you need to know is that in most graphs in this book the independent variable is along the horizontal (or X-) axis, and the dependent variable is along the vertical (or Y-) axis.

Control and Data Collection

The procedure for deciding whether blondes have more fun would qualify as a psychology experiment. But, if that's what we're interested in, why on earth did we also study the fun that was had by non blondes? The main reason is the "more" used in the question "Is it true blondes have more fun?" More than whom? The non blondes, meaning all the rest, serve as a very important reference point. We all have a certain amount of fun. We were interested in finding out whether blondes have more fun then most other people. So, a group of non blondes was found to serve as our reference or control group.

This principle of controlled comparison is probably the single most important feature in scientific experiments. By control we mean isolating the impact of the cause (independent variable) on the dependent variable that is being studied. We knew that people have fun, but we were interested in finding out whether blond people have more fun. So we set up an experiment in which a large number of non blonde people would have fun. That was our control group. They established how much fun the average person would have at a rock concert as measured by the number of smiles. We also placed 20 subjects who were people in

that same situation, but they were also blonde. Blondeness was our independent variable, and the group of blondes is our experimental group. By comparing the non blonde (control) group's smiling rate with the blond (experimental) group's rate of smiling, we could determine whether blondes had more fun than a comparable group of non blonde people.

Creating a good control group is one of the skills in running a good experiment. To have a good control group you must be sure that two things have happened. First, everyone (whether blond or non blonde) must have an equal chance of being selected to be in the experiment when the subjects are identified -- a process called random sampling. Otherwise we would have a biased sample. Second, we must control what some people call "nuisance" variables. Nuisance variables are uncontrolled variables that might cause the same change in the dependent variable as the variable we are actually studying. Both the experimental and the control group must be treated identically throughout the experiment except for the independent variable that will be experienced by the experimental group. In that way if there are any differences in the behavior of the experimental and control group subjects, we will be able to conclude that those differences were likely caused by the independent variable.

Applying the use of operational definitions to everything they study, psychologists still use a wide variety of techniques in collecting data. The same behavior may be studied in many different ways. The three most common techniques include experiments, naturalistic observation, and case histories obtained through interviews.

Experiments in Psychology

The experimental method refers to any data collection technique in which control is exercised over many variables that might influence the behavior being studied. Such research is frequently conducted in the laboratory. In fact, the term "experiment" usually refers to procedures in which the effects of one or two independent variables are being studied in a well-controlled (laboratory) situation.

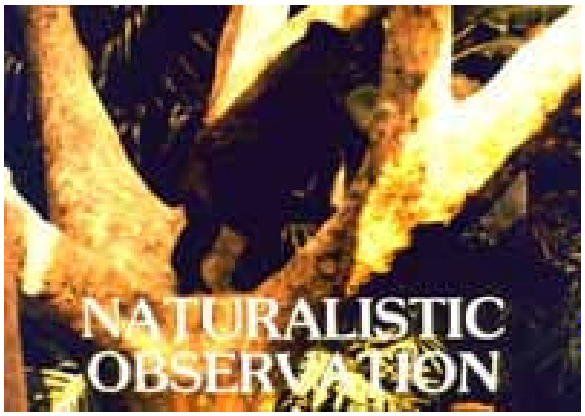
The experimental methods are good for several reasons: (1) When accurate operational definitions have been used, you can repeat other people's experiments to question or replicate their results. (2) The laboratory-based experiments are usually well controlled so that nuisance variables are not a big problem. (3) The laboratory allows for very precise presentation of independent variables. But, as you probably suspected, there

are also some problems. For one thing, you can't always measure something in the laboratory.

If we wanted to study the social process of falling in love -- as we were talking about earlier -- it would be almost impossible to do so in a laboratory setting. Also, the laboratory situation is artificial. Sometimes by bringing a behavior into the laboratory to study it we may interfere with the behavior as we try to measure it. So there are some limits on what we can study in the laboratory, especially in psychology (The previous Feature (1.1) shows you one example of such research.)

