Introduction

One day in July, an unemployed security guard stormed into a fast-food restaurant in California and opened fire upon the people eating there. He shot down twenty-one people, total strangers, before he was killed by police. Why did he do it?

Tomorrow morning (as this is written), a group of about eighty young women and men will sit in uncomfortable chairs, moving little and talking less, while someone lectures at them. They will keep that up for an hour and a quarter, which is quite a long time. Why will they do it?

One day while looking for a friend's house in a strange city, I knocked on the door of a house. A woman answered. She gave me, a total stranger, a brilliant smile and said, "Good morning!" Why did she do that?

And a minute ago, in deciding which of these vignettes to put first, I sat back in my seat and began doodling an owl. Why an owl? Why doodle at all? Why did I do it?

For any action a person or animal performs, we may ask: "Why did she or he do that?" When we ask that question, we are asking about the person or animal's *motivation.*

As these examples show, we can ask the question "Why did he or she or it do that?" about any action at all, important, like the shootings, or trivial, like the owl (Figure 1-1). Moreover, the answers may have important consequences. Suppose A shoots and kills B. Was it intentional? Was he *trying* to kill B? If so, he is guilty of murder. If not, he may be guilty

Figure 1-1.
Why are they doing that?

of manslaughter, but he will probably receive a lighter sentence if convicted. The difference is one of motivation.

Questions about motivation, then, are questions about the *causes of specific actions.* Why does this organism, this person or rat or chimpanzee, do this particular thing we see it do? The study of motivation is the search for principles that will help us understand *why people and animals initiate, choose, or persist in, specific actions in specific circumstances.*

We seek to assign causes to actions for two reasons at least. First, the way we explain an action affects what we do about it. In the case of the shootings, one person might explain it as an inevitable result of the availability of guns and the glorification of violence in our society. Another might explain it as a result of lenient judges and clever attorneys who let people literally get away with murder. Another might attribute it to a deranged mind. And these three people might even press for social action on the basis of their explanations—the first advocating gun control; the second, harsher and swifter penalties; and the third, research into treatment and prevention of mental disorders.

But there is another reason, and that is the human urge to understand, to make sense of things. We are a curious species, in more ways than one. To consider the shootings again, a whole evening of serious discussion might center around the reasons why a person might do such a thing—even if the discussants didn't intend to do anything about it. Let us discuss that point a bit further.

UNDERSTANDING

The scientific study of motivation is a recent development in human history. But the attempt to understand the world has been characteristic of the human mind for as far back as we have any records. Our ancestors poured much intellectual effort, and a great deal of poetic genius, into the making of myths and legends about the origins and workings of the world, for no other reason than to satisfy the human itch to understand. If a bolt of lightning was the hammer of an angry god hurled through the sky, that was intelligible. We could understand it.

Notice something about such myths. They explain physical events in terms of the urges, feelings, and wishes—the *motives*—of the supernatural beings who make them happen. Lightning bolts are explained by the anger of the gods who hurl them; rain, by the good will of the gods who provide it.

Empathic Understanding

As theories, these myths fulfilled our urge to make sense of things. They gave us what we might call **empathic understanding**; that is, they allowed us to *empathize* with the beings who made the world work as it does. If an angry god hurls thunderbolts, well, we can empathize with that. We throw things when we are angry, too, though thunderbolts are a bit beyond us. If a benevolent spirit gives us rain, we can empathize with that too; we do favors for people when we feel benevolent toward them. In such cases, we understand the actions of the spirits, in this sense: We see that, given the same wishes and feelings, *we would do the same thing.* That is what empathic understanding means.

But as theories about how the world works, there were two difficulties with such myths. First, they were wrong; or at least, they gave way to other theories that worked better. Second, they explained events piecemeal, one at a time. Rain came from the benevolence of a rain spirit, lightning from the anger of a thunder god. There were no *general principles* by which to relate one event to another.

Understanding and Science

The scientific method, we might say, developed as a way of avoiding these problems. It differs from the method of the poet and the mythmaker in at least two important ways.

Systematic Observation

In the first place, for the scientist, empathy is not enough. Rather than seek psychological explanations of physical events, scientists **systematically observe** the events themselves. They observe physical phenomena —lightning, or the movements of compass needles—under different conditions, noting what conditions are present when the phenomenon is

present, and absent when it is absent. Sometimes they *create* special conditions—that is, they perform experiments—to isolate one possible influence on the phenomenon from others. In that way, scientists identify the *causes* of events—in other words, the conditions required to produce them.

Moreover, it is a continuous process. Having arrived at a tentative explanation, scientists check that explanation with further observations. That way, if an explanation is mistaken, we will know it sooner or later. If we know when we are wrong, we can correct our mistakes; if we don't, we can't.

As our understanding developed, careful observations and experiments showed that lightning bolts do not, in fact, occur at the whim of gods. They occur under specifiable conditions and have specific causes. They followed certain general principles, or laws, of physics. That was important to know; but perhaps more important was the underlying idea that made these discoveries possible: We need to check our explanations, by making observations.

The Search for Principles

The second characteristic of scientific method is the search for *general principles* that underlie specific instances. Knowing these, we can relate different events to one another. And we can use the principles to create new instances—that is, to put our knowledge to use.

To see this, let us consider what kind of explanation a scientist would give for a familiar physical event. We flip a switch, and a light bulb lights up. We ask, "Why?"

