Congratulations on your course selection of AP Psychology. You have made a wise yet demanding choice. You will have the opportunity to find out what makes people tick and have a better understanding of yourself as well. I have high expectations for this class and demand students who are willing to put in the required effort necessary to succeed. My goal is for every student enrolled in the class to pass the AP Exam in May and earn college credit. That requires dedication, enthusiasm, and hard work on both our parts. I will do my job and I expect you to do yours. Because of the short amount of time before the AP Exam and the extensive material we must cover, the work must begin now. Most assignments will be due the 1st day of school, except the "About Me" essay. I am looking forward to an outstanding year with you. Have a great and safe summer!

Summer Assignment:

☐ Part 1: “About Me” email (due August 1st) sent to Rachel.blessing@dc.gov.

☐ Part 2: Actively read and annotate 14 studies from 40 Studies that Changed Psychology. As you read, please answer (by hand) the corresponding questions for each study. I will check the study guides and there will be an assessment during the first week of school.

- 1. "One Brain or Two?: The Split Brain in Man", Gazzaniga, M.S.
- 4. "Watch out for the Visual Cliff!", Gibson, E.J.
- 5. "What you see is what you’ve learned: Some observations regarding the experiences and behavior of the BaMbuti Pygmies", Turnbull, C.M.
- 10. "Little Emotional Albert: Conditioned emotional responses", Watson, J.B. & Rayner, R.
- 16. "Thanks for the Memories! Leading questions and the eyewitness report", Loftus, E.F.
- 17. "Discovering Love", Harlow, H.F.
- 19. "How Moral are You? The development of children’s orientation toward a moral order", Kohlberg, L.
- 21. "I can see it all over your face! Constants across cultures in the face of emotion", Ekman, P.
- 23. "Thoughts Out of Tune: Cognitive consequences of forced
compliance", Festinger, L.
  o 24. "Are You the Master of Your Fate? Generalized expectancies for internal versus external control of reinforcement", Rotter, J.B.
  o 36. "The Power of Conformity", Asch, S.E.
  o 37. "To Help or Not to Help: Bystander intervention in emergencies", Darley, J.M.
  o 38. "Obey at Any Cost?", Milgram, S.

A good way to complete these assignments before the end of the summer is complete 2 studies a week. This should take about 1-1.5 hours each week.
Part 1: This is the only assignment DUE during the summer

Your first assignment due on or before 8/1 via e-mail is an introduction to yourself. Send this email from an address you will check often over the summer.

Draft an e-mail using the following rules:

a. Use well-written, complete sentences! Do not abbreviate words. Use spell check. This is a professional communication similar to what you would use with a college professor or boss.

b. Address it to Rachel.blessing@dc.gov.

c. Make to subject: “AP Psychology: Introduction to <Your name here>”

d. Begin your e-mail with Ms. Blessing or Dear Ms. Blessing.

e. Introduce yourself and tell me a little about yourself, like:

a. What do you like to do (hobbies, music, sports, instruments played, other interests)

b. Do you have a job? What is it? Do you like it, or do you have your sights set on other things in the future?


d. What was the last book you read FOR FUN?

e. Are you taking any other AP classes? Are you active in extracurricular activities in school/religious institutions? What are they? How are you involved?

f. How do you think you will prioritize your time?

g. Why are you taking this class? What are you looking forward to in this class? What things about psychology interest you or puzzle you?

h. Have you had any experiences with people who act “abnormal”? What did they do? What does “abnormal” mean to you? Was there a reason for their actions?

i. Any additional information you would like to share?

f. End your email with a formal closing: “Cordially”, “Sincerely”, “With regards”, “Your student” etc, and add your name as you would if you signed a letter.
1. What is the name of this study? Who is responsible for this study?

2. What is the corpus collosum?

3. How did Gazzaniga get his subjects?

4. What are the theoretical propositions?

5. Briefly describe the three tests administered:

6 & 7. Briefly state the results of these tests:

8. Briefly describe the responsibilities of each side of the brain:

9. How does this study help us treat victims of brain damage.

10. What is the major criticism of this study?
Study # 4  
Watch Out for the Visual Cliff  

Name ____________________________

1. What is the name of this study, and who is responsible for it?

2. What is the central question to this study?

3. What is the theoretical proposition?

4. Briefly describe the method:

5. What were the results of the human children?

6. What were the differing animal results?

7. How does human depth perception differ from animal depth perception?

8. What is the biggest criticism of this study?

9. What was so significant of this study?

10. Why do you think virtual reality is an effective way to study depth perception in autistic children?
Study # 5
What You See is What You’ve Learned

1. What is the name of this study, and who is responsible for this study?

2. Define Sensation and Perception:

3. What is figure ground?

4. What is size constancy?

5. What is the question that this study addresses?

6. Briefly discuss Turnbull’s method:

7. Discuss Kenge’s initial reaction to the buffalo:

8. How did Kenge react when they drove toward the buffalo?

9. What are some factors that affect the acquisition of perceptual abilities?

10. Briefly describe the kitten study, and the results.
Study # 10
Little Emotional Albert

1. What is the name of this study, and who is responsible for it?

2. What does Watson believe about all human behavior?

3. What is Watson’s basic theoretical proposition?

4. Describe Albert, and his initial fears (or non-fears):

5. Briefly describe the method Watson used to produce fear in Albert:

6. What other items did this fear generalize to?

7. What are Watson’s goals in this study?

8. How did Watson defend his theory?

9. State two criticisms of this study:

10. How does this study relate to phobias?
Study # 13
What You Expect is What You Get

1. What is the name of the study and the names of the people responsible for the study?

2. What is self-fulfilling prophecy?

3. What was Rosenthal’s theoretical proposition?

4. How were the students selected that were classified as the “top 20%”?

5. Briefly state the results of the study:

6 & 7. What were the four reasons Rosenthal gave as to why the younger students’ results were so different from the older students?

8. What did Chaiken, Sigler, and Derlega find in their study?

9. What is a criticism of IQ tests, and why?

10. Briefly discuss one of the recent applications.
Study # 16
Thanks for the Memories

1. What is the name of this study and who is responsible for it?

2. What has Loftus' research demonstrated?

3. What did Loftus hypothesize?

4. Briefly describe the method and results of experiment 1.

5. Briefly describe the method and results of experiment 2.

6. Briefly describe the method and results of experiment 3.

7. Briefly describe the method and results of experiment 4.

8. What is Loftus' theory of why many eyewitness testimonies are incorrect?
9. What is one criticism of Loftus' work?

10. How does Loftus feel about repressed memories?
Study # 17
Discovering Love

1. Why did Harlow use rhesus monkeys in his study?

2. What was Harlow’s theoretical proposition?

3. Describe the two surrogate mothers.

4. What were the three different tests that he subjected the monkeys to?

5 & 6. What were the results of Harlow’s study?

7. In what way did Harlow think he could apply his results to humans?

8. State two criticisms of this study.

9. What does his study tell us about the treatment of children in orphanages?

10. Briefly discuss one recent application.
Study # 19

How Moral Are You?

1. Who is the psychologist associated with this study?
2. Define morals.

3. Briefly explain what is meant by “structural moral stages.”

4. Briefly Explain how these moral stages were studied.

5. Briefly explain each of the stages in moral development.
   a. Stage 1
   b. Stage 2
   c. Stage 3
   d. Stage 4
   e. Stage 5
   f. Stage 6

6. Explain the three major criticisms against the stage theory of moral development.
Study # 21
I Can See It All Over Your Face!

1. What is the name of the study and who is responsible for it?

2. What was significant of the South fore people?

3. What was the theoretical proposition?

4. Briefly explain the method:

5. What were the results of this study?

6. What two emotions are easily confused, and why?

7. What implications does this study have for the nature/nurture debate?

8. What appears to be the six basic emotions?

9. How do facial expressions relate to survival? Give an example.

10. Explain the "facial feedback theory": 
1. What is the name of the study, and who is responsible for it?

2. What is the theory of cognitive dissonance? Cognitive dissonance just seems like a technical word for the our term of ________?

3. What are Festinger's theoretical propositions?

4 & 5. Briefly describe the experiment.

6. What was the result of the experiment?

7. What is the relationship between reward and cognitive dissonance?

8 & 9. What are Cooper and Fazio's four steps that apply to cognitive dissonance?

10. What did one study reveal about reward and hard work?
Study # 24
Are You the Master of Your Fate?

1. What is the name of this study, and who is responsible for this study?

2. Differentiate between external locus of control and internal locus of control:

3. What were Rotter's theoretical propositions?

4. Briefly describe Rotter's scale.

5 & 6. Discuss the results with respect to gambling, hospitalization, political activism, persuasion, smoking, achievement motivation, and conformity.