Naturalistic Observation

Another often-used method for collecting data is that of naturalistic observation. Here the researcher goes out "into the field" and observes behavior in the environment where it occurs without direct influence by the researcher. This is important in psychology, for the subject doesn't need to cooperate in order for such research to be done. Sometimes the observations may be more true-to-life if the subject doesn't know he or she is being observed. Observing or measuring behavior is less likely to interfere with the behavior being studied, as sometimes happens in the laboratory.



Yet, there are problems here, too. Since the observer doesn't directly influence the behavior being observed, it sometimes requires great patience to wait for the expected event to occur. Moreover, we humans sometimes tend to become overly generous with our own attributes as we observe subhuman animals. Have

you ever heard someone talk about a "sly" fox? What is a sly fox? At best, what people are talking about is a fox that behaves as if it were sly in the human sense. But granting human characteristics to subhuman animals (called anthropomorphism) must be avoided.

One researcher who lived in the African jungles for several years in the late 60s observed some never-previously recorded behaviors of jungle apes. Feature 2 tells you more about her research.

Feature 2

APES OF WRATH?

At the corner of three African nations -- Rwanda, Uganda, and the Democratic Republic of the Congo -- lie the Virunga mountains. The wooded slopes are the remote African highland home of the mountain gorilla.

These are not small animals. The largest males may stand six feet tall and weigh as much as 400 pounds (180 kilograms). Using a variation of naturalistic observation, Dian Fossey lived in these mountains for thirteen years starting in the late 1960s. Not content simply to sit and observe, Ms. Fossey started acting like a gorilla. The more she learned about gorillas, the more like them she was able to act.

Ms. Fossey reports that gaining the gorilla's confidence was a long, slow process. She states: "I imitated their feeding and grooming, and later, when I was sure what they meant, I copied their vocalizations, including some startling deep belching noises." When trying to gain the gorillas' confidence, Fossey used to beat her thighs with her open palms to mimic their chest beating. She reports that the "sound was an instant success in gaining [their] attention.... I thought I was very clever but did not realize that I was conveying the wrong information. Chest beating is the gorillas' signal for excitement or alarm, certainly the wrong message for me to have sent as appeasement!"

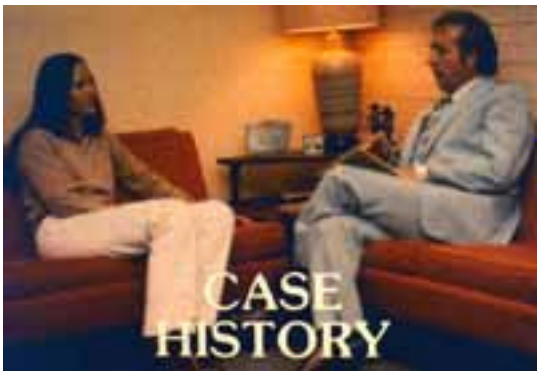
But by waiting for the gorillas to come to her and by imitating the gorillas' actions, Ms. Fossey gradually became accepted by them. Some of her observations were surprising. In fiction the gorilla is portrayed as a savage, highly aggressive animal. Not so, reports Ms. Fossey. Of a total of some 2,000 hours of close observation, she reports only three instances of aggression started by the gorillas. They'll fight back when

threatened, but, being vegetarians, they almost never attack humans.

Such observations result from a technique in which the experimenter becomes "part of the scenery."

Case Histories and the Interview

The third method for collecting data has probably been applied to you many times already: the case history, or interview. Perhaps it was in your doctor's office. Or, if you have ever been treated by a psychologist, you were probably asked about your personal history. So it's a method that can be well fitted to the individual. Relying on the traditional, trusting, doctor-patient relationship, it is a very efficient way to gather data. On the other hand, such a method yields data that apply to only one person or subject. Will it hold true for others? Only more interviews will tell us.