An explanation might go like this: "Well, when the switch was flipped, two pieces of metal came into contact. This permitted electric current to flow through that connection, through the wires attached to the bulb, and through a little wire (the filament) inside the bulb itself. Now the flow of electricity generates heat. When the filament in the bulb gets hot enough, it glows, just as white-hot steel gives off a glow. That glow is what we see."

Of course our expert might have to backtrack a bit, if we didn't know enough about electricity or the anatomy of switches to understand him; but you see the idea. We have a chain of events laid out for us, each causing the next. Notice too that at each step, there is an appeal to a *general* fact or principle. It is true *in general* that electricity flows through metal wires, that heat is generated in the process, and that metals glow if sufficiently heated. The explanation *relates the specific event to general principles* and shows how it is an instance of them.

Why do we want general principles? For one thing, it permits us to relate one event to another. Knowing the principles of electricity helps us understand light bulbs *and* thunderbolts, and magnets and compasses and much besides. Second, these principles can be put to use. If we understand the principles of electric circuits, then we can build a circuit for some special purpose—a circuit perhaps different from any that has

ever been built before—and be reasonably confident that it will work. That is what has given us electric lights, telephones, television, computers, and space travel—the use of general principles to *predict* whether a new method or invention will work, and implement it if we predict that it will.

Understanding Behavior

The explosive growth of science over the past few centuries has affected every aspect of our lives. And as it progressed, it has moved ever closer to home: Beginning with the stars and planets, it expanded its methods to include physical events here on earth, then the biology of earthly creatures, and finally the behavior of living organisms—humans included. It has turned its methods upon the human mind itself.

The physical sciences have transformed the way we think about the world. Progress in psychology, however, has affected our thinking less. We have changed the way we explain physical events; we no longer appeal to the psychology of gods and demons. But in explaining behavior, we usually stick to the original form of explanation in terms of urges, wishes, or feelings. If a person greets us in a warm, smiling way, we say that she has a friendly personality. If students sit quietly in class, they must want to learn (or want good grades).

Are these explanations wrong? Not necessarily—there is some dispute about that, as we will see. But at best, they are incomplete explanations. Why? First, because we need to check them; second, because we need to know the *principles* that underlie them. The plain fact is: We do not understand how wishes, urges, and feelings work! *The psychological mechanisms that once served to explain the physical world, as ascribed to gods and demons, now are seen to require explanation themselves.*

Checking Our Explanations

Take our new acquaintance who greeted us with a smile. She has a friendly personality, we say. But we'd better check. She may not really have a friendly personality; she may, for all we know, be pretty cold most of the time. Maybe the students we see sitting in a classroom are not eager for knowledge *or* for good grades; they might be frozen in fear, or trying to win a bet about who can sit longest without moving. Without more information, we do not know.

Systematic Observations

Our first task, then, is to acquire the further information we need—to make some systematic observations.

Consider our new friend again. Suppose we find, as we investigate further, that she always greets people warmly—not just us, and not just today. She goes out of her way to put people at ease, whistles while she works, and sings in the rain. If so, then we have gone *some* way toward

explaining her behavior if we say, "She was friendly toward us because she's a friendly person in general." We are saying that her actions resulted from something about her that was stable, not something temporary—say, some joyful news she had just received.

We have gone *some* way, we say. But not all the way; and here we meet the second aspect of scientific understanding.

The Search for Psychological Principles

Even if we are right about our new friend's personality, we have the most interesting questions still before us. How are personality traits formed? How do they guide specific actions? Why did her friendly personality express itself in that way rather than some other way? What *principles* govern the formation and expression of personality traits?

Or consider the students. They want good grades, let us say. But getting good grades hasn't happened yet; it lies in the future. How can events that haven't happened yet affect action now? If it is *expectations* that affect us now—well, how are expectations formed? How do expectations control muscles? What *principles* are involved?

The whole situation is similar to the case in physics. We want to be able to relate the specific events of sitting and listening, or greeting with a smile, to general principles. These principles, if we knew what they are, would be analogous to laws of thermodynamics, electric circuits, energy exchange, etc., in physics.

Needless to say, we are quite some way from achieving that ambitious goal. We understand electric circuits far, far better than we understand the causes of action. However, we have made some beginnings. This book will look at many examples, but here is just one to show the parallel: Many scientists believe that rewarded actions are likely to be repeated. If so, that is a principle of behavior. The principle was established largely in laboratory studies of animal behavior. But, by assuming that the *principle* applied to human behavior as well, scientists were able to make *predictions* that could be tested in the human case. They predicted that, for example, if one stopped rewarding the disruptive or self-destructive behavior of mentally ill patients, such behavior should become less frequent. As we will see later (pp. 269–272), this prediction has been confirmed in at least some settings.

POINTS OF VIEW IN MOTIVATION THEORY

The field of motivation seeks to understand the causation of specific actions. What will such explanations look like? What kinds of ideas will be most helpful in giving us causal explanations of behavior?

Let us face one fact at the outset: Motivation theorists do not agree with each other even about that. There are strong differences of opinion, good for many an argument, about what causal principles apply to human and animal actions.

Let's look again at the shooting episode. Some theorists might explain that action as the bursting loose of furious anger, anger perhaps pent up for many years and directed originally at the parents. Others would look for a history of reinforcement for violent actions in this person, perhaps coupled with emotional reactions to the absence of reinforcers now. Still others would see it as the result of a reasoned, if not rational, *decision.* Perhaps the man had somehow convinced himself that people in general —just people, any people—were responsible for his misery. And so he took furious revenge on whatever people were around.

Since these are important points of view in motivation, let's look at them in more detail.

