

J. B. WATSON: THE ORIGINAL BEHAVIORISM

BIOGRAPHY

John Broadus Watson was born on a farm near Greenville, South Carolina in 1878. He received an A.M. at Furman University in Greenville in 1899 and in 1903 was the youngest candidate to have received a Ph.D. at the University of Chicago (see Figures 4.1 and 4.2). After several years as an instructor at Chicago, he was offered a professorship and a department chairmanship at Johns Hopkins, which he accepted in 1908. His academic career was cut short in 1920, due to the conditions surrounding his scandalous divorce, which led to his forced resignation. Abandoned by virtually the entire academic community, he began a second career in advertising, first with the J. Walter Thompson agency and later with William Esty. Watson continued to lecture occasionally during the 1920s and published a good deal, but largely in popular magazines; academic journals were closed to him.

Before 1915 Watson's research was restricted to animal behavior, including several papers on kinesthesia and maze learning in rats, the behavior of noddy and sooty terns, and color vision and imitation in monkeys. From 1915 on, his interest centered on child development, an interest that persisted after he was forced from academics. The following are some of his most representative and influential publications; the last is a collection of popular articles published in *Harper's Magazine*.

"Psychology as the Behaviorist Views It,"
1913

Behavior: An Introduction to Comparative Psychology, 1914

Psychology from the Standpoint of a Behaviorist,
1919

Behaviorism, 1930

The Ways of Behaviorism, 1928

MALONE



FIGURE 4.1 John B. Watson, 1878–1958. This photograph shows Watson as a young man. *Photo courtesy of Clark University Press*

Although Watson often pointed out that he was not the founder of behaviorism, it is certain that he was its most vocal and effective advocate. Watson argued that the emphasis on the analysis of consciousness, which had almost solely occupied psychologists, was misguided and extremely damaging to progress. If humans are treated objectively, we find that we can discover the factors that lead them to act in the ways they do, and, knowing that, we can influence their actions.

A science of behavior can aid us in raising our young and eventually lead to a world fit for human habitation. Watson's views produced

strong opposition from his peers, who erroneously characterized behaviorism as a crass mechanical model of humanity, devoid of thoughts, hopes, dreams, and emotions. Attacks on Watson's position were really more successful than was warranted, since there was no way for him to respond to critics after his forced departure from academics.

Tolman, Hull, and Skinner carried on versions of Watson's general point of view, although their theories differed from Watson's in many specifics. However, J. R. Kantor and his followers have espoused a view very similar to Watson's for more than half a century. Watson conscientiously applied his theories in his second career, advertising, and the great success he had there certainly lends support to his cause.

INTRODUCTION

Section 1 of this chapter considers the significance of Watson's radical break with what had been called psychology before 1913. We now pretty much agree that the older psychology was headed nowhere, but it did correspond with our commonsense ways of viewing things, and Watson's attack thus seems as threatening now as it did then! Now, however, psychologists are more interested in practical applications, so Watson's position seems less extreme than it did in his time. His criticisms of reliance on the nervous system and on instinct are as valid now as they were then.

Section 2 examines the specifics of his theory of learning, which arose from countless observations of both animal and human behavior. His study of the behavior of human infants entailed more actual hours than was the case for many later child psychologists, who tended to make only sporadic observations, yielding an odd time-lapse picture of child development.

Watson's basic explanatory terms were *stimuli* and *responses*, but we will see that he did not define them simply and crassly, as did Thorndike

and later behaviorists. His treatment of language, memory, thinking, and consciousness surely raised hackles in his day, but you will see that he was really quite reasonable. Read what he had to say about mental activity and decide for yourself whether he was describing humans as robots, as Hull later did. Watson stressed emotion in all of his writings, and his famous work with "little Albert" was only one instance of his long-standing concern with the harmful effects that certain kinds of parental care can have on the future mental health of children.

In Watson's day most psychologists placed great emphasis on the importance of heredity in determining intelligence and the general features of personality. In England, Sir Francis Galton had argued that superior parents produce superior offspring, with *superior* defined as the characteristics of male leaders in business, science, and the military. In this country James Cattell and others, including Thorndike, held similar views and emphasized the importance of heredity.

Watson fought hard against this view and, almost single-handedly, amassed evidence that showed the strong effects of environment on later performance. His observations of infants were carried out over remarkably long periods, considering that he saw the subjects daily. His conclusion was that the effects of heredity were overrated and that any supposed difference in intelligence or personality that seemed to depend on sex or race was wholly due to the conditions of upbringing. He was thus one of the first leaders in psychology to provide evidence for what could happen if there were true equality of opportunity.

His views of psychopathology also emphasized the effects of personal history; he pointed out that "mental illness" is not an illness, in the sense that a viral infection is an illness. His opinions are shared by many today, and they offer an alternative to the older view that treats psychopathology as illness.

Section 3 considers criticisms of Watson's behaviorism. He has been accused of denying the



FIGURE 4.2 John B. Watson. This photograph of Watson was taken later in his life. *Photo courtesy of Bettmann Archive*

existence of mind and consciousness, which is true. (Consider his reasons and just what it was that he denied!) He called *thinking* "talking to oneself." Consider, though, what he meant by *talking*! Watson has been criticized for being purely descriptive, but we will see that this may be just what is needed if we are to have a practical psychological theory.

Section 4 briefly describes the scandal that forced him to leave academics and to begin a second career in advertising. What happens when one of the best-known psychologists in the world is forced into such a position at the age of 42? His income increased manyfold, and advertising became what we see it to be today.

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1. THE SIGNIFICANCE OF WATSON'S THEORIES

Psychology at the Turn of the Century

According to the eminent British philosopher Bertrand Russell, Watson made "the greatest contribution to scientific psychology since Aristotle." This may seem undeserved praise for a man who was made the villain of psychology for over fifty years. Watson is the supposed simpleton or archfiend (depending upon the critic) who denied the very existence of mind and consciousness, reduced us to the status of robots, and urged that we dispense with baby talk and treat our children as little adults. He has been accused of interpreting thinking as nothing more than laryngeal muscle twitches and of denying that we have mental images. How could anyone take such notions seriously? Is it any wonder that he has been so vigorously attacked?

To appreciate Watson's thesis and its significance, one must consider what was called *psychology* at the turn of the century. It was this state of affairs that led Thorndike to formulate his version of *behaviorism* and that produced Watson's even stronger protest.

Thorndike argued that conscious activity is still activity and is therefore subject to learning principles. Watson went further and suggested in 1913 that *mind*, *consciousness*, *images*, and *sensations* are really nonsense terms that have no place in psychology. The introspectionists, led by Edward Titchener at Cornell, had long argued that a prerequisite to the understanding of psychological phenomena was an analysis of conscious experience. This view was a continuation of hundreds of years of philosophical and psychological thought, and it was accepted by virtually all influential European and American psychologists. (See Chapter 1.)

The basic elements of consciousness were sensations, images (which were fainter), and affect (emotional elements). Sensations and images had the attributes of quality (for example, blue or

cold), duration, clarity, and sometimes extension in space. Emotional elements were characterized only by quality and duration; if you clearly felt an emotion, you were not introspecting properly. One of the most interesting debates during the early part of the century concerned the question of whether auditory sensations had the attribute of extension in space. Does a rich tone from a pipe organ occupy more space than a shrill note from a flute, or is extension in space a characteristic of only visual and tactual sensations?

Difficulties arose concerning the limits of introspective analysis, especially in the reports of Külpe and his followers in Germany, who spoke of imageless elements, illustrated by the following example. Suppose a subject is highly trained to report accurately his conscious experience. An experimenter asks him to describe the feelings that accompany simple judgments of heavier or lighter, but he finds that the experience is indescribable. He feels the weights, but the judgments "same" or "different" seem to come instantaneously. There is no image to report, and the feeling that goes with the judgment itself is therefore an imageless element.

This is an inconvenient finding if one has put all one's stock in such introspective reports. If there is no mental content to be reported in the making of such simple judgments, then what hope is there for such a method when we come to more complex mental activities? For his part, Titchener was content to suggest that the making of such judgments has occurred so frequently in life that the mental content originally accompanying it has become unconscious. Thus, a good part of our experience takes the form of unconscious content.

Watson (e.g., 1930) suggested that anyone critical of his theory first read some of the "pabulum" proposed in the introspective textbooks; and that he or she then will see the virtues of behaviorism. Watson himself was brought up on such pabulum, and his dissertation was concerned with the psychical development of the white rat; introspection by analogy was used even by animal researchers.

The Selling of Behaviorism

Watson was urged by his friends to refrain from his attack on the introspectionists; since he was also a close friend of Titchener, he did refrain for some time. Finally, his restraint ended in 1913, and he attacked vigorously and in language too plain to be misunderstood. He argued that psychology as it was being done was a waste of time and that if it were continued we would still be arguing over whether auditory sensations were extended in space two hundred years hence. According to Watson, one can write a psychology without even using the terms *consciousness*, *mind*, or *images*, since such entities are pure inventions of the introspectionists, having no existence in fact. As he said in 1928, consciousness has never been seen, smelled, nor tasted, nor does it take part in any human reactions! Many were shocked when Watson denied the existence of consciousness. Or did he?

