Two little boys: the story of Little Albert and Little Peter

The history of psychology is littered with accounts of academics contesting the merits of their respective theories, with which they seek to fully explain all facets of human behaviour. One such academic, called J.B. Watson, proposed a scientific, objective psychology of behaviour called 'behaviourism'. He argued that learning should be studied without any reference to internal mental processes. He rejected the idea of introspection and instead focused on observable behaviour and how an organism (human and/or animal) learns through adaptation to their environment; in terms of the classic nature-nurture philosophical argument, the emphasis was placed very much on 'nurture'. Ivan Pavlov, working in Russia, had already shown the effect of conditioning in simple behaviours such as the salivation response in dogs, but Watson suggested that more complex human behaviours might also easily be conditioned. In order to test this hypothesis, he decided to take an 11-month-old infant and try to condition a fear response in the child, one evoked from a previously neutral stimulus. So began one of the most cited case studies in the history of psychology: the testing of Little Albert.

Background to the study

John Broadus ('J.B.') Watson originally started his work by concentrating on learning in (non-human) animals but, by 1916, had turned his attentions to human infants. Initially interested in the use of conditioned reflexes as a method of testing the senses in infants, he began to write about the conditioning of human fears. He had noticed his own children's seemingly unlearned fear of thunder and lightning, and began to consider methods by which he might condition such fears in a laboratory experiment. His first attempts to inhibit a child's reaching response to a lit candle had taken over 150 trials (mainly, he argued, because he had to stop the child from burning their hand severely) and so was not a particularly effective demonstration of the power of conditioning.

Although no one is certain exactly when the so-called 'Little Albert' study

The results of the study were co-published by Watson in 1920 with his assistant Rosalie Rayner. They suggested that the complex range of human emotions shown by adults must be the result of learning through their environment. They set out to demonstrate this in an experimental demonstration with an 11-month-old infant whom they named 'Albert B.'. Albert was described as a 'normal' child, well developed for his age, with a phlegmatic character described as 'stolid and unemotional'. He had been chosen by Watson and Rayner simply because he was readily available for study (his mother was a wet-nurse at a local home for invalid children) and because, being such a strong and stable character, they felt he would come to 'relatively little harm' as a result of the study. The use of such phrases suggests they were aware at the outset that some harm might befall him.

At the age of nine months, Albert was put through a battery of emotional tests. He was also shown a white rat, rabbit, dog, monkey, face masks, cotton wool and a burning newspaper to gauge his reactions. His responses to these stimuli were filmed and at no time did he show any fear in any of the situations in which he was placed. During the testing it was noticed that he rarely cried, so because Watson and Rayner needed to test his fear reaction, it was necessary for them to devise a method of inducing fear in him. Possibly drawing on his own children's reactions to thunder, Watson developed a technique whereby one of the researchers, without warning, would strike a hammer on a four-foot-long steel bar suspended just behind Albert and out of his view. This procedure had the desired effect. Albert immediately showed distress at this unanticipated unpleasant sound; his breathing became stilted, his hands were flung upwards and his lips trembled. By the third stimulation, 'the child broke into a sudden crying fit'.

Questions to consider

In their journal article, Watson and Rayner stated that they then spent two months deliberating over the procedure to adopt in their study. They were clearly worried about the possible effects of their experiment on Albert. Nevertheless, they decided that many of the fear reactions they were going to induce may have occurred naturally in the normal 'rough and tumble of the home'. So with Albert now aged 11 months and three days they began their series of groundbreaking experiments.

The questions they set out to test were as follows: Could they condition fear of an animal by presenting it visually at the same time as striking the steel bar?
How long might such a response last? Further, what methods might be devised for removal of the response if it did not extinguish immediately?

As a test of the first question, they presented Albert with a white rat from a basket. Showing no fear, Albert reached out for the rat with his left hand and, just as he touched the rat, one of the researchers struck the steel bar with the hammer, just behind his head. He jumped violently and buried his face in the mattress. After a short period of time, he again reached out for the rat and the procedure was repeated. Albert fell forward and began to whimper. Watson and Rayner reported that, ‘in order not to disturb the child too seriously, no further tests were given for one week’.

Exactly seven days later the rat was presented without sound. With Albert making no attempt to reach for the rat, they moved it closer. Albert instantly withdrew his hand. It was clear that his behaviour had been modified after just two presentations, and this effect had lasted a week. They gave Albert building blocks to play with to check that he had not been conditioned to fear any object given to him and he showed no fear, playing with them in the usual way. The blocks were then cleared away and five presentations of the rat and the sound were conducted, with Albert showing various levels of distress on each occasion. After these presentations, when the rat was presented to him on its own, Albert cried, turned sharply and crawled away at great speed. So fast, in fact, that they barely had time to catch him before he fell off the edge of the table on which he was sitting! As Watson and Rayner reported, it ‘was as convincing a case of a completely conditioned fear response as could have been theoretically pictured’.

This had taken just seven joint presentations (of the rat and the sound) over a seven-day period. They had found the answer to their first question: it is possible to condition fear of an animal by presenting it visually along with an unpleasant, unexpected and unexplained sound.

It seems clear that Albert had acquired a conditioned (or learnt) emotional (fear) response. Before the conditioning trials, he had shown no fear of the rat, which class represented a neutral stimulus. The striking of the steel bar was an unconditioned stimulus (US) since it naturally provoked a fear response (an unconditioned response, or UR) in Albert. With repeated presentations of the rat and the unpleasant sound, the sight of the rat alone became a conditioned stimulus (CS) and produced a learnt fear response (conditioned response, or CR) in Albert. This classical conditioning procedure is summarised in Figure 13.1.

Another five days later, Little Albert found himself back in the experimental room. He played happily with his building blocks, which showed there had been no transfer of fear to other objects, such as the room, the table or the blocks. The rat was presented and he showed the conditioned fear response. To test whether there had been any transferring of the response to other animals, a rabbit was presented. Albert reacted at once. He leaned as far away as possible and started to whimper and cry. When the rabbit was placed next to him, he crawled away as he had done from the rat. After a period during which he was given his building blocks to play with, a dog was presented. Albert’s reaction was described as not being as pronounced as to the rabbit but still resulted in him crying. Other objects were tested. These included a fur coat made of seal skin (crying and crawling away), cotton wool (markedly less shock and fear shown) and a Santa Claus mask. One of the researchers also put his head down to see if Albert would show fear of his hair. (An aversive response was shown to the mask but less so to the presentation of the hair.) Watson and Rayner had found the answer to their second question: the conditioned fear response did transfer or generalise to other animals and, indeed, some similar-looking objects.

Yet again, after a period of another five days, Little Albert returned to the small, experimental room to be placed on the mattress on top of the table. Watson and Rayner decided to strengthen his fear reaction to the dog and rabbit, so paired the presentation of these animals with the striking of the steel bar. Albert was then taken to another larger room, lit with natural sunlight. They wanted to test whether his reactions would be the same in a different situation from the original experimental setting. They presented Albert on separate occasions with the rat alone, the rabbit alone and the dog alone. On each presentation, they reported a slight fear reaction but, as they describe it, it did not seem as marked as Albert’s reactions in the original experimental setting. The experimenters then decided to ‘freshen up the reaction to the rat’ by pairing it with the sound. After a single presentation of the rat and sound in this new environment, Albert showed a fear response to presentations of both the rat and the rabbit separately. On initial presentation of the dog, he did not show such a marked fear reaction but when it was only about six inches from Albert’s face, the previously mute dog barked very loudly three times. Watson and Rayner note that this
produced a marked fear response in both Albert (immediate wailing) and all the experimenters present! Watson and Rayner concluded that emotional transfers do take place and are not dependent on the experimental setting. They next set about testing how long such a response might last.

Watson and Rayner stated that they knew that Albert was due to leave the hospital in one month and that this, therefore, was the longest period for which they could test how long the response would last. During this month, Albert was given no further conditioning trials, although he was given weekly developmental tests such as those concerned with handedness (testing left or right hand preferences). Three weeks after his first birthday, Albert was re-tested on his emotional responses to the previously conditioned stimuli. On presentation of the Santa Claus mask he withdrew from it and, on being 'forced to touch it', whimpered and cried. On presentation of the seal-skin coat, he withdrew his hands immediately and also began to whimper; when it was moved closer to him, he tried to kick it away. Next he was presented with his building blocks, with which he happily played again, showing discrimination or the ability to differentiate among stimuli. Albert then allowed the rat to crawl towards him, while he kept completely still. When the rat touched Albert's hand, he withdrew it immediately. Watson and Rayner then placed the rat on his arm and Albert began to fret. They let the rat crawl across his chest and he covered his eyes with both hands. Albert's reaction to the presentation of the rabbit was very muted at first. But after a few seconds he tried to push it away with his feet. However, as the rabbit came nearer, he reached out to touch its ear; when it was placed in his lap, however, he started to cry and, at one point, characteristically sought comfort through thumb-sucking. When presented with the dog, Albert began to cry and covered his face with his hands. Watson and Rayner concluded that these experiments 'would seem to show conclusively that directly conditioned emotional responses as well as those conditioned by transfer persist, although with a certain loss in the intensity of the reaction, for a longer period than one month.'

Watson and Rayner were also planning to test the removal of the conditioned emotional responses from Albert, but this proved impossible since they report that, 'unfortunately Albert was taken from the hospital the day before tests were made.' They concluded that the emotional responses that had conditioned in Albert would persist indefinitely unless an accidental method for removing them was encountered. Nevertheless, Watson and Rayner outlined how they would have attempted to remove Albert's conditioned responses. They suggested that they would have constantly presented the conditioned stimulus (the rat) without the presentation of the unconditioned stimulus (the sound) and that, with repeated trials, the child would have habituated to the stimuli. Alternatively, they would have tried a form of 're-conditioning' whereby they might have paired pleasurable sensations with the fear-inducing stimuli. They suggested these might have included feeding Albert sweets just as the rat was presented or 'simultaneously stimulating the erogenous zones (by touch) ... first the lips, then the nipples and as a final resort the sex organs.'

In their original 1920 report, Watson and Rayner added further observations about the study. They discussed the fact that when emotionally upset, Albert would often resort to thumb-sucking as a form of comfort. They noted that while doing this Albert was impervious to the fear-producing stimulus. To stop this happening, the researchers had had continually to pull his thumb out of his mouth.

The lessons from Little Albert

So what can we make of this case study? Did Watson and Rayner manage to demonstrate the acquisition of a phobia (an exaggerated, illogical fear of an object or category of objects) through classical conditioning? Should it be cited as a piece of classic, groundbreaking research into the effects of classical conditioning on behaviour or are there justifiable areas of concern regarding the ethical treatment of the participant, as well as further methodological criticisms that cannot be ignored?

One problem with the Little Albert study is that so many discrepancies and myths have evolved from it. Indeed, it has been claimed that 'most accounts of Watson and Rayner's research with Albert feature as much fabrication and distortion as they do fact. From information about Albert himself to the basic experimental methods and results, no detail of the original study has escaped misrepresentation in the telling and retelling of this bit of social science folklore.'