An interview always relies on the subject's memory of past events, and under certain situations such memories can't be trusted. We aren't always reliable in recording our own past. In addition, trying to put such verbal reports into numerical terms for analysis can be difficult, if not impossible. Finally, there may be many different interpretations of a person's responses to interview questions. So, although this is a valuable source of data in dealing with individuals, it is not often used in studies involving large numbers of people. Feature 3 on case histories contains an interview with two parents whose daughter began behaving in unusual ways. The information the psychotherapist gained through the interview helped her identify how to solve the parents' problems with their children. Yet this information may not apply to the unique problems of other parents.

Feature 3

"MANY A TEAR HAS TO FALL"

MOTHER: My son, Cary, was throwing temper tantrums when I dropped him off at nursery school on my way to the university. But we've corrected his problem.

DR. MARTINEZ: How did you do that?

MOTHER: We set up a chart at home. Cary got a gold star every day he went to school without crying. Five stars and we took him to his favorite restaurant. But now Katie, my daughter, has become so upset.... I just don't understand it! She's been perfect for five years, and now this!

DR. MARTINEZ: What's happened?

MOTHER: She's started throwing temper tantrums. She doesn't want to stay with her baby-sitter while I'm at school. She doesn't want to visit friends, and she doesn't want me to leave.

DR. MARTINEZ: That sounds like a really dramatic change. As I think about it, it seems to me your son's crying was related to his anxiety about being separated from you. He was in school -- a new and stressful situation for him. He missed the consolation of knowing you were home when he left and would be there when he returned. Why do you think your daughter is suddenly acting this way?

FATHER: I don't know. I think it's because Katie doesn't like to leave Kim.

MOTHER: No, I think it s because Katie saw Cary crying about school.

(As you can see, even direct participants in the event couldn't agree on the impact the mother's absence had had on their daughter. From this fact, what would you conclude about this family?)

DR. MARTINEZ: I suspect that's part of it, but it may not be the whole story. Yes, Katie misses you, Kim, and she saw Cary doing the same thing a month ago. The difference is that she later saw Cary being rewarded for not crying any longer. I suspect we should deal with it in exactly the same way. I'd suggest you try giving Katie a gold star every time you can leave to go to the university without Katie shedding a tear.

Goals of Psychological Study

At this point you may be asking yourself a very simple question: "So what?" Why are psychologists going to all this trouble? What are their goals for using such methods? It's a good question, and it can be answered in several ways. We'll answer it one way now, and add more information at the end of the book -- after you've read more about psychology. Most psychologists have two major goals when they study behavior: understanding and utilization. These two goals imply certain other goals.

When you understand something, there are several things you're able to do. First, you can describe it. If you show up two hours late for a date to an important dance, your partner (if he/she is still waiting for you) will be very mad. You understand why and can describe how in terms of (1) the importance of the dance to your date, (2) the social embarrassment your date will experience unless there's a logical reason why you were so late, (3) the fact that the flowers he or she bought for you are now wilting, and so forth.

If you understand a behavior, you can identify and describe the independent variables, which influence it. Second, if you identify something and can describe it, then you can measure it. Third, if you can describe and measure something, then you can explain it. This means that you can identify the important independent variables and how they influence the dependent variables you are measuring or observing. Psychology as a science is an effort to understand human and animal behavior -- understanding is a primary goal of its research methods. Another goal is that of application or utilization.

If we understand something, there may be an even more important goal that follows from that understanding -- use of the knowledge. If we've gone to the trouble of studying a behavior so as to understand it, that understanding is of little benefit unless it is put to use. Good salespersons "understand" human behavior. They may not be able to tell you what cues they're using in selling a product to their customer, but cues are being used.

There are at least two ways in which psychology uses the understanding of human behavior that we've already achieved. One use is the prediction of future behavior. In applying to college, you very likely took one or more aptitude tests. These measure what you already know, and the results were used to predict your probable success in college. If we understand the important independent and dependent variables in any situation, then we can use this understanding to predict when, where, how, and why a behavior will occur.

