

and venture into the untested, uncharted, and highly questionable science of nineteenth-century psychology.

- Ader, R., & Cohen, N. (1985). CNS-immune system interactions: Conditioning phenomena. *Behavioral and Brain Sciences*, 8, 379–394.
- Fredrikson, M., Annas, P., & Wik, G. (1997). Parental history, aversive exposure, and the development of snake and spider phobias in women. *Behavior Research and Therapy*, 35(1), 23–28.
- Gustafson, C. R., Garcia, J., Hawkins, W., & Rusiniak, K. (1974). Coyote predation control by aversive conditioning. *Science*, 184, 581–583.
- Miller, G., & Cohen, S. (2001). Psychological interventions and the immune system: A meta-analytic review and critique. *Health Psychology*, 20, 47–63.
- Mystkowski, J., Mineka, S., Vernon, L., & Zinbarg, R. (2003). Changes in caffeine states enhance return of fear in spider phobia. *Journal of Consulting and Clinical Psychology*, 71, 243–250.

Reading 10: LITTLE EMOTIONAL ALBERT

Watson, J. B., & Rayner, R. (1920). Conditioned emotional responses. *Journal of Experimental Psychology*, 3, 1–14.

Have you ever wondered where your emotions come from? If you have, you're not alone. The source of our emotions has fascinated behavioral scientists throughout psychology's history. Part of the evidence for this fascination can be found in this book; four studies are included that relate directly to emotional responses (Chapter V, Harlow, 1958; Chapter VI, Ekman & Friesen, 1971; Chapter VIII, Seligman & Meier, 1967; and Chapter IX, Wolpe, 1961). This study by Watson and Rayner on conditioned emotional responses was a strikingly powerful piece of research when it was published nearly a century ago, and it continues to exert influence today. You would be hard pressed to pick up a textbook on general psychology or on learning and behavior without finding a summary of the study's findings.

The historical importance of this study is not solely due to the research findings but also to the new psychological territory it pioneered. If we could be transported back to the turn of the century and get a feel for the state of psychology at the time, we would find it nearly completely dominated by the work of Sigmund Freud (see the reading on Anna Freud in Chapter VIII). Freud's psychoanalytic view of human behavior was based on the idea that we are motivated by unconscious instincts and repressed conflicts from early childhood. In simplified Freudian terms, behavior, thoughts, and emotions are generated internally through biological and instinctual processes.

In the 1920s, a new movement in psychology known as behaviorism, spearheaded by Pavlov (as discussed in the previous study) and Watson, began to take hold. The behaviorists' viewpoint was radically opposed to the psychoanalytic school and proposed that behavior is generated *outside* the person through various environmental or situational stimuli. Therefore, Watson theorized, emotional responses exist in us because we have been conditioned to respond emotionally to certain stimuli that we encounter. In other words, we *learn* our emotional reactions. Watson (1913) believed that all human behavior

was a product of learning and conditioning, as he proclaimed in his famous statement:

Give me a dozen healthy infants, well-formed, and my own special 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, beggarman and thief.

This was, for its time, an extremely revolutionary view. Most psychologists, as well as public opinion in general, were not ready to accept these new ideas. This was especially true for emotional reactions, which seemed to be generated from within the person. Watson set out to demonstrate that specific emotions could be conditioned without regard for any internal forces.

THEORETICAL PROPOSITIONS

Watson theorized that if a stimulus automatically produces a certain emotion in you (such as fear) and that stimulus is repeatedly experienced at the same moment as something else, such as a rat, the rat will become associated in your brain with the fear. In other words, you will eventually become conditioned to be afraid of the rat (this view reflects Pavlov's theory of classical conditioning). He maintained that we are not born to fear rats but that such fears are learned through conditioning. This formed the theoretical basis for his most famous experiment, which involved a participant named "Little Albert."