It has been demonstrated that numerous textbooks have made serious mistakes about the exact details reported in the original 1920 article. This is attributed to many factors. The most likely source of confusion, and perhaps the most surprising, is Watson himself. Watson wrote a number of articles in subsequent years detailing the Albert case study and often seems to have (mis)reported various important details that do not concur with the original. For example, Watson subsequently failed to mention that he and Rayner had been aware that Albert would be leaving the hospital and that they knew the reconditioning of Albert would thus become impossible. Did Watson deliberately omit this important detail in order to make the study appear less heartless?
Examples of textbook errors include conditioning of different stimuli such as a man's beard, a cat and a teddy bear. Many texts change the ending to report that Watson and Rayner did remove (or re-condition) Albert's fear. Possible reasons for such errors are the desire to tell ethically pleasing stories and/or to make the evidence 'fit in' with everyday explanations of how organisms act - in essence, to make the findings more readily believable. It is also thought that such changes help portray the study, and Watson's role in it, in a far more favourable light. Any criticisms of the study would be seen as a criticism of both behaviourism and its leading and most influential exponent.

So are these errors just slips of the pen or are they more serious than that? On closer inspection, there are also a number of serious methodological criticisms that can be made of the original 1920 study: Watson and Rayner's procedure of removing Albert's thumb from his mouth on various occasions in order to obtain the fear response; Albert being forced occasionally to touch some (but not all) of the stimuli; and the decision periodically to 'freshen up the [fear] reaction a bit'. These actions suggest that the experimental procedures were not standardised. The lack of detail regarding such behaviours brings into question the precise experimental techniques used. These are serious criticisms of the research and particularly ironic given Watson's emphasis on objective, scientific methods.

Another problem with the Little Albert study is that subsequent researchers have been unable to replicate it - surely a prerequisite of science and a further indication that 'the [conditioning] process is not as simple as the story of Albert suggests'.

Why did Watson not replicate his Albert study with other infants? Indeed, Watson had spent his earlier career testing animals and had never previously relied on a single participant. Many books suggest that Watson was unable to do this because he resigned his position at Johns Hopkins University very soon after the original study. Again, such stories may reflect a desire to make the account more believable since, in fact, Watson did actually continue at the university until September 1920, well over six months after the Albert study was published. In addition, Watson continued to play an active part in behavioural research projects for many years to come and would certainly have had the opportunity to supervise a direct replication of the study.

There is also some question as to exactly how much of a fear reaction was induced in Little Albert. It has been suggested that Albert did not develop a phobia - i.e. not even a consistent or pronounced fear of them or any other animals. Even in the original paper, the description of Albert's reaction to the rat after eight conditioning trials over a ten-day period revealed that although he did try to crawl away, 'there was no crying, but strange to say, as he started away he began to gurgle and coo'. There are further descriptions such as 'fear reaction slight ... allowed the rat to crawl towards him without withdrawing', 'reached out tentatively and slowly and touched the rabbit's ear with his right hand, finally manipulating it'. All of these responses seem at odds with the strength of feeling one would normally associate with a marked fear or phobia. How many people with a spider phobia would willingly reach out and touch one?

Given all these inconsistencies it is no surprise that the study 'could not have become enshrined as the paradigm for human conditioning on the basis of its hard scientific evidence'. Even Watson himself described the study as being in such an incomplete state that the verified conclusions are not possible; hence this summary, like so many other bits of psychological work, must be looked upon merely as a preliminary exposition of possibilities rather than a catalogue of concrete usable results.

This quote is in direct contrast to the one mentioned above, where Watson and Rayner describe the Albert study as 'as convincing a case of a completely conditioned fear response as could have been theoretically pictured'. So which version are we to believe, and why has this study become such a 'classic'?

**Academic debate**

At the end of their journal article, Watson and Rayner ridiculed the Freudian analyst who might one day find him/herself treating Albert's phobia. They stated:

The Freudians twenty years from now, unless their hypotheses change, when they come to analyze Albert's fear of a seal skin coat - assuming that he comes to analysis at that age - will probably tosses 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 soiled violently for it. (We are by no means denying that this might in some other case condition it.) If the analyst has sufficiently prepared Albert to accept such a dream when found as an explanation of his avoiding tendencies, and if the analyst has the authority and personality to put it over, Albert may be fully convinced that the dream was a true reveler of the factors which brought about the fear.

The inclusion of this paragraph suggests two things. First, it confirms that Watson and Rayner believed that Albert's phobia might persist into adulthood; second, it suggests a rather uncaring or flippant attitude towards this state of affairs. Whatever one's opinion of Freudian interpretations, it seems incredible that Watson and Rayner felt they could use Albert's misfortune (brought about entirely by their own actions) to poke fun at Freudian therapists' views of phobic acquisition.
Ethical issues

Watson and Rayner’s research would never be allowed to go ahead under the ethical guidelines we have in place today. Some people might argue that it is unfair to impose current ethical standards on a piece of research that is over 80 years old. Indeed, the ethics of the techniques used by Watson and Rayner did not seem to attract open criticism at the time, and this cultural change is an interesting subject in itself. In 1920, psychologists did not have a set of written ethical guidelines to follow. There is little doubt that at least one of today’s key ethical rules – namely, protection of the participant from both psychological and physical harm – was broken. Albert certainly appeared to suffer a great deal of distress and this may have continued beyond the duration of the study. Watson and Rayner wrote that it was unfortunate that Albert was removed from the hospital before they had a chance to re-condition him. As mentioned above, their subsequent writings hint that they were taken by surprise at his departure, but a closer reading of the original report makes clear that they knew of his departure a month in advance. In any case, exactly how difficult would it have been to locate Albert at a later date and offer his mother the chance for them to re-condition him? The question of how hard they tried to minimise any permanent harm suffered by Albert remains unanswered. Watson and Rayner discussed the possibility of harm being caused, but stated that they decided to go ahead in the belief that many of the conditioned emotional reactions they were planning might have been acquired by Albert in his everyday life, in ‘the rough and tumble of the home’. This may have satisfied both Watson and Rayner, but it is surely questionable as to how many of the reactions might have been encountered. Many children may well encounter rabbits, but not usually at the same time as an unexpected and unpleasant noise sounds behind their head. Indeed, most children probably have very positive initial encounters with rabbits and dogs. These positive associations lead many of them, from an early age, to want to keep their own pets. Although it is clear that a small minority of children do, through particular circumstances, naturally develop phobias – of dogs, say – this does not justify the deliberate infliction of one.

It may be that it was fortunate for Albert that Watson and Rayner did not manage to ‘re-condition’ him, since the techniques they suggested they might have used to do this seem dubious in the extreme. It is often reported that they were planning to re-condition him by pairing the rat (by now the conditioned stimulus), with a pleasurable stimulus, such as sweets, to try to reverse the effects of the unpleasant noise association. They also suggested, however, as we have already seen, that they would have used other methods too, including tactual stimulation of the lips, then the nipples and, as a last resort, the sex organs. This is far less readily reported, yet today these outrageous methods would surely be regarded as a form of child sexual abuse.

Further studies: Little Peter

Watson did, indeed, supervise and advise on further studies that involved young children and their fears and phobias. These experiments, although supervised by Watson, were actually conducted by Mary Cover Jones. The goal of the research was systematically to study the best method for the elimination of children’s fears. Children (aged from three months to seven years) from a local care home, who already had a fear of certain situations such as the dark, sudden presentation of a rat, a rabbit, a frog, and so on, were the participants. Jones tried many different methods of elimination including finally, direct conditioning.

The child in Jones’s ‘direct conditioning’ case was named ‘Peter’. The case of ‘Little Peter’ is widely recognised as the sequel to the Little Albert case study, and gave Watson and Jones the chance to test the principles of ‘re-conditioning’ that they had not implemented with Albert. Peter was two years ten months old and intensely afraid of various things, including rats, rabbits, fur coats and cotton wool. Initially, they tried to lessen his fears using ‘modelling’ techniques whereby he was allowed to observe and interact with children who played happily with a white rabbit – one of his feared objects. The rabbit was moved closer to Peter each day and this ‘gradual’ technique seemed to have a positive effect to the extent that he could eventually pet the rabbit on the back. Unfortunately, Peter then contracted scarlet fever and during the ensuing two-month delay was scared by a large dog. This event, Watson and Jones reported, meant that his fears of various animals, including the rabbit, reoccurred. A new technique was devised. This involved presenting food (an unconditioned pleasant stimulus) simultaneously with the rabbit (the conditioned stimulus). The rabbit was gradually brought closer to Peter, in conjunction with his favourite food. Peter grew more and more tolerant of the rabbit (presumably associating it with his liking for the food) and was able to touch the rabbit without fear. When his fears spontaneously returned, the researchers used a similar counter-conditioning method where he was allowed to play while the rabbit was gradually brought closer and closer to him over a series of sessions. Eventually Peter was able to play happily with the rabbit. This is thought to be the first case of behavioural therapy and laid the foundation for Joseph Wolpe’s later work into systematic desensitisation. Although Wolpe is generally credited with developing the technique, he acknowledged his debt to Mary Cover Jones. As a result of the Little Peter study
and her subsequent research, Jones gained the informal title ‘the mother of behavioural therapy’.

**What happened to Little Albert and Watson?**

There is no record of what happened to Little Albert, or whether his fears persisted into adulthood or were extinguished over time, perhaps due to habituation or through some form of counter-conditioning. We can be more certain of what happened to J.B. Watson. During the Little Albert study, he was having an extra-marital affair with his co-author Rosalie Rayner. The scandal that ensued when this became public knowledge meant that he was subsequently forced to resign his academic appointment just as his ideas were gaining more acceptance in the wider scientific community. There may have been no set of ethical guidelines to protect research participants like Albert in the 1920s but there were strict moral standards that academics were expected to follow. Bitterly disappointed, Watson took his knowledge of psychology and human behaviour and applied it in the far more financially lucrative area of advertising. He pioneered the use of classical conditioning techniques in advertising campaigns. Watson was convinced that successful advertising was not entirely dependent on the quality of the product but on the emotional responses that consumers would associate with each product. To this end he exhorted advertisers to ‘tell him something that will tie him up with fear, something that will stir up a mild rage, that will call out an affectionate or love response, or strike at a deep psychological or habit need’.

Nowadays, thanks in no small part to Watson, classical conditioning is used in a glut of advertisements. The idea is to produce an advert (the unconditioned stimulus) and make sure that it elicits a positive response (unconditioned response) in the viewing public. The product being advertised thus becomes the conditioned stimulus. The next time someone is shopping they associate the positive feeling they had for the advert with the product. The positive feeling they have for the product is now the conditioned response, and the advertisers hope this will lead them to purchase the product in order to prolong the response.