Now think a moment. Wouldn't it be nice if you could always predict your boss or your best friend was going to react? It's but a short step from predicting behavior to attempt to control it -- the second use of understanding. The fear that psychologists might strive to control human behavior has made some members of the public needlessly nervous in recent years.

Two counterpoints should be noted. Psychology as a science is very young. We don't know enough about many human behaviors to be able to control them -- they're too complex. Moreover, more of our behaviors than we may be prepared to acknowledge are already controlled. We are told how fast we can drive on the highway. We are expected to respect our elders. We sit in a large group facing the front of the room in most high school and college classrooms. We're already controlled.

But the advantage of a public search for greater understanding of the principles that control human behavior by scientific methods is good. People who worry about psychologists controlling the world give psychologists a great deal more credit for the ability to apply their knowledge than the facts you are about to study will warrant. For more on this issue, try the Think About It.

Think About It

The question: Will psychologists learn how to control behavior? If they do, will they have too much power over our lives?

The answer: To a limited degree, yes, they may learn how to control behavior. But the answer to the second question is no. The main goal of scientists who are psychologists is to understand behavior. It is true that they wish to utilize that understanding to predict and control behavior. But, as scientists, psychologists are no different from physicists who are gaining understanding of and utility from the atomic structure of matter.

Science is the most powerful tool yet invented that can give humans some sort of understanding of and control over their environment. This does cause problems sometimes in that science delivers products that political, social, and religious institutions don't know how to control. As science makes advances (for instance, the ability of parents-to-be to select the sex of their to-be created child before conception), the results are constantly challenging society to reassess itself. Society is forced to appraise the value of the discovery.

Will psychologists ever gain absolute control? That's very unlikely. Society would not allow it to happen. Psychologists are not likely to want it to happen. Behavior is too complex and our understanding of the laws and principles of behavior too elementary. If control of behavior becomes possible, the governmental institutions of society as a whole will have to develop legal mechanisms for controlling the products of scientific laboratories.

Central Issues and Why They Are

The topic on the history of psychology speaks about the mind-body problem that was "left over" when psychology became a formal science. Why, exactly, did interest in this issue wane? First, scientists began to develop more elegant operational definitions. Trying to separate mind from body or brain was not a problem that could be easily operationalized or studied with scientific methods. Second, as scientists continue to learn more about brain function, they tend to believe that all mind functions -- whether we speak of perception or thinking or "the mind" -- are directly related to brain function. Some even suggest that everything studied by psychologists will eventually be explained in terms of the principles of physiological psychology. (There is a full chapter you can read on the biology of behavior).

Nevertheless, there are other enduring issues, which continue to influence psychological research. For example, the role of experience versus the role of inheritance -- referred to as the nature versus nurture problem -- remains an important issue. Likewise, the level at which a psychologist is satisfied with his explanations will guide how research is conducted, just as the researcher's theoretical views will. And the scientist's goals of basic research or practical utilization influence all research.

The Nature-Nurture Problem

What causes you to behave as you do? Did you learn how to behave? Did you learn how to speak? Or are you just somehow responding to inherited messages passed on from your parents?

This is a debate that you will see reappearing again and again in the chapters to follow. Nature is sometimes called "inherited inclination" or heredity or inheritance, but the terms mean essentially the same thing. "Nurture" is sometimes called learning or "environmental influences" or experience. but all these terms identify the same processes.

The mistake that is often made is to pose this as an either-or question in defining the methods and problems of modern psychology. In fact, very few of our behaviors can be traced strictly to environmental or inherited causes. Typically, both factors are influencing our behavior as you will see in your study of psychology.

Levels of Explanation

You're riding in the back seat of your family's car on a vacation trip with your parents. Your older (or younger) sister (or brother) is "sharing" the back seat with you. You've been driving for hours in hot, sticky, dusty country. You're fed up. Your brother or sister puts something on "your" side. You push it back. He/she pushes it over -- slowly, subtly, but he/she definitely inches it back onto your side. You shove it back. He/she jams it back. You slam it back. He/she literally throws it back. You are just arming yourself for all-out war when one of your parents looks back and asks. "ALL RIGHT! WHO STARTED IT!?!"