7. What three factors did Rotter believe were causes of the differing loci of control?

8. How does parenting style correlate with locus of control?

9. How does belief in a higher being affect locus of control?

10. Can locus of control change? Example:
Study # 36
The Power of Conformity

1. What is the name of this study, and who is responsible for it?

2. What are social norms?

3. Briefly describe the method: Honestly, what would you have done?

4. What were the results of the study?

5. Why were Asch’s results so important? (2 answers)

6 & 7. What are the four other factors that affect conformity?

8. What is the criticism of Asch’s study?

9. What is the argument against this criticism?

10. What are the results of Bond and Smith’s study?
Study #37

To Help Or Not To Help

1. Explain the case that brought about research in this area.

2. Who are the psychologists associated with this research?

3. What is the theory that these psychologists are testing?

4. Briefly explain how they tested this theory.

5. Briefly explain the results of their experiment.

6. Explain the terms diffusion of responsibility and evaluation apprehension.

7. What are the five steps that a person goes through before deciding to help?
8. Did they find in their later studies that being within close proximity to a group changed a person's willingness to act or help?

9. What is the one rule that we should try to live by when it comes to deciding whether to act or not act in emergencies?
Name________________________

Study # 38
Obey At Any Cost?

1. What is the name of this study, and who is responsible for this study?

2. What is Milgram’s main proposition?

3. Briefly describe the shock generator:

4. How many people were active in each experiment session, and what were their roles?

5. How did Milgram measure the subjects’ behaviors?

6. What were the results of the study?

7. What behaviors did the subjects display while administering painful shocks?

8. What were some of the rationales that subjects gave for their behaviors?

9. What are the three factors that affect conformity?

10. State two criticisms of this study:
You are probably aware that the two halves of your brain are not the same and that they perform different functions. For one thing, the left side of your brain is responsible for movement in the right side of your body, and vice versa. Even beyond this, though, the two brain hemispheres appear to have even greater specialized abilities.

It has come to be rather common knowledge that, for most of us, the left brain controls the ability to use language while the right is involved more in spatial relationships, such as those needed for artistic activities. It is well known that stroke or accident victims who suffer damage to the left side of the brain will usually lose their ability to speak (often this skill returns with practice and training). Many people believe that each half, or "hemisphere," of your brain may actually be a completely separate mental system with its own individual abilities for learning, remembering, perceiving the world, and even feeling emotions. The concepts underlying this popular awareness are the result of many years of rigorous scientific research on the effects of splitting the brain into two separate hemispheres.

Research in this area was pioneered by Roger W. Sperry (1913-1994), beginning about 15 years prior to the article examined in this chapter. In his early work with animal subjects, Sperry made many remarkable discoveries. For example, consider a cat that has had surgery to cut the connection between the two halves of its brain and to alter its optic nerves so that its left eye only transmitted information to the left hemisphere and the right eye only to the right hemisphere. Following surgery, the cat appeared to behave normally and exhibited virtually no ill effects. Then the cat's right eye was covered, and the cat learned a new behavior, such as walking through a short maze to find food. After the cat became skilled at maneuvering through the maze, the eye cover was shifted to its left eye. Now when the cat was placed in the maze, its left brain had no idea where to turn and the animal had to relearn the entire maze from the beginning.

Sperry conducted many related studies over the next 30 years and in 1981 received the Nobel Prize for his work on the specialized abilities of the two halves of the brain. When his research endeavors turned to human subjects in the early 1960s, he was joined in his work by Michael Gazzaniga. Although Sperry is considered the founder of split-brain research, Gazzaniga's article has been chosen because it is a clear, concise summary of their early collaborative work with human subjects and is cited consistently in many general psychology texts. Its selection is in no way intended to overlook or overshadow either Sperry's leadership in this field or his great contributions. Gazzaniga, in large part, owes his early research, and his ongoing leadership in the area of hemispheric specialization, to Roger W. Sperry (see Sperry, 1968; Puente, 1995).

To understand split-brain research, some knowledge of human physiology is required. The two hemispheres of your brain are in constant communication with one another via the corpus callosum, a structure made up of about 200 million nerve fibers. If your corpus callosum is cut, this major line of communication is disrupted, and the two halves of your brain must then function independently. So, if we want to study each half of your brain separately, all we need to do is surgically sever your corpus callosum.

But can scientists divide the brains of humans? This sounds like psychology by Dr. Frankenstein! Obviously, research ethics would never allow such drastic methods simply for the purpose of studying the specialized abilities of the brain's two hemispheres. However, in the late 1950s, the field of medicine provided psychologists with a golden opportunity. In some people with very rare and very extreme cases of uncontrollable epilepsy, seizures could be virtually eliminated by surgically severing the corpus callosum. This operation was (and is) extremely successful, as a last resort, for those patients who cannot be helped by any other means. When this article was written in 1966, 10 such operations had been undertaken, and four of the patients consented to participate in examination and testing by Sperry and Gazzaniga to determine how their perceptual and intellectual skills were affected as a result of this surgical treatment.

THEORETICAL PROPOSITIONS

The researchers wanted to explore the extent to which the two halves of the human brain are able to function independently, and whether they have separate and unique abilities. If the information traveling between the two halves of your brain is interrupted, would the right side of your body suddenly be unable to coordinate with the left? If language is controlled by the left side of the brain, how would your ability to speak and understand words be affected by this surgery? Would thinking and reasoning processes exist in both halves separately? If the brain is really two separate brains, would a person be capable of functioning normally when these two brains are no longer able to communicate? Since we receive sensory input from both the right and the left, how would the
senses of vision, hearing, and touch be affected? Sperry and Gazzaniga attempted to answer these and many other questions in their studies of split-brain individuals.

METHOD

The researchers developed three types of tests to explore a wide range of mental (cognitive) capabilities of the patients. One was designed to examine visual abilities. They devised a technique to allow a picture of an object, a word, or parts of words to be transmitted only to the visual area (called a "field") in either the right- or left-brain hemisphere, but not to both. Normally, both of your eyes send information to both sides of your brain. However, with exact placement of items or words in front of you, and with your eyes fixed on a specific point, images can be fed to only the right or the left visual field of your brain.

Another testing situation was designed for tactile (touch) stimulation. Here, participants could feel, but not see an object, a block letter, or even a word in cutout block letters. The apparatus consisted of a screen with a space under it for the subject to reach through and touch the items without being able to see them. The visual and the tactile devices could be used simultaneously so that, for example, a picture of a pen could be projected to one side of the brain and the same object could be searched for by either hand among various objects behind the screen (see Figure 1).

Finally, testing auditory abilities was somewhat more tricky. When sound enters either of your ears, sensations are sent to both sides of your brain. Therefore, it is not possible to limit auditory input to only one side of the brain even in split-brain patients. However, it is possible to limit the response to such input to one brain hemisphere. Here is how this was done. Imagine that several common objects (a spoon, a pen, a marble) are placed into a cloth bag, and you are then asked, verbally, to find certain items by touch. You would probably have no trouble doing so. If you place your left hand in the bag, it is being controlled by the right side of your brain, and vice versa. Do you think either side of your brain could do this task alone? As you will see in a moment, both halves of the brain are not equally capable of responding to this auditory task. What if you are not asked for specific objects, but are simply requested to reach into the bag and identify objects by touch? Again, this would not be difficult for you, but it would be quite difficult for a split-brain patient.

Gazzaniga combined all of these testing techniques to reveal some fascinating findings about how the brain functions.

RESULTS

First of all, you should know that following this radical brain surgery, the patients' intelligence level, personality, typical emotional reactions, and so on were relatively unchanged. They were very happy and relieved that they were now free of seizures. Gazzaniga reported that one patient, while still groggy from surgery, joked that he had "a splitting headache." When testing began, however, these subjects demonstrated many unusual mental abilities.
Visual Abilities

One of the first tests involved a board with a horizontal row of lights. When a patient sat in front of this board and stared at a point in the middle of the lights, the bulbs would flash across both the right and left visual fields. However, when the patients were asked to explain what they saw, they said that only the lights on the right side of the board had flashed. Next when the researchers flashed only the lights on the left side of the visual field, the patients claimed to have seen nothing. A logical conclusion from these findings was that the right side of the brain is blind. Then an amazing thing happened. The lights were flashed again, only this time the patients were asked to point to the lights that had flashed. Although they had said they only saw the lights on the right, they pointed to all the lights in both visual fields. Using this method of pointing, it was found that both halves of the brain had seen the lights and were equally skilled in visual perception. The important point here is that when the patients failed to say that they had seen all the lights, it was not because they didn’t see them, but because the center for speech is located in the brain's left hemisphere. In other words, in order for you to say you saw something, the object has to have been seen by the left side of your brain.