Using such techniques, Watson helped shape creative advertising campaigns for, among others, Maxwell House Coffee, Pond’s Cold Cream, Johnson’s Baby Powder, Odorono (one of the first deodorants) and Pabeco Toothpaste. In the baby powder advertisements he played on the fears that young mothers have in relation to looking after their children. In the Pabeco Toothpaste campaign, he associated the brand with sexually arousing cues. A seductively dressed young woman was pictured smoking a cigarette, with the words ‘You can smoke and still be lovely if you’ll just use Pabeco twice a day.’ Here the attractive woman was the unconditioned stimulus and the toothpaste the conditioned stimulus. It has been claimed that Watson was the man who put the ‘sex’ into the phrase ‘sex sells’.

Watson also placed a great deal of emphasis on empirical marketing research by stressing the importance of knowing the consumer through scientific study. He viewed the process of selling as a laboratory for advertising and made frequent comparisons between the consumer and experimental participants. In the same way that he had manipulated Albert’s behaviour, he believed that, with the appropriate reinforcers, advertisers could manipulate consumers’ buying behaviour. To this end, Watson developed marketing research techniques and was one of the first to study the idea of brand loyalty – a subject studied by advertisers to this day.

Watson’s success in advertising ensured that by 1924 he had become vice president of the J. Walter Thompson (JWT) advertising agency – one of the largest ad agencies in the world. His personal life was less successful, however. Soon after divorcing his first wife, he married Rosalie Rayner. Their marriage produced two children but, unfortunately, Rosalie died of complications due to dysentery, aged just 35. Watson retired from advertising in 1945 and burnt all his unpublished works shortly before his death in 1958.

One of the most memorable (and most cited) quotes from Watson put forward the case for environmental influences on behaviour:

> 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, merchant-chief, and yes, even beggarman and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors.

But the sentence that follows is cited less often. He added, ‘I’m going beyond my facts and I admit it, but so have advocates of the contrary and they have been doing it for thousands of years.’

One of the lessons to be learned from the Little Albert case study is to do with the way that (questionable) experimental evidence can inadvertently be misinterpreted and re-evaluated. These second-hand myths get taken as ‘facts’ and they, in their turn, help confer a study with the status of a ‘classic’. There is no doubt that the case study of Little Albert remains a ‘classic’ in psychology, but the question remains as to whether it deserves its place on the basis of its experimental findings alone. Perhaps it deserves its status on the basis of the influence (desired or otherwise) it had on thinking at the time, an influence that continues to this day.
IT'S NOT JUST ABOUT SALIVATING DOGS!


Have you ever walked into a medical building where the odor of the disinfectant made your teeth hurt? If you have, it was probably because the odor triggered an association that had been conditioned in your brain between that smell and your past experiences at the dentist. When you hear “The Star-Spangled Banner” played at the Olympic Games, does your heart beat a little faster? This happens to most Americans. Does the same thing happen when you hear the Italian national anthem? Most likely it does not, because you have been conditioned to respond to one song, but not to the other. And why do some people squint and become nervous if you inflate a balloon near them? Well, obviously it is because they have been conditioned to associate the expanding balloon with something fearful (such as a loud pop). These are just a few of countless human behaviors that exist because of a process known as “classical conditioning.”

The classical conditioning theory of learning was developed and articulated nearly 100 years ago in Russia by one of the most familiar names in the history of psychology, Ivan Petrovich Pavlov. Unlike most of the research presented in this book, Pavlov's name and his basic ideas of learning by association are widely recognized in popular culture (there is even a Rolling Stones song that refers to “salivating like Pavlov's dogs”). However, how he came to make his landmark discoveries and the true significance of his work are not so widely understood.

Interestingly, while Pavlov's contribution to psychology was one of the most important ever made, he was not a psychologist at all, but rather a prominent Russian physiologist studying digestive processes. For his research on digestion he was awarded the Nobel Prize for science. But the discoveries that dramatically changed his career and the history of psychology began virtually by accident. It is important to note that in the late 1800s, psychology was a very young science and considered by many to be less than a true science. Therefore, for Pavlov to make such a radical turn from the more solid and respected science of physiology to psychology was a risky career move. He wrote about the dilemma facing a physiologist whose work might involve studying the brain:

> It is logical that in its analysis of the various activities of living matter, physiology should base itself on the more advanced and more exact sciences—physics and chemistry. But if we attempt an approach from this science of psychology ... we shall be building our superstructure on a science that has no claim to exactness ... In fact, it is still open to discussion whether psychology is a natural science, or whether it can be regarded as a science at all (p. 3).

The area of psychology concerned with learning and conditioning has produced a rather well-defined body of literature explaining how animals and humans learn. Some of the most famous names in the history of psychology have devoted their entire careers to this research—names that are widely recognized even outside the behavioral sciences, such as Watson, Skinner, Pavlov, and Bandura. Picking a few of the most influential studies from this branch of psychology and from these researchers is no easy task, but the ones selected can be found in nearly every introductory psychology textbook and are representative of the mammoth contributions of these scientists.

For Pavlov, of course, we take a journey back nearly 100 years to review his work with dogs, metronomes, salivation, and the discovery of the conditioned reflex. Second, Watson, known for many contributions, is probably most famous (notorious?), for his torturous experiment with Little Albert, which demonstrated for the first time how emotions are a product of experience. For the third study in this section, we discuss Skinner's famous explanation and demonstration of superstition behavior in a pigeon and how humans become superstitious in exactly the same way. Finally comes an examination of the well-known “Bobo Doll Study,” in which Albert Bandura established that aggressive behaviors could be learned by children through their modeling of adult violence.
Looking back on Pavlov’s discoveries, it was fortunate for the advancement of psychological science and for our understanding of human behavior that he took the risk and made the career change. Pavlov’s physiological research involved the use of dogs as subjects for studying the role of salivation on digestion. He or his assistants would introduce various food or non-food substances into a dog’s mouth and observe the rate and amount of salivation. In order to measure salivation scientifically, minor surgery was performed on the dogs so that a salivary duct was redirected through an incision in the dog’s cheek and connected to a tube that would collect the saliva. Throughout this research, Pavlov made many new and interesting discoveries. For example, he found that when a dog received moist food, only a small amount of saliva would be produced, compared with a heavy flow when dry food was presented. When inedible substances were placed in the dog’s mouth (a marble, some sand), saliva was produced (in varying amounts depending on the substance) to assist the dog in rejecting the substance. The production of saliva under these conditions was regarded by Pavlov as a reflex; that is, a response that occurs automatically to a specific stimulus without conscious control or learning. If you think about it, salivation is purely reflexive for humans, too. Suppose I ask you, as you read this sentence, to salivate as fast as you can. You cannot do it. But if you are hungry and find yourself sitting in front of your favorite food, you will salivate whether you want to or not!

So, Pavlov experimented with various stimuli to determine just how “intelligent” these salivary glands were. As the research continued, he began to notice certain events that were totally unexpected. The dogs began to salivate before any food reached their mouths and even before the odor of food was present. After a while the dogs were salivating at times when no digestive stimulus was present at all. Somehow, the reflexive action of the salivary glands had been altered through the animals’ experience in the lab: “Even the vessel from which the food has been given is sufficient to evoke an alimentary reflex [salivation] complete in all its details; and, further, the secretion may be provoked even by the sight of the person who has brought the vessel, or by the sound of his footsteps” (p. 13).

This was the crossroads for Pavlov. He had observed digestive responses occurring to stimuli seemingly unrelated to digestion, and pure physiology could not provide an explanation for this. The answer had to be found in psychology.

THEORETICAL PROPOSITIONS

Pavlov theorized that the dogs had learned from experience in the lab to expect food following the appearance of certain signals. While these “signal stimuli” do not naturally produce salivation, the dogs came to associate them with food, and thus responded to them with salivation. Consequently, Pavlov determined that there must be two kinds of reflexes.

Unconditioned reflexes are inborn and automatic, require no learning, and are generally the same for all members of a species. Salivating when food enters the mouth, jumping at the sound of a loud noise, and the dilation of your pupils when the lights are turned off are examples of unconditioned reflexes. Conditioned reflexes, on the other hand, are acquired through experience or learning and may vary a great deal among individual members of a species. A dog salivating at the sound of footsteps, or you feeling pain in your teeth when you smell medical disinfectant, are conditioned reflexes.

Unconditioned reflexes are formed by an unconditioned stimulus (UCS) producing an unconditioned response (UCR). In Pavlov’s studies, the UCS was food and the UCR was salivation. Conditioned reflexes consist of a conditioned stimulus (CS), such as the footsteps, producing a conditioned response (CR), salivation. You will notice that the response in both of these examples is salivation, but when the salivation results from hearing footsteps, it is conditioning that prompts it.

The question Pavlov wanted to answer was this: Since conditioned reflexes are not inborn, exactly how are they acquired? He proposed that if a particular stimulus in the dog’s environment was often present when the dog was fed, this stimulus would become associated in the dog’s brain with food; it would signal the approaching food. Prior to being paired with the food, the environmental stimulus did not produce any important response. In other words, to the dogs, it was a neutral stimulus (NS). When the dogs first arrived at the lab, the assistant’s footsteps might have produced a response of curiosity (Pavlov called it the “what is it?” response), but hearing the footsteps certainly would not have caused the dogs to salivate. The footsteps, then, were a neutral stimulus. However, over time, as the dogs heard the same footsteps just prior to being fed every day, they would begin to associate the sound with food. Eventually, according to the theory, the footsteps alone would cause the dogs to salivate. So, according to Pavlov, the process by which a neutral stimulus becomes a conditioned stimulus could be diagrammed as follows:

<table>
<thead>
<tr>
<th>Step 1.</th>
<th>UCS (food)</th>
<th>UCR (salivation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2.</td>
<td>NS (footsteps) + UCS (food)</td>
<td>UCR (salivation)</td>
</tr>
<tr>
<td>Step 3.</td>
<td>(Repeat step 2 several times)</td>
<td></td>
</tr>
<tr>
<td>Step 4.</td>
<td>CS (footsteps)</td>
<td>CR (salivation)</td>
</tr>
</tbody>
</table>
Now that he had a theory to explain his observations, Pavlov began a series of experiments to prove that it was correct. For some reason, it is commonly believed that Pavlov conditioned dogs to salivate at the sound of a bell. But as you will see, his early experiments involved a metronome.

**METHOD AND RESULTS**

Pavlov’s first problem was that there were too many sources of stimulation in his laboratory. It was extremely important that he be able to isolate one single stimulus to determine if the dogs could be conditioned to respond to it. He tried to limit these influences by allowing only one experimenter to come in contact with a particular dog. However, this was inadequate because that one person would unintentionally provide numerous subtle stimuli, such as blinking of the eyes or standing a certain way, that made an exact interpretation of the dog’s behavior very difficult.

Fortunately, Pavlov was able to build a special laboratory at the Institute of Experimental Medicine in Petrograd (which became Leningrad and has now returned to its original name of St. Petersburg) with funds donated by “a keen and public-spirited Moscow businessman.” This soundproof lab allowed for complete isolation of the subjects from the experimenters and from all extraneous stimuli during the experimental procedures. Therefore, a specific stimulus could be administered and responses could be recorded without any direct contact between the experimenters and the animals.