Indignantly, and of course full of innocence, you reply, "He (or she) did!"

Your brother (or sister), just as indignantly, and also just as innocently, interrupts and shouts, "NO! He (or she) did!"

Resolving this may take hours (and miles). But this story illustrates a point. At one level your brother or sister started the fight by encroaching on your territory. At another level you were responsible (especially if you were the older child) for starting the fight by insisting on your share of seat even though you didn't need it at the time. At another level your parents were at fault for driving the "southern" route -- which they knew would be hot -- instead of a more northern route on the vacation.

Psychologists face somewhat the same problem. To "explain" something at one level may mean ignoring facts at another level. For instance, some would argue that all of sociology will ultimately be explained by the principles of psychology. Biologists would insist that psychology can be explained by biological principles. The logic reduces explanation through biology and chemistry to physics -- the basic science. This is a process called reductionism. It involves reducing the principles and explanations of any discipline to a science that is in some way considered more "basic."

Yet, the same process goes on within psychology itself. If we take a complex personality problem -- such as disorganization caused by schizophrenia (discussed in the chapter on Personality and Mental Disorders) -- we can "explain" it in terms of the social environment from which the person came. At another level we might offer an explanation in terms of the learning experiences and potential of the person. At yet a third level for some of the psychotic personality disorders we can offer a physiologically based explanation in terms of blood chemistry or basic biological malfunctions. This problem of the level at

which to assume we have sufficiently "explained" something is constantly with psychologists.

How is the problem resolved? The family doctor explains to the children at one level when their father is about to die. Yet, he or she will usually speak at a different level to the mother and wife. Thus the problem of choosing the appropriate level of explanation of any behavior rests primarily on judging the purpose to which the answer will be put. We can explain many psychological effects at a number of different levels and a persistent issue is that of deciding on the level that is most appropriate. Watch how that level will shift as you read the chapters that follow.

Theoretical Views

As we start our study of the science of psychology, you should be warned that psychologists often disagree in explaining a particular behavior. The argument is generally based on the fact that there are many different theories to explain what is going on. Learning or social-learning explanations are usually derived from environmentally based principles. We'll examine these in detail in the chapter on Learning.

Other explanations focus on psychodynamic or psychoanalytic concepts. These theories trace their origins to the pioneering work of Sigmund Freud. They place great emphasis on how the conscious and unconscious parts of the mind function.

Some cognitive theories can be traced to the work of Jean Piaget. Piaget was a Swiss psychologist whose work impacted psychology especially from the 1960s onward. Cognitive theories stress the importance of mental operations. We'll see such theories mainly in developmental and language areas, but they'll also show up elsewhere.

Finally, humanistic theories are mainly concerned with attributes and abilities that are human -- not those we share with animals. Theorists in this camp tend to reject much of what is assumed by other theorists. These theories focus on the self, stressing the importance of our perception both of ourselves and of the world of which we are a part. The emphasis is on growth, achievement, and the positive aspects of human behavior.

These theories are not all applicable when we try to explain a specific human or animal behavior. However, keep your eyes open as we move through the following chapters. You'll see when we have competing explanations that they are usually drawn from one of these four types of theories. Psychology is still a very young science, and some disagreement among its theories as

well as tension over its central issues and most appropriate methods for research is to be expected.

Research vs. Application

A significant argument in psychology and its research methods is based on the immediacy of goals. Is this an applied psychologist pursuing immediate answers to current problems? Or is he or she a basic researcher trying to understand the fundamental principles of behavior? This "battle" may take many forms: The clinician versus the experimentalist. The practitioner versus the theoretician. The field of psychology is full of people who like to argue, but the arguments aren't as serious as they appear.

Some psychologists are called clinicians, others call themselves researchers. The "researcher" may be pursuing "pure" research and long-range answers -- for instance, in studying in what form words are stored in our memory. The clinician is trying to use the current level of understanding -- however incomplete or partial it may be -- to offer solutions to today's needs. The clinician is challenged to help the person with a Dissociative Identity Disorder sitting across the clinician’s desk today.