Tactile Abilities

You can try this test yourself. Put your hands behind your back. Then have someone place familiar objects (a spoon, a pen, a book, a watch) in either your right or your left hand and see if you can identify the object. You would not find this task to be very difficult, would you? This is basically what Sperry and Gazzaniga did with the split-brain patients. When an object was placed in the right hand in such a way that the patient could not see or hear it, messages about the object would travel to the left hemisphere and the patient was able to name the object and describe it and its uses. However, when the same objects were placed in the left hand (connected to the right hemisphere), the patients could not name them or describe them in any way. But did the patients know what the object was? In order for the researchers to find out, they asked the subjects to match the object in their left hand (without seeing it, remember) to a group of various objects presented to them. This they could do as easily as you or I. Again, this places verbal ability in the left hemisphere of the brain. Keep in mind that the reason you are able to name unseen objects in your left hand is that the information from the right side of your brain is transmitted via the corpus callosum to the left side, where your center for language says “that's a spoon!”

Visual Plus Tactile Tests

Combining these two types of tests provided support for the findings above and also offered additional interesting results. If subjects were shown a picture of an object to the right hemisphere only, they were unable to name it or describe it. In fact, there might be no verbal response at all or even a denial that anything had been presented. But if the patients were allowed to reach under the screen with their left hand and touch a selection of objects, they were always able to find the one that had been presented visually.

The right hemisphere was found to be able to think about and analyze objects as well. Gazzaniga reported that when the right hemisphere was shown a picture of an item such as a cigarette, the subjects could touch 10 objects behind the screen that did not include a cigarette, and select an object that was most closely related to the item pictured-in this case an ashtray. He went on to explain:

Oddly enough, however, even after their correct response, and while they were holding the ashtray in their left hand, they were unable to name or describe the object or the picture of the cigarette. Evidently, the left hemisphere was completely divorced, in perception and knowledge, from the right. (p. 26)

Other tests were conducted to shed additional light on the language-processing abilities of the right hemisphere. One very famous, ingenious, and revealing use of the visual apparatus came when the word HEART was projected to the patients so that HE was sent to the right visual field and ART was sent to the left. Now, keeping in mind (your connected mind) the functions of the two hemispheres, what do you think the patients verbally reported seeing? If you said ART, you were correct. However, and here is the revealing part, when the subjects were presented with two cards with the words HE and ART printed on them and asked to point with the left hand to the word they had seen, they all pointed to HE! This demonstrated that the right hemisphere is able to comprehend language, although it does so in a different way from the left: in a nonverbal way.

The auditory tests conducted with the patients produced similar results. When patients were asked to reach with their left hand into a grab bag hidden from view and pull out certain specific objects (a watch, a marble, a comb, a coin) they had no trouble. This demonstrated that the right hemisphere was comprehending language. It was even possible to describe a related aspect of an item with the same accurate results. An example given by Gazzaniga was when the patients were asked to find in a grab bag full of plastic fruit "the fruit monkeys
like best," they retrieved a banana. Or when told "Sunkist sells a lot of them," they pulled out an orange. However, if these same pieces of fruit were placed out of view in the patients' left hand, they were unable to say what they were. In other words, when a verbal response was required, the right hemisphere was unable to speak.

One last example of this amazing difference between the two hemispheres involved plastic block letters on the table behind the screen. When patients were asked to spell various words by feel with the left hand they had an easy time doing so. Even if three or four letters that spelled specific words were placed behind the screen, they were able, left-handed, to arrange them correctly into words. However, immediately after completing this task, the subjects could not name the word they had just spelled. Clearly, the left hemisphere of the brain is superior to the right for speech (in some left-handed people, this is reversed). But in what skills, if any, does the right hemisphere excel? Sperry and Gazzaniga found in this early work that visual tasks involving spatial relationships and shapes were performed with greater proficiency by the left hand (even though these patients were all right-handed). As can be seen in Figure 2, copying three-dimensional drawings (using the pencil behind the screen) was much more successful with the left hand.

![Figure 2](image-url)

**FIGURE 2** Drawings made by split-brain patients. (Adapted from "The Split Brain in Man," by Michael S. Gazzaniga.)

Finally, the researchers wanted to explore emotional reactions of split-brain patients. While performing visual experiments, Sperry and Gazzaniga suddenly flashed a picture of a nude woman to either the left or right hemisphere. In one instance, when this picture was shown to the left hemisphere of a female patient:

> She laughed and verbally identified the picture of a nude. When it was later presented to the right hemisphere, she said ... she saw nothing, but almost immediately a sly smile spread over her face and she began to chuckle. Asked what she was laughing at, she said: "I don't know ... nothing ... oh-that funny machine." Although the right hemisphere could not describe what it had seen, the sight nevertheless elicited an emotional response like the one evoked in the left hemisphere. (p. 29)

**DISCUSSION**

The overall conclusion drawn from the research reported in this article was that there are two different brains within each person's cranium, each with complex abilities. Gazzaniga notes the possibility that if our brain is
really two brains, then perhaps we have the potential to process twice as much information if the two halves are divided. Indeed, there is some research evidence to suggest that split-brain patients have the ability to perform two cognitive tasks as fast as a normal person can carry out one.

SIGNIFICANCE OF FINDINGS

These findings and the subsequent research carried out by Sperry and Gazzaniga and others are extremely significant and far-reaching. We now know that the two halves of your brain have many specialized skills and functions. Your left brain is "better" at speaking, writing, mathematical calculation, and reading and is the primary center for language. Your right hemisphere, however, possesses superior capabilities for recognizing faces, solving problems involving spatial relationships, symbolic reasoning, and artistic activities.

Our increased knowledge of the specialized functioning of the brain allows us to treat victims of stroke or head injury more effectively. By knowing the location of the damage, we can predict what deficits are likely to exist as the patient recovers. Through this knowledge, therapists can employ appropriate relearning and rehabilitation strategies to help patients recover as fully and quickly as possible.

Gazzaniga and Sperry, after years of continuous work in this area, concluded that each hemisphere of your brain really is a mind of its own. In a later study, split-brain patients were tested on much more complex problems than have been discussed here. One question asked was, "What profession would you choose?" A male patient verbally (left hemisphere) responded that he would choose to be a draftsman, but his left hand (right hemisphere) spelled by touch in block letters automobile race (Gazzaniga & LeDoux, 1978). In fact, Gazzaniga has taken this theory a step further. He now maintains that even in people whose brains are normal and intact, there may not be complete communication between the two hemispheres (Gazzaniga, 1985). For example, if certain bits of information, such as those forming an emotion, are not stored in a language format, the left hemisphere may not have access to it. The result of this is that you may feel sad and not be able to say why. Since this is an uncomfortable cognitive situation, the left hemisphere may try to find a verbal reason to explain the sadness (after all, language is its main job). However, since your left hemisphere does not have all the necessary data, its explanation may actually be wrong!

CRITICISMS

The findings from the split-brain studies carried out over the years by Sperry, Gazzaniga, and others have rarely been disputed. The main body of criticism about this research has focused instead on the way the idea of right- and left-brain specialization has filtered down to popular culture and the media.

There is now a widely believed myth that some people are more right-brained or more left-brained, or that one side of your brain needs to be developed in order for you to improve certain skills. Jarre Levy, a psychobiologist at the University of Chicago, has been in the forefront of scientists who are trying to dispel the notion that we have two separately functioning brains. She claims that it is precisely because each hemisphere has separate functions that they must integrate their abilities instead of separating them, as is commonly believed. Through such integration, your brain is able to perform in ways that are greater than and different from the abilities of either side alone.

When you read a story, for example, your right hemisphere is specializing in emotional content (humor, pathos), picturing visual descriptions, keeping track of the story structure as a whole, and appreciating artistic writing style (such as the use of metaphors). While all this is happening, your left hemisphere is understanding the written words, deriving meaning from the complex relationships among words and sentences, and translating words into their phonetic sounds so that they can be understood as language. The reason you are able to read, understand, and appreciate a story is that your brain functions as a single, integrated structure (Levy, 1985).

In fact, Levy explains that no human activity uses only one side of the brain. "The popular myths are interpretations and wishes, not the observations of scientists. Normal people have not half a brain, nor two brains, but one gloriously differentiated brain, with each hemisphere contributing its specialized abilities" (Levy, 1985, p. 44).