METHOD AND RESULTS

The participant, Albert B., was recruited for this study at the age of 9 months from a hospital where he had been raised as an orphan from birth. The researchers and the hospital staff judged him to be very healthy, both emotionally and physically. To see if Albert was naturally afraid of certain stimuli, the researchers presented him with a white rat, a rabbit, a monkey, a dog, masks with and without hair, and white cotton wool. Albert's reactions to these stimuli were closely observed. Albert was interested in the various animals and objects and would reach for them and sometimes touch them, but he never showed the slightest fear of them. Because they produced no fear, these are referred to as *neutral stimuli*.

The next phase of the experiment involved determining if a fear reaction could be produced by exposing Albert to a loud noise. This was not difficult, because all humans, and especially infants, will exhibit fear reactions to loud, sudden noises. Because no learning is necessary for this response to occur, the loud noise is called an *unconditioned stimulus*. In this study, a steel bar 4 feet in length was struck with a hammer just behind Albert. This noise startled and frightened him and made him cry.

Now the stage was set for testing the idea that the emotion of fear could be conditioned in Albert. The actual conditioning tests were not done until the child was 11 months old. The researchers were hesitant to create fear reactions

in a child experimentally, but they made the decision to proceed based on what was, in retrospect, questionable ethical reasoning. (This is discussed in conjunction with the overall ethical problems of this study, elsewhere in this review.)

As the experiment began, the researchers presented Albert with the white rat. At first, Albert was interested in the rat and reached out to touch it. As he did this, the metal bar was struck, which startled and frightened Albert. This process was repeated three times. One week later, the same procedure was followed. After a total of seven pairings of the noise and the rat, the rat was presented to Albert alone, without the noise. As you've probably guessed by now, Albert reacted with extreme fear to the rat. He began to cry, turned away, rolled over on one side away from the rat, and began to crawl away so fast that the researchers had to rush to catch him before he crawled off the edge of the table! A fear response had been conditioned to an object that had not been feared only one week earlier.

The researchers then wanted to determine if this learned fear would transfer to other objects. In psychological terms, this transfer is referred to as *generalization*. If Albert showed fear of other similar objects, then the learned behavior is said to have generalized. The next week, Albert was tested again and was still found to be afraid of the rat. Then, to test for generalization, an object similar to the rat (a white rabbit) was presented to Albert. In the author's words:

Negative responses began at once. He leaned as far away from the animal as possible, whimpered, then burst into tears. When the rabbit was placed in contact with him, he buried his face in the mattress, then got up on all fours and crawled away, crying as he went. (p. 6)

Remember, Albert was not afraid of the rabbit prior to conditioning, and had not been conditioned to fear the rabbit specifically.

Little Albert was presented over the course of this day of testing with a dog, a white fur coat, a package of cotton, and Watson's own head of gray hair. He reacted to all of these items with fear. One of the most well-known tests of generalization that made this research as infamous as it is famous occurred when Watson presented Albert with a Santa Claus mask. The reaction? Yes . . . fear! After another 5 days Albert was tested again. The sequence of presentations on this day are summarized in Table 10-1.

Another aspect of conditioned emotional responses Watson wanted to explore was whether the learned emotion would transfer from one situation to another. If Albert's fear responses to these various animals and objects occurred only in the experimental setting and nowhere else, the significance of the findings would be greatly reduced. To test this, later on the day outlined in Table 10-1, Albert was taken to an entirely different room with brighter lighting and more people present. In this new setting, Albert's reactions to the rat and rabbit were still clearly fearful, although somewhat less intense.