It is important to note that Watson did not deny the existence of seeing, hearing, thinking, hoping, and remembering. But for him, as for Thorndike, these were things that we *do*. Is there really a remainder—consciousness—after we subtract these activities from our experience? Is there really a thing called *mind*, independent of those activities? (Refer to Table 4.1.) Although his suggestion is essentially in agreement with Thorndike, it was Watson who pressed the point and who took the credit or blame for behaviorism in general. And we will see that Watson was far more extreme than Thorndike; it was not only consciousness that Watson questioned.

The goal of psychology was clear to Watson: We want to be able to predict with reasonable certainty what people will do in specific situations. Given a stimulus, defined as an object of outer or inner experience, what response may be expected? A stimulus could be a blow to the knee or an architect's education; a response could be a knee jerk or the building of a bridge. Similarly, we want to know, given a response, what situation produced it. Why do people yawn in crowded auditoriums? What conditions lead to

TABLE 4.1 Two Views of Consciousness

Cognitive Activities		Consciousness
Seeing Hearing Smelling Touching Thinking Remembering Hoping Feeling Attending and so on	AND	Consciousness as a separate entity observing all of this and having contents (ideas, sensations, feelings, memories)
Seeing Hearing Smelling Touching Thinking Remembering Hoping Feeling Attending and so on	IS	Consciousness! There is no special entity that presides over mental activity.

criminal behavior? What leads a person to act and feel depressed?

In all such situations the discovery of the stimuli that call out one or another behavior should allow us to influence the occurrence of behaviors; prediction, which comes from such discoveries, allows control. What does the analysis of conscious experience give us?

Behavior, the Brain, Instinct, and Consciousness

For many summers Watson had studied terns on the island of Tortuga. Having caught some of these birds, he observed their behavior and watched how they mated, raised their young, reacted to predators, and so on. This led to a fair understanding of terns. The same strategy is the only key to understanding more complicated life forms, such as preliterate humans or modern Europeans. There is no shortcut; we must determine

what we do, think, and feel under specific circumstances.

Thorndike suggested that our actions depend upon the S-R connections that we are born with and that are modified with experience. For Watson, such dependence upon neural substrata or analogies was unnecessary. In 1919 he pointed out that he presented few pictures of neural structures, since the reader could erroneously conclude that the nervous system was important as a static structure. What is important is the activity of the nervous system as a part of a whole, only *one* part of an acting organism. As he wrote, "one should strive to get the beginner to view the organism as a whole as rapidly as possible and to see in the working of all its acts an integrated personality" (1919, preface). The positing of S-R connections in the brain not only is needless, but fosters the view that the brain is the initiator of action. We act as a whole; we are not controlled by impulses sent from the brain. Rather, we are controlled by external (and bodily) stimuli and situations.

Watson was also extremely opposed to the emphasis of *instinct*, as the term was used by Thorndike and others of the time. Recall that Thorndike was an extreme hereditarian, and in 1913 he included a long list of instincts in his *Educational Psychology*. Are we born with the instincts of rivalry, acquisitiveness, constructiveness, sympathy, and the like? Because of our evolutionary history, is swimming instinctive? Does nature ensure that one of us is marked at birth as a future genius while another is doomed as a dunce? Watson thought it was not the case, and he argued that no one had troubled to observe closely the behavior of infants at birth and to follow the development of later behaviors. If this had been done, we would have found that we all come with a set of instincts, such as grasping and sneezing, and that it is the environment in which we develop that molds the so-called instincts of rivalry and imitation, which Thorndike and James had stressed. The environment also determines subsequent intellectual capabilities. Watson was intensely interested in this developmental process,

evidenced in his research with children, which began in 1915 and continued even after he left academics.

What is psychology without consciousness, S-R connections, instinct, or purpose? It is practical and concrete, and it deals with practical and concrete events: What is that man doing? How may we change it? What is he thinking? What is he feeling? How may we change that? What is he buying? How may we change *that*?

The one cherished possession of the old psychology that Watson did not cast out was emotion, which played a large part in his overall view of psychology. The following section examines the central importance of emotion and Watson's treatment of the traditional areas of psychology. You may then decide whether Watson deserved the censure he has received over the years.

2. BASICS OF WATSON'S THEORY

Learning: Not Thorndike

Watson (1919) said that we are "what we come with and what we have been through," and he believed that what we go through is by far the more important determinant. What we come with is a set of hereditary (reflex) reactions called out by specific stimuli. A touch of the skin produces movement of the infant's limbs, a speck in the eye produces a blink, food in the alimentary canal produces peristaltic movements, a moving object in the visual field may evoke orienting and following with the eyes. While still in the womb we react incessantly, adjusting to the stimulation constantly affecting us. We continue adjusting until death, the final adjustment.

Consider what adjustment means to an infant. The sight of an object such as a bottle produces agitation, movement of arms and legs, cooing and gurgling sounds, internal glandular secretions, eye movements, changes in respiration, and so on. Because of the infant's hereditary equipment

and its learning history to date, a variety of stimuli (sights, sounds, touches, smells) produce general reactions; the infant responds with everything it has. How does such generalized reactivity eventually lead to grasping the bottle? It is not easy. If one observes the development of grasping from the 120th to the 200th day of the infant's life, as Watson did, it is clear that manipulation and grasping are not instinctive. The infant "learns to manipulate objects and even its own bodily parts literally by the sweat of its brow" (1919).

The way in which this occurs is Watson's model for all learning and contrasts with the way in which Thorndike would account for the same events (see Table 4.2). For Watson, the bottle produces movement (along with activity of internal organs) that continues as long as it is present as a stimulus. Assuming that the bottle is not being held and withdrawn by a fiend, eventually the infant's arm or hand strikes it. When the infant strikes the bottle with its hand it grasps the bottle, since grasping is an instinctive activity evident at birth. Once the infant successfully grasps the bottle, which may take a great deal of practice, it moves the bottle toward itself or flings the bottle awkwardly away. In either event, the bottle no longer is present as a stimulus, and the generalized agitation or movement ceases. With sufficient repetition, the sight of the bottle may be enough to evoke a smooth and coordinated hand movement and grasping; the infant has learned the requisite habits.

For Thorndike, this episode of learning depends upon the effect of the satisfier involved, the feel of the bottle. Whatever movements produce this outcome are stamped in, and other movements are stamped out—just as the movements of the cat in the problem box are stamped in and out. Watson's view of learning was different and did not require the action of satisfiers, which he likened to the "implanting of habits by kind fairies." If one observes either the cat or the infant, the movements that produce escape from the box or that secure the bottle are the movements that have occurred most frequently, since they must

TABLE 4.2 Two Accounts of How an Infant Learns to Grasp a Bottle

Thorndike's Account

Stimulus (sight of bottle)
 Paired with accidental (?) grasping
 Consequence: may manipulate, stroke, nurse
 Hence: S-R connection "visual bottle" and "grasp" stamped in

Watson's Account

Stimulus (sight of bottle)
 Elicits movement of whole body, vocalizations
 Hand strikes, grasps bottle
 Hence: "sight of bottle" no longer present as a stimulator

occur at least once per trial. Also, since they were the last movements made in the preceding solution of the same problem, they are the most recent actions. What is learned is whatever has occurred most frequently and most recently in that situation or in response to that stimulus. Hence, frequency, recency, and stimulus change are sufficient to account for the formation of habits.

As another example, consider a six-month-old baby, sitting on its mother's lap, learning not to put its hand into a candle flame placed within reach. In Watson's experiment, it took Baby L. two weeks and 150 trials to learn this. (If a severe burn had been allowed it surely would have taken fewer trials, but Watson ensured that a real burn did not occur.) What was learned? Was the behavior of reaching for shining, dancing objects stamped out? Was reaching punished? Watson's interpretation is otherwise. The original stimulus—the bright, shiny, dancing flame—eventually is replaced by a new stimulus—bright, shiny, dancing, painful flame. Our commerce with objects changes them and thus changes our reactions to them. The stimulus is not flame plus punishment; it is literally a different flame, one with the property of producing pain (see Dewey's 1896 very similar interpretation in Chapter 1).

Such is the case with other stimuli. Does food not change as we consume it? Is the eighth piece of pizza the same in kind as the first? Is *wood* the

same word or thing to a lumberman, a wood-carver, a beaver, and a musician? Our actions with respect to objects change them and thus change our future reactions to them.

Watson provides charming advice along these lines for anyone who has a problem with egg-sucking dogs or cats. If one injects quinine into the eggs, the animal will soon stop its annoying practice and our eggs will be safe. We have here supplemented nature, which has already arranged that flames burn, by arranging that the insides of eggs taste different. As nature teaches its children to react properly to the objects of the world, we may arrange conditions to produce behaviors we want and eliminate those we do not want.

Watson's View of Classical Conditioning

Most readers will recognize that the above examples of adjustment can easily be interpreted as classical conditioning, and Watson did suggest that himself. To Watson, *classical conditioning* meant no more than the effects of pairing of stimuli—the simple view of classical conditioning discussed in Chapter 3. Pair the pain with the flame or the quinine with the sight of the egg and the conditioned response follows. But Watson was loose and unspecific about the whole process. He did not hesitate to call the picking up of a revolver a conditioned response, clearly a different usage from that of Pavlov.