RECENT APPLICATIONS

The continuing influence of Sperry's and Gazzaniga's split-brain research echoes the quote from Levy. A review of recent medical and psychological literature reveals numerous articles in various fields referring to the early work and methodology of Roger Sperry as well as to more recent findings by Gazzaniga and his associates. For
example, a study from 1998 conducted in France (Hommet & Billard, 1998) has questioned the very foundations of Sperry's and Gazzaniga's studies, namely, that severing the corpus callosum actually divides the hemispheres of the brain. The French study found that children who were born without a corpus callosum (a rare brain malformation) demonstrated that information was being transmitted between their brain hemispheres. The researchers concluded that significant connections other than the corpus callosum must exist in these children. Whether such subcortical connections are indeed present in split-brain individuals remains unclear.

Later that same year, a study was published by a team of neuropsychologists that included Gazzaniga, from several prestigious research institutions in the United States (University of Texas, Stanford, Yale, and Dartmouth). The study demonstrated that split-brain patients may routinely perceive the world differently from the rest of us (Parsons, Gabrieli, Phelps, & Gazzaniga, 1998). The researchers found that when subjects were asked to identify whether drawings presented to only one brain hemisphere were drawn by right- or left-handed people, the split-brain patients were only able to do so correctly when the handedness of the artist was the opposite of the hemisphere to which the picture was projected. Normal control subjects were correct regardless of which hemisphere "saw" the drawings. This implies that communication between your brain hemispheres is necessary for imagining or simulating in your mind the movements of others, that is, "putting yourself in their place" in order to perceive their actions correctly.

Finally, researchers continue to explore the idea that our two brain hemispheres have separate, yet distinct consciousnesses. One such study (Morin, 2001), focused on the idea of inner speech (internal dialogue with and about yourself) as a signpost for self-awareness and consciousness. Morin proposed that your self-awareness may be quite different in your right and left cerebral hemispheres due to the greater ability of the left brain for language. However, the right brain may have the ability to perceive "the self" in a physical or bodily way, rather than through an awareness of mental processes. Therefore, Morin suggested an alternative interpretation of commissurotomy [surgical separation of the corpus callosum] according to which split-brain patients exhibit two uneven streams of self-awareness: a "complete" one in the left hemisphere and a "primitive" one in the right hemisphere" (p. 594).

Some have carried this idea a step further and applied it to some psychological disorders, such as dissociative, multiple personality disorder (e.g., Schiffer, 1996). The idea behind this notion is that in some people with intact, "nonsplit" brains, the right hemisphere may be able to function at a greater-than-normal level of independence from the left, and may even take control of a person's consciousness for periods of time. Is it possible that multiple personality disorder might be the expression of hidden personalities contained in our right hemisphere? It's something to think about ... with both of your hemispheres.

One of the most often told anecdotes in psychology concerns a man called S. B. (initials used to protect his privacy). S. B. had been blind his entire life until the age of 52, when a newly developed operation (the now-common corneal transplant) was performed on him and his sight was restored. However, S. B.'s new ability to see did not mean that he automatically perceived what he saw the way the rest of us do. One important example of this became evident soon after the operation, before his vision had cleared completely. S. B. looked out his hospital window and was curious about the small objects he could see moving on the ground below. He began to crawl out on his window ledge, thinking he would lower himself down by his hands and have a look. Fortunately, the hospital staff prevented him from trying this. He was on the fourth floor, and those small moving things were cars! Even though S. B. could now see, he was not able to perceive depth.

Our visual ability to sense and interpret the world around us is an area of interest to experimental psychologists. And within this lies the central question of whether such abilities are inborn or learned. As you will recall from the previous article, Turnbull addressed this issue in his report of the Bambuti Pygmy Kenge's inability to perceive the true size of objects at great distances. Kenge had the ability to perceive depth per se, but because his life had been spent in dense jungle, he did not have the experiences necessary to develop the capacity for the visual skill of size constancy. While Turnbull's discoveries were enlightening to the scientific community, the observational nature of his work did not allow for the systematic study of visual perception. In order to determine accurately if certain perceptual skills are learned or inborn, research would have to move into the laboratory.

Many psychologists believe that our most important visual skill is depth perception. You can imagine how difficult, and probably impossible, survival would be if you could not perceive depth. You would run into things, be unable to judge how far away a predator was, or step right off cliffs. Therefore, it might be logical to assume that depth perception is an inborn survival mechanism that does not require experience to develop. However, as Eleanor Gibson and Richard Walk point out in their article, "Human infants at the creeping and toddling stage are notoriously prone to falls from more or less high places. They must be kept from going over the brink by side panels on
their cribs, gates on stairways, and the vigilance of adults. As their muscular coordination matures, they begin to avoid such accidents on their own. Common sense might suggest that the child learns to recognize falling-off places by experience—that is, by falling and hurting himself" (p. 64).

These researchers wanted to study this visual ability of depth perception scientifically in the laboratory. To do this, they conceived of and developed an experimental device they called the "visual cliff."

THEORETICAL PROPOSITIONS

If you wanted to find out at what point in the developmental process animals or people are able to perceive depth, one way to do this would be to put them on the edge of a cliff and see if they are able to avoid falling off. This is a ridiculous suggestion because of the ethical considerations of the potential injury to subjects who were unable to perceive depth (or more specifically, height). The "visual cliff" avoids this problem because it presents the subject with what appears to be a drop-off, when no drop-off actually exists. Exactly how this is done will be explained in a moment, but the importance of this apparatus lies in the fact that human or animal infants can be placed on the visual cliff to see if they are able to perceive the drop-off and avoid it. If they are unable to do this and step off the "cliff," there is no danger of falling.

Gibson and Walk took a "nativist" position on this topic, which means that they believed that depth perception and the avoidance of a drop-off appear automatically as part of our original biological equipment and are not, therefore, products of experience. The opposing view, held by empiricists, contends that such abilities are learned. Gibson and Walk's visual cliff allowed them to ask these questions: At what stage in development can a person or animal respond effectively to the stimuli of depth and height? And do these responses appear at different times with animals of different species and habitats?

METHOD

The visual cliff consisted of a table about 4 feet high with a top made from a piece of thick, clear glass (Figures 1 and 2). Directly under half of the table (the shallow side) is a solid surface with a red-and-white checkered pattern. Under the other half is the same pattern, but it is down at the level of the floor underneath the table (the deep side). At the edge of the shallow side, then, is the appearance of a sudden drop-off to the floor although, in reality, the glass extends all the way across. Between the shallow and the deep side is a center board about a foot wide. The process of testing infants using this device was extremely simple.

The subjects for this study were 36 infants between the ages of 6 months and 14 months. The mothers of the infants also participated. Each infant was placed on the center board of the visual cliff and was then called by the mother first from the deep side and then from the shallow side.
In order to compare the development of depth perception in humans with that in other baby animals, the visual cliff allowed for similar tests with other species (without a mother’s beckoning, however). These animals were placed on the center board and observed to see if they could discriminate between the shallow and deep sides and avoid stepping off “the cliff.” You can imagine the rather unique situation in the psychology labs at Cornell University when the various baby animals were brought in for testing. They included chicks, turtles, rats, lambs, kids (baby goats, that is), pigs, kittens, and puppies. One has to wonder if they were all tested on the same day!

Remember, the goal of this research was to examine whether depth perception is learned or innate. What makes this method so ingenious is that it allowed that question to at least begin to be answered. After all, infants, whether human or animal, cannot be asked if they perceive depth, and, as mentioned above, they cannot be tested on real cliffs. In psychology, many answers are found through the development
of new methods for studying the questions. And the results of Gibson and Walk's early study provide an excellent example of this.

RESULTS AND DISCUSSION

Nine children in the study refused to move off the center board. This was not explained by the researchers, but perhaps it was just infant stubbornness. When the mothers of the other 27 called to them from the shallow side, all the infants crawled off the board and crossed the glass. Only three of them, however, crept, with great hesitation, off the brink of the visual cliff when called by their mothers from the deep side. When called from the cliff side, most of the children either crawled away from the mother on the shallow side or cried in frustration at being unable to reach the mother without moving over the cliff. There was little question that the children were perceiving the depth of the cliff. "Often they would peer down through the glass of the deep side and then back away. Others would pat the glass with their hands, yet despite this tactile assurance of solidity would refuse to cross" (p. 64).

Do these results prove that humans' ability to perceive depth is innate rather than learned? Well, obviously it does not, since all the children in this study had at least 6 months of life experience in which to learn about depth through trial and error. However, human infants cannot be tested prior to 6 months of age because they do not have adequate locomotor abilities. It was for this reason that Gibson and Walk decided to test various other animals as a comparison. As you know, most nonhuman animals gain the ability to move about much sooner than humans. The results of the animal tests were extremely interesting, in that the ability of the various animals to perceive depth developed in relation to when the species needed such a skill for survival.

For example, baby chickens must begin to scratch for their own food soon after hatching. When they were tested on the visual cliff at less than 24 hours of age they never made the mistake of stepping off onto the deep side.