After the necessary research environment had been established, the procedure was quite simple. Pavlov chose food as the unconditioned stimulus. As explained previously, food will elicit the unconditioned response of salivation. Then Pavlov needed to find a neutral stimulus that was, for the dogs, completely unrelated to food. For this he used the sound of the metronome. Over several conditioning trials, the dog was exposed to the ticking of the metronome and then was immediately presented with food. “A stimulus which was neutral of itself had been superimposed upon the action of the inborn alimentary reflex. We observed that, after several repetitions of the combined stimulation, the sounds of the metronome had acquired the property of stimulating salivary secretion.” (p. 26). In other words, the metronome had become a conditioned stimulus for the conditioned response of salivation.

Pavlov and his associates elaborated on this preliminary finding by using different unconditioned and neutral stimuli. For example, the odor of vanilla (NS) was presented to the subjects prior to a mild acid solution (similar to lemon juice) being placed in the dog’s mouth (the UCS). The acid, of course, caused heavy salivation (UCR). After 20 repetitions of the combination, the vanilla alone produced salivation. For a visual test, an object would begin to rotate just prior to the presentation of food. After only five pairings, the rotating object by itself (CS) caused the dogs to salivate (CR).

One additional important finding was that if the neutral stimulus (the vanilla or the rotating object) was presented to the subject after the unconditioned stimulus, no conditioning takes place. A demonstration of this was made in Pavlov’s lab when the acid solution was placed in the dog’s mouth and then, five seconds later, the odor of vanilla presented. After 427 of these pairings the vanilla did not become a conditioned stimulus.

Of course, the importance and application of Pavlov’s work extends far beyond salivating dogs. His theories of classical conditioning explained a major portion of human behavior and helped to launch psychology as a true science.

**SIGNIFICANCE OF THE FINDINGS**

The theory of classical conditioning (also called Pavlovian conditioning) is universally accepted and has remained virtually unchanged since its conception through Pavlov’s work. It is used to explain and interpret a wide range of human behavior, including where phobias come from, why you dislike certain foods, the source of your emotions, how advertising works, why you feel anxiety before a job interview or an exam, and what arouses you sexually. Several later studies dealing with some of these applications will be discussed here.

Classical conditioning focuses on reflexive behavior: those behaviors that are not under your voluntary control. Any reflex can be conditioned to occur to a previously neutral stimulus. You can be classically conditioned so that your left eye blinks when you hear a doorbell, your heart rate increases at the sight of a flashing blue light, or you experience sexual arousal when you eat strawberries. The doorbell, blue light, and strawberries were all neutral in relation to the conditioned responses until they somehow were paired with and became associated with unconditioned stimuli for eye blinking (a puff of air into the eye), heart rate increase (a sudden loud noise), and sexual arousal (romantic caresses).

To experience firsthand the process of classical conditioning, here is an experiment you can perform on yourself. All you will need is a bell, a mirror, and a room that becomes completely dark when the light is switched off to serve as your temporary laboratory. The pupils of your eyes dilate and constrict reflexively according to changes in light
intensity. You have no voluntary control over this, and you did not have to learn how to do it. If I say to you, "please dilate your pupils now," you would be unable to do so. However, when you walk into a dark theater, they dilate immediately. Therefore, a decrease in light would be considered an unconditioned stimulus for pupil dilation, the unconditioned response. In your "lab," ring the bell and immediately after, turn off the light. Wait in the total darkness about 15 seconds and turn the light back on. Wait another 15 seconds and repeat the procedure: bell . . . light off . . . wait 15 seconds . . . light on . . . . Repeat this pairing of the neutral stimulus (the bell) with the unconditioned stimulus (the darkness) 20 to 30 times, making sure that the bell only rings just prior to the sudden darkness. Now, with the lights on, watch your eyes closely in the mirror and ring the bell. You will see your pupils dilate slightly even though there is no change in light! The bell has become the conditioned stimulus and pupil dilation the conditioned response.

RELATED RESEARCH

There are two other stories presented in this book that rest directly on Pavlov's theory of classical conditioning. In the next chapter, Watson conditioned little Albert to fear a white rat (and other furry things) by employing the same principles Pavlov used to condition salivation in dogs. By doing so, Watson demonstrated how emotions, such as fear, are formed. Later, Joseph Wolpe (see the reading on Wolpe in the chapter on psychotherapy) developed a therapeutic technique for treating intense fears (phobias) by applying the concepts of classical conditioning. His work was based on the idea that the association between the conditioned stimulus and the unconditioned stimulus must be broken in order to reduce the fearful response.

The examples and uses for Pavlov's theory in the literature on learning and conditioning are far too numerous to summarize here. Instead, a few of the more notable findings will be discussed.

A common problem that plagues ranchers around the world is that of predator animals, usually wolves and coyotes, killing and eating their livestock. In the early 1970s, studies were conducted that attempted to apply Pavlovian conditioning techniques to solve the problem of the killing of sheep by coyotes and wolves without the need for killing the predators (see Gustafson, García, Hawkins, and Rusiniak, 1974). Wolves and coyotes were given pieces of mutton containing small amounts of lithium chloride (UCS), a chemical that if ingested makes an animal sick. When the animals ate the meat, they became dizzy with severe nausea and vomiting (UCR). After recovering, these same hungry predators were placed in a pen with live sheep. The wolves and coyotes began to attack the sheep (CS), but as soon as they smelled their prey, they stopped and stayed as far away from the sheep as possible. When the gate to the pen was opened, the wolves and coyotes actually ran (CR) from the sheep! Based on this and other related research, it is now common practice for ranchers to use this method of classical conditioning to keep wolves and coyotes away from their herds.

Another application of Pavlov's discoveries is in advertising. In fact, the entire advertising industry has at its foundation the principles of classical conditioning. Most television commercials and magazine advertisements are trying to pair a product with something that produces a positive response. Each advertiser's hope is that when you are trying to choose among, say, 30 brands of beer at the market, you will see their brand, experience a pleasant emotion based on your association between their beer and "Here's to good friends," or "It doesn't get any better than this," or "For all you do," and, therefore, be more likely to buy it. There has been research to support the effectiveness of this marketing strategy. One study exposed subjects to either pleasant or unpleasant music while they were looking at advertisements for competing products. Results indicated that the products paired with the pleasant music were preferred over those paired with the unpleasant music, even though all the products were essentially the same (Gorn, 1982).

Finally, a relatively new and potentially vital line of research involving classical conditioning is in the field of behavioral medicine. Recent research has found that the activity of the immune system can be altered by using Pavlovian principles. Ader and Cohen (1985) gave mice water flavored with saccharine (mice love this water). They then paired the saccharine water with an injection of a drug that weakened the immune system of the mice. Later, when these conditioned mice drank the saccharine water, they showed signs of immunosuppression, a weakening of the immune response. Currently research is underway to discover if the reverse is also possible. Laboratory rats have been exposed to the strong odor of camphor and then injected with a drug that enhances the immune response. Early results have shown that the camphor odor alone becomes a conditioned stimulus for increased immune functioning.

If the same strategy is effective for humans, and there is reason to believe it would be, it may be possible one day soon to strengthen your resistance to illness (a conditioned response) by exposing yourself to a non-medical conditioned stimulus. For example, imagine you feel the beginnings of a cold or the flu, so you slide your special classically conditioned "immune response enhancement music disk" into your CD player. As the music fills the room, your resistance rises as a conditioned response to this stimulus and stops the disease in its tracks.
CONCLUSION

It is clear from these few examples how extensive Pavlov’s influence has been on the field of psychology. There are few scientists who have had as much impact in any single discipline. Classical conditioning is one of the fundamental theories on which modern psychology rests. Without Pavlov’s contributions, behavioral scientists still may have uncovered most of these principles over the decades. It is unlikely, however, that such a cohesive, elegant, and well-articulated theory of the conditioned reflex would have ever existed if Pavlov had not made the decision to risk his career and venture into the untested, uncharted, and highly questionable science of 19th-century psychology.


LITTLE EMOTIONAL ALBERT


Have you ever wondered where your emotional reactions come from? If you have, you’re not alone. The source of emotions has fascinated behavioral scientists throughout psychology’s history. Part of the evidence for this fascination can be found here in this book; there are five studies included that relate directly to emotional responses (see also Schachter and Singer, 1962; Ekman and Oster, 1979; Harlow, 1958; Seligman and Meier, 1967). This study by Watson and Raynor on conditioned emotional responses was a strikingly powerful piece of research when it was published over 70 years 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 their 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 A. Freud). 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, and specifically emotion, is generated internally through biological and instinctual processes.

In the 1920s a new movement in psychology known as behaviorism, spearheaded by Pavlov and Watson, began to take hold. The behaviorist 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 in the environment. In other words, we learn our emotional reactions. In fact Watson believed that all human behavior was a product of learning and conditioning, as he proclaimed in his famous statement of 1913:

Give me a dozen healthy infants, well-formed, and my own specia 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 (Watson, 1913).

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 somehow generated from within. So Watson set out to demonstrate that emotions could be experimentally conditioned.

THEORETICAL PROPOSITIONS

Watson theorized that if a stimulus that automatically produces a certain emotion in you (such as fear) 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. 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, involving a subject named “little Albert B.”

METHOD AND RESULTS

The subject, 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. He was judged by the researchers and the hospital staff to be very
healthy, both emotionally and physically. In order to see if Albert was afraid of certain stimuli, he was presented 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 any of them. Since 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 in Albert by exposing him to a loud noise. All humans, and especially all infants, will exhibit fear reactions to loud, sudden noises. Since 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 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 test was not done until the child was 11 months old. There was hesitation on the part of the researchers to create fear reactions in a child experimentally, but the decision was made to proceed (based on reasoning to be discussed in conjunction with the overall questionable ethics of this study, found later in this chapter).

As the experiment began, the researchers presented Albert with the white rat and the frightening noise at the same time. 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. Well, 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 to 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 even 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 famous as it is famous occurred when Watson presented Albert with a Santa Claus mask. The reaction? Yes . . . fear!

After another five days Albert was tested again. The sequence of presentations on this day are summarized in Table 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 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 Raynor wanted to see was to see if Albert’s newly learned emotional responses would persist over time. Well, Albert had 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 was still very afraid of all these objects.