Causation by the Environment: Behaviorism

Most of our common-sense theories of motivation explain behavior by looking for internal causes, such as wishes, urges, and desires. To see the diversity of viewpoints, let us begin by looking at a quite different approach. **Behaviorist** theorists reject all explanations of action in terms of internal events such as thoughts or desires. They seek to explain action by *influences from outside.*

Behavior allows us to meet the demands of our environment. We are here because our ancestors were able to find food in the environment, find mates in the environment, avoid being eaten by predators* in the environment, and so on. So, we have evolved organs that register the external situation (the sense organs), and ones that allow us to do something about it (the muscles and joints). Psychology, to behaviorists, is the study of how we go about adjusting to the environment by behaving within it.

It follows that *the causes of behavior are outside the organism, in the environment.* Environmental events may *elicit* actions directly, as in reflexive flinching away from a painful stimulus. Or certain actions may have been strengthened and made more probable because they have been *reinforced* by environmental events in the past. Why does a trained rat press a lever? Because that response has been reinforced with food, and thus strengthened.

A person who encounters the behaviorist view for the first time may find it very strange. It seems to leave much too much out of account. A critic might raise this objection: "Suppose you have two people in the same situation, the same environment. Let's suppose they both flunked the same quiz. One says, 'I'd better study harder for the next one.' The other says, 'I can't do it; I'm a failure.' Doesn't it make a great difference? Doesn't that show that internal thoughts and feelings count for more than the external environment does?"

*A *predator* is anything that eats you. To a mouse, a cat is a predator; to a blade of grass, a cow is; to a human, an occasional shark can be. Notice that a cobra does not qualify; he might do you in, but not for food.

Now no behaviorist would be so foolish as to deny that such things happen. A behaviorist would reply to that objection this way: "Yes, of course two people might react in those different ways, and of course it's important. But speaking of thoughts and feelings doesn't explain anything. Thoughts and feelings are also behavior; thinking a thought is something we *do*. Now, *why* do the two people think different thoughts? Presumably because they have different learning histories; they have had different life experiences. And life experiences are provided by the environment! If two people react differently to the same environment now, in what they do *and* in what they think and feel, it's because their environments have been different in the past."

In other words, the behaviorist says: If we appeal to thoughts and feelings in explaining an action, we now have to explain the thoughts and feelings as well as the action. And if we try to do that, we will be led *outside* the actor to his environment—his learning history—which is the cause of his thinking what he thinks, feeling what he feels, *and* acting as he does.

This, then, is the behaviorist's view of explaining behavior. Thoughts, feelings, and other internal events are not part of the causes of action. They *are* actions, to be explained in turn. They are caused by the same environmental events that cause the external, overt behavior (Figure 1-2A). That is why we speak of the environment as cause.

Inner Causes: The Mediationist Point of View

In contrast to behaviorists, other theorists believe that internal events such as wishes, urges, expectancies, and thoughts are important in the

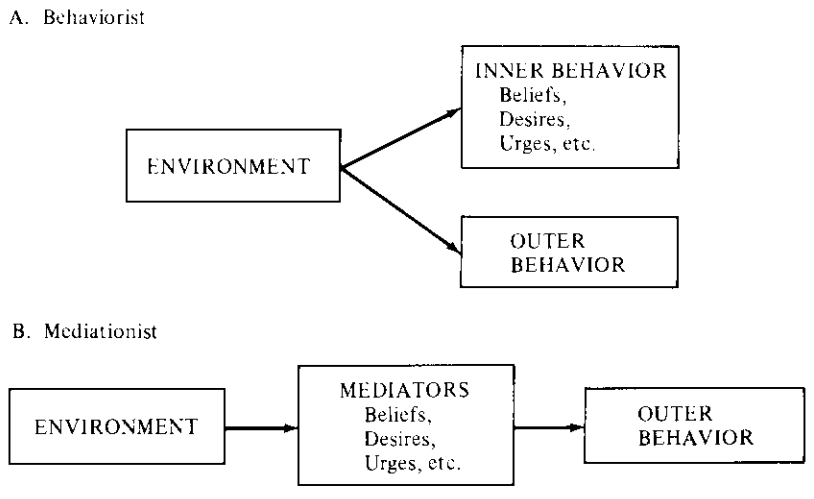

Figure 1-2.
Behaviorist (A) and mediationist (B) conceptions of the causes of action.

causation of behavior. These writers grant the importance of the situation. But they insist that to understand what a person does, we must know how she perceives the situation, what she thinks about it, what it means to her, what she wants to have happen within it, and the like. These internal events occur in the middle of the causal chain, or, as we say, they *mediate* between the situation and the action (Figure 1-2B). Hence we refer to this as the **mediationist** point of view.

Mediationist theorists can in turn be divided into two classes, depending on what they emphasize. First, there are the **psychodynamic** theorists, who emphasize urges or impulses, arising from within the actor,* as sources of motivation. The most familiar of the psychodynamic writers is the founder of psychoanalysis, Sigmund Freud (1856–1939). Freud thought of our actions—including the internal actions of thinking, wishing, dreaming, and so on—as driven by *psychic energy,* produced in turn by tensions arising from within our bodies. Often we are unaware of these motivational forces; to Freud, *unconscious* motives are often the most important ones.

Second, there are the **cognitive** theorists, who emphasize the thinking, judging, rational processes that in turn lead to action. Such writers think of the actor as considering various possible actions, anticipating the outcome of each action, and choosing the action whose outcome is most desired. Considering, anticipating, and choosing—these are *cognitive* processes or operations that are assumed to determine what action takes place.