It is sometimes tempting to pose the problem as research versus application, but the more important issue is: How soon do we ultimately need the correct answer? That's all that separates researchers from those psychologists applying the principles of the discipline now.

Psychology: Art? Science? Common Sense?

We define psychology as the science of human and animal behavior and experience. One of the central issues for some psychologists concerns how scientific psychology actually is. Let's examine it in terms of the definition of science offered elsewhere in this book.

Science involves observation. Psychology clearly qualifies. Psychologists do experiments the results of which can be confirmed by any informed observer.

Science implies measurement. Again, psychology clearly qualifies. As we'll see, psychologists use a wide range of measures of behavior in order to quantify (or measure) dependent variables.

Science implies some form of organization to allow the various facts to be treated logically. Here psychology falls a

bit short. Psychology doesn't have a single theory -- or even a small or limited number of theories -- which can organize large numbers of facts. There are many laws that have limited applicability, but there is no single all-encompassing theory. Psychology doesn't yet have its version of a Periodic Table such as organizes most of chemistry.

Finally, science also implies communication. Here psychology qualifies very well. In fact, you are reading one effort at communication. Many books are published; innumerable journals and experimental reports are printed each year. So psychology does share its information. It is communicating its findings.

In summary, then, by a vote of three to one, psychology qualifies as a science. Yet, is it something more? Some say art is involved. Defining "art" is a bit more difficult than defining "science." Is psychology an art? Yes . . . and no. It depends, once again, on how broadly the term is used. "Art" can refer to the refined techniques or skills of an able person practicing his or her profession. A psychologist who is sensitive and intuitive in helping a patient solve emotional problems is practicing an art. We are a long way from bringing human relations, with all their vast complexities, to the same degree of scientific reliability as elements in chemistry or physics. The part of psychology that is not based on scientific method alone but on creative insight -- that's what we can call an "art."

Art often involves the ability to take common materials and create uncommon effects. In that sense, the creativity shown by a psychologist can be called an art. Designing a good experimental procedure is an art.

Yet, one problem remains. Have you ever heard someone suggest that everyone is a psychologist? Does your mother think she is a psychologist? Do you think you are? This problem is unique to psychology as a discipline. We all "study" behavior. We all watch each other behave. We organize our own behavior according to how we expect others will behave. Aren't we all psychologists then? The answer is no. Psychologists use common sense to identify what behavior ought to be studied. But after that first step, the scientific processes of psychological research and the principles derived through them separate psychology from common sense knowledge. Mom’s use of "common sense" is ad hoc (to this) and changes in light of changing circumstances. Psychologists seek through their artistic talents and scientific methods to establish more fundamental principles which are constant across widely varied situations.

REVIEW

To assure your understanding of the issues discussed in this chapter, try answering the following questions for yourself:

WHAT IS PSYCHOLOGY?

1) What are some of the meanings of the term "science"?
2) Is psychology a science? Why or why not?
3) What are some of the basic assumptions of psychology?

THE HISTORY OF PSYCHOLOGY

1) What were the earliest schools of psychology, and how did they differ?
2) Has psychology as a field become more unified since its early days? Explain.

PROBLEMS AND METHODS IN PSYCHOLOGY TODAY

1) What is an operational definition? Why it is used in psychology?
2) Think up an experiment (or look ahead in this text) and then identify the independent variable(s), dependent variable(s), and any intervening variables. Give the purposes of each variable.
3) If you designed your own study, did you include a control group in your experiment? What is the importance of a control group?

GOALS OF PSYCHOLOGICAL STUDY

1) What goals do psychologists have in studying behavior?
2) How do research psychologists and clinical psychologists differ, if at all?

CENTRAL ISSUES AND WHY THEY ARE

1) Describe ways in which psychology is a science and ways in which it qualifies as an art.
2) How does psychology differ from common sense?