**TABLE 1 Sequence of Stimulus Presentations To Albert On Fourth Day of Testing**

<table>
<thead>
<tr>
<th>STIMULUS PRESENTED</th>
<th>REACTION OBSERVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Blocks</td>
<td>Played with blocks as usual</td>
</tr>
<tr>
<td>2. Rat</td>
<td>Fearful withdrawal (no crying)</td>
</tr>
<tr>
<td>3. Rat + Noise</td>
<td>Fear and crying</td>
</tr>
<tr>
<td>4. Rat</td>
<td>Fear and crying</td>
</tr>
<tr>
<td>5. Rat</td>
<td>Fear, crying, and crawling away</td>
</tr>
<tr>
<td>6. Rabbit</td>
<td>Fear, but less strong reaction than on former presentations</td>
</tr>
<tr>
<td>7. Blocks</td>
<td>Played as usual</td>
</tr>
<tr>
<td>8. Rabbit</td>
<td>Same as 6</td>
</tr>
<tr>
<td>9. Rabbit</td>
<td>Same as 6</td>
</tr>
<tr>
<td>10. Rabbit</td>
<td>Some fear, but also wanted to touch rabbit</td>
</tr>
<tr>
<td>11. Dog</td>
<td>Fearful avoidance</td>
</tr>
<tr>
<td>12. Dog + Noise</td>
<td>Fear and crawling away</td>
</tr>
<tr>
<td>13. Blocks</td>
<td>Normal play</td>
</tr>
</tbody>
</table>
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 psychology, that our behavior stems from unconscious processes, was wrong. This study, with all its methodological flaws and serious breaches of ethical conduct (to be discussed on the next page) succeeded to a large extent in convincing a great portion of 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, personal, and human as an emotion was shown to be subject to conditioning, just as a rat in a maze learns to find the food faster and faster on each successive try.

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. These processes are the same as what Watson found with little Albert, although usually more complex.

Watson was quick to point out that his findings could explain human behavior in rather straightforward and simple terms, compared with the psychoanalytic notions of Freud and his followers. As Watson and Raynor 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, he ceased being afraid. Therefore, Watson interpreted thumb-sucking as a conditioned device for blocking fear-producing stimuli.

An additional attack on Freudian thinking made in this article concerned how Freudians in the future, given the opportunity, might analyze Albert's fear of a white fur coat. Watson and Raynor claimed that Freudian analysts "will probably tease from him the recital of a dream which, upon their analysis, will show that Albert at 3 years of age attempted to play with the pubic hair of the mother and was scolded violently for it." 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 was commonly interpreted.

QUESTIONS AND CRITICISMS

As you have been reading this, you have probably been concerned or even angered over the treatment by the experimenters of this innocent child. This study clearly violates current standards of ethical conduct in research involving humans. It would be highly unlikely that any human-subjects committee at any research institution would approve this study today. Seventy years 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 considerable hesitation in proceeding with the conditioning process, but decided that it was justifiable since, 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 Raynor contend 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?).

On a related point, several researchers have criticized Watson's assumption that these conditioned fears would persist indefinitely (Harris, 1979). Others claim that Albert was not conditioned as effectively as the authors maintained (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 5, 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). But as he continued to be exposed to the rabbit without anything frightening occurring (such as that loud noise), very likely he slowly became 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.


KNOW WOOD!


In this chapter we examine one study from a huge body of research carried out by one of the most influential and most widely known psychologists ever, B.F. Skinner. Deciding how to present Skinner and which of his studies to explore was a difficult task. It is clearly impossible to represent adequately in one short chapter his contributions to the history of psychological research. After all, Skinner is considered by most to be the father of radical behaviorism, is the inventor of the famous (or infamous) “Skinner Box,” and is the author of over a dozen books and over 70 scientific articles. This article, with the somewhat humorous-sounding title “Superstition in the pigeon,” has been selected from all of 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 was called a radical behaviorist because he believed that all behavior in either human or non-human animals is caused, shaped, and maintained by its consequences. To put it in basic terms: If, in a given situation, you behave in some way and your behavior is followed by a rewarding event (such as food, praise, or money), you will tend to behave that way again. On the other hand, if you do something that produces an unpleasant event (such as pain or embarrassment), you will be less likely to do that again in identical or similar situations. Rewarding events are called “reinforcement” and unpleasant events are called “punishment.” Skinner called this learning process operant conditioning. It may be diagrammed as follows:

```
Situation --> Behavior --> Consequence --> |
|------>Reinforcement = Learning |
|------>Punishment = No learning |
```

Within this conceptualization, Skinner also was able to explain how behaviors are lost or unlearned. Once a behavior has been reinforced and the reinforcement is then discontinued, the behavior will slowly decrease until it disappears completely. This unlearning process is called “extinction.”

If you think about it, these ideas are not new to you. The process we all use to train our pets follows these same rules. You tell a dog to sit, it sits, and you reward it with a “dog yummy.” After a while the dog will sit when told to, even without the immediate reward of a dog yummy. 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 is remove the reinforcement, and the behavior will stop. 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 “beggar” some food once in a while, extinction will never happen.

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 so easy to identify. Skinner was well-known for arguing that if a human behavior was interpreted by others (such as cognitive or humanistic psychologists) to be due to our highly evolved consciousness or intellectual capabilities, it was only because psychologists had been unable to pinpoint the reinforcers that had created and were maintaining the behavior. If this feels like a rather extreme position to you, remember that Skinner’s position was called radical behaviorism and was always surrounded by controversy.

Skinner often met skepticism and defended his views by demonstrating experimentally that behaviors considered to be the sole property of humans could be learned by lowly creatures such as pigeons or rats. One of these demonstrations involved the seemingly human activity of “insight,” or working on a problem until a solution presented
itself in a flash of finger-snapping illumination. Skinner set up an experiment in which a pigeon solved a problem of the food dish being too high to reach in a way that appeared to be the same as human insight. Of course it was really operant conditioning—as it is, Skinner argued, for humans as well.

Another challenge accepted by Skinner was the contention by others that superstitious behavior is uniquely human. The argument was that superstition requires human cognitive activity (thinking, knowing, reasoning). A superstition is a belief in something, and we do not usually attribute such "beliefs" to animals. Well, Skinner said in essence that superstitious behavior could be explained as easily as any other action by using the principles of operant conditioning. He performed an experiment to prove it.

THEORETICAL PROPOSITIONS

Think back to a time when you have behaved superstitiously. Did you knock on wood, avoid walking under a ladder, avoid stepping on cracks, carry a lucky coin or other charm, shake the dice a certain way in a board game, change your behavior because of your horoscope? It is probably safe to say that everyone has done something out of superstition at some time, even if some of them might not want to admit it. Skinner said that the reason people do this is that they believe or presume that there is a connection between the superstitious behavior and some reinforcing consequence, even though, in reality, there is not. This connection exists because the behavior (such as shaking the dice that certain way) was accidentally reinforced (such as a good roll) once, twice, or several times. Skinner called this “non-contingent” reinforcement, a reward that is not contingent on any particular behavior. You believe that there is a causal relationship between the behavior and the reward, when no such relationship exists.

“And if you think this is some exclusive human activity,” Skinner might have said, “I’ll make a superstitious pigeon!”

METHOD

In order to understand the method used in this experiment, a brief description of what has become known as the “Skinner Box” is necessary. The principle behind the Skinner Box (or conditioning chamber, as Skinner called it) is really quite simple. It consists of a cage or box that is empty except for a dish or tray into which food may be dispensed. This allows a researcher to have control over when the animal receives reinforcement, such as pellets of food. The early conditioning boxes also contained a lever which, if pressed, would cause some food to be dispensed. If a rat (rats were used in Skinner’s earliest work) was placed in one of these boxes, it would eventually, through trial and error, learn to press the lever for food. Alternately, the experimenter could, if desired, control the food dispenser and reinforce a specific behavior. Later it was found that pigeons also made ideal subjects in conditioning experiments, and conditioning chambers were designed with disks to be pecked instead of bars to be pressed.

One of these conditioning cages was used in the study discussed here, but with one important change. In order to study superstitious behavior, the food dispenser was rigged to drop food pellets into the tray at intervals of 15 seconds, regardless of what the animal was doing at the time. You can see that this produced non-contingent reinforcement. In other words, the animal received a reward every 15 seconds, no matter what it did.

Subjects in this study were eight pigeons. These birds were fed less than their normal daily amount for several days, so that when tested they would be hungry and therefore highly motivated to perform behaviors for food (this increased the power of the reinforcement). Each pigeon was placed into the experimental cage for a few minutes each day and just left to do whatever a pigeon does. During this time, reinforcement was being delivered automatically every 15 seconds. After several days of conditioning in this way, two independent observers recorded the birds’ behavior in the cage.

RESULTS

As Skinner reports:

In six out of eight cases the resulting responses were so clearly defined that two observers could agree perfectly in counting instances. One bird was conditioned to turn counter-clockwise about the cage, making two or three turns between reinforcements. Another repeatedly thrust its head into one of the upper corners of the cage. A third developed a tossing response as if placing its head beneath an invisible bar and lifting it repeatedly. Two birds developed a pendulum motion of the head and body in which the head was extended forward and swung from right to left with a sharp movement followed by a somewhat slower return. The body generally followed the movement and a few steps might be taken when it was extensive. Another bird was conditioned to make incomplete pecking or brushing movements directed toward but not touching the floor (p. 168).

None of these behaviors had been observed in the birds prior to the conditioning procedure. As you can see, the new behavior had
nothing to do with the pigeon receiving food. Nevertheless, they behaved as if a certain action would produce the food: they became superstitious.

Skinner next wanted to see what would happen if the time interval between reinforcements was extended. With one of the head-bobbing birds, the interval between the delivery of food pellets was slowly increased to one minute. When this occurred the pigeon’s movements became more energetic until finally the stepping became so pronounced that it appeared the bird was performing a kind of dance during the minute between reinforcement (such as a “pigeon food dance”).

Finally, the new behavior of the birds was put on extinction. This meant that the reinforcement in the test cage was discontinued. When this happened the superstitious behaviors gradually decreased until they disappeared altogether. However, it was noted that in the case of the “hopping” pigeon with a reinforcement interval that had been increased to a minute, over 10,000 responses were recorded before extinction occurred!

DISCUSSION

Clearly, what Skinner ended up with here was six superstitious pigeons. However, he explains his findings more carefully and modestly: “The experiment might be said to demonstrate a sort of superstition. The bird behaves as if there were a causal relation between its behavior and the presentation of food, although such a relation is lacking” (p. 171).

Of course, the next step would be to apply these findings to humans. I am sure it is not difficult for you to think of analogies in human behavior, nor was it for Skinner. He described “the bowler who has released a ball down the alley but continues to behave as if he were controlling it by twisting and turning his arm and shoulder as another case in point” (p. 171). You know, rationally, that behaviors such as these don’t really have any effect on a bowling ball that is already halfway down the alley. As Skinner points out in the case of the pigeons in this study, the food was going to appear no matter what the bird did.

An additional and interesting point made by Skinner in this article was that it is not completely correct to conclude that there is no relationship between the twisting and turning of the bowler and the direction of the ball. What is true is that after the ball has left the bowler’s hand, the “bowler’s behavior has no effect on the ball, but the behavior of the ball has an effect on the bowler” (p. 171). In other words, it is a fact that on some occasions, the ball might happen to move in the direction of the bowler’s body movements. That movement of the ball, coupled with the consequence of a strike or a spare, is enough to accidentally reinforce the twisting behavior and maintain the superstition.