At first glance, the mediationist position sounds like such obvious common sense that one may wonder why there should be any dispute about it. There is dispute, however, for three reasons. First, it is challenged by behaviorists, who point out the incompleteness of appealing to mental events in explaining anything. A full explanation, they argue, must take us back to the environment to explain both actions *and* cognitions.

Second, mediationists are keenly aware that if we do not understand behavior very well, neither do we understand wishes, expectations, and the like. How do they work? What principles do they follow? We do not know. So, in insisting that wishes and expectations are important, the cognitivist is not so much offering explanations as telling us what she thinks an explanation will look like, what concepts it will use. We are a long way from complete explanations, and the mediationist knows that as well as anyone does.

Third, mediationist theories are not as close to common sense as they might seem. These theorists are convinced that complex mental operations—believing, desiring, deciding—take place in us. But that does not mean that we see them taking place. Much of our thinking and judging

*The term *actor,* used this way, does not mean someone who performs on a stage. It is a shorthand term for "he, she, or it who acts"—that is, the organism whose behavior is under discussion.

may go on without our awareness. If so—if there are internal causes of our actions that we do not know are there, and cannot describe—then our common sense will be a most unreliable guide to them.

The Biological Perspective

There is another point of view about motivation. This one is not really an alternative to the other two, for it cuts across them. Whether we see behavior as caused by internal mechanisms or by the environment, we can ask: How does the process work, within the *biological* system that is the behaving organism? There are two questions that can arise here in turn.

First, there is the *physiological question:* How does the organism work? How do cells—in the brain, in the spinal cord, in the endocrine glands, in the muscles—cooperate to produce these effects? How are urges, or environmental impacts, or cognitions, translated into action by the physiological machinery of the body? This is the province of the neurophysiologist, the neuroendocrinologist, the neuroethologist, and the psychobiologist.

Second, there is the *evolutionary question:* How did this kind of organism get to be that way? How did this species evolve its repertoire of reflexes, its instinctive action patterns, and the mechanisms of perceiving, learning, and thinking that it now has? This question becomes: What advantages did these mechanisms provide, in the ecology within which the species evolved, so that ancestral forms that had them left more offspring than those that lacked them?—for this, as we will see in the next chapter, is how evolution works. This question is the province of the evolutionary biologist, the ecologist, the ethologist, and the sociobiologist.

The Prospects for Synthesis

This is not the place to get into the arguments that have arisen among these schools of thought. We will be doing that throughout this book. For now, the point is that there are fundamental differences of opinion about what motivational influences there are, and what they are like.

This is hardly surprising. The diversity in viewpoint is matched by the diversity of human behavior itself. After all, we are the species whose members invent computers, send people to the moon, crack genetic codes —and shoot one another. Approach this complex subject from different starting places, and you reach very different conclusions about it.

Then again, perhaps these viewpoints are not as different as they seem. Perhaps their differences arise because they are studying different aspects, or different parts, of a single complex system. Or they may sometimes be saying similar things in different words.

Two things at least are perfectly clear. First, each of these groups of

investigators, using its own methods and concepts, has provided us with ideas, findings, and phenomena that the others, using their methods and concepts, would never have discovered. Second, some of our most productive and insightful scientists have been able to pull useful ideas from all of them.

By way of preview, here is just an example of how different approaches may be integrated.

Severe *depression* can be a paralyzing disorder. A severely depressed person may be unable to initiate any action, to think or reason clearly, or to find any pleasure in life. Freud thought of this as resulting from aggressive *urges,* turned inward. The depressed person, he concluded, is unconsciously angry at himself.

Martin Seligman[1] had a different interpretation, based on his *behavioral* studies of learning in dogs. The exposure to *uncontrollable events* —unpleasant events from which the dogs could not escape—could produce symptoms in the dogs that paralleled many of the symptoms of human depression (see pp. 504–508). Going on to study humans directly, Seligman found evidence for his hunch: Uncontrollable unpleasant events could produce depressive symptoms in humans too. Here we see the behaviorist approach: It is events *in the environment* that trigger the symptoms. But Seligman added a *cognitive* interpretation of what was going on. He thought that dogs (and humans), when subjected to uncontrollable events, developed a *belief* in their own helplessness, and that this belief interfered with effective action. As his work continued to develop, he found that a great deal of cognitive theory was relevant—how people interpret events, what they think the causes are, what they believe about themselves—and, in particular, how depressed people *blame themselves,* whether consciously or not, for uncontrollable events.

The important thing to see is how the pieces from different viewpoints fit together here. Self-blame sounds similar to Freud's inner-directed anger, resulting from aggressive urges. But Seligman sees it as the result, not of urges, but of beliefs—a cognitive state. And yet it can also be an *unconscious* cognitive state—another contribution from Freud. Then again, those beliefs are beliefs about the causes of *environmental* events —uncontrollable events, whose effects on *behavior* started Seligman thinking about these issues in the first place.

Finally, one of the results of this work has been a new series of questions at the biological level, questions that we would not have thought to ask without this work. The role of *uncontrollability* in stress, and its effects on neurochemical function, on the body's defenses against infection, and much besides, is a rapidly growing field of research in psychobiology and behavioral medicine. Here we see a further convergence of ideas—behavioral and physiological.

[1]Seligman, 1975.

METHODS IN THE STUDY OF MOTIVATION

We have seen that the questions asked by motivation theorists, and the kinds of answers they seek, are very diverse. So are the methods used to get these answers. We will discuss three such methods.