Kids and lambs are able to stand and walk very soon after birth. From the moment they first stood up, their response on the visual cliff was as accurate and predictable as that of the chicks. Not one error was made. When one of the researchers placed a 1-day-old baby goat down on the deep side of the glass, it became frightened and froze in a defensive posture. If it was then pushed over toward the shallow side, it would relax and jump forward onto the seemingly solid surface. This indicated that the visual sense was in complete control and that the animals' ability to feel the solidity of the glass on the deep side had no effect on the response.

For the rats, it was a different story. They did not appear to show any significant preference for the shallow side of the table. Why do you suppose this difference was found? Before you conclude that rats are just stupid, consider Gibson and Walk's much more likely explanation: A rat does not
depend very much on vision to survive. In fact, its visual system is not highly developed. Since it is nocturnal, a rat locates food by smell and moves around in the dark using cues from the stiff whiskers on its nose. So when a rat was placed on the center board, it was not fooled by the visual cliff because it was not using vision to decide which way to go. To the rat's whiskers, the glass on the deep side felt the same as the glass on the shallow side and, thus, the rat was just as likely to move off the center board to the deep side as to the shallow side.

You might expect the same results from kittens. They are basically nocturnal and have sensitive whiskers. However, cats are predators, not scavengers like rats. Therefore, they depend more on vision. And, accordingly, kittens were found to have excellent depth perception as soon as they were able to move on their own: at about 4 weeks.

Although at times this research article (and this discussion) risks sounding like a children's animal story, it has to be reported that the species with the worst performance on the visual cliff was the turtle. The baby turtles chosen to be tested were of the aquatic variety, because the researchers expected that since the turtles' natural environment was water, they might prefer the deep side of the cliff. However, it appeared that the turtles were smart enough to know that they were not in water, and 76 percent of them crawled off onto the shallow side. But 24 percent went "over the edge." "The relatively large minority that chose the deep side suggests either that this turtle has poorer depth perception than other animals, or its natural habitat gives it less occasion to 'fear' a fall" (p. 67). Clearly, if you live your life in water, the survival value of depth perception, in terms of avoiding falls, would be diminished.

Gibson and Walk pointed out that all of their observations were consistent with evolutionary theory. That is, all species of animals, if they are to survive, need to develop the ability to perceive depth by the time they achieve independent movement. For humans this does not occur until around 6 months of age, but for chickens and goats, it is nearly immediate (by 1 day), and for rats, cats, and dogs about 4 weeks of age. The authors conclude, therefore, that this capacity is inborn, because to learn it through trial and error would cause too many potentially fatal accidents.

So, if we are so well prepared biologically, why do children take so many falls? Gibson and Walk explained that the human infants' perception of depth had matured sooner than had their skill in movement. During testing, many of the infants supported themselves on the deep side of the glass as they turned on the center board, and some even backed up onto the deep side as they began to crawl toward the mother across the shallow side. If the glass had not been there, some of the children would have fallen off the cliff!

CRITICISMS AND SUBSEQUENT RESEARCH

The most common criticism of the researchers' conclusions revolves around the question of whether they really proved that depth perception is innate
in humans. As mentioned earlier, by the time infants were tested on the visual cliff, they had already learned to avoid such situations. A later study placed younger infants, ages 2 to 5 months, on the glass over the deep side of the visual cliff. When this happened, all of the babies showed a decrease in heart rate. Such a decrease is thought to be a sign of interest, not fear, which is accompanied by heart rate increases (Campos, Hiatt, Ramsay, Henderson, & Svejda, 1978). This indicates that these younger infants had not yet learned to fear the drop-off and would learn the avoidance behavior somewhat later. These findings argued against Gibson and Walk's position:

It is important to notice, however, that while there was and still is controversy over just when we are able to perceive depth (the nativists vs. the empiricists), much of the research that is done to find the answer incorporates the visual cliff apparatus developed by Gibson and Walk. Additionally, other related research using the visual cliff has turned up some fascinating findings.

One example is the work of Sorce, Emde, Campos, and Klinnert (1985). They put 1-year-old infants on a visual cliff for which the drop-off was neither shallow nor deep but in between (about 30 inches). As a baby crawled toward the cliff, it would stop and look down. On the other side, as in the Gibson and Walk study, the mother was waiting. Sometimes the mother had been instructed to maintain an expression of fear on her face while other times the mother looked happy and interested. When infants saw the expression of fear, they refused to crawl any further. However, most of the infants who saw their mother looking happy checked the cliff again and crawled across. When the drop-off was made flat, the infants did not check with the mother before crawling across. This method of nonverbal communication used by infants in determining their behavior is called social referencing.

**RECENT APPLICATIONS**

Gibson and Walk's ground-breaking invention of the visual cliff still exerts a major influence on current studies of human development, perception, emotion, and even mental health in infancy, childhood, adolescence, adulthood, and old age. A recent study by Eppler, Adolph, and Weiner (1996) expanded on Gibson and Walk's visual cliff model to explore infants' perception of slanted surfaces. The study found that 14-month-old toddlers simply walked down a shallow slanted surface (a 10% slope), but knew to either slide down or avoid altogether a steep slant (a 36% slope), even though the height at the top of the hill was the same in both conditions. Younger, crawling infants (9 months old) also seemed to explore the shallow slant differently than the steeper hill demonstrating a cognitive ability to differentiate between them. However, when such crawling infants were placed at the top of the hill, they would plunge down both slopes with equal abandon. The authors claim that these findings are evidence that developing infants can perceive differing degrees of slope before they are able to apply this knowledge to their understanding of the consequences of locomotion.
WHAT YOU SEE IS WHAT YOU’VE LEARNED

This study is a somewhat unusual one to appear in this book. Turnbull did not have any specific theoretical propositions, there was no clear scientific method used, and the author is not a psychologist. Nevertheless, this short article has been frequently and widely cited to demonstrate some important psychological concepts relating to your ability to perceive the world around you. Before reaching the point where Turnbull’s observations can be placed in the proper context, a considerable amount of conceptual explanation is necessary. Keep in mind that we will get to the study itself, even though we may seem to be taking the long way around. Let’s begin by filling in the theory behind Turnbull’s discoveries, which the brevity of his article did not allow him to do.
THEORETICAL PROPOSITIONS

Two large and important fields of study within psychology are those of sensation and perception. These are fundamentally separate areas, but they are highly related. Sensation refers to the information you are constantly receiving from your environment through your senses. You are bombarded with a huge amount of sensory data every minute of every day. If you just stop and think about it for a minute, frequencies of light are reflecting off all the objects around you wherever you look, near or far. There are probably a multitude of sounds entering your ears at any moment, parts of your body are in contact with various objects, and several tastes and smells are often present. If you take your attention off this book for a moment (I know this is difficult!) and focus on each sense, one at a time, you'll begin to get some idea of the amount of "sensory input" that was beneath your level of awareness. In fact, if I do this right now I become aware of the hum from my computer, a car going by outside, a door slamming somewhere, a painting on the wall, a partly cloudy sky, the light from my desk lamp, the feel of my elbows resting on the arms of the chair, the taste of the apple I just finished eating, and so on. However, just a few seconds ago, I was not aware of any of these sensations. We are continuously filtering all this available input and using only a small percentage of it. If your sensory filtering mechanisms were suddenly to fail, the world would become so intensely confusing that you would be overwhelmed, and probably you would not be able to survive it.

The fact that the sensory world (what you see, hear, touch, taste, and smell) usually appears to you in an organized way is due to your abilities of perception. Sensations are the raw materials for perception. Your brain's perceptual processes are involved in three general activities: (1) selecting the sensations to pay attention to as discussed in the previous paragraph; (2) organizing these into recognizable patterns and shapes; and (3) interpreting this organization to explain and make judgments about the world. In other words, perception refers to how we take this jumble of sensations and create meaning. Your visual sensations of the page you are reading are nothing more than random black shapes on a white background. This is what is projected onto the retinas of your eyes and sent to the visual fields of your brain. However, you pay attention to them, organize them, and interpret them so that they become words and sentences that contain meaning.

Your brain has many tricks or strategies available to assist in organizing sensations in meaningful and understandable ways. To put Turnbull's study in proper perspective, let's take a look at several of these. The perceptual strategy you probably use the most is called figure-ground. A well-known example of the figure-ground relationship is pictured in Figure 1. When you look at the drawing, what do you see immediately? Some of you will see a white vase, while others will see two profiles facing one another. As you study this drawing, you will be able to see either one and you will be able to switch back and forth between seeing the vase and seeing the profiles. You'll notice
FIGURE 1  Figure-ground relationship—a reversible figure. From Charles G. Morris, Psychology 7th ed. Copyright 1990. Reprinted by permission of Prentice-Hall.

that if you look at the vase (figure), the profiles (ground) seem to fade into the background. But focus on the profiles (figure) and the vase (ground) becomes the background. We appear to have a natural tendency to divide sensations into figure and ground relationships. If you think about it, this makes the world a much more organized place. Imagine trying to spot someone in a crowd of people. Without your figure-ground abilities, this task would be impossible. When soldiers wear camouflage clothing, the distinction between figure and ground is blurred so that it becomes difficult to distinguish the figure (the soldier) from the ground (the vegetation).