Finally, the reason that superstitions are so resistant to extinction was demonstrated by the pigeon that hopped 10,000 times before giving up the behavior. When any behavior is only reinforced once in a while, it becomes very difficult to extinguish. This is because the expectation stays high that the superstitious behavior might work to produce the reinforcing consequences. You can imagine that if the connection was present every time and then disappeared, the behavior would stop quickly. However, for humans, the instances of that accidental reinforcement usually occur at large time intervals, so the superstitious behavior often may persist for a lifetime.

CRITICISMS AND SUBSEQUENT RESEARCH

As mentioned before, Skinner’s behaviorist theories and research were always the subject of great and sometimes heated controversy. Other prominent theoretical approaches to human behavior argued that the strict behavioral view was unable to account for many of the psychological processes that are fundamental to humans. Carl Rogers, the founder of the “humanistic” school of psychology, and well-known for his debates with Skinner, summed up this criticism:

In this world of inner meanings, humanistic psychology can investigate issues which are meaningless for the behaviorist: purposes, goals, values, choice, perceptions of self, perceptions of others, the personal constructs with which we build our world . . . the whole phenomenal world of the individual with its connective tissue of meaning. Not one aspect of this world is open to the strict behaviorist. Yet that these elements have significance for man’s behavior seems certainly true (Rogers, 1964, p. 119).

Behaviorists would argue in turn that all of these human characteristics are open to behavioral analysis. The key to this is a proper interpretation of the behaviors and consequences that constitute them (see Skinner, 1974, for a complete discussion of these issues).

On the specific issue of superstitions, however, there appears to be less controversy and a rather wide acceptance of the learning processes involved in their formation. An experiment performed by Bruner and Reviski (1961) demonstrated how easily superstitious behavior develops in humans. Four high school students each sat in front of four telegraph keys. They were told that each time they pressed the correct key, a bell would sound, a red light would flash, and they would earn a nickel. The correct response was key number three. However, as in Skinner’s study, key number 3 would produce the desired reinforcement only after a delay interval of 10 seconds. During this interval the students would try other keys in various combinations. Then, at some point following the
delay, they would hit the third key again and receive the reinforcement. The results were the same for all the students. After a while they had each developed a pattern of key responses (such as 1, 2, 3, 4, 1, 2, 3) that they repeated over and over between each reinforcement. Pressing the 3-key was the only reinforced behavior; the other presses in the sequence were completely superstitious. Not only did they behave superstitiously, but all the students believed that the other key presses were necessary to "set up" the reinforced key. They were not aware of their superstitious behavior.

CONCLUSION

Superstitions are everywhere. You probably have some, and you surely know others who have them. One study of high school and college athletes found that 40 percent of them engaged in superstitious behavior before or during games (Buhrmann and Zaugg, 1981). A famous story of superstitious behavior was told by hockey player Phil Esposito (of the Boston Bruins and the New York Rangers). Prior to each game he would wear the same black turtleneck, drive through the same tollbooth on the way to the stadium, and get dressed in his uniform in exactly the same sequence. Years earlier, when he had first done all these things, he had been the team's high scorer. He behaved as if there were a causal connection between these behaviors and his performance on the ice, when no such connection actually existed. That's exactly how Skinner defined superstition.

Some superstitions are such a part of a culture that they produce societywide effects. You may be aware that most high-rise buildings do not have a 13th floor. Well, that's not exactly true. Obviously there is a 13th floor, but there is no floor that is called "13." This is probably not because architects and builders are an overly superstitious bunch, but it is rather due to the difficulty of renting or selling space on the 13th floor. Another recent example is that Americans are so superstitious about $2 bills that the U.S. Treasury has a pile of 4 million of these bills that people refuse to use!

Are superstitions psychologically unhealthy? Most psychologists believe that even though superstitious behaviors, by definition, do not produce the consequences that you think they do, they can serve useful functions. Often such behaviors can produce a feeling of strength and control when a person is facing a difficult situation. It is interesting to note that people who are employed in dangerous occupations tend to have more superstitions than others do. This feeling of increased power and control that is sometimes created by superstitious behavior can often lead to reduced anxiety, greater confidence and assurance, and improved performance.


SEE AGGRESSION . . . DO AGGRESSION!

Bandura, Albert, Ross, Dorothea, and Ross, Sheila A. (1961)

Aggression, in its overabundance of forms, is arguably the greatest social problem facing this country and the world today. Consequently, it is also one of the most heavily researched topics in the history of psychology. Over the years, the behavioral scientists who have been in the forefront of this research have been the social psychologists, whose focus is on human interaction. One goal of social psychologists has been to define aggression. This may, at first glance, seem like a relatively easy goal, but such a definition turns out to be rather elusive. For example, which of the following behaviors would you define as aggression: A boxing match? A cat killing a mouse? A soldier shooting an enemy? Setting rat traps in your basement? A bullfight? The list of behaviors that may or may not be included in a definition of aggression goes on. As a result, if you were to consult 10 different social psychologists, you would probably get 10 different definitions of aggression.

Many researchers have gone beyond trying to agree on a definition to the more important process of examining the sources of human aggression. The question they pose is this: Why do people engage in acts of aggression? Throughout the history of psychology, many theoretical approaches have been proposed to explain the causes of aggression. Some of these contend that you are biologically preprogrammed for aggression, such that violent urges build up in you over time until they demand to be released. Other theories look to situational factors, such as
repeated frustration, as the main determinants of aggressive responses. A third view, and one that may be the most widely accepted, is that aggression is learned.

One of the most famous and influential experiments ever conducted in the history of psychology demonstrated how children learn to be aggressive. This study, by Albert Bandura and his associates Dorothea Ross and Sheila Ross, was carried out in 1961 at Stanford University. Bandura is considered to be one of the founders of a school of psychological thought called “social learning theory.” Social learning theorists believe that learning is the primary factor in the development of personality, and that this learning occurs through interactions with other people. For example, as you are growing up, important people such as your parents and teachers reinforce certain behaviors and ignore or punish others. Even beyond direct rewards and punishments, however, Bandura believed that behavior can be shaped in important ways through simply observing and imitating (or modeling) the behavior of others.

As you can see from the title of this chapter’s study, Bandura, Ross, and Ross were able to demonstrate this modeling effect for acts of aggression. This research has come to be known throughout the field of psychology as “the Bobo doll study,” for reasons that will become clear shortly. The article began with a reference to earlier research findings which demonstrated that children readily imitated the behavior of adult models while they were in the presence of the model. One of the things Bandura wanted to address in the new study was whether such imitative learning would generalize to settings in which the model was not with the child.

THEORETICAL PROPOSITIONS

The researchers proposed to expose children to adult models who behaved in either aggressive or non-aggressive ways. The children would then be tested in a new situation without the model present to determine to what extent they would imitate the acts of aggression they had observed in the adult. Based on this experimental manipulation, Bandura and his associates made four predictions.

1. Subjects who observed adult models performing acts of aggression would imitate the adult and engage in similar aggressive behaviors, even if the model was no longer present. Furthermore, this behavior would differ significantly from subjects who observed non-aggressive models or no models at all.
2. Children who were exposed to the non-aggressive models would not only be less aggressive than those who observed the aggression, but also significantly less aggressive than a control group of children who were exposed to no model at all. In other words, the non-aggressive models would have an aggression-inhibiting effect.
3. Because children tend to identify with parents and other adults of their same sex, subjects would “imitate the behavior of the same-sex model to a greater degree than a model of the opposite sex” (p. 575).
4. “Since aggression is a highly masculine-typed behavior in society, boys should be more predisposed than girls toward imitating aggression, the difference being most marked for subjects exposed to the male model” (p. 575).

METHOD

This article by Bandura, Ross, and Ross outlined the methods used in the experiment with great organization and clarity. Although somewhat summarized and simplified, these methodological steps are presented here.

Subjects

The researchers enlisted the help of the director and head teacher of the Stanford University Nursery School in order to obtain subjects for their study. Thirty-six boys and 36 girls, ranging in age from 3 years to almost 6 years, participated in the study as subjects. The average age of the children was 4 years and 4 months.

Experimental Conditions

Twenty-four children were assigned to the control group, which meant that they would not be exposed to any model. The remaining 48 subjects were first divided into two groups: one exposed to aggressive models and the other exposed to non-aggressive models. These groups were divided again into male and female subjects. Finally, each of these groups were divided so that half of the subjects were exposed to same-sex models and half to opposite-sex models. This created a total of eight experimental groups and one control group. A question you might be asking yourself is this: What if the children in some of the groups are already more aggressive than others? Bandura guarded against this potential problem by obtaining ratings of each subject’s level of aggressiveness. The children were rated by an experimenter and a teacher (both of whom knew the children well) on their levels of physical aggression, verbal aggression, and aggression toward objects. These ratings allowed the researchers to match all the groups in terms of average aggression level.
The Experimental Procedure

Each child was exposed individually to the various experimental procedures. First, the experimenter brought the child to the playroom. On the way, they encountered the adult model who was invited by the experimenter to come and “join in the game.” The child was seated in one corner of the playroom at a table containing highly interesting activities. There were potato prints (this was 1961, so for those of you who have grown up in the high-tech age, a potato print is a potato cut in half and carved so that, like a rubber stamp, it will reproduce geometric shapes when inked on a stamp pad), and stickers of brightly colored animals and flowers that could be pasted onto a poster. Next, the adult model was taken to a table in a different corner containing a tinker toy set, a mallet, and an inflated Bobo doll 5 feet tall. The experimenter explained that these toys were for the model to play with and then left the room.

For both the aggressive and non-aggressive conditions, the model began assembling the tinker toys. However, in the aggressive condition, after a minute, the model attacked the Bobo doll with violence. For all the subjects in the aggressive condition, the sequence of aggressive acts performed by the model was identical.

The model laid Bobo on its side, sat on it, and punched it repeatedly in the nose. The model then raised the Bobo doll, picked up the mallet, and struck the doll on the head. Following the mallet aggression, the model tossed the doll up in the air aggressively, and kicked it about the room. This sequence of physically aggressive acts was repeated three times, interspersed with verbally aggressive responses such as, ‘Sock him in the nose . . .’, ‘Hit him down . . .’, ‘Throw him in the air . . .’, ‘Kick him . . .’, ‘Pow . . .’, and two non-aggressive comments, ‘He keeps coming back for more’ and ‘He sure is a tough fella’ (p. 576).

All this took about 10 minutes, after which the experimenter came back into the room, said goodbye to the model, and took the child to another game room.

In the non-aggressive condition, the model simply played quietly with the tinker toys for the 10-minute period and completely ignored the Bobo doll. Bandura and his collaborators were careful to ensure that all experimental factors were identical for all the subjects except for the factors being studied: the aggressive vs. non-aggressive model, and the sex of the model.