The final test that Watson and Rayner wanted to make was to see if Albert's newly learned emotional responses would persist over time. Albert had

TABLE 10-1 Sequence of Stimulus Presentations to Albert on Fourth Day of Testing

STIMULUS PRESENTED	REACTION OBSERVED
1. Blocks	Played with blocks as usual
2. Rat	Fearful withdrawal (no crying)
3. Rat + Noise	Fear and crying
4. Rat	Fear and crying
5. Rat	Fear, crying, and crawling away
6. Rabbit	Fear, but less strong reaction than on former presentations
7. Blocks	Played as usual
8. Rabbit	Same as 6
9. Rabbit	Same as 6
10. Rabbit	Some fear, but also wanted to touch rabbit
11. Dog	Fearful avoidance
12. Dog + Noise	Fear and crawling away
13. Blocks	Normal play

been adopted and was scheduled to leave the hospital in the near future. Therefore, all testing was discontinued for a period of 31 days. At the end of this time, he was once again presented with the Santa Claus mask, the white fur coat, the rat, the rabbit, and the dog. After a month, Albert remained very afraid of all these objects.

Watson and his colleagues had planned to attempt to *recondition* Little Albert and eliminate these fearful reactions. However, Albert left the hospital on the day these last tests were made, and, as far as anyone knows, no reconditioning ever took place.

DISCUSSION AND SIGNIFICANCE OF FINDINGS

Watson had two fundamental goals in this study and in all his work: (a) to demonstrate that all human behavior stems from learning and conditioning and (b) to demonstrate that the Freudian conception of human nature, that our behavior stems from unconscious processes, was wrong. This study, with all its methodological flaws and serious breaches of ethical conduct, succeeded to a large extent in convincing many in the psychological community that emotional behavior could be conditioned through simple stimulus-response techniques. This finding helped, in turn, to launch one of the major schools of thought in psychology: behaviorism. Here, something as complex and personal as an emotion was shown to be subject to conditioning, just as Pavlov demonstrated that dogs learn to salivate at the sound of a metronome.

A logical extension of this is that other emotions, such as anger, joy, sadness, surprise, or disgust, may be learned in the same manner. In other words, the reason you are sad when you hear that old song, nervous when you have a job interview or a public speaking engagement, happy when spring arrives, or afraid when you hear a dental drill is that you have developed an association in your brain between these stimuli and specific emotions through conditioning.

Other more extreme emotional responses, such as phobias and sexual fetishes, may also develop through similar sequences of conditioning.

Watson was quick to point out that his findings could explain human behavior in rather straightforward and simple terms, compared with the complexities of the psychoanalytic notions of Freud and his followers. As Watson and Rayner explained in their article, a Freudian would explain thumb sucking as an expression of the original pleasure-seeking instinct. Albert, however, would suck his thumb whenever he felt afraid. As soon as his thumb entered his mouth, his fear lessened. Therefore, Watson interpreted thumb sucking as a conditioned device for blocking fear-producing stimuli.

An additional questioning of Freudian thinking in this article concerned how Freudians in Albert's future, given the opportunity, might analyze Albert's fear of a white fur coat. Watson and Rayner claimed that Freudian analysts "will probably tease from him the recital of a dream which, upon their analysis, will show that Albert at three years of age attempted to play with the pubic hair of the mother and was scolded violently for it" (p. 14). Their main point was that they had demonstrated with Little Albert that emotional disturbances in adults cannot always be attributed to sexual traumas in childhood, as the Freudian view maintained.

QUESTIONS AND CRITICISMS

As you have been reading this, you have probably been concerned or even angered over the experimenter's treatment of this innocent child. This study clearly violated current standards of ethical conduct in research involving humans. It would be highly unlikely that any institutional review board at any research institution would approve this study today. A century ago, however, such ethical standards did not formally exist, and it is not unusual to find reports in the early psychological literature of what now appear to be questionable research methods. It must be pointed out that Watson and his colleagues were not sadistic or cruel people and that they were engaged in a new, unexplored area of research. They acknowledged their considerable hesitation in proceeding with the conditioning process but decided that it was justifiable, because, in their opinion, some such fears would arise anyway when Albert left the sheltered hospital environment. Even so, is it ever appropriate to frighten a child to this extent, regardless of the importance of the potential discovery? Today nearly all behavioral scientists would agree that it is not.