Case Studies

Case studies are in-depth observations of single individuals, groups, or events. The attempt is, by detailed examination of single cases, to see clearly the complex network of influences that affect that individual or event.

EXAMPLE 1: THE CASE OF ANNA O.

One of the most influential case studies ever published dealt with a clinical case—the case of a woman called Anna O. The woman, when she came to her physician Josef Breuer (1842–1925), suffered from a distressing number and variety of physical symptoms, which had no identifiable organic basis. One of her arms was paralyzed, for example; and that was only one symptom out of many.

Breuer and his associate, Sigmund Freud, treated Anna by hypnosis. They found that under hypnosis, Anna was able to remember episodes that she had quite forgotten in the waking state. And these episodes often related to the symptoms in surprising ways. The paralysis of the arm, for instance, had first occurred at the time Anna's father died. Anna had dozed off at her father's deathbed, with her arm in an uncomfortable position.

After Anna had remembered that episode, the paralysis went away. Breuer and Freud concluded that it had been a reaction to the trauma of her father's death and her guilt at her neglectfulness in dozing off—as if it were a punishment imposed by one part of the mind on the rest of it. This case and the ones that followed led Sigmund Freud to the idea of *unconscious motivation*—the idea that the things we do, including the dreams we dream and the symptoms we suffer, have causes that come from within our minds, but of which we are unaware. This was surely one of the most influential ideas in the history of thought.

EXAMPLE 2: WHEN PROPHECY FAILS

In that example, the case study was of a particular person. However, the "case" might be a whole group of people, or an event. One team of researchers[2] described a group of people who believed that the world was coming to an end, and that they knew the date on which this would happen. These scientists followed the group through the period of waiting, the predicted day of doom, and the period following.

[2]Festinger, Reicken, and Schachter, 1956.

Doomsday came and went, and nothing happened. One would think that the group would accept this clear evidence that their prophecy had been wrong. They ought to change their minds and acknowledge their mistake. What happened was quite the opposite: The group members' beliefs actually intensified. They began publicizing their views and seeking new members, things they had never done before. Clearly, people *can* hang on to a strongly held opinion despite the clearest possible evidence that it is wrong.

This episode, by the way, is another example of how different theoretical perspectives converge. The group decided that the destruction of the world must have been averted by the "light of their faith." We could see that as an example of what psychoanalysts call *rationalization*—the invention of rational-sounding reasons for irrational actions. But we will also discuss it as an instance of *cognitive dissonance*—a concept from cognitive psychology (see Chapter 11). Finally, a behaviorist writer would point to the importance of the social *environment*—the influence of the group members on one another—as important in providing support, or reinforcement, for steadfastness of faith. As it happens, the cognitive psychologists who did the study were also struck by the importance of this social support, which again makes us wonder whether these perspectives are as different from one another as they look.

Limitations of Case Studies

Case studies, then, can be extremely useful in showing us what *can* happen. They have, however, two severe limitations.

First, it is easy to overgeneralize them; to conclude, because something *can* happen, that it typically *does* happen. One of the major criticisms of Freud's theory is just this: From his conclusion that neurotic symptoms can express unconscious urges, he went on to propose that *all* neurotic behavior, and most normal behavior too, is of that kind. Many think that Freud simply went too far beyond his data, basing a whole theory of mind on a few neurotic people.

The second limitation is even more serious. Case studies look at individuals, or groups, in the natural setting where a great deal is going on. An interviewer cannot inquire about *everything* that happens, nor can the interviewee report everything—there is just too much of it. Both must be selective. And it is very easy to let one's selections be guided by one's theories or preconceptions.

Thus a Freudian therapist, listening to a patient, already believes that events in the patient's early childhood are important. So the therapist is likely to listen carefully when the patient describes such events; she is likely to remember such events and forget other things the patient says; she may even *elicit* reports of such events, by the questions she asks and the interest she expresses. Thus, she is likely to find and remember events that confirm the theory she began with. In a word, she is likely to find

what she is looking for; and what she looks for will be determined by the theory.

This is a persistent and real danger in case studies. Because of it, the experimental scientist is likely to be skeptical of case-study research. He accepts it as a source of ideas and possibilities to be explored; but as a source of conclusions, he does not trust it.

Correlational Studies

Whereas case studies focus on single cases, **correlational studies** typically gather data from a large number of subjects. Typically, there will be two or more measures taken on each subject. Then one asks whether one measure is *correlated* with another. Given measures X and Y, one asks: Are the sample members who are high in X also likely to be high in Y, and those low in X low in Y? If so, we say that X and Y are positively correlated.

Example 1: Infants and Mothers

The measures X and Y can be almost anything that is measurable at all. They may, for instance, be direct observations of behavior. For example, one study[3] found a negative correlation between the frequency of infants' cries and the promptness of the mothers' reactions to the cries. The *more* promptly a mother reacted to cries, the *less* crying the baby was likely to do. This finding, and others like it, have implications for theories of infant-parent relations (see pp. 463–465).

Example 2: Depression and Explanations of Events

Alternatively, X, Y, or both could be paper-and-pencil measures. We will see, for instance, that score on a test of depression is correlated with a tendency, also measured by a questionnaire, to blame oneself when bad things happen. That is exactly the correlation that is predicted by Seligman's theory of depression (pp. 504–513).

Limitations of Correlational Research

Thus we see that correlational data can be used to test predictions based on theory. And, of course, the relations they establish may be worth knowing just for themselves; it is certainly important that, for instance, the severity of stress in one's life is correlated with the risk of illness.