Motives

Watson also emphasized that a good many of the stimuli to which we adjust are due to visceral needs, such as hunger pangs or sexual urges. Hunger stimuli produce movements that continue until the ingestion of food abolishes the stimuli; in the future, the movements that accompany such an effect will occur again, owing to the principles of frequency and recency. In addition, such successful adjustments may be accompanied by a decrease in emotional tension (as in the ending of great hunger) and perhaps emotional ex-

citement. What is absolutely essential for the formation of habits was hazy to Watson in 1919 and even in 1930. Frequency and recency were the most important factors; if something else was necessary, it was not Thorndike's concept of satisfier, which Watson interpreted as a hedonistic theory.

In Watson's opinion, once we have acquired a supply of habits, we can quickly make the adjustments that life requires and we may stop learning anything new. It takes a new situation, requiring adjustment, to produce new learning. For many of us, that may necessitate a fire, a flood, an earthquake, or a stockmarket crash. When new learning is required of an adult, failure to adjust rapidly may lead the person to revert to more primitive habit systems or even to instinctive behavior. Watson gives the example of the 35-year-old man learning to play tennis for the first time. He does not know how to swing the racquet, but he has swung a bat and a golf club and he swings the racquet as he swings them. Repeated failure to efficiently strike the ball using these primitive habit systems may lead to their abandonment and to the appearance of more primitive instinctive reactions that lead to the destruction of the racquet and thus to adjustment, even if not a socially acceptable kind.

Stimuli and Responses

Watson offered further opinions on the nature of learning, most of which are treated in the following sections. One interesting principle suggested in 1919 has to do with the number of habits being learned simultaneously. The larger the number of such habits, the slower the growth in strength of any single habit, as if there exists a finite sum of strength to be shared by these habits. Interestingly, this is the essence of the Rescorla-Wagner theory of conditioning, which has been very popular since 1972 and which is discussed in Chapter 9.

Finally, Watson always spoke of stimuli and responses, S and R, but his usage was unlike that of later writers. S was any object shown to be

relevant, whether it be hunger pangs, a light flash, one's family, or an education in law. A response could be eating, building a house, swimming, talking, or arguing a case before the supreme court. Watson was interested in accounting for whatever it is that people do that interests us. We cannot expect that the units of description will always be on the same level (see Table 4.3).

Throughout his writings, Watson urged psychologists to make field observations, particularly of children, so they could better understand the learning process. To his credit, he did a good deal of such observation himself, but his post-1920 position made it nearly impossible to continue that work.

Language

The learning discussed in the previous section was concerned with what Watson called *manual habits*, bodily movements produced by the contraction of striped muscles. A second class of habit referred to the learning of words and the use of language; Watson persistently referred to this as *laryngeal habits*, although he pointed out that language was by no means solely dependent upon movements of the larynx. Language depended upon the whole body, and virtually any bodily movement could act as a word.

The simple learning and repeating of words, as done by a parrot or myna, represents only the formation of vocal habits. When words or word substitutes (gestures, shrugs) are used as substitutes for actions and objects, we have evidence of language habits. Sometimes language behavior has nothing to do with words; as Watson (1919) suggested, there are many situations in life for which we have no organized reaction. Curling the lip, shrugging, and uttering *bumpf* is all we can do.

Since language habits are defined as substitutes for objects and for actions, Watson opposed free speech:

"[T]he only person who ought to be allowed free speech is the parrot, because the parrot's words are

TABLE 4.3 Watson's Use of *Stimulus* and *Response*

<i>Stimuli</i>	<i>Responses</i>
A puff of air to the eye	An eye blink
A sudden noise	Orienting, startle
A pinprick	Tensing, withdrawing
A red light	Pressing the brake pedal
.	.
.	.
A medical education	Performing an operation
A general education	Writing a book
Equal distribution of wealth	?
?	A decrease in the crime rate

not tied up with his bodily acts and do not stand as substitutes for his bodily acts. . . . When the agitator raises the roof because he hasn't free speech, he does it because he knows that he will be restrained if he attempts free action. He wants by his free speech to get someone else to do free acting. (Watson, 1930, p. 303)

Memory

Watson did not believe in memory, as the term was used by the introspectionists and by many contemporary psychologists. That is, he was opposed to the notion that what we see, hear, smell, and feel is somehow preserved in little copies in the nervous system and retrieved in the act of remembering. Perhaps you can see the reasons for his objecting to such a conception. If we consider all of the things we do that have any connection with what we mean by *memory*, we find that assuming that experiences are stored and retrieved gains us nothing. It may seem necessary to us that things be stored and retrieved, since we cannot imagine how we can see and hear things that are not now present. But this is not a sufficient reason to concoct such a mechanism; the fact is, we have little understanding of how we see and hear things that *are* present, to say nothing

TABLE 4.4 The Whole Body Remembers

<i>Verbal (Laryngeal)</i>	<i>Visceral</i>	<i>Manual</i>
"That's John Brown."	warm feeling	wave hello
"What's his name?"	visceral arousal	withdraw
"I can't explain how this works."	—	obvious skill in using a device
"I forgive you."	vigorous arousal	smile
"I thought I knew you."	—	uninvited approach

of things that formerly were present but that now are not! Yet, when we glibly speak of the storage and retrieval of memories, we delude ourselves by thinking we have explained something, while in truth we have merely diverted attention away from the real problem. How do we see and hear in the first place?

The study of memory is properly the study of the factors that affect our performance (whether verbal or manual or emotional) after a period of no practice (see Table 4.4). I meet a friend; I nod my recognition, shake his hand, and begin to speak with him of old times. Yet, I cannot for the life of me remember his name! What is it that I do remember? I remember the manual habits appropriate to the situation and I feel glad, angry, or sad that I ran into him. *Memory* is a word for the host of habits developed with respect to him in the past and active at this meeting. A part of the verbal behavior is missing, but after a few minutes, the name comes out. The same thing happens when I run into a piece of equipment that I have not used for a while. Often we are surprised by the memory we have of its workings, shown by our skill in operating it.

Watson felt that those studying memory placed far too much emphasis on verbal memory,

our ability to recite words and lists and to produce verbal descriptions of past events. Verbal behavior is not an adequate indicator of what memory should really mean. For example, the two-year-old who says, "Billy ride kiddy car," speaks on a primitive level that certainly cannot be taken as an indicator of his current abilities, which he is capable of coordinating and which constitute his memory.

For adults, verbal habits may become much more important, and a good deal of our memories are cast in almost purely verbal form—"word pictures," as Watson called them. Before we verbalize our experiences we have no way to carry them reliably with us; an un verbalized emotional experience is lost unless translated to words. How many of us are sure to spend some time discussing our triumphs and joys with others immediately after they happen? The retelling of the happy experience and the casting and recasting of the movements and feelings involved in word form puts it in a form we can carry with us.

Before we are capable of verbalization, our moments pass forever away, and early childhood is thus a closed book to us. Watson showed his two-year-old son Billy (of kiddy car fame) the bottle from which he had been weaned as a one-year-old. Billy had no idea what to do with it, nor with his mother's breast! Both had been familiar and important objects to him for half of his life, but that half was preverbal and gone forever. Despite the coaching used to try to evoke some memory of bottle and breast, which Watson (1930) described in detail, Billy seemed genuine in his bewilderment.

Thinking and Consciousness

For Watson, thinking is part of what we do in the business of adjustment. It is talking; recall that language habits were by no means restricted to verbal behavior. We act with the whole body and we think with the whole body. *Consciousness* is a popular or literary term that does not really refer to a thing but only applies a name to our naming activity. We name the universe of objects both

inside and outside us; that is what is meant by consciousness. It is all that we have reacted to, labeled, and made a part of what we will respond to in the future.

It is important to note that Watson's critics have greatly misunderstood his position on private experience. It is easy to conclude, as they have, that when Watson denied mind, consciousness, and imagery he was denying experience in general. But Watson was simply denying the existence of mind, thoughts, images, and the like as *things*. In denying images, for example, he was not denying imagination (1919). Imagining is a name for something we do, but is it necessary to say that we imagine images? Do we think or do we think thoughts? Watson believed that imagining and thinking were best treated as activities; enough time had been spent by Titchener and others studying *things* like "images" and "thoughts."

Thinking is a constituent part of every adjustment process; it is also what we do before we take action. It may include verbal elements, false starts, muscular tensions, emotional elements, or more. As a diminished form of action, it follows that thinking can be no better than muscular action. It is not by any means a matter of talking to ourselves, following the rules of syntax and grammar. Watson provided this concrete example:

A friend comes to you and tells you that he is forming a new business. He asks you to leave your present splendid position and come into the new business as an equal partner. He is a responsible person; he has good financial backing. He makes the offer attractive. He urges the larger ultimate profits you will make. He enlarges upon the fact that you will be your own boss. He has to leave at once to see other people interested in the venture. He asks you to call him up and give him an answer in an hour. Will you think? Yes, you will, and you'll walk the floor too, and you will pull your hair, and you may even sweat and you will smoke. Follow out the process step by step: Your whole body is as busy as though you were cracking rock—but your laryngeal mechanisms are setting the pace—they are dominant. (1930, p. 245)

The fact that much thinking is silent language behavior seemed to be evident to Watson after observing the stages shown by children learning to read. Initially, they read everything aloud, much to the annoyance of whatever representative of organized society is present. Scolding reduces the verbalization to mumbling, further scolding reduces that to whispering, and yet more scolding reduces that to lip movements alone. Finally, "Can't you read without moving your lips?" removes even that vestige of overt activity, and the reader eventually only thinks the written words. The activity still goes on in the form of minute muscular movements, not only of the larynx, but of the whole body. Thinking is doing and there is no difference in kind between the thought and its expression; the difference is in degree only.