Another important point regarding the ethics of this study was the fact that Albert was allowed to leave the research setting and was never reconditioned to remove his fears. Watson and Rayner contended in their article that such emotional conditioning may persist over a person's lifetime. If they were correct on this point, it is extremely difficult, from an ethical perspective, to justify allowing someone to grow into adulthood fearful of all these objects (and who knows how many others!).

Several researchers have criticized Watson's assumption that these conditioned fears would persist indefinitely (e.g., Harris, 1979). Others claim that

Albert was not conditioned as effectively as the authors maintained (e.g., Samelson, 1980). It has frequently been demonstrated that behaviors acquired through conditioning can be lost because of other experiences or simply because of the passage of time. Imagine, for example, that when Albert turned age five, he was given a pet white rabbit for a birthday present. At first, he might have been afraid of it (no doubt baffling his adoptive parents). As he continued to be exposed to the rabbit without anything frightening occurring (such as that loud noise), he would probably slowly become less and less afraid until the rabbit no longer caused a fear response. This is a well-established process in learning psychology called *extinction*, and it happens routinely as part of the constant learning and unlearning, conditioning and unconditioning processes we experience throughout our lives.

RECENT APPLICATIONS

Watson's 1920 article continues to be cited in research in a wide range of applications, including theories of effective parenting and psychotherapy. One study, examined the facial expressions of emotion in infants (Sullivan & Lewis, 2003). We know that facial expressions corresponding to specific emotions are consistent among all adults and across cultures (see the reading on Ekman's research in Chapter VI). This study, however, extended this research to how such expressions develop in infants and what the various expressions mean at very young ages. A greater understanding of infants' facial expressions might be of great help in adults' efforts to communicate with and care for babies. The authors noted that their goal in their research was "to provide practitioners with basic information to help them and the parents they serve become better able to recognize the expressive signals of the infants and young children in their care" (p. 120). These authors' use of Watson's findings offers us a degree of comfort in that his questionable research tactics with Little Albert, may, in the final analysis, allow us to develop greater sensitivity and perception into the feelings and needs of infants.

As mentioned previously in this discussion, one emotion, fear, in its extreme form, can produce serious negative consequences known as *phobias*. Many psychologists believe that phobias are conditioned much like Little Albert's fear of furry animals (see the discussion of Wolpe's research on the treatment of phobias in Chapter IX: Psychotherapy). Watson's research has been incorporated into many studies about the origins and treatments of phobias. One such article discussed phobias from the nature-nurture perspective and found some remarkable results. Watson's approach, of course, is rooted completely in the environmental or nurture side of the argument, and most people would view phobias as learned.

However, a study by Kendler, Karkowski, and Prescott (1999) provided compelling evidence that the development of phobias may include a substantial genetic component. The researchers studied phobias and unreasonable fears in more than 1,700 female twins (see the discussion of Bouchard's twin research in Chapter I). They claim to have found that a large percentage of

the variation in phobias was due to *inherited* factors. The authors concluded that, although phobias may be molded by an individual's personal experiences, the role of a person's family in the development of phobias is primarily genetic, not environmental. Imagine: *Born to be phobic!* This view flies directly in the face of Watson's theory and should provide plenty of fuel for the ongoing nature–nurture debate in psychology and throughout the behavioral sciences.

Harris, B. (1979). What ever happened to Little Albert? *American Psychologist*, 34, 151–160.
 Kendler, K., Karkowski, L., & Prescott, C. (1999). Fears and phobias: reliability and heritability. *Psychological Medicine*, 29(3), 539–553.
 Samelson, F. (1980). Watson's Little Albert, Cyril Burt's twins, and the need for a critical science. *American Psychologist*, 35, 619–625.
 Sullivan, M., & Lewis, M. (2003). Emotional expressions of young infants and children: A practitioner's primer. *Infants and Young Children*, 16, 120–142.
 Watson, J. B. (1913). Psychology as the behaviorist views it. *Psychological Review*, 20, 158–177.