ACTIVITIES

1. One of the hardest things to do is to gain control of your time. How you spend (or waste) your time is a key factor in determining your success-as a student, on the job, indeed in

life itself. Students are often heard to complain that they "just don't have time for . . ." this, that, or the other thing. You can check your behavior by finding out how you spend your time. Create a sheet of paper for yourself with seven days of the week written across the top, starting with today o tomorrow. Down the left side of the sheet put time in 30-minute intervals from when you get up until when you usually go to bed: 7 a.m., 7:30 a.m., and so forth. For one week keep track of how you spend your time, putting down just enough information so you can remember next week what you were doing: eat, sleep, study psychology(??),team practice, whatever. After your schedule is finished, analyze it. Are you making the best use of your time? Could you change your behavior in certain ways so your time would be spent more effectively?

2. Interview a psychologist. There are several places you might find one: check the Yellow Pages, under "Psychologist"; seek out a professor, or see if a nearby school has a counseling or school psychologist. Find out his or her job title, whom he or she works for, what the hours are, what is actually done on the job, and how he or she likes the work. In terms of the material in this first chapter, did you interview a researcher or a practitioner? Does this type of activity appeal to you? Why?

3. Try conducting an experiment to understand the difference between independent and dependent variables. Locate some public building that has a multi-floor elevator. With four friends get on the elevator and ride facing the back. When the door opens and someone you don't know starts to get on, record two things:

a. Did he or she get on or not, and
b. If he or she got on, which direction did he or she face while on the elevator:
   frontwards (ignoring you),
   sideways,
   backwards (conforming with you), or
   did they wait for the next elevator?

You'll also need to collect some data while you ride facing frontwards with the same arrangements. Again, record the behavior of the people who get on the elevator alone. Your independent variable is the position of you and your friends: front-facing (control) or back-facing (experimental condition). Your dependent variable is the response of the person waiting for the elevator-did he/she wait or get on and face the front,

side, or back? If you compare the number of people doing each of those responses in your experimental and control conditions and they differ, what can you conclude about the effects of your independent variable?

4. Conduct a simple experiment using naturalistic observation. How slow do you suppose most people go when they reach a stop sign? Find an intersection that has a stop sign and a clearly marked crosswalk. Most state laws say a driver is to stop at a stop sign behind the first stripe of the crosswalk, so mark off a distance ten feet behind that first stripe and ten feet in front of it. Now record one of two things for each car going straight ahead (not turning) at the intersection: Did it stop within the 20 feet you marked off? If so, indicate its "speed" at the stop sign as 0. If it did not stop, then use a stop watch (or count as best you can) to find how long it takes the front bumper of each car to pass from the first to the second stripe. Use the following data to record an estimated speed through the stop sign:

Sec.	MPH	Sec.	MPH	Sec.	MPH	Sec.	MPH
0.1	136	0.7	19	1.4	10	3.4	4
0.2	68	0.8	17	1.5	9	4.5	3
0.3	45	0.9	15	1.7	8	6.8	2
0.4	34	1.0	14	1.9	7	3.6	1
0.5	27	1.1	12	2.3	6	27.3	1/2
0.6	23	1.2	11	2.7	5	54.5	1/4

Refer to the Methods and Data Chapter for help in developing a frequency distribution, but based on the data you collected, what would you say is the behavior most often seen at a stop sign?

5. Volunteer some time after school to work in the emergency ward of a local hospital, or in a nursing home or home for the retired. Keep a diary of your experiences. Record your observations on aging, on the reactions of people in emergencies, or on the reactions of families to death. You might also be able to add your experiences to discussions on the use of psychological principles of learning, or on therapy, or on other topics covered elsewhere in this book. Write down your expectations before you start and then tuck them away so you can't see them. Check after a month of volunteer work. Are your expectations being met? Would you define "psychology" after a month as you did when you started this class?