Emotion

The third major class of innate reactions (after manual and laryngeal reactions) are those of the viscera, the emotional reactions. The effects, both good and bad, of emotional learning were considered of crucial importance by Watson, who devoted a good deal of research effort to the subject. Watson called these learned behaviors *visceral habits*. When he said that every reaction is a reaction of the whole body, he included the actions of the smooth muscles and glands. Unlike manual and laryngeal responses, which may appear discrete and specific, emotional reactions are always pattern reactions, clearly involving the whole body. A bit of bad news may paralyze the striped muscles, stop digestion, and throw verbal habits into disarray.

For what is usually viewed as a mechanistic psychology, emotion has a special role:

[E]motions remove the individual from the monotonous level of existence as a highly perfected machine. . . . If all hearts were calm, the great artists would have lived in vain. . . . The world would be a sorry place indeed . . . if the distress of the child, of the weak and the downtrodden moved no eye to tears. (1919, p. 223)

The cold sweat of fear, the head bowed in grief, and the exuberance of youth are not just literary expressions; visceral or emotional reactions are reactions!

Beginning in 1915 and extending into the 1920s, Watson and his students made countless observations of infants at the Phipps Clinic in Baltimore and later at the Manhattan Day Nursery. Out of this came Watson's famous postulation of three basic emotions—the X, Y, and Z reactions, corresponding to fear, rage, and love. An infant shows the innate fear reaction soon after birth, characterized by closed eyes, a catching of breath, spasmodic movements of legs and arms, grasping with the hands, and puckered lips. Such a reaction is reliably produced by a loud noise or loss of support (and by tissue injury producing pain), but by nothing else. Watson exposed six-month-old infants to every sort of zoo animal at close range, to pigeons flapping in a paper bag, to darkness, and to brightness; the infants never showed any sign of fear. Fears of such things appear later in childhood and are instilled by society or by the child's personal experience.

Rage, reaction Y, is produced by anything that impedes movement; holding the infant's limbs is enough to produce the stiffened body, held breath, and thrashing that characterizes rage. Love, the Z reaction, is produced by petting and stroking; the reaction appears as the extending of limbs, smiling, and cooing. Any stimuli that reliably accompany loud noise or loss of support, restraint, or stroking and petting come to evoke fear, rage, or love. Such pairing accounts for the development of phobias (learned fears) and for the neuroses of Freud's patients, who carried with them acquired love reactions toward their parents, who spent much time instilling them.

Watson spent a good deal of time studying acquired emotional reactions, and he observed a great many children. But all of his work seems to have crystallized in the work done with an eleven-month-old infant named Albert, whose case has achieved the status of a myth, appearing in many

forms in many textbooks. As Harris (1979) pointed out, many of the details of the case have been related incorrectly in many of the texts, although all that the authors had to do was examine Watson's own account (e.g., 1919, 1930; Watson & Rayner, 1920).

Albert B. was a wonderfully good child of a wet nurse at the Lane Hospital in Baltimore who, at eleven months of age, feared only loud noises and loss of support. When presented with a white rat, he showed only curiosity. As he reached for it, a four-foot-long steel bar, $\frac{3}{4}$ inch in diameter, was struck by a carpenter's hammer nearby but behind him and out of sight. The noise made him jump violently and bury his face in the mattress, but he did not cry. The rat was presented again; as Albert reached for the rat, the bar was again struck. Albert still did not cry, but he appeared so disturbed that no further trials were conducted. After a week, the rat and the loud noise were paired five more times and finally Albert cried. The sight of the rat alone sent him crying and crawling away so rapidly that it was difficult to prevent him from falling off the bed. Albert had acquired a new fear.

After five days Albert was tested with blocks, a white rat, a rabbit, a dog, a sealskin coat, cotton wool, Watson's hair, and a Santa Claus mask with white beard. All of these items except the blocks produced a greater or lesser fear reaction, showing that the acquired fear was not specific to the white rat but occurred to other objects that were white and/or hairy or furry. Watson claimed that Albert was no longer available to the researchers and that it was therefore impossible to investigate methods to remove this acquired fear. Harris (1979) argued that Watson was well aware that Albert was to be adopted and knew well in advance the date of his departure. Why Watson should leave Albert in that state is unclear, since the cure was not hard to find.

Watson (1930) later reported attempts to remove fears in 70 children, age three months to seven years; much of this work was done by Mary Cover Jones, a graduate student at Columbia for

whom he was an unofficial sponsor and for whom he had set up the Manhattan Day Nursery. For example, one child, "little Peter," had a host of pre-established fears; he was afraid of rats, rabbits, fish, cotton, frogs, and mechanical toys. How does one remove such fears? Watson described several methods, including disuse (preventing exposure to the feared object); telling the child stories about the feared object, in which the object is portrayed as nondangerous (for example, telling stories about Peter Rabbit to combat fear of rabbits); frequently applying the feared object, now known as *emotional flooding* or implosive therapy; using social methods, such as pointing out that only "fraidy cats" are fearful of rabbits; and, finally, reconditioning. Only the last method proved useful and was successful in curing Peter of his fear of rabbits.

Reconditioning simply attaches a new reaction to the object feared, replacing the existing fear response. This is done by presenting the object in such a way that it produces no fear reaction; for example, the object could be present but at a great distance. Then, while the person is induced to make a response incompatible with fear, the object is brought gradually nearer.

In Peter's case, the rabbit was initially presented at a distance of 40 feet. As Peter ate crackers and milk, the rabbit was gradually brought closer until Peter petted it as he ate. This is, of course, the method of systematic desensitization made popular by Wolpe decades later and already described in Chapters 2 and 3.

Instincts and Innate Traits

Unlike Thorndike, a real hereditarian who pretty much accepted James's long list of instincts, Watson saw no evidence of innate constructiveness, combativeness, rivalry, hunting, and other so-called instincts. Significantly enough, it was Watson and not James or Thorndike who actually *examined* the development of infants over a significant portion of their early lives. Perhaps careful observation of a child's development leads to the

conclusion that environment, not instinct, is important. James and Thorndike, who favored instinct, based their judgment only on casual observations.

We may also believe in instinct for the wrong reasons. In Watson's opinion, the belief in instincts and traits (the "gifts" that are passed on from parent to child) reflects only our desire to live forever, in the form of passed on characteristics. "It is hard for most of us to believe that when we are dead we are dead all over, like Rover" (1928a). Is that an important reason for our belief in heredity, or do we have clear evidence that intelligence and other characteristics are passed from generation to generation? Is only body structure inherited?

Based on his observations of the development of many infants, Watson concluded that we do come with many instinctive reactions but that these are more elementary than is commonly supposed (1919). We instinctively have fears (at least of loud noises and loss of support); we sneeze, hiccup, have erections, void, produce tears, raise our heads, kick, and grasp. And we come prepared to react positively to hundreds of objects (such as shiny things or moving things) and to react negatively to a few things (such as loud noises or pain). During development, new stimuli become paired with those producing the original positive or negative reactions, and we live a life of attractions, aversions, and mixtures of attraction and aversion for reasons largely unknown to us. Table 4.5 outlines Watson's findings regarding instinctive and conditioned reactions of human babies.

Two observations struck Watson as significant regarding instinct. First, contrary to some theories of evolutionary recapitulation, swimming is not an instinctive behavior in human children. This was shown by placing a newborn in a tank of water and observing only unmistakable fear reactions. Secondly, contrary to some views concerning the significance of sexuality in infants, there seemed to be no tendency for the infant to touch the sex organs. After 500 periods of

TABLE 4.5 Birth Equipment of the Human Young

<i>Activity</i>	<i>How or When It Occurs</i>
Sneezing	
Hiccupping	
Crying	Soon becomes conditioned. Not produced by sounds of others' crying, unless very loud. Any loud sound has the same effect.
Urinating	
Defecating	
Eye movements	Orientation toward faint lights begins soon after birth.
Smiling	Occurs by fourth day; may become conditioned so that smile is returned by 30th day.
Manual responses	
Hand movements	
Arm movements	May be produced by many forms of stimulation.
Leg or foot movements	Kicking is produced by many forms of stimulation.
"Climbing" motions	
Turning over	May occur shortly after birth.
Feeding	Mouth moves toward stimulation as early as five hours after birth; like suckling, mouth movement is easily conditioned.
Crawling	Great variation exists among infants; in some infants it never occurs.
Standing or walking	Begins with the extensor thrust, which may occur after a few months; the first step occurs only after eleven months to a year.
Vocalizing	
Swimming	Does not occur when infants are placed in water; only pronounced fear responses are evident.
Grasping	Newborn can support its full weight with either hand; so can premature infants and those born with no cerebrum.
Blinking	May be produced by air puff or touch at birth; may be produced by a moving shadow at 65 days.
Hand preference	No evidence for hand preference when candy offered at 165 days; there may be no difference in work done with right or left hand at one year.

observation of infants from birth to 300 days, it was clear that the sex organs, like the feet and the rest of the body, are discovered purely by chance at about 150 days.