Reading 11: KNOCK WOOD!

Skinner, B. F. (1948). Superstition in the pigeon. *Journal of Experimental Psychology*, 38, 168–172.

In this reading, we examine one study from a *huge* body of research carried out by one of the most influential and most widely known figures in the history of psychology: B. F. Skinner (1904–1990). Deciding how to present Skinner and which of his multitude of studies to explore is a difficult task. It is impossible to represent adequately in one short article Skinner's contributions to the history of psychology. After all, Skinner is considered by most to be the father of radical behaviorism, he was the inventor of the famous (or infamous) Skinner Box, and he was the author of over 20 books and many hundreds of scientific articles. This article, with the funny-sounding title "Superstition in the Pigeon," has been selected from all his work because it allows for a clear discussion of Skinner's basic theories; provides an interesting example of his approach to studying behavior, and offers a "Skinnerian" explanation of a behavior with which we are all familiar: superstition.

Skinner is referred to as a *radical behaviorist* because he believed that all behaviors—including public, or external behavior, as well as private, or internal, events such as feelings and thoughts—are ultimately learned and controlled by the relationships between the situation that immediately precedes the behavior and the consequences that directly follow it. Although he believed that private behaviors are difficult to study, he acknowledged that we all have our own subjective experience of these behaviors. He did not, however, view internal events, such as thoughts and emotions, as causes of behavior but rather as part of the mix of environment and behavior that he was seeking to explain (see Schneider & Morris, 1987, for a detailed discussion of the term *radical behaviorism*).

To put Skinner's theory in very basic terms: In any given situation, your behavior is likely to be followed by consequences. Some of these consequences, such as praise, receiving money, or the satisfaction of solving a problem, will make the behavior more likely to be repeated in future, similar situations. These consequences are called reinforcers. Other consequences, such as injuring yourself or feeling embarrassed, will tend to make the behavior less likely to be repeated in similar situations. These consequences are called punishers. The effects of these relationships between behavior and the environment are called reinforcement and punishment respectively (Edward K. Morris, personal communication, September 1987). Reinforcement and punishment are two of the most fundamental processes in what Skinner referred to as operant conditioning and may be diagrammed as follows:



Within this conceptualization, Skinner also was able to explain how learned behaviors decrease and sometimes disappear entirely. When a behavior has been reinforced and the reinforcement is then withdrawn, the likelihood of the behavior reoccurring will slowly decrease until the behavior is effectively suppressed. This process of behavior suppression is called *extinction*.

If you think about it, these ideas are not new to you. The process we use to train our pets follows these same rules. You tell a dog to sit, it sits, and you reward it with a treat. After a while the dog will sit when told to, even without an immediate reward. You have applied the principles of operant conditioning. This is a very powerful form of learning and is effective with all animals, even old dogs learning new tricks and, yes, even cats! Also, if you want a pet to stop doing something, all you have to do for the behavior to stop is remove the reinforcement. For example, if your dog is begging at the dinner table, there is a reason for that (regardless of what you may think, dogs are not born to beg at the table). You have conditioned this behavior in your dog through reinforcement. If you want to *put that behavior on extinction*, the reinforcement must be totally discontinued. Eventually, the dog will stop begging. By the way, if one member of the family cheats during extinction and secretly gives the canine beggar some food once in a while, extinction will never happen, but the dog will spend much more of its begging energy near that person's chair.

Beyond these fundamentals of learning, Skinner maintained that all human behavior is created and maintained in precisely the same way. It's just that with humans, the exact behaviors and consequences are not always easy to identify. Skinner was well known for arguing that if a human behavior was interpreted by other theoretical approaches to be due to our highly evolved consciousness or intellectual capabilities, it was only because those theorists