Other organizational strategies we use routinely to create order and meaning out of those chaotic sensations are called "perceptual constancies." These refer to our ability to know that the characteristics of objects stay the same even though our sensations of them may change drastically. One of these, for example, is shape constancy. If you stand up and walk around a chair, the image of that chair projecting onto your retina (the sensation) changes with every step you take. However, you perceive the shape of the chair to be unchanged. Imagine how impossibly confusing your world would be if all objects were perceived differently each time your angle of vision changed.

Another one of these techniques is size constancy. This is the perceptual facility that is most related to Turnbull's article. Size constancy enables you to perceive a familiar object as being the same size, regardless of its distance from you. If you see a school bus two blocks away, the image projected onto your retina is the same as that of a small toy bus seen close up. Nevertheless, you perceive the distant bus to be its large, normal size. Likewise, if you are looking at two people standing in a field, one 10 feet from you and the other 100 feet in the distance, your sensation of the more distant person is of someone 3 feet tall. The reason you perceive that person to be of normal size is due to your ability of size constancy.

Your perceptions using any of these strategies can be tricked. This is how visual (optical) illusions work. A film director can shoot a scene in which a ship is being tossed about in a terrible storm. Even though the camera is filming a 2-foot-long model ship in a special effects tank, we perceive the ship as full size because of size constancy and the lack of any comparison objects to offer cues as to its true size. In the film spoof Airplane, we see
a room shot from a low angle directly behind a telephone on a desk (therefore, we know this phone is about to ring with important information). The phone is so close to the camera lens that it appears huge on the screen, but we see it as a normal-size phone due to our ability of size constancy. The perceptual surprise comes when the phone rings and the actor crosses the room to answer. The phone he picks up turns out to really be as huge as it looked: about 3 feet across!

The last important point that must be made before turning to this chapter’s study concerns whether these perceptual abilities are learned or inborn. Research with individuals who were blind at birth and who later gain their sight has suggested that our ability to perceive figure-ground relationships is, at least in part, innate; that is, present from birth. Perceptual constancies, on the other hand, are a product of experience. When young children (age 5 and under) see cars or trains in the distance, they perceive them as toys and sometimes will ask quite adamantly to have one. By the time children reach age 7 or 8, size constancy has developed and they are able to judge sizes correctly over varying distances.

Psychologists have asked the question: What kinds of experiences allow us to acquire these abilities? And could a situation exist in which a person might grow to adulthood and not possess some of these perceptual talents? Well, Turnbull’s brief report published 30 years ago shed a great deal of light on these questions.

METHOD

As mentioned at the beginning of this chapter, Turnbull is not a psychologist, but rather an anthropologist. In the late 1950s and early 1960s, he was in the dense Ituri Forest in the Congo (now Zaire) studying the life and culture of the BaMbuti Pygmies. Because he was an anthropologist, Turnbull’s primary method of research was naturalistic observation; that is, observing behavior as it occurs in its natural setting. This is an important method of research for psychologists as well. For example, differences in aggressive behavior between young boys and girls during play could be studied through observational techniques. Examining the social behavior of nonhuman primates, such as chimpanzees, would also require a method involving naturalistic observation. Such research is often expensive and time consuming, yet some behavioral phenomena cannot be properly researched in any other way.

Turnbull, on one excursion, was traveling through the forest from one group of Pygmies to another. He was accompanied by a young man (about 22 years old) named Kenge, who was from one of the local Pygmy villages. Kenge always assisted Turnbull in his research as a guide and introduced Turnbull to groups of BaMbuti who did not know him. Turnbull’s observations that constitute this published report began when he and Kenge reached the eastern edge of a hill that had been cleared of trees for a missionary station. Because of this clearing, there was a distant view over the
forest to the high Ruwenzori Mountains. Since the Ituri Forest is extremely thick, it was highly unusual to see views such as this.

RESULTS
Kenge had never in his life seen a view over great distances. He pointed to the mountains and asked if they were hills or clouds. Turnbull told him that they were hills, but they were larger than any Kenge had seen before in his forest. Turnbull asked Kenge if he would like to take a drive over to the mountains and see them more closely. After some hesitation—Kenge had never left the forest before—he agreed. As they began driving, a violent thunderstorm began and did not clear until they had reached their destination. This reduced visibility to about 100 yards, which prevented Kenge from watching the approaching mountains. Finally, they reached the Ishango National Park, which is on the edge of Lake Edward at the foot of the mountains. Turnbull writes:

As we drove through the park the rain stopped and the sky cleared, and that rare moment came when the Ruwenzori Mountains were completely free of cloud and stood up in the late afternoon sky, their snow-capped peaks shining in the afternoon sun. I stopped the car and Kenge very unwillingly got out. (p. 304)

Kenge glanced around and declared that this was bad country because there were no trees. Then he looked up at the mountains and was literally speechless. The life and culture of the BaMbuti were limited to the dense jungle and, therefore, their language did not contain words to describe such a sight. Kenge was fascinated by the distant snow caps and interpreted them to be a type of rock formation. As they prepared to leave, the plain stretching out in front of them also came clearly into view. The next observation makes up the central point of this article and this chapter:

Looking out across the plain, Kenge saw a herd of buffalo grazing several miles away. Remember that at such a distance, the image (the sensation) of the buffalo cast onto the retinas of Kenge's eyes was very small. Kenge turned to Turnbull and asked what kind of insect they were! Turnbull replied that they were buffalo even bigger than the forest buffalo Kenge had seen before. Kenge just laughed at what he considered to be a stupid story and asked again what those insects were. "Then he talked to himself, for want of more intelligent company, and tried to liken the distant buffalo to the various beetles and ants with which he was familiar" (p. 305).

Turnbull did precisely what you or I would do in the same situation. He got back into the car and drove with Kenge to the grazing buffalo. Kenge was a very courageous young man, but as he watched the animals steadily increase in size, he moved over next to Turnbull and whispered that this was witchcraft. Finally, as they approached the buffalo and he could see them for the size they truly were he was no longer afraid, but he
was still unsure as to why they had been so small before, and wondered if they had grown larger or if there was some form of trickery going on.

A similar event occurred when the two men continued driving and came to the edge of Lake Edward. This is quite a large lake, and there was a fishing boat two or three miles out. Kenge refused to believe that the distant boat was something large enough to hold several people. He claimed that it was just a piece of wood, until Turnbull reminded him of the experience with the buffalo. At this, Kenge just nodded in amazement.

During the rest of the day spent outside the jungle, Kenge watched for animals in the distance and tried to guess what they were. It was apparent to Turnbull that Kenge was no longer afraid or skeptical, but was working on adapting his perceptions to these entirely new sensations. And he was learning fast. The next day, however, he asked to be returned to his home in the jungle and again remarked that this was bad country: no trees.

DISCUSSION
This brief research report dramatically illustrates how we acquire our perceptual constancies. Not only are they learned as a result of experience, but these experiences are influenced by the culture and environment in which we live. In the jungle where Kenge had spent his entire life, there were no long-range views. In fact, vision was usually limited to about a hundred feet. Therefore, there was no opportunity for the BaMbuti to develop size constancy and, if you stop to think about it, there was no need for them to do so. Although it has not been directly tested, it is possible that these same groups of Pygmies may have a more highly developed ability for figure-ground relationships. The logic here is that it is extremely important for the BaMbuti to distinguish those animals (especially the potentially dangerous ones) that are able to blend into the surrounding background vegetation. This perceptual skill would seem less necessary for people living in a modern industrialized culture.

In regard to size constancy, Turnbull's observational study may offer us an explanation for why this ability is learned rather than innate. Certain perceptual skills may be necessary for our survival, but we do not all develop and grow in the same situation. Therefore, to maximize our survival potential, some of our skills are allowed to unfold over time in ways that are best suited to our physical environment.

SIGNIFICANCE OF FINDINGS AND RECENT APPLICATIONS
Turnbull's work fueled the fire of behavioral scientists who address the question of the relative influence of biology vs. environment (learning) on our behavior: the "nature-nurture" controversy. Turnbull's observations of Kenge's perceptions points strongly to the nurture or environmental side of the issue. In a fascinating series of studies by Blakemore and Cooper (1970), kittens were raised in darkness except for exposure to either vertical or horizontal stripes. Later when the cats were taken out of the dark environment,
the ones who had been exposed to vertical lines responded to the vertical lines on objects in the environment, but ignored horizontal lines. Conversely, the cats exposed to horizontal lines during development later appeared to recognize only the presence of horizontal figures. The cats' ability to see was not damaged, but some specific perceptual abilities had not developed. These particular deficits appeared to be permanent.