Watson's argument against heredity, innate "gifts" and the like, is often criticized as an extreme and almost crackpot position. We have so many of the physical attributes of our parents

that it seems reasonable that we have inherited more; we may have their intelligence, their morality, their strength of character, their mechanical ability, their athletic prowess, and so on. Such an argument has been made for thousands of years, and there is no doubt that the belief in "good and bad seed" has unjustly kept many a superior person in servitude and many a dunce

on the throne. Watson did not deny that heredity was a factor, but he stressed the greater effect of environment. The following famous quote regarding heredity deserves to be presented in a longer version than is customary; the pages preceding this passage are well worth reading but are too much to include:

Our conclusion, then, is that we have no real evidence of the inheritance of traits. I would feel perfectly confident in the ultimately favorable outcome of careful upbringing of a *healthy, well-formed baby* born of a long line of crooks, murderers and thieves, and prostitutes. Who has any evidence to the contrary? Many, many thousands of children yearly, born from moral households and steadfast parents become wayward, steal, become prostitutes, through one mishap or another of nurture. Many more thousands of sons and daughters of the wicked grow up to be wicked because they couldn't grow up any other way in such surroundings. But let one adopted child who has had a bad ancestry go wrong and it is used as incontestable evidence for the inheritance of moral turpitude and criminal tendencies. As a matter of fact, there has not been a double handful of cases in the whole of our civilization of which records have been carefully enough kept for us to draw any such conclusions. . . . One cannot use statistics gained from observations in charitable institutions or orphan asylums. All one needs to do to discount such statistics is to go there and work for a while, and I say this without trying to belittle the work of such organizations.

I should like to go one step further now and say, "Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief, and, yes even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors." I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for many thousands of years. (Watson, 1930, pp. 103–104)

In 1936, after sixteen years out of academics, Watson ended his brief autobiography by expressing his regret that he was never able to set up the three "infant farms" he had earlier planned. Envi-

ronmental conditions would have been the same on all three and only the inhabitants would have differed. According to Watson's plan, one farm was to be populated with orientals, the second with Negroes, and the third with "pure-blooded" Anglo-Saxons. Watson was certain that the sole effect of racial background would be on physical appearance.

Kuo and the Demise of Instinct

Zing Yang Kuo was an influential figure in biology and psychology during this century, and his views on instinct were obviously the same as Watson's, at least the Watson of 1920 and later. The leading exponent of instinct as a factor in human motivation was William McDougall, a psychologist credited with the founding of social psychology. It is worth examining Kuo's arguments against instinct, since they apply as well today as they did when he published his famous paper, "Giving Up Instincts in Psychology." This was published in 1921 and was written while Kuo was an undergraduate at the University of California.

Kuo denied the existence of instinct not only in humans but in animals as well. How do we explain much of animal behavior if not as the product of instinct? How is it that the chick leaves the egg and immediately starts pecking? Surely it is instinct that guides it. How is it that birds, restrained since birth, fly off unimpaired at the age when unrestrained birds begin to fly? Surely they have a flying instinct! Why do barnyard fowl run off when a cutout resembling a hawk passes overhead? Why do they remain when the cutout comes from the opposite direction, so that it looks like a goose? Surely these are instinctive reactions. Animals must have instincts, even if humans do not.

Yet, Kuo argued that there were no instincts, that their use was no more than a cloak for ignorance, and that the methods used to demonstrate instinct were all faulty. These were his arguments against instinct, and they are as good (or as bad) today as they were in 1921.

The Teleological Emphasis When we attribute an act to instinct, we are explaining it with respect to its aim or end product. The bird is building a nest, the spider is spinning a web, the birds are migrating to warmer climes, and so on. Once we have classified the activities, we stop, feeling that no further explanation is possible or necessary. But if we closely observe the development of such activities, we find that each is composed of smaller acts; these acts are put together (in part) through learning. Birds do not always build good nests and spiders sometimes botch a web.

Emphasis on Adaptiveness If we concentrate on instinctive causes for behavior, we are apt to over-emphasize the adaptive nature of the activity of other animals and of ourselves. Instinctive behavior is the product of evolution and therefore should have survival value (be adaptive), but we find that much behavior is not adaptive. A child will eat poison, grasp a flame, and swallow dirt if left to itself. Only the viscera is really acting as a proper adaptive mechanism should, and even it requires some learning. (We do not feed ground beef, spaghetti, or many other things to an infant, because the infant's digestive system needs experience with easier foods before it has learned to digest such things.)

Instinct as a Motive McDougall and others felt that motivation was entirely dependent on instinct, but Kuo charged that we do not need instinct (or motivation) to explain our activities. We are not mechanical devices that need a motivating engine to make us go. An infant *comes* already active and needs no special source of motivation to account for its actions.

Methods for Demonstrating Instinct The three main sources of evidence for instinct are all faulty, and we will consider them in turn. The genetic method relies on the existence of a behavior at birth or after a period of maturation as evidence for instinct. Recall that the chick comes out of the egg and spontaneously begins pecking.

Is that not evidence for instinct? Not at all, said Kuo. He showed that the chick is so positioned in the egg that its head rests on its breast. Within its breast is its little heart, beating constantly. As the heart beats, the breast moves up and down and so does the chick's head, which is resting on it. The chick comes out moving its head up and down ("pecking") because that is what it had been doing in the egg! Thus, Kuo regarded this as a clear case of learning. Kuo goes on to argue that other behaviors, such as sexual preferences, are not instinctive either. For example, a pigeon raised with doves will try to mate with doves, spurning pigeons of the opposite sex.

A second form of evidence for instinct relies on the observation that many behaviors are common to all or most members of a species. For example, McDougall describes an ox that became agitated when separated from its herd; evidently it had a herd instinct. We all know many behaviors characteristic of dogs, cats, and other animals; aren't these therefore instinctive? Kuo suggests that we see behaviors common to a species because members are born with the same basic reflex behaviors and they live in similar environments. Cats wash their faces in a certain way because cats are physically constructed in a certain way. Cats raised in very different environments do behave differently; compare a house cat with an alley cat and you will see the truth of this. If the ox that McDougall described had been raised alone, rather than in a herd, it would become agitated when placed in the herd, not when it was removed from it.

Finally, evidence for instinct has come from experiments that have attempted to prevent learning, as was the case with Spalding's birds (1873), which were confined so as to prevent movement of their wings until they reached the age when such birds fly. Despite the confinement, they flew off when released, showing that flying is instinctive. But Kuo pointed out that a simpler alternative is available. If an organism is built like a bird, with a light body and hollow bones, any movement of its wings is likely to lift it off the ground. It may then flap and stay aloft or not flap and fall.

Birds fly because of their bodily construction, not because of a flying instinct.

Kuo's Alternative to Instinct Kuo believed that we come with no instincts, only a set of basic reflex reactions that occur more or less randomly. These reaction units are selected through trial and error, and the selected acts become habitual. With practice they become integrated, as is the case in eye-hand coordination. The selection of acts may depend upon their natural consequences, as when we learn that a flame burns. It also may depend on their social consequences, as when our early utterances are praised.

If we remain in the same environment, our habits become fixed; if we move to a radically new environment, our set of behaviors changes. Kuo suggests that commonly assumed instincts, such as morality and acquisition, are learned trends, arising from past punishment (in the case of morality) or past encouragement (in the case of acquisition).

In a concrete example, Kuo explains the development of the instinct of construction. See if you can detect a fairly large flaw in his account. First, imagine a child sitting on the floor with a number of blocks before her. She places one block on top of another, stacking them securely. Then she places another on that one and so on. The actions involved are simply selected through trial and error.

But what is a trial? *Trial and error* really means "success and error," but what is a success if we are beginning with essentially random acts? Kuo suggests that the placing of blocks on one another is selected because it produces pleasure. But why does it produce pleasure? Is it because the carrying out of activity motivated by the instinct to construct is pleasant, as McDougall suggested? Kuo really had no answer, although he lamely suggested that the pleasure arises due to certain reflex body effects, to more intense sensory stimulation, or because of approval and encouragement. Since children stack blocks when they are alone, the third explanation is not enough; it also does not explain why they would engage in this

activity for the first time. The other two explanations are obviously meaningless, and Kuo leaves us with the naive hedonism that McDougall tried to replace: The child stacks the blocks because she derives pleasure from doing so, and we do not have a clue as to why that should be.

Child Development

From 1915 to 1920, Watson studied dozens of infants over surprisingly protracted periods (that is, for months), studying the development of simple reactions, such as blinking when an object rapidly approaches, to more complicated coordinations, such as learning to grasp a hanging candy or to avoid grasping a flame. After 1920, he was forced to rely on Mary Jones's observations. When she left for California with her husband in 1926, Watson was left with only the two sons of his second marriage as subjects.