Correlational studies do have a drawback, however: They cannot, by themselves, establish the *causes* of actions or events.

Take, for instance, the fact that smoking (X) is correlated with risk of lung cancer (Y). The more a person smokes, the more likely he or she is to develop lung cancer. But that fact by itself does not show that smoking

[3]Bell and Ainsworth, 1972.

causes an increased risk of cancer—as the tobacco industry was not slow to point out.

If smoking and cancer are correlated, maybe it is because smoking causes cancer. But, one could argue, maybe not. Instead, something else may cause both. Maybe people who are under stress are more likely to smoke *and* to develop cancer. It makes a big difference, because if that is so, then cancer-prevention programs should concentrate on reducing stress, and not on reducing smoking!

Now in this particular case, the causal relationship has been pretty well established. It turns out that smoking does cause increased risk of cancer. But that was established by experiment, not by correlational data. When experimental evidence is not available, we need to keep this caution in mind whenever we look at correlational data. A correlation shows that X and Y are related; but it does *not* show what causes what.

Experiments

Case studies and correlational research both look at what happens in nature as we find it. An **experiment** intervenes in nature, by *making* something happen so as to observe the effects. Ideally, some one influence is made to vary, in a situation where everything else is held constant. Some aspect of the subject's behavior is observed, and we can see how that one influence affects it.

The experimental method has two great strengths. First, it can tease apart a complex network of possible influences. It can show us which, of the many things that go on in nature, are the important things.

Example 1: Hormones and Hunger Reduction

A team of experimenters measured the amount of food eaten by a group of hungry young men. Before some of these meals, the subjects received an injection of a hormone (see p. 81). Before other meals, they received injections of a saline solution; this was a control for injection stress, expectancy effects, and the like. It turned out that the subjects ate less after hormone injections than after control injections. In other words, they became satiated sooner when the hormone was administered.[4]

Now, the release of that hormone into the blood is one of the complex series of events that occurs when food is eaten. Many other things occur along with it; the stomach fills, the intestine fills, the nutrients are absorbed into the bloodstream, and so on. With all these things going on at once, it is hard to know how important any one of them is.

In this experiment, however, all these events took place under *both* experimental conditions; only the level of the hormone in the blood was different. And so, since everything else was constant too—the food that was offered, how long the subjects had gone without food, the stress of

[4]Pi-Sunyer, Kissileff, Thornton, and Smith, 1982.

injection, the external setting—we know that it was the hormone, *and nothing else,* that led the subjects to eat less.

Example 2: Uncontrollability and Helplessness

The second strength of experiments is that they can establish the direction of causal relations. Here again is an example.

Two groups of dogs were presented with a learning problem, in which they had to learn to make the correct response to avoid painful shock. One group was introduced to the problem without any previous experience in such situations. But the other group, before the training began, had received a series of shocks that they could not control; they could do nothing about those shocks. When faced with the learning task, the dogs in the first group quickly learned to avoid the shocks. The dogs in the second group never did. Even though they could easily turn off the shocks now, they did not learn to do so. The experimenters concluded that the earlier, uncontrollable shocks produced *learned helplessness,* so that the dogs simply gave up and did not even try to solve this new, solvable problem. This was the starting point of Seligman's work on depression, mentioned earlier.

Since the experimenters themselves subjected some dogs, but not others, to the early uncontrollable shocks, we are in no doubt here that the earlier experience *caused* the later failure to learn. Instead, we could do a correlational study, asking: Do dogs (or people) who experience uncontrollable events also show learning deficits? But even if the answer was yes, we would not know what caused what. Do some subjects have learning deficits because they have experienced uncontrollable situations? Or do they put themselves in uncontrollable situations because they have learning deficits?

In an experiment, these ambiguities disappear. We know what caused some dogs, but not others, to experience uncontrollable events. The experimenters did! And since the task was the same, and the dogs were comparable except for this prior experience, we know that it was the uncontrollable shocks *and nothing else* that caused the failure to learn a learnable task later on.

Limitations of Experiments

The experimental method has great strengths. But it does have limitations, too, and three in particular are worth noting here.

First, an experiment simply isn't always possible, for ethical or practical reasons. We might think it would be interesting to know whether uncontrollable shocks would lead to learning deficits in human babies. But we are not about to do that experiment, first because we don't shock babies, and second because we don't do things to them that might cause learning deficits! Questions about the origins and effects of learned helplessness in humans must be addressed in other ways.

Second, the experimental method is sure, but slow—very slow. In the

feeding experiment, we know that the hormone suppresses feeding under given conditions, in men. What about women? What if a different food had been offered? What if the room had been warmer? Each of these questions requires its own experiment to answer. That is why it is very rare that a general conclusion can rest on a single experimental finding.

The third limitation is this: If we vary some influence on behavior, with all else constant, we see the effect of that influence—but we see nothing else. Take the hormone experiment, for instance. We know that the level of that hormone, by itself, *can* reduce the amount eaten. But it may well be that other events, such as stomach fullness, also can do so. In short, we have shown that the hormone is *an* influence on feeding. We have not shown that it is *the* influence on feeding—much less *the* mechanism of hunger or satiation. To know how important other mechanisms are, we must study other mechanisms.

This may seem an obvious point, but it is often overlooked. In fact, many of psychology's sillier arguments have arisen because we have forgotten this simple fact: To show that something is *an* important influence is one thing. To show that it is *the* important influence is another.