6. Try another experiment in observing human behavior. As you change from one class to another one day, try smiling at every person whose eye you catch. Count how many of them smile back at you. The next day at the same time look at about the same number of people in much the same way as you did the day before, but this time do not smile at all. Again count how many people smile at you. Would you say that smiling is a reflection of a person's internal state, or is it simply a response to stimuli offered by other people? Basing your conclusions on the data you've collected, you should be able to agree with one or, the other of these possibilities. Another way to conduct the same experiment is to keep track of how many people say back to you exactly what you say to them when you first greet them. If you say "Good morning" (afternoon or evening, as appropriate), or "Hello" or "Hi" or whatever, do people mimic you, or respond with a different greeting? If you change your greeting, do the greetings that people say to you tend to change? What does this tell you about who “controls" what people say to you?

INTERESTED IN MORE?

As we introduce you to psychology, we recommend that you consider doing some additional reading and study on any topics of particular interest to you. We have chosen a variety of appropriate sources -- some easy, some difficult -- which we list after each chapter. For the most part, they are books that you should be able to locate somewhere in your community -- perhaps at your town library or in a bookstore -- or obtain by ordering from the publisher.

Since this chapter touches lightly upon a wide range of subject matter, we've included here some recommendations for general resources, such as textbooks, that may help you delve more deeply into the various topics that are introduced later in the course. We've also included the names of a few general magazines in the field. To help you make your selections, the bibliography for this chapter is divided into topical areas.

History of Psychology:

WATSON, R. I. (1971). *The Great Psychologists, 3rd ed*. Lippincott. Traces the major works of important psychologists over the last 100 years.

WERTHEIMER, M. (1970). *A Brief History of Psychology*. Holt, Rinehart & Winston. Covers the major schools of

psychology and places them in the context of science and philosophy.

Research and Psychology:

DEESE, J. (1972). *Psychology as Science and Art*. Harcourt Brace Jovanovich. Challenging reading, this book analyzes psychology as both art and science. Suggests how our knowledge of behavior mixes myth with scientific facts.

DOHERTY, M.E. & SHEMBERG, X.M. (1978). *Asking Questions About Behavior: An Introduction to What Psychologists Do, 2nd ed*. Scott, Foresman. Opens with the kind of questions that you're probably interested in right now and then guides you in the formation of scientific questions. Shows how to design experiments to answer such questions. Gives special attention to the study of stress.

How to Study:

ROBINSON, F. P. (1970). *Effective Study, 4th ed*. Harper & Row. A classic book in this field, it emphasizes the application of psychological principles in the development of effective study skills. Includes checklists of work behavior and a full description of the Survey, Question, Read, Recite, and Review (or SQ3R) study technique.

Magazines:

Human Behavior. A more subdued version of Psychology Today, covering topics at somewhat greater depth. An interesting source, although it was only published from 1972 through 1979.

Psychology Today. A monthly magazine that stresses broad coverage of contemporary topics more than in-depth analysis of behavior. Colorful and readable.

Scientific American. Almost every month, this lavishly illustrated magazine contains at least one article written by a nationally known psychologist on a topic of current interest.

New York Times (Sunday) Science Section. A very high level presentation of topics ranging across the entire array of interesting problems studied by scientists. Coverage is much broader than just psychologically interesting topics, but well

worth reading. Though not as regularly, the Washington Post also includes psychological topics in its Sunday edition.

General Introductory Texts:

ATKINSON, R.L., ATKINSON, R.C., SMITH,. E., & BEM, D. J. (1993). *Introduction to Psychology, 11th ed*. Harcourt Brace Jovanovich College Publishers. A richly illustrated text by a well-known team of authors. Covers a wide variety of psychological phenomena in a highly readable style.

BOURNE, L. E., Jr. & RUSSO, N. (1998). *Psychology: Its Principles and Meanings*. W. W. Norton & Company. Includes many newspaper articles and cartoons relating psychology to issues of current concern.

MYERS, D. G. (1998). *Psychology, 5th ed*. New York, N.N.: Worth Publishers. A popular, highly readable general introductory psychology.