Watson felt strongly that children are greatly damaged by the average upbringing, and he made his views known in 1928 in *Psychological Care of Infant and Child*, a popular book that sold 100,000 copies within a few months. He stressed the ill effects that parents wreak when they stroke and pet their children and thus make their children love them more than they should. Overaffection on the one hand and inculcated fears on the other produce problems for the child that can last a lifetime. Watson believed that parents should not hug or hit a child; rather, he encouraged conditions for the healthy development of the child, including varied experiences, responsibility, and adult treatment as early as possible. This may seem harsh, since it seems unfair to deny children their "childhood." Yet, Watson questioned if a childhood as a pampered pet was really a good preparation for life or a device used by the parent to foster neurotic dependence. Is it better to treat a child as an adult (as far as is possible) or to treat the child as a doll-baby-thing-object-pet until he or she is capable of adult speech? Does the behavior of the child change because of the unfolding of his or her innate dispositions, or is the child simply the product of the environment? Ac-

according to Watson, there is a good chance that the environment is important; thus more attention must be paid to the specifics of child raising.

Personality and Psychopathology

What is personality? Is personality another name for soul? If it is, then it, like the soul, is beyond our understanding. What of those who have a dominating personality, whose personality seems to fill the room? What about the magnetic personality?

The fact is that *personality* is simply a name given to the sum of our behavioral assets and liabilities, a cross-section of our current manual, laryngeal, and visceral habits. Watson mentions the difference between a Ford and a Rolls Royce and goes on:

In a similar way this man, this John Doe, who so far as parts are concerned is made up of head, arms, hands, trunk, legs, feet, toes and nervous, muscular, and glandular systems, who has no education and is too old to get it, is good for certain jobs. He is as strong as a mule, can work at manual labor all day long. He is too stupid to lie, too bovine to laugh or play. He will work all right as a "white wing," as a digger of ditches or as a chopper of wood. Individual William Wilkins, having the same bodily parts, but who is good looking, educated, sophisticated, accustomed to good society, travelled, is good for work in many situations—as a diplomat, a politician or a real estate salesman. He, however, was a liar from infancy and could never be trusted in a responsible place. (1930, pp. 269–270.)

We, like John Doe and William Wilkins, start equal with the same body parts and, theoretically, the same chances in life. But our environments are not the same and we soon become unequal.

Is there more to personality than that? What of the individual whose personality seems to fill the room, is magnetic, or dominates? According to Watson, these qualities describe people whose appearance and behavior evoke our infantile reactions to authority; people with those qualities

resemble our fathers and, like one's father, their behavior suggests that swift and certain obedience is expected. We are trained by society, both formally and informally, to recognize cues from those who can demand our obedience and who can punish us when we do not obey quickly enough. Put some of those cues on the face staring at us from the billboard or talking to us from the television screen and you will at least get our attention.

So-called dissociation or splitting of personality makes sense if we accept Watson's interpretation. If personality is a label for the totality of habits characterizing us at a given time, it is reasonable that this totality be subdivided according to the main classes of situations in which we routinely find ourselves. We have a set of manual, verbal, and visceral reactions attached to a situation at work, another for situations with family and friends, another tied to the situations in which we play, and so on. For example, I am a college professor, a husband and father, a bad mechanic, and a former serviceman. Is it not reasonable that different sets of habits have become built up in those different situations? In a very real sense, those different sets define different "personalities," as this term usually is used. The mental patient whose personality is split represents an extreme form of what is true of all of us, and when the subparts are given different names by the patient, it only shows the lack of awareness that this is true.

Mental illness is a normal phenomenon; it is what has become the normal behavior of a specific pathological environment, which produces behavior that society decrees is deviant. Watson put the matter in an amusing but plausible way:

I know in general what is meant by appendicitis, cancer of the breast, gall stones, typhoid fever, tonsillitis, tuberculosis, paresis, brain tumor, and even cardiac insufficiency. . . . Yet when the psychopathologist tries to tell me about a "schiz" or a "homicidal mania" [sic] or an "hysterical" attack, I have the feeling, which as grown stronger with the years, that he doesn't know what he is talking about. And

I think the reason that he doesn't know what he is talking about is that he has always approached his patients from the point of view of the *mind* rather than from that of the way the whole body behaves and the genetic reasons for that behavior.

To show the needlessness of introducing the "conception of mind" in so-called mental diseases, I offer you a fanciful picture of a psychopathological dog (I use the dog because I am not a physician and have no right to use a human illustration—I hope the veterinarians will pardon me!). Without taking anyone into my counsel suppose I once trained a dog so that he would walk away from nicely-ground, fresh hamburger steak and would eat only decayed fish (true examples of this are now at hand). I trained him (by use of the electric shock) to avoid smelling the female dog in the usual canine way . . . by letting him play with male puppies and dogs and punishing him when he tried to mount a female, I made a homosexual out of him (F. A. Moss has done something closely akin to this in rats). Instead of licking my hands and becoming lively and playful when I go to him in the morning, he hides or cowers, whines and shows his teeth. Instead of going after rats and other small animals in the way of hunting, he runs away from them and shows the most pronounced fears. He sleeps in the ash can, he fouls his own bed, he urinates every half hour and anywhere. Instead of smelling every tree trunk, he growls and fights and paws the earth but will not come within two feet of the tree. . . . He salivates constantly (because I have conditioned him to salivate to hundreds of objects). . . . I then take him to the dog psychopathologist. His physiological reflexes are normal. No organic lesions are to be found anywhere. The dog, so the psychopathologist claims, is mentally sick, actually insane. . . . The psychopathologist says that I must commit the dog to an institution for the care of insane dogs; that if he is not restrained he will jump from a ten-story building, or walk into a fire without hesitation. (1930, pp. 298–300)

Watson goes on to reveal to the psychopathologist what he has done to the dog, and the psychopathologist becomes angry and challenges Watson to cure the dog. He does so, unless the dog is too old or things have gone too far, using the same methods used to create the "mental ill-

ness." After arguing thus against psychotherapy as it was (is?) practiced, Watson goes on to suggest that, despite its flaws, the psychopathologist is necessary.

However badly he handles his job at present, we have to go to him when a habit breakdown occurs. If I got to the point where I could not pick up my knife and fork, if one arm became paralyzed or if I couldn't visually react to my wife and children, and a physical examination showed no organic lesion of any kind, I should hasten to my psychoanalytic friends and say: "Please, in spite of all the mean things I've said about you, help me out of this mess." (1930, p. 301)

One may well wonder how a personality constructed as Watson suggests could get in that mess. How does a set of acquired manual, laryngeal, and visceral habits become deranged? It does so because the world changes and the old established habit patterns are no longer appropriate. Watson continues:

Almost any event or happening might start a change; a flood might do it, a death in the family, an earthquake, a conversion to the church, a breakdown in health, a fist fight—anything that would break up your present habit patterns, throw you out of your routine and put you in such a position that you would have to learn to react to objects and situations different from those to which you have had to react in the past—such happenings might start the process of building a new personality for you. (1930, p. 301)

Since it depends on experience, personality can be changed, but it is no easy matter to change the habits of a lifetime. One does not learn chemistry or become a violin virtuoso in a week, and it is unreasonable to expect to change a personality, which is infinitely more complicated, in a short time. But it can be done and Watson predicted that future hospitals would be devoted to doing just that.

One of Watson's manuscripts, never published, dealt with the problem of suicide (Cohen, 1979). During the 1930s, a great many suicides occurred,

and for good reason: The great depression made life difficult. Even the relatively well off had little reason to live because of the structure of modern society.

The Native American youth of 200 years ago may have suffered many privations, at least from our point of view, but such youth surely had reason to live. Every day was an opportunity to be a hero. The modern youth graduating from college is hardly in the same position.

Why do people go on living? The question interested Watson, who suffered from depression frequently during his life, and he sent out a letter to 100 people asking the simple question, "Why go on living?" The results were to be presented in an article commissioned by *Cosmopolitan* magazine.

He sent the letters in 1932. The answers he received were depressing indeed. Respondents often said that they feared they would botch a suicide try, that they wouldn't give their enemies the satisfaction, and similar dismal reasons. Only Watson's former friend, Robert Yerkes, replied really positively, saying that life was a contest between himself (the scientist) and the universe and that he enjoyed the game. The general response, however, was so negative that the editor of *Cosmopolitan* refused to publish it; it was too depressing. A few months later, the editor committed suicide himself!

Summary

Watson viewed learning essentially as escape; stimuli call out reactions, which continue until the stimuli are somehow removed. In the case of a noxious stimulus, the removal occurs because we remove ourselves from its presence. Experience with recurring stimuli leads to the formation of habits, made up of those reactions that most frequently and recently occurred in the presence of that stimulus. Watson's descriptions were always cast in terms of stimuli and responses, but these terms did not have the narrow connotations they later acquired in the hands of other psychol-

ogists. A stimulus may be a ringing bell or ten years of schooling and a response may be salivation, or the writing of a book. The level of specificity depends on the phenomenon we wish to explain.