A Note on Animal Research

The case of the helpless dogs was chosen for a reason. Throughout this book, we are going to be hearing quite a bit about rats, dogs, and even stickleback fish, as well as about ourselves. But what do animal studies tell us about human behavior? I am often asked, "How can you generalize from animals to humans?"

I usually answer that there are generalizations and generalizations. What I call *hand-waving* generalizations—rats do it, so humans must do it too—simply do not often occur in the writings of serious investigators. But what I call *empirical* generalizations, the kinds that rest on data, do. The fact is that animal research at the very least tells us how *one* system works; that is, that a system *can* work in such-and-such a way. Knowing that, we may come up with ideas about human behavior that would not otherwise have occurred to us. Then we can test these ideas, and *see* whether they help us understand the human case. We don't just assume that they do—or if we do assume that, it is as a working hypothesis to be checked against direct observation in humans. The helplessness and depression story is one example. We will see many others.

TWO QUESTIONS ABOUT METHOD

When we discuss methods of research in motivation, people often wonder whether we are missing some obvious bets. Two methods, in particular, often seem obvious ones to use, and students often are surprised to find that we do not use them more than we do. There are reasons for this apparent neglect, however, and we should take a minute to discuss them.

Why Not Just Ask?

If we want to know why a person performed some action, there seems to be a straightforward way to find out. Ask him! Granted, this doesn't work with animals very well, but with people it should work just fine. Why don't psychologists do more of that?

Well, often we do. And the answer can be helpful for certain purposes; that is the good news. The bad news is that the answer can lead us far astray under certain conditions; and the worst news of all is that we are not sure what those conditions are. But let us consider the good news first.

The Good News: Empathic Understanding Revisited

If we ask, "Why did you do that?" the person will describe the considerations that led to the action, *as she perceives them.* These may provide valuable information, on two counts.

First, they rule out possibilities. Suppose a visitor asks, "Why are all you young people sitting in these hard seats?" and one of my students replies, "We're waiting to hear a lecture." This does tell the visitor something; it tells her that the students are *not* being punished for sleeping on sentry duty or trying to win a bet, and that they are not catatonic. Why did I doodle an owl? Because I felt like it—and *not* because I was entering an owl-sketch contest, and not because a picture of an owl had been demanded of me at gunpoint.

Second, the visitor can *empathize* with what the students are doing. She now knows that they are sitting quietly waiting for a lecture to begin—well, if the visitor wanted to hear a lecture, she'd wait quietly too. I felt like drawing an owl; well, if our visitor felt like drawing an owl just for fun, she'd draw one. She can *relate* to what is being done, as we might now say. So, from answers to the question "Why did you do that?" we can come to empathize with the actor. We can see that, given the actor's situation as he perceived it, *we would have done the same thing.*

The Bad News: How Much Can We Tell?

But now the bad news. Maybe we would have done the same thing as the actor. That does not mean that we understand the causes of such action. Let us remind ourselves again: We don't know how, for example, "feeling like it" works—not even when it happens to us! We know very little about the principles that govern even our own behavior.

What is worse still, we may be mistaken when we think we do know. It is interesting that of the points of view we considered earlier—the psychoanalytic, the behaviorist, and the cognitive—*all agree* that we may simply be wrong about the causes even of our own actions.

The Psychoanalyst's Objection. Fundamental to psychoanalytic theory is the notion of *unconscious motivation.* Freud emphasized that we often are not, and cannot be, aware of the causes of our own actions. We do not permit ourselves to recognize them. So, if we ask a person, "Why did

you do that?" his answer may lead us far from the true causes—because the person may be doing a great deal of unconscious work to conceal the true causes from himself, as well as from us.

The Behaviorist's Objection. The behaviorist takes a different tack. She points out that the original action, the one we want to explain, was produced by certain causes in the environment. If the subject tells us why he did the action, that is an action in itself. It is a new bit of behavior—verbal behavior—produced by its own causes. And the variables causing the verbal behavior may be quite different from the ones that caused the original action.

So, the behaviorist argues, if we ask a person "Why did you do that?" and get a reply, we have two bits of behavior to explain rather than one. We must explain why he did what he did, and we must explain why he said what he said. There is no reason to think that the causes of the one action will always be related to the causes of the other in any simple way. Indeed, behaviorists have shown, by direct experiment, that environmental conditions can affect what a subject does, when the subject *cannot describe* either the conditions or the effect.

The Cognitivist's Objection. For their part, some cognitive theorists have reached a remarkably similar conclusion. Some even make the same distinction behaviorists do. Certain cognitive processes affect action. Certain cognitive processes affect the explanations we give, to ourselves and to others, for our actions. And these may or may not be the same processes.

These writers too have supported their point with experimental data. Even when it can be shown by direct experiment that some factor affected the subject's behavior, the subject may deny that the factor was there, or that the behavior took place, or that the one had any influence on the other.*

There you have it. All three points of view, for different reasons, arrive at the same conclusion: "Just asking" can give us misleading answers, because we simply are not always able to identify the causes of our own actions. On the other hand, we also know that the answers we get can be quite accurate. The real problem is to know when they are likely to be accurate and when not, and why. Until we do understand that, "just asking" is suspect.

Why Not Wait Till the Physiologist Comes?

These considerations raise another possibility. If our subjects have trouble looking inside themselves, figuratively—well, why not look inside

*For examples from cognitive theorists see Nisbett and Wilson, 1977; Nisbett and Ross, 1980; Wilson, 1985. For examples from behaviorist writers see Catania et al., 1982; Schwartz, 1982. This, by the way, is one of the many cases where different theories end up saying much the same thing, as noted earlier.

literally? When physiologists can give us a complete account of the brain and its workings, then won't we know the answers to our questions of "why?" We will be able to say, "Because these cells did this, and then those cells did that . . ." Won't the whole concept of motivation become superfluous?