Arousal of Anger or Frustration

Following the 10-minute play period, all subjects from the various conditions were taken to another room that contained very attractive toys, such as a fire engine, a jet fighter, a complete doll set including wardrobe, a doll carriage, and so on. The researchers believed that in order to test the subjects for aggressive responses, the children should be somewhat angered or frustrated, which would make such behaviors more likely to occur. To accomplish this, they allowed the subjects to begin playing with the attractive toys, but after a short time told them that the toys in this room were reserved for the other children. The subjects were also told, however, that they could play with some other toys in the next room.

Test For Imitation of Aggression

The final experimental room was filled with both aggressive and non-aggressive toys. Aggressive toys included a Bobo doll (of course!), a mallet, two dart guns, and a tether ball with a face painted on it. The non-aggressive toys included a tea set, crayons and paper, a ball, two dolls, cars and trucks, and plastic farm animals. Each subject was allowed to play in this room for 20 minutes. During this period judges behind a one-way mirror rated each child’s behavior on several measures of aggression.

Measures of Aggression

A total of eight different responses were measured in the subjects’ behavior. In the interest of clarity, only the four most revealing measures will be summarized here. First, all acts that imitated the physical aggression of the model were recorded. These included sitting on Bobo, punching it in the nose, hitting it with the mallet, kicking it, and throwing it into the air. Second, imitation of the models’ verbal aggression was measured by counting the subjects’ repetition of the phrases, “Suck him,” “Hit him down,” “Pow,” etc. Third, other mallet aggression (that is, hitting objects other than the doll with the mallet) were recorded. Fourth, non-imitative aggression was documented by tabulating all subjects’ acts of physical and verbal aggression that had not been performed by the adult model.

RESULTS

The findings from these observations are summarized in Table 1. If you examine the results carefully, you will discover that three of the four hypotheses presented by Bandura, Ross, and Ross in the introduction were supported.

The children who were exposed to the violent models tended to imitate the exact violent behaviors they observed. There were an average of 38.2 instances of imitative physical aggression for each of the male
subjects, and 12.7 for the female subjects who had been exposed to the aggressive models. Additionally, the models’ verbally aggressive behaviors were imitated an average of 17 times by the boys and 15.7 times by the girls. These specific acts of physical and verbal aggression were virtually never observed in the subjects exposed to the non-aggressive models or in the control subjects who were not exposed to any model.

As you will recall, Bandura and his associates predicted that non-aggressive models would have a violence-inhibiting effect on the children. In order for this hypothesis to be supported, the results should show that the subjects in the non-aggressive conditions averaged significantly fewer instances of violence than those in the no-model control group. In Table 1, if you compare the non-aggressive model columns with the control group averages, you’ll see that the findings were mixed. For example, boys and girls who observed the non-aggressive male exhibited far less non-imitative mallet aggression than controls, but boys who observed the non-aggressive female aggressed more with the mallet than did the boys in the control group. As the authors readily admit, these results were so inconsistent in relation to the aggression-inhibiting effect of non-aggressive models that they were inconclusive.

The predicted gender differences, however, were strongly supported by the data in Table 1. Clearly, boys’ violent behavior was influenced more by the aggressive male model than by the aggressive female model. The average total number of aggressive behaviors by boys was 104 when they had observed a male aggressive model, compared with 48.4 when a female model had been observed. Girls, on the other hand, while their scores were less consistent, averaged 57.7 violent behaviors in the aggressive female model condition, compared with 36.3 when they observed the male model. The authors point out that in same-sex aggressive conditions, girls were more likely to imitate verbal aggression while boys were more inclined to imitate physical violence.

Finally, boys were significantly more physically aggressive than girls in nearly all the conditions. If all the instances of aggression in Table 1 are tallied, there were 270 violent acts by the boys, compared with 128.3 by the girls.

**DISCUSSION**

Bandura, Ross, and Ross claimed that they had demonstrated how specific behaviors, in this case violent ones, could be learned through the process of observation and imitation without any reinforcement provided to either the models or the observers. They concluded that
Critics of Bandura’s research on aggression have pointed out that aggressing toward an inflated doll is not the same as attacking another person, and that children know the difference. Building on the foundation laid by Bandura and his colleagues, other researchers have examined the effect of modeled violence on real aggression. In a study using Bandura’s Bobo doll method (Hanratty, O’Neill, and Sulzer, 1972), children observed a violent adult model and were then exposed to high levels of frustration. When this occurred, they often aggressed against a live person (dressed like a clown), whether that person was the source of the frustration or not.

Another study randomly assigned children to two groups. One group watched a portion of a television show (“The Untouchables”) that contained violence such as shootings, knifings, and fights, while the other group saw an exciting sports show. Besides the difference in program viewing content, the two groups were treated exactly the same. Later, the children from both groups were given the opportunity to aggress toward another child by pressing a button marked “hurt” (the button wasn’t really connected to anything, of course). Those who had been exposed to the violent program were more likely to press the button and hold it down longer than those who viewed the sports (Liebert and Baron, 1972).

CONCLUSION

The research by Bandura, Ross, and Ross discussed in this chapter made two crucial contributions to psychological thought. First, it demonstrated quite dramatically how children can acquire new behaviors simply by observing adults. Social learning theorists believe that much if not most of human personality is formed through this modeling process. Second, this research laid the groundwork for decades of research and dozens of studies on the effects of children viewing violence in person or in the media. While the controversy and debate continue, the body of literature that has grown out of Bandura’s work, taken together, supports the view that there is a link between violence in the media and violent behavior among children.


Finally, a third area of criticism deals with the belief that Kohlberg's stages of moral development may not apply equally to males and females. The researcher leading this line of questioning is Carol Gilligan (see Gilligan, 1982). She has maintained that women and men do not think about morality in the same way. In her own research she found that in making moral decisions, women talked more than men about interpersonal relationships, responsibility for others, avoiding hurting others, and the importance of the connections among people. She called this foundation upon which women's morality rests a "care orientation." Based on this gender difference, Gilligan has argued that women will score lower on Kohlberg's scale because the lower stages deal more with these relationship issues (such as stage 3, which is based primarily on building trust and loyalty in relationships). Men, on the other hand, Gilligan says, make moral decisions based on issues of justice, which fit more easily into Kohlberg's highest stages. She contends that neither of these approaches to morality is superior, and that if women are judged to be at a lower moral level than men it is because of an unintentional gender bias built into the theory.

Researchers, for the most part, have failed to find support for Gilligan's assertion. Several studies have found no significant gender differences in moral reasoning using Kohlberg's methods. Gilligan has responded to those negative findings by acknowledging that although women are capable of using all levels of moral reasoning, in their real lives they choose not to. Instead, women focus on the human relationship aspects discussed in the preceding paragraph. This has been demonstrated by research (not employing Kohlberg's methods specifically) showing how girls are willing to make a greater effort to help another person in need and tend to score higher on tests of emotional empathy (see Hoffman, 1977, for a complete discussion of these gender issues).

CONCLUSION

Dialogue and debate on Kohlberg's work within the behavioral sciences has continued to the present and shows every sign of continuing vigorously into the future. Its ultimate validity and importance remain to be clearly defined. However, little new conceptualizations of human development have produced the amount of research, speculation, and debate that surrounds Kohlberg's theory of moral development. And its usefulness to society, in one sense, was predicted by Kohlberg in this statement from 1964:

While any conception of moral education must recognize that the parent cannot escape the direct imposition of behavior demands and moral judgments upon the child, it may be possible to define moral education primarily as a matter of stimulating the development of the child's own moral judgment and its control of action... The writer [Kohlberg] has found teachers telling 13-year-olds not to cheat 'because the person you copied from might have it wrong and so it won't do you any good.' Most of these children were capable of advancing much more mature reasons for not cheating... Children are almost as likely to reject moral reasoning beneath their level as to fail to assimilate reasoning too far above their level (Kohlberg, 1964, p. 425).


LEARNING TO BE DEPRESSED


If you are like most people, you expect that your actions will produce certain consequences. Your expectations cause you both to behave in ways that will produce desirable consequences and to avoid behaviors that will lead to undesirable consequences. In other words, your actions are determined, at least in part, by your belief that they will bring about a certain result; they are contingent upon a certain consequence (see the readings on B.F. Skinner and J. Rotter for discussions on behavioral contingencies).

Let's assume for a moment that you are unhappy in your present job, so you begin the process of making a change. You make contacts with others in your field, read publications that advertise positions in which you are interested, begin training in the evening to acquire new skills, and so on. All of those actions are motivated by your belief that your effort will eventually lead to the outcome of a better job and a happier life. The same is true of interpersonal relationships. If you are in a relationship that is wrong for you because it is abusive or it
otherwise makes you unhappy, you will take the necessary actions to change it or end it because you expect to succeed in making the desired changes.

All of these are issues of power and control. Most people believe they are personally powerful and able to control what happens to them, at least part of the time, because they have exerted control in the past and have been successful. They believe they are able to help themselves achieve their goals. If this perception of power and control is lacking, all that is left is helplessness. If you feel you are stuck in an unsatisfying job and you are unable to find another job or learn new skills to improve your professional life, you will be unlikely to make the effort needed to change. If you are too dependent on the person with whom you have a damaging relationship and you feel powerless to fix it or end it, you may simply remain in the relationship and endure the pain.

Perceptions of power and control are crucial for psychological and physical health (refer to the discussion on the research by Langer and Rodin on issues of control for the elderly in nursing homes). Imagine how you would feel if you suddenly found that you no longer had the power or control to make changes in your life; that what happened to you was independent of your actions. You would probably feel helpless and hopeless, and you would give up trying altogether. In other words, you would become depressed.

Martin Seligman, a well-known and influential behavioral psychologist, maintains that our perceptions of power and control are learned from experience. He believes that when a person’s efforts at controlling certain life events fail repeatedly, the person may stop attempting to exercise control altogether. If these failures happen often enough, the person may generalize the perception of lack of control to all situations, even when control may actually be possible. This person then begins to feel like a “pawn of fate” and becomes helpless and depressed. Seligman termed this cause of depression learned helplessness. He developed his theory at the University of Pennsylvania, in a series of now classic experiments that used dogs as subjects. The research discussed here is that Seligman conducted with Steven Maier is considered to be the definitive original demonstration of his theory.

THEORETICAL PROPOSITIONS

Seligman had found in an earlier experiment on learning that when dogs were exposed to electrical shocks they could neither control nor escape from, they later failed to learn to escape from shocks when such escape was easily available. You have to imagine how odd this looked to a behaviorist. In the laboratory, dogs had experienced shocks that were designed to be punishing, but not harmful. Later, they were placed in a “shuttle box,” which is a large box with two halves divided by a partition. An electrical current could be activated in the floor on either side of the box. When a dog was on one side and felt the electricity, it simply had to jump over the partition to the other side to escape the shock. Normally, dogs and other animals learn this escape behavior very quickly (it’s not difficult to see why!). In fact, if a signal (such as a flashing light or a buzzer) warns the dog of the impending electrical current, the animal will learn to jump over the partition before the shock and thus avoid it completely. However, in Seligman’s experiment, when the dogs that had already experienced electrical shocks from which they could not escape were placed into the shuttle box, they did not learn this escape-avoidance behavior.