Watson interpreted language as a category of behavior similar in kind to manual and visceral behavior. We use words to stand for objects and activities, and this symbolic role may be carried out by bodily activities (gestures and postures) as well as words. Language is important in memory, but much of what we remember has nothing to do with verbal material.

Watson considered thinking to be talking to oneself, but by *talking* he did not mean simply verbal activity. Thinking may involve the whole body, including the viscera. Watson acknowledged conscious activity; we may often note that we are thinking (as well as seeing, hearing, and so on), just as we may note that a fly is in the room. But there is no special entity—consciousness—that is different from the sum of our thinking, seeing, hearing, or other such activity.

We acquire emotional habits through our lifetimes and some of the most important are established in infancy and childhood. Watson believed that parents can do great damage to their children, and he was one of the real pioneers in the treatment of learned fears. He emphasized the importance of the environment in influencing our development, opposing the fashionable emphasis on heredity. His observations of children convinced him that we do come with instinctive behaviors but that such behaviors are certainly not those proposed by the advocates of heredity.

Watson argued that mental illness is not illness at all, but only the result of learning and environment. As we mature, we develop routine reactions to the common situations in which we find ourselves. If something happens to change our world so that routine behaviors are no longer effective, we are apt to suffer a breakdown of our habit systems in general. The problem is a consequence of years of previous learning, and the cure may require years. But the cure, Watson

believed, must be directed toward a re-education of the individual, not toward curing a disease.

3. CRITICISMS OF WATSON'S BEHAVIORISM

Many of the criticisms leveled at Thorndike's connectionist behaviorism were applied with even greater fervor to Watson's version, probably since it was Watson who really established behaviorism, even though Thorndike and a number of others are considered the founders. Like Thorndike, Watson was charged with oversimplification and overmechanization of human behavior. Such criticism is as misguided and nonsensical as when applied to Thorndike: The suggestion that something very complex ultimately depends on relatively simple general principles hardly means that the subject matter has been distorted. But Watson was criticized especially for his alleged treatment of thinking and his denial of the existence of mind and consciousness.

Watson's Denial of Mind and Consciousness

Pick up almost any book that devotes a paragraph or more to Watson and you may be certain to read that Watson, denying mind, proposed that humans are mere mechanical contrivances, "penny-in-the-slot" beings, as McDougall charged (Joncich, 1968). Other texts may say that Watson was not really denying the existence of mind and consciousness but just arguing that the mind could not be objectively studied, since we cannot measure experience. Both criticisms are dead wrong, as any author or reader may see by examining any of Watson's substantive works (e.g., 1919).

Defining Mind and Consciousness Watson did deny the existence of mind and consciousness, as pointed out previously. What he denied, though, was the existence of some magical mental entity—something that might be part of a science fiction

plot, in which evil aliens transfer a human mind to another individual. Watson felt that there was no mind as stuff-to-be-transferred; this does not mean that anything familiar and dear to us has been neglected, however. Watson knew that people see, hear, remember, dream, daydream, feel emotion, and so on. These are things that we do, and muscular or glandular activity is important in the doing of it. But, given seeing, thinking, and the rest, what is the mind? To Watson, the mind is a bugaboo that has hampered understanding of human workings for many centuries. Better it be abandoned.

As for studying covert activity, Watson believed strongly that dreams, daydreams, and the like were an important part of what we do (as in seeing and thinking) and surely could be studied (Watson, 1919). Verbal reports were perfectly acceptable to Watson as sources of data, as long as they were properly interpreted. That is, they were part of ongoing behavior and not a reflection of mysterious processes of the mind.

What about mental content? Don't we have thoughts when we think? Don't we see images when we imagine? How did Watson deal with such things?

Mental Imagery William James (1890) claimed that he was unable to conjure up visual imagery, and he apologized to artist friends that he liked their work but was completely unable to picture it unless the work were present. He referred to a famous survey conducted by Sir Francis Galton that produced results puzzling to Galton but reassuring to James. Galton sent out a questionnaire to prominent Englishmen asking them to what extent they could visualize that morning's breakfast table. Scientists, military leaders, and industrialists claimed that they had no such imagery to describe and some seemed unable even to understand the question! Similar results were obtained when prominent Frenchmen were queried. Believing as he did that imagery plays a large part in thought, Galton was greatly surprised, espe-

cially when children answered the same question with detailed accounts of visual imagery.

What did this finding signify? William James suggested that imagery is actually an obstacle to clear and superior thought. As children, we may well have lots of visual imagery, but it later gets in the way. One reason for this is the fact that imagery often produces emotional reactions that are better avoided. If a military commander could clearly imagine the scenes of the next day's battle, it probably would not help him to plan for it. Is it a help to the scientist's rational thought to have constant visual imagery? James believed that imagery and its attendant emotion was damaging to most intellectual activity.

With the advent of Watson's behaviorism, imagery was far less emphasized. It is commonly asserted that Watson denied the existence of imagery, banishing it from psychology. In fact, he did banish the image as it was used by the introspectionists. Of course, he did not banish seeing, hearing, and thinking, and he spoke of reactions to stimuli that were not there; in that sense, he accepted imagery. Suppose, for example, that someone says, "I see a dagger before me," and that you see nothing. That individual's behavior is controlled by what he or she sees. But is that thing a dagger or an image? By arguing against the existence of "pictures in the head," Watson was saying no more than current investigators of imagery would say.

If you, the reader, believe that you have pictures in your head (as I usually believe I do), try this simple test. Picture as clearly as you can a moderately long word, such as *imagination*. Examine the image and read from it to spell the word backwards. You will note that this is much more difficult than spelling it normally. Yet, why should it be if you are just reading the image (cf. Posner & Shulman, 1979)? There is no question that we can, in a sense, see things that are not now present. But current opinion agrees with Watson; there are no pictures in our heads (Neisser, 1976)! Neisser suggests that imagery represents an anticipatory phase of perception, which

blends into subsequent acts of locomotion and perception. This is close to Watson's view.

Criticism of Thinking as Talking to Oneself

Watson viewed thinking as silent speech, or talking to oneself. *Talking* seems to imply that only the activity of the larynx is involved (the making of certain sounds as air passes through the throat), since that is what most of us view as talking. But Watson, who classified thinking as laryngeal habits, often made clear what he meant, although he equally often appeared to enjoy baiting critics with statements such as, "My current laryngeal habits lead me to believe . . ."

Talking, laryngeal habits, and language habits are three ways of referring to symbolic activity, although Watson did not use that term. Words are substitutes for actions and objects. To make the meaning clear here, imagine the origin of the shrug, the wink, obscene gestures, and other bodily word substitutes. These movements are part of thinking; if we suppose that they often may be the larger part, then we have a body talking. Take all of these movements and the speaking in words, which we often do silently, and we have thinking. Yes, thinking is talking to oneself, but talking normally includes much more than words.

Behaviorism as Merely Descriptive

Watson's version of behaviorism as well as other versions have frequently been criticised for being merely descriptive. That is, if we follow Watson's advice and simply seek the situations and stimuli that produce behavior, we will finish with no more than a transient technology. Suppose that we observe and manipulate long enough to discover that the best way to influence people is by directly evoking some emotion, whether it be fear, rage, or love. Or suppose that we find that a man can do 30 percent more heavy labor if we increase the frequency of brief rests that he is allowed. In both cases we now know how to influence behavior, but we don't know why the emotional appeals or the more frequent rests

work. We have no explanation, say the critics, if we stick to behavioral explanations. What are the neural processes involved in both cases? What cognitive structures participate? Is the actualizing tendency somehow involved in both cases? Answers to these questions would provide explanations.

The one thing inimical to true behaviorism is the explanation of a phenomenon in terms of some supposed underlying mechanism, whether that mechanism be a model of the nervous system, an imagined actualizing tendency, or whatever. The behaviorist would say that the behavioral account is actually an empirical fact that, when applied to other cases, becomes an empirical generalization. It is useful; it allows us to predict and control. An explanatory account usually does not explain and it is typically not useful.

Edwin Holt (1915) suggested that explanatory accounts, which answer the "why" questions, are popular before a phenomenon is well understood. For example, the rising of the sun was once explained as the work of the sun god Helios, riding his fiery chariot across the sky on his way to pay court to the goddess Ceres. Because the god's action was so charming, the crops watching it were cheered and grew. That is why the sun travels across the sky from east to west, and that is why crops grow.

Holt went on to point out that once we know the "how" of an event, the "why" answers become less interesting. In the case of the sunrise, once we know that the earth turns on its axis and that the sun is more or less stationary with respect to the earth, we still don't know (ultimately) why the earth rotates, why the sun is there, and so on. But the "how" account makes the "why" account seem less important. "How" explanations allow us to predict sunrises and other events in nature. Watson argued that once we can make reliable predictions about human behavior, the gods and ghosts and minds and consciousnesses and other remnants of magic and savagery will be abandoned.

4. WATSON'S WORK AFTER 1920

The 1920 Scandal

Watson's famous divorce and the profound change that it made in his life and his work should be briefly noted. The episode has become part of the folklore of psychology, and it forced Watson into a line of work that he would not have chosen otherwise. It also showed how an academician can apply his or her knowledge to a commercial enterprise that may at first seem far removed from the academic work.