Other research, however, has suggested that some of our perceptual abilities may be present at birth, that is, given to us by nature without any learning needed. For example, one study (Adams, 1987) exposed newborn infants (only 3 days old) to squares of various colors of light (red, blue, green) and to squares of gray light at the exact same brightness. All these very young infants spent significantly more time looking at the colorful squares than at the gray ones. It is unlikely that infants had the opportunity to learn that preference in 3 days, so these findings provide evidence that some of our perceptual abilities are innate.

The overall conclusion from research in this area is that there is not a single definitive answer regarding the source of our perceptual abilities. Turnbull and Kenge clearly demonstrated that some are learned, but others may be innate or part of our "factory-installed standard equipment." The one sure point here is that this area of research is bound to be pursued far into the future.

It should be noted that this article by Turnbull, even though it appeared in a psychology journal, has made lasting contributions to Turnbull's own field of anthropology and has helped to illustrate important cross-overs between the two fields. Psychologists have continually been informed about the underlying causes of human behavior by studying it across cultural borders and ethnic boundaries. Conversely, anthropologists have broadened their scope of study through an awareness of the psychological underpinnings of human behavior in societal and cultural settings. This is exemplified by two anthropological studies that made reference to Turnbull's 1961 article. One study examined the inferred meaning of the organization of campsites in early African Pygmy settlements (Fisher & Strickland, 1989) and another explored the interplay between the forest environment and the social organization of Kenge's native culture (Mosko, 1987).

Finally, what is perhaps most indicative of Turnbull's on-going influence in psychology is the observation that his 1961 article and his related book (Turnbull, 1962), continue to be cited and quoted in most general psychology texts as demonstrations of environmental influences on human perceptual development (e.g., Morris, 1996; Plotnik, 1996).

LITTLE EMOTIONAL ALBERT

Have you ever wondered where your emotions 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 in this book; four studies are included that relate directly to emotional responses (Harlow, 1958; Ekman & Friesen, 1971; Seligman & Meier, 1967; and Wolpe, 1961). This study by Watson and Raynor on conditioned emotional responses was a strikingly powerful piece of research when it was published more than 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. 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. 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 special world to bring them up in, and I'll guarantee to take anyone 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 nine 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 four 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 they made the decision to proceed based on what was, in retrospect, questionable ethical reasoning. (This is discussed in conjunction with the overall ethical problems of this study, 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 been conditioned to fear the rabbit specifically.

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

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 make 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>
<thead>
<tr>
<th>STIMULUS PRESENTED</th>
<th>REACTION OBSERVED</th>
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<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>

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

DISCUSSION AND SIGNIFICANCE OF FINDINGS

Watson had two fundamental goals in this study and in all his work: (a) to demonstrate that all human behavior stems from learning and conditioning and (b) to demonstrate that the Freudian conception of 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 shortly) 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 three 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. Eighty 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 five, he was given a pet white rabbit for a birthday present. At first, he might have been afraid of it (no doubt baffling his adoptive parents). 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.

RECENT APPLICATIONS

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

As mentioned earlier in this discussion, one emotion, fear, in its extreme form, can produce serious negative consequences known as phobias. Many psychologists believe that phobias are conditioned much like Little Albert’s fear of furry animals (see the discussion of Wolpe’s research on the treatment of phobias). Watson’s research has been incorporated into many recent studies about the origins and treatments of phobias. One such article discussed phobias from the nature-nurture perspective and found some remarkable results. Watson’s approach, of course, is rooted completely in the environmental or nurture side of the argument, and most people would view phobias as learned. However, a study by Kendler, Karkowski, and Prescott (1999) provided compelling evidence that the development of phobias may include a substantial genetic component. The researchers studied phobias and unreasonable fears in more than 1,700 female twins (see the discussion of Bouchard’s twin research). They claim to have found that a large percentage of the variation in phobias was due to inherited factors. The authors concluded that, while phobias may be molded by an individual’s personal environmental experiences, the role of the family in phobias is primarily biological, not environmental.

Imagine: Born to be Phobic! This view flies directly in the face of Watson’s theory and should provide plenty of fuel for the ongoing nature-nurture debate in psychology and throughout the behavioral sciences.

WHAT YOU EXPECT IS WHAT YOU GET


We are all familiar with the idea of the self-fulfilling prophecy. One way of describing this concept is to say that if we expect something to happen in a certain way, our expectation will tend to make it so. Whether self-fulfilling prophecies really do occur in a predictable way in everyday life is open to scientific study, but psychological research has demonstrated that in some areas they are a reality.

The question of the self-fulfilling prophecy in scientific research was first brought to the attention of psychologists in 1911 in the famous case of “Clever Hans,” the horse of Mr. von Osten (Pfungst, 1911). Clever Hans was a horse that was famous for being able to read, spell, and solve math problems by stomping out answers with his front hoof. Naturally there were many skeptics, but when a committee of experts tested Hans’s abilities, they were found to be genuinely performed without prompting from Mr. von Osten. But how could any horse (except possibly for Mr. Ed! [1950’s television show that featured a talking horse!]) possess such a degree of human intelligence? Well, a psychologist, O. Pfungst, performed a series of careful experiments and found that Hans was receiving subtle unintentional cues from his questioners. For example, after asking a question, people would look down at the horse's hoof for the answer. As the horse approached the correct number of hoof-beats, the questioners would raise their eyes or head very slightly in anticipation of the horse completing his answer. The horse had been conditioned to use these subtle movements from the observers as signs to stop stomping, and this usually resulted in the correct answer to the question.

So, you might ask, how is a trick horse related to psychological research? Well, the Clever Hans findings pointed out the possibility that observers often have specific expectations or biases that may cause them to send covert and unintentional signals to a subject being studied. These signals, then, may cause the subject to respond in ways that are consistent with the observers' bias and, consequently, confirm their expectations. What all this finally boils down to is that an experimenter may think a certain behavior results from his or her scientific treatment of one subject or one group of subjects compared with another. Actually the behavior may result from nothing more than the experimenter's own biased expectations. If this occurs, it renders the experiment invalid. This threat to the validity of a psychological experiment is called the experimenter expectancy effect.

Robert Rosenthal, a leading researcher on this methodological issue, has demonstrated the experimenter expectancy effect in laboratory psychological experiments. In one study (Rosenthal & Fode, 1963), psychology students in a learning and conditioning course unknowingly became subjects themselves. Some of the students were told they would be working with rats that had been specially bred for high intelligence, as measured by their ability to learn mazes quickly. The rest of the students were told that they would be working with rats bred for dullness in learning mazes. The students then proceeded to condition their rats to perform various skills, including maze learning. The students who had been assigned the maze-bright rats reported significantly faster learning times than those reported by the students with the maze-dull rats. In reality, the rats given to the students were standard lab rats and were randomly assigned. These students were not cheating or purposefully slanting their results. The influences they exerted on their animals were apparently unintentional and unconscious.

As a result of such research, the threat of experimenter expectancies to scientific research has been well established. Properly trained researchers, using careful procedures (such as the double-blind method, in which the experimenters who come in contact with the subjects are unaware of the hypotheses of the study) are usually able to avoid most of these expectancy effects.

Beyond this, however, Rosenthal was concerned about how such biases and expectancies might occur outside the laboratory, such as in school classrooms. Because teachers in public schools may not have the opportunity to learn about the dangers of expectancies, how great an influence might this tendency have on the students' potential
performance? After all, teachers have historically been given students' IQ scores beginning in the first grade. Could this information set up biased expectancies in the teachers' minds and cause them to unintentionally treat "bright" students (as judged by high IQ scores) differently from those seen as less bright? And if so, is this fair? Those questions formed the basis of Rosenthal and Jacobson's study.

THEORETICAL PROPOSITIONS

Rosenthal labeled this expectancy effect, as it occurs in natural interpersonal settings outside the laboratory, the Pygmalion effect. In the Greek myth, a sculptor (Pygmalion) falls in love with his sculpted creation of a woman. Most people are more familiar with the modern Shaw play Pygmalion (My Fair Lady is the musical version) about the blossoming of Eliza Doolittle because of the teaching, encouragement, and expectations of Henry Higgins. Rosenthal suspected that when an elementary school teacher is provided with information (such as IQ scores) that creates certain expectancies about students' potential, whether strong or weak, the teacher might unknowingly behave in ways that subtly encourage or facilitate the performance of the students seen as more likely to succeed. This, in turn, would create the self-fulfilling prophecy of actually causing those students to excel, perhaps at the expense of the students for whom lower expectations exist. In order to test these theoretical propositions, Rosenthal and his colleague Jacobson obtained the assistance of an elementary school (called Oak School) in a predominantly lower-middle-class neighborhood in a large town.