Seligman theorized that there was something in what the animals had learned about their ability to control the unpleasant stimulus that determined the later learning. In other words, these dogs had learned from previous experience with electrical shocks that their actions were ineffective in changing the consequence of the shocks. Then, when they were in a new situation where they did have the power to escape—to exercise control—they just gave up. They had learned to be helpless.

To test this theory, Seligman and Maier proposed to study the effect of controllable vs. uncontrollable shock on later ability to learn to avoid shock.

METHOD

This is one of several classic studies in this book that used animals as subjects. However, this one, probably more than any of the others, raises questions about the ethics of animal research. Dogs received electrical shocks that were designed to be painful (though not physically harmful) in order to test a psychological theory. Whether such treatment was (or is) ethically justifiable is an issue that must be faced by every researcher and student of psychology. (This issue will be addressed again after a discussion of the results of Seligman’s research.)

Subjects for this experiment were 24 “mongrel dogs, 15 to 19 inches high at the shoulder and weighing between 25 and 29 pounds” (p. 2). They were divided into three groups of eight. One group was the “escape group,” another the “no-escape group,” and the third was the no-harness control group.

The dogs in the escape and no-escape groups were placed individually in a harness similar to that developed by Pavlov (see page 68 for a description of Pavlov’s methods); they were restrained, but not completely unable to move. On either side of the dog’s head was a panel to keep the head facing forward. A subject could press the panel on
either side by moving its head. When an electrical shock was delivered to
dogs in the escape group, it could terminate the shock by pressing
either panel with its head. For the no-escape group, each dog was paired
with a dog in the escape group (this is an experimental procedure called
"yoking"). Identical shocks were delivered to each pair of dogs at the
same time, but the no-escape group had no control over the shock. No
matter what those dogs did, the shock continued until it was terminated
by the panel press of the dog in the escape group. This ensured that
both groups of dogs received exactly the same duration and intensity of
shock, the only difference being that one group had the power to stop it
and the other did not. The eight dogs in the no-harness control group
received no shocks at this stage of the experiment.

The subjects in the escape and no-escape groups received 64 shocks
at about 90-second intervals. The escape group quickly learned to press
the side panels and terminate the shocks (for themselves and for the
no-escape group). Then, 24 hours later, all the dogs were tested in a
shuttle box similar to the one described above. There were lights on
either side of the box. When the lights were turned off on one side, an
electrical current would pass through the floor of the box 10 seconds
later. If a dog jumped the barrier within those 10 seconds, it escaped the
shock completely. If not, it would continue to feel the shock until it
jumped over the barrier or until 60 seconds of shock passed, at which
time the shock was discontinued. Each dog was given 10 trials in the
shuttle box.

Learning was measured by the following: (1) how much time it
took, on average, from the time the light in the box went out until the
dog jumped the barrier, and (2) the percentage of dogs in each group
that failed entirely to learn to escape the shocks. Also, the dogs in the
no-escape group received 10 additional trials in the shuttle box seven
days later to assess the lasting effects of the experimental treatment.

RESULTS

In the escape group, the time it took for the dogs to press the panel and
stop the shock quickly decreased over the 64 shocks. In the no-escape
group, panel pressing completely stopped after 30 trials.

Figure 1 shows the average time to escape for the three groups of
subjects over all the trials in the shuttle box. Remember, this was the
time between when the lights were turned off and when the animal
jumped over the barrier. The difference between the no-escape group
and the other two groups was statistically significant, but the small
difference between the escape group and the no-harness group was
insignificant. Figure 2 illustrates the percentage of subjects from each

discussion

Since the only difference between the escape and the no-escape groups
was the dogs' ability to actively terminate the shock, Seligman and Maier
concluded that it must have been this control factor that accounted for
the clear difference in the two groups' later learning to escape the shock
in the shuttle box. In other words, the reason the escape group subjects

1. Average time to escape in shuttle box.

2. Percent of subjects failing to learn to escape shock in shuttle box.
performed normally in the shuttle box was that they had learned in the
harness phase that their behavior was correlated with the termination of
the shock. Therefore, they were motivated to jump the barrier and
escape from the shock. For the no-escape group, the termination of
shock in the harness was independent of their behavior. Thus, since they
had no expectation that their behavior in the shuttle box would
terminate the shock, they had no incentive to attempt to escape. They
had, as Seligman and Maier had predicted, learned to be helpless.

Occasionally, a dog from the no-escape group made a successful
escape in the shuttle box. Following this, however, it reverted to
helplessness on the next trial. Seligman and Maier interpreted this to
mean that the animals’ previous ineffective behavior in the harness
prevented the formation of a new behavior (jumping the barrier) to
terminate shock in a new situation (the shuttle box), even after a
successful experience.

In their article, Seligman and Maier reported the results of a
subsequent experiment that offered some interesting additional findings.
In this second study, dogs were first placed in the harness-escape
condition where the panel press would terminate the shock. They were
then switched to the no-escape harness condition before receiving 10
trials in the shuttle box. These subjects continued to attempt to panel
press throughout all the trials in the no-escape harness and did not give
up as quickly as did those in the first study. Moreover, they all
successfully learned to escape and avoid shock in the shuttle box. This
indicated that once the animals had learned that their behavior could be
effective, subsequent experiences with failure were not adequate to
extinguish their motivation to change their fate.

SUBSEQUENT RESEARCH

Of course, Seligman wanted to do what you are probably already doing:
apply these findings to humans. In later research, he asserted that the
development of depression in humans involves processes similar to those
of learned helplessness in animals. In both situations there is passivity,
giving up and “just sitting there,” lack of aggression, slowness to learn
that a certain behavior is successful, weight loss, and social withdrawal.
Both the helpless dog and the depressed human patient have learned
from specific past experiences that their actions are useless. The dog was
unable to escape the shocks, no matter what it did, while the human had
no control over events such as the death of a loved one, an abusive
parent, the loss of a job, or a serious illness (see Seligman, 1975).

The learned helplessness that leads to depression in humans
can have serious consequences beyond the depression itself. Research
has demonstrated that the elderly who, for various reasons such as
nursing-home living, are forced to relinquish control over their daily
activities have poorer health and a greater chance of dying sooner than
those who are able to maintain a sense of personal power (for a
discussion of related research by Langer and Rodin see the reading on
the study). In addition, several studies have demonstrated that
uncontrollable stressful events can play a role in serious diseases such as
cancer. One such study found an increased risk of cancer in individuals
who in previous years had suffered the loss of a spouse, the loss of a
profession, or the loss of prestige (Horne and Picard, 1979). In
hospitals, patients are expected by the doctors and staff to be
cooperative, quiet, and willing to place their fates in the hands of the
medical authorities. Patients believe that they must follow doctors’ and
nurses’ instructions without question in order to recover as quickly as
possible. A prominent health psychologist has suggested that being a
“good hospital patient” implies that one must be passive and give up all
expectations of control. This actually may create a condition of learned
helplessness in the patients whereby they fail to exert control later when
control is both possible and desirable for continued recovery (Taylor,
1979).

As further evidence of the learned helplessness effect, consider the
following remarkable study by Finkelstein and Ramey (1977). Groups
of human infants had rotating mobiles mounted over their cribs. One
group of infants had special pressure-sensitive pillows so that by moving
their heads, they could control the rotation of the mobile. Another
group of infants had the same mobiles, but these were programmed to
turn randomly without any control by the infants. After a two-week
exposure to the mobile for 10 minutes each day, the control-pillow
group had become very skilled at moving their heads to make the
mobiles turn. However, the most important finding came when the
no-control group of infants was later given the same control pillows and
an even greater amount of learning time than the first group. The
infants failed entirely to learn to control the rotation of the mobiles.
Their experience in the first situation had taught them that their
behavior was ineffective, and this knowledge transferred to the new
situation where control was possible. In terms of moving mobiles, the
infants had learned to be helpless.

CONCLUSION

In conclusion, it is important to return to the issue of experimental
ethics. For most of us, it is difficult to read about animals, especially
dogs, being subjected to painful shocks in a psychology laboratory. Over
the years, standards have been developed to ensure that laboratory
animals are treated humanely (see the discussion of this issue in the preface of this book). However, there are many, both within and outside the scientific professions, who believe these standards to be inadequate. Some advocate the complete elimination of animal research in psychology, medicine, and all the sciences. Whatever your personal stand on this issue, the question you should be asking is this: Do the findings from the research extend our knowledge, reduce human suffering, and improve the quality of life sufficiently to justify the methods used to carry out the study?

Ask yourself that question about this study by Seligman and Maier. What they found were the beginnings of a theory to explain why some people become helpless, hopeless, and depressed. Seligman went on to develop a widely accepted model of the origins of and treatments for depression. Over the years his theory has been refined and detailed so that it applies more accurately to types of depression that occur under well-defined conditions. For example, individuals are most likely to become depressed if they have learned to attribute their lack of control to causes that are (1) permanent rather than temporary, (2) related to factors within their own personality (instead of situational factors), and (3) pervasive across many areas of their life (see Abramson, Seligman, and Teasdale, 1978). By understanding this, therapists and counselors have become better able to understand, intervene in, and treat serious depression.

Does this knowledge justify the methods used in the early research on learned helplessness? You decide.


RACING AGAINST YOUR HEART

Who are you? If someone were to ask you that question, you would probably respond by describing some of your more obvious or dominant characteristics. Such characteristics, often referred to as traits, are important in making you the unique person that you are. Traits are assumed to be consistent across situations and over time. The psychologists who have supported the trait theory of personality (and not all have) have proposed various groups of traits that exist in all of us, but in different amounts. An example of a trait that appears to influence a great deal of our behavior is that of introversion-extroversion. Introverts tend to be reserved, withdrawn, and more focused on ideas than social relations. Extroverts are more sociable and friendly, and are more involved in events outside the self. You probably have a sense of which you are (most of the time), and you can also place family and friends in one category or the other. This trait, which is only one of many, allows us to predict something about a person's behavior in a given situation. The predictive ability of personality traits is what makes them interesting to most psychologists. Therefore, it is easy to imagine how dramatically this interest would increase if certain personality characteristics were found to predict how healthy you will be or even predict your chances of dying from a heart attack.

Well, most of you are probably aware of one group of characteristics related to health, popularly known as the "Type A personality." This name is somewhat inaccurate however, because in the scientific research, Type A refers to a specific pattern of behavior rather than the overall personality of an individual. This behavior pattern was first reported in the late 1950s by two cardiologists, Meyer Friedman and Ray Rosenman, and it has had a huge influence in how we view the causes of certain illnesses.

The story of where these doctors obtained the idea for their research demonstrates how careful observation of small details can sometimes lead to major scientific breakthroughs. Dr. Friedman was having the furniture in his office waiting room reupholstered. The upholsterer pointed out that the material on the couches and chairs had not worn out in a normal way. Instead, the front edges of the seat cushions had worn away faster than the rest had. It was as if Dr. Friedman's cardiac patients were literally sitting on the edge of their