In 1919, Watson was one of the best-known psychologists in the United States. He had spent years in animal research and studied children intensively for four years. He had had many affairs over the years, but, according to a biographer (Cohen, 1979), these were long tolerated by his wife of seventeen years, Mary Ickes Watson. Mary was not disturbed at first when Watson began an affair with Rosalie Rayner, an extraordinarily attractive nineteen-year-old graduate student, Vassar graduate, and daughter of a prominent Baltimore family. But this affair persisted and finally Mary procured more than a dozen love letters written to Rosalie by Watson. She gave them to her brother, who evidently attempted to blackmail Rosalie's father. Watson and Mary were separated in April of 1920, and the letters, delivered either by Mary's brother or by Albert Rayner, fell into the hands of Johns Hopkins president Goodnow in September.

After a faculty meeting in which no support came from Watson's friends, he was called to Goodnow's office and forced to resign. Watson left Baltimore with Rosalie. At the age of 42, Watson—one of the best-known psychologists in the country—was out of work and forever cut off from academics. He moved to New York City, where a friend introduced him to people connected with J. Walter Thompson advertising agency, and Watson got a provisional job with the company. It is likely that he was hired largely

because he was "Dr. Watson, the scientist," not because it was seriously believed that he could really contribute to the success of the agency. But Watson did contribute mightily, applying the principles he had advocated for so long.

Advertising Career

Watson's initial assignment was to conduct a survey of the preferences for various types of rubber boots among the inhabitants living along the Mississippi River, from Cairo to New Orleans. After that he was sent to northern Ohio and western Pennsylvania to push Yuban coffee in the groceries of that region. He evidently did well because he was soon made a vice-president of the company, conducting campaigns for Maxwell House coffee, Johnson's baby powder, and Pond's cold cream. Because of his efforts, Johnson's baby powder became synonymous with purity, love, and being a good mother. Pond's became the cold cream of royalty; Watson hired the queens of Spain and of Romania to give testimonials. Advertising before that time was concerned largely with informing the public of the products that were available. With Watson, the scope of advertising expanded to informing the public which products it wanted.

Watson believed that the way to appeal to the consumer was through emotions—the basic fear, rage, and love reactions. Those, together with sex, food, and shelter represented six basic elements that could be combined in 720 ways to sell a product. Johnson's baby powder became a symbol of maternal love; ads showed happy, healthy babies being patted and stroked by a mother applying the powder. How could rage be used to sell a product? Recall that the basic instigator of rage is restraint, interference with movements. What better advertising for a commuter train service than to show the traffic jams that beset motorists, contrasted with the fortunate train traveler, who is free to move about with no worry about weather conditions or snarled traffic. Watson used fear in a campaign for Scott's toilet tissue. Advertisements showed an operating room

with a group of surgeons surrounding an operating table. The operation looked serious and gruesome and the caption read, "And the trouble began with harsh toilet tissue!"

These methods seemed to work well, and Watson was soon living on Fifth Avenue and later on a 40-acre farm in fashionable Westport, Connecticut. During the 1920s, he continued in academics to the limited extent that he was allowed. He supported Mary Cover Jones's work with children and wrote a number of popular articles for *Harper's Magazine*, *Cosmopolitan*, and other magazines. For years he lectured weekly at the New School for Social Research and even invited McDougall to debate him on the virtues of behaviorism in 1928. But his popular articles tapered off after 1930 and with Rosalie's death from dysentery in 1936, his writing ceased. He said many years later that the lack of a laboratory and a ready reference library caused him to "dry up." After so long away from academics he found that he had nothing more to say.

After being shunned by the entire academic community (except for Edward Titchener, who remained a faithful friend until his death in 1927), Watson was belatedly recognized by the American Psychological Association, which awarded him its gold medal in 1957. Watson seemed pleased with this honor, which said that he had "initiated a revolution in psychological thought." At the last moment, though, the award was accepted for him by his son Billy, who had become a psychiatrist. Watson died in 1958 at the age of 80.

SUMMARY

Although Thorndike had opposed mentalism, which stressed the importance of mental states in determining behavior, Watson was widely interpreted as denying the very existence of mental life. He did feel that the introspective psychology of his day was so futile and so harmful to progress that both its method and its language was best abandoned. Hence, he discarded the images, sen-

sations, and thoughts that were the elements of experience assumed by the introspectionists. He did not, of course, deny the existence of seeing, thinking, and imagining.

Watson saw the goal of psychology as the prediction and control of behavior. Given a situation, what behavior may we expect? Given a behavior, what are the factors that produce it? For Watson, behavior included overt muscular activity, thinking, talking, imagining, emoting, buying, and whatever else may be construed as activity. He described activity in terms of stimuli and responses. Depending upon what is to be explained, a stimulus could be a puff of air, a medical education, and so on; a response could be an eye blink, the performance of a surgical operation, and so on.

Watson opposed the explanation of behavioral phenomenon in terms of assumed underlying mechanisms. Thus, he argued against the positing of S-R connections in the nervous system, as was Thorndike's practice. He was opposed to the use of instinct, trait, and purpose, for the same reasons. Watson viewed learning as adjustment; stimuli and situations call out behaviors that persist until the stimulus is removed. He believed the law of effect to be superfluous and whatever it is invoked to explain may be explained in terms of frequency and recency. He adopted Pavlov's conditioned reflex as a provisional model for learning, but his interpretation of what could be called a conditioned response was quite broad.

Watson viewed thinking as "talking to oneself," but talking was by no means restricted to verbal behavior. Thinking is an activity that involves the whole body, including abbreviated verbal behavior, as well as emotional behavior, muscular movements, and tensions. Watson interpreted memory differently from the introspectionists; he did not consider memory to be a storehouse of experiences. Remembering, like thinking, is by no means merely verbal but includes emotional and muscular aspects.

Emotional behavior was very important to Watson. He studied the development and modification of emotional reactions in scores of chil-

dren, in addition to Albert B., even after he was forced from academics. His views on emotion played a large part in his later work in advertising.

Watson stressed the practical goals of psychology. Like Skinner years later, he insisted that behavior was significant in its own right. The answer to the question, "What is that man doing and how may we change it?" was the proper goal of psychology, and any recourse to underlying neural and mental mechanisms could only impede the progress in reaching that goal. This applies as well in industry, in advertising, and in the treatment of psychopathology.

GLOSSARY

Behaviorism The view that the subject matter of psychology is the study of behavior, which usually includes private behavior, such as seeing and dreaming. Behaviorists do not use explanations that refer to hypothetical inner mechanisms, such as mental powers, or supposed neural events.

Emotional flooding Method of psychotherapy in which a feared object is repeatedly presented at close range to the patient, who may react quite violently. Such treatment has been reported to sometimes alleviate unreasonable fears (phobias).

Functionalism Movement in psychology that opposed the emphasis on the analysis of the structure of consciousness. Functionalists stressed the importance of activity, especially adaptive activity. Watson opposed this movement because, despite its emphasis on behavior, it still stressed the importance of consciousness, which he felt was counterproductive.

Instinct Behavior present at birth or after a period of maturation. Older views of instinct treated it as independent of learning, and much research was done to separate instinctive from learned behavior. *Instinct* usually was not applied to obvious reflexive behavior, such as occurs in the process of digestion or in the blinking of the eye when a speck of dust strikes it. Depending upon the theorist, instinct could refer to the nest building of birds and the web spinning of spiders or to the performance of children on so-called intelligence tests and the customs of ethnic groups. Current opinion holds that the

crass division of behavior into instinctive and learned is unwise. In Watson's time it was common to invoke instinct as the explanation for differences in the behavior of groups of individuals, whether human or animal.

Kinesthesia Sensory effects produced by muscular movement. When a muscle contracts, muscle spindles produce neural impulses that aid in the coordination of muscular movement. Other feedback occurs when a limb is moved, due to the action of Golgi tendon organs. Without information from muscle spindles and Golgi tendon organs, coordinated movement is difficult.

Laryngeal habits Watson's term for learned behavior that constitutes the use of language. This includes not only spoken words, but any behavior that acts as a substitute for action or as a symbol for an object. Laryngeal habits have a communicative function and include, for example, a shoulder shrug.

Manual habits Watson's term for learned behaviors that involve skeletal muscles and, usually, observable actions. Threading a needle is an example of a manual habit.

Visceral habits Watson's term for learned behaviors in-

volving the viscera, or internal organs. For example, changes in heart rate, perspiration, and gastric activity may occur when we are frightened by a ghost story. This emotional reaction is due to prior learning and thus represents a visceral habit. Our reaction to the pledge of allegiance, the phrases "up against the wall" and "good job" likewise include visceral components. Visceral, or emotional, reactions are part and parcel of most of our reactions, along with the manual and laryngeal components.

RECOMMENDED READINGS

Watson, J. B. (1919). *Psychology from the standpoint of a behaviorist*. Philadelphia: J. B. Lippincott.

This was Watson's last scholarly effort. Anyone seriously interested in details of Watsonian behaviorism will find this the best source.

Watson, J. B. (1925). *Behaviorism*. New York: Norton.

This popular presentation of behaviorism appeared in a second edition in 1930, which is still in print.