Probably not. To see why, consider an example.

If you cross your knees and I tap you with a hammer just so, your leg will kick. The harder I tap, the more vigorous your kick will be. That is a simple law of reflex behavior: The more intense the stimulus, the bigger the response. This *law of stimulus intensity* makes no reference to underlying physiological events. It just relates the strength of the stimulus to the strength of the response.

Now the physiological events underlying such reflexes are fairly well understood. If we want to know what the nerve cells and muscle cells are doing when the reflex is evoked, a physiologist could tell us. But that does not make the reflex concept useless.

In fact, quite the contrary: The laws of the reflex had to come first. The physiologist, who seeks an explanation of behavior in terms of the action of cells, must know the properties of the behavior she is trying to explain —what the behavior is affected by, and what laws it follows—*before* she looks for physiological explanations. We know that any physiological explanation of the reflex must account for the law of stimulus intensity. If any explanation is offered that does not account for that law, we know the explanation is inadequate. But that is because we already know that the law holds. The behavioral laws must be known first, before we can know what physiological mechanisms to look for. As a result, the physiologist must wait for the psychologist, at least as much as the other way around. The psychologist, who investigates *what* the system does, defines the physiologist's problem of explaining *how* it does it.

Moreover, there is a certain logical independence of the laws of behavior from the physiological laws of cellular activity. After all, the law of stimulus intensity would hold true even if we did not understand the physiology of the matter at all. In a similar way, many of the purported laws of motivation are stated without any reference to physiology. They include statements like "The effect of a reinforcement decreases with the availability of other reinforcers," or "Obese people tend to be more reactive to their environment than the nonobese," or even, "Other things equal, a person who is high in achievement motivation is more likely to go to business school than one who is low." We will see later what these statements mean, and discuss whether or not there is good reason to believe them. For now, the important point is: We can ask whether or not they are true, even though the neurology of the matter would be a total mystery either way.

None of this means that we should not make use of physiological knowledge when we can. Of course we should. What it does mean is that

we can also study behavior in its own right, apart from its physiology—thus discovering *what* the system does, apart from *how* it does it.

A LOOK AHEAD

Let us summarize the problem we have set ourselves. We want to know what sorts of ideas will help us answer the question, "Why did she or he or it do that, just then?" We will try to identify what causes operate to produce an action, and how. It will not be enough just to empathize with the actor, and see that we would have done the same thing; rather, we seek to understand the processes that cause the action, whether in someone else or in ourselves.

Often we will be contrasting the kinds of explanations offered by behaviorist writers on the one hand, and mediationists on the other. Just as often, though, we will be pulling ideas from both, seeing how they complement each other in seeking the *general principles* that apply to human or animal action.

We will seek these principles. We may or may not find them. Our ideas about motivation are in a state of rapid change, and definitive answers are few and far between. We will see what people think about the problem of motivation at this point in history, and why they think it. And we will want to consider carefully at each point, not whether we have reached our goal of understanding—we have not—but whether we are on the right path.

SUMMARY

Motivation deals with the causation of specific actions. When we ask, "Why did he or she or it do that?" we are asking about the actor's motivation.

We seek to understand the world, first because we use that understanding in dealing with its problems, and second because we are a curious species; we want understanding for its own sake. Once we explained the physical universe in terms of the thoughts, wishes, and emotions—the motives—of spirits, gods, and demons. By doing so we were able to gain empathic understanding; that is, we were able to relate the motives and actions of supernatural beings to what our own motives and actions would be. However, as scientific methods gained force, they changed the way we look at the world. We now check our conclusions to see if they are right; and we seek to go beyond empathy, to establish general principles that allow us to relate phenomena to each other and to create new phenomena—that is, to put the principles to use.

Now we are applying the methods of science to human behavior, seeking general principles and checking our theories against the facts. We realize that wishes, thoughts, and emotions need to be understood in their

turn. There is dispute, however, about what role they play. The *mediationist* theorists believe that internal events such as wishes and thoughts are among the causes of action. These include psychodynamic writers who emphasize the role of urges and desires, and cognitive writers who emphasize thoughts, beliefs, and judgments. *Behaviorist* writers deny that these internal events cause behavior. Rather, they see both the inner events and the behavior as caused by the environment. Cutting across this dispute is the biological perspective, which asks how the mechanisms of behavior work at the level of cells or organ systems, or how the characteristics of the behaving organism evolved.

Three methods of investigating motivation were discussed, each having strengths and limitations. Case studies can give us important information about things that *can* happen, though it is easy to overgeneralize their results or to find in them what a theory leads us to expect. Correlational studies show what variables are related to each other. These relationships may be important in their own right, and they sometimes provide tests of theories, but they do not establish causality. Experimental research does establish causal relationships, but for one or a few variables at a time, and so it is sure but slow. And we must remember not to mistake *a* causal variable for *the* causal variable.

Another method is simply to ask a person, "Why did you do that?" This can rule out possibilities and may give accurate information, but all agree that it may also give very inaccurate information—and we are not sure when to expect accuracy and when not. Finally, physiological investigation can show how behavioral laws are mediated by the mechanisms of the body. But we must know what the laws are before we search for those mechanisms. At this stage of our knowledge, many theories and principles are stated without reference to physiology, so we test and evaluate them by other means.