METHOD

With the cooperation of the Oak School administration, all the students in grades one through six were given an IQ test (called the Tests of General Ability, or TOGA) near the beginning of the academic year. This test was chosen because it was a nonverbal test for which a student's score did not depend primarily upon school-learned skills of reading, writing, and arithmetic. Also, it was a test with which the teachers in Oak School probably would not be familiar. The teachers were told that the students were being given the Harvard Test of Inflected Acquisition. Such deception was important in this case in order for expectancies to be created in the minds of the teachers, a necessary ingredient for the experiment to be successful. It was further explained to the teachers that the Harvard Test was designed to serve as a predictor of academic blooming or spurting. In other words, teachers believed that students who scored high on the test were ready to enter a period of increased learning abilities within the next year. This predictive ability of the test was also, in fact, not true.

At Oak School, there were three classes at each of the six grade levels. All of the 18 teachers (16 women, 2 men) for these classes were given a list of names of students in their classes who had scored in the top 20% on the Harvard Test and were therefore identified as potential academic bloomers during the academic year. But here's the key to this study: The children on the teachers' top 10 lists had been assigned to this experimental condition purely at random. The only difference between these children and the others (the controls) was that they had been identified to their teachers as the ones who would show unusual intellectual gains.

Near the end of the school year, all children at the school were measured again with the same test (the TOGA), and the degree of change in IQ was calculated for each child. The differences in IQ changes between the experimental group and the controls could then be examined to see if the expectancy effect had been created in a real-world setting.

RESULTS

Figure 1 summarizes the results of the comparisons of the IQ increases for the experimental versus the control groups. For the entire school, the children for whom the teachers had expected greater intellectual growth averaged significantly greater improvement than did the control children (12.2 and 8.2 points, respectively). However, if you examine Figure 1, it is clear that this difference was accounted for by the huge differences in grades one and two. Possible reasons for this are discussed shortly. Rosenthal and Jacobson offered another useful and revealing way to organize the data for these first and second graders. Figure 2 illustrates the percentage of the children in each group who obtained increases in IQ of at least 10, 20, or 30 points.
Two major findings emerged from this early study. First, the expectancy effect previously demonstrated in formal laboratory settings also appears to function in less experimental, real-world situations. Second, the effect was very strong in the early grades, yet almost nonexistent for the older children. What does all this mean?

DISCUSSION

As Rosenthal suspected from his past research, the teachers' expectations of their students' behavior became a self-fulfilling prophecy. "When teachers expected that certain children would show greater intellectual development, those children did show greater intellectual development" (Rosenthal & Jacobson, 1968, p. 85). Remember that the data reported are averages of three classes and three teachers for each grade level. It is difficult to think of other explanations for the differences in IQ gains besides the teachers' expectations.

However, Rosenthal felt it was important to try to explain why the self-fulfilling prophecy was not demonstrated in the higher grade levels. Both in the article that is the focus of this chapter and in later writings, Rosenthal and Jacobson offered several possible reasons for this finding:

1. Younger children are generally thought of as being more malleable or "transformable." If this is true, then the younger children in the study may have experienced greater change simply because they were easier to change than the older children were. Related to this is the possibility that even if younger children are not more malleable, teachers may have believed that they were. This belief alone may have been enough to create differential treatment and produce the results that were reported.

2. Younger students in an elementary school tend to have less well-established reputations. In other words, if the teachers had not yet had a chance to form an opinion of a child's abilities, the expectancies created by the researchers would have carried more weight.

3. Younger children may be more easily influenced by and more susceptible to the subtle and unintentional processes that teachers use to communicate performance expectations to them:

   Under this interpretation, it is possible that teachers react to children of all grade levels in the same way if they believe them to be capable of intellectual gain. But perhaps it is only the younger children whose performance is affected by the special things the teacher says to them; the special ways in which she says them; the way she looks, postures, and touches the children from whom she expects greater intellectual growth (Rosenthal & Jacobson, 1968, p. 83).

4. Teachers of these lower grades may differ from upper-grade teachers in ways that produce greater communication of their expectations to the children. Rosenthal and Jacobson did not speculate as to exactly what these differences might be if indeed they exist.

Hock, Roger. Forty Studies that Changed Psychology: Explorations into the History of Psychological Research. Prentice Hall. Pages 92-100
SIGNIFICANCE OF FINDINGS AND SUBSEQUENT RESEARCH

The real importance of Rosenthal and Jacobson's findings at Oak School relates to the potential long-lasting effects of teachers' expectations on the scholastic performance of students. This, in turn, feeds directly into one of the most controversial topics in psychology and education today: the question of the fairness of IQ tests. We'll return to this discussion shortly, but first it is of interest to explore some later research that examined the ways in which teachers unconsciously communicate their higher expectations to the students whom they believe possess greater potential.

A study conducted by Chaiken, Sigler, and Derlega (1974) involved videotaping teacher-student interactions in a classroom situation in which the teachers had been informed that certain children were extremely bright (these bright students had been chosen at random from all the students in the class). Careful examination of the videos indicated that teachers favored the identified brighter students in many subtle ways. They smiled at these students more often, made more eye contact, and had more favorable reactions to these students' comments in class. These researchers go on to report that students for whom these high expectations exist are more likely to enjoy school receive more constructive comments from teachers on their mistakes, and work harder to try to improve. What this and other studies indicate is that teacher expectancies, while their influence is not the only determinant of a child's performance in school, can affect more than just IQ scores.

Imagine for a moment that you are an elementary school teacher with a class of 20 students. On the first day of class, you receive a class roster on which is printed the IQ scores for all of your students. You notice that five of your pupils have IQ scores over 145, well into the genius range. Do you think that your treatment and expectations of those children during the school year would be the same as your other students? What about your expectations of those students compared with another five students with IQ scores in the low to normal range? If you answered that your treatment and expectations would be the same, I'd be willing to bet that you'd be wrong. As a matter of fact, they probably shouldn't be the same! The point is that if your expectations became self-fulfilling prophecies that might be unfair to some of the students. Now consider another, more crucial point. Suppose the IQ scores you received on your class roster were wrong. If these erroneous scores created expectations that benefited some students over others, it would clearly be unfair and probably unethical. This is one of the major issues fueling the IQ controversy that rages today.

For many years, many researchers have charged that the standard IQ tests used to assess the intelligence of children contain a racial or cultural bias. The argument is that since the tests were designed primarily by white, upper middle-class males, they contain ideas and information to which other ethnic groups are not exposed. Children from various minority groups in the United States traditionally score lower on these tests than white children do. Since it would be ridiculous to assume that these nonwhite children possess less basic intelligence than white children, the reason for these differences in scores must lie in the tests themselves. Traditionally, however, teachers in grades K through 12 were given this IQ information on all their students. If you stop and think about this fact in relation to the research by Rosenthal and Jacobson, you'll see what a potentially dangerous situation may have been created. Besides the fact that children have been categorized in school according to their IQ scores (advanced placement, remedial classes, etc.), teachers' unintended expectations, based on this possibly biased information, may have been creating unfair self-fulfilling prophecies. The arguments supporting this idea are convincing enough that most states have instituted a moratorium on IQ testing and the use of IQ scores until such testing can be shown to be bias-free.

RECENT APPLICATIONS

Due in large part to Rosenthal and Jacobson's research, the power of teachers' expectations on students' performance has become an integral part of our understanding of the educational process. Furthermore, Rosenthal's theory of interpersonal expectancies has exerted its influence in numerous areas other than education. In 2002, Rosenthal himself reviewed the literature on expectancy effects using meta-analysis techniques. He demonstrated how "the expectations of psychological researchers, classroom teachers, judges in the courtroom, business executives, and health care providers can unintentionally affect the responses of their research participants, pupils, jurors, employees, and patients" (Rosenthal, 2002, p. 839).
An uncomfortably revealing article incorporating Rosenthal's expectancy research examined the criteria school teachers use to refer their students to school psychologists for assessment and counseling (Andrews, et al., 1997). The researchers found that teachers referred African American children for developmental handicap assessment at rates significantly higher than the rates of Caucasian students in their classrooms. In addition, boys were referred in equally disproportionate numbers over girls for problems of classroom and playground behavior problems. The researchers suggested that the differences among the various student groups may have revealed more about teachers' expectancies than real individual differences.

Finally, Rosenthal's Pygmalion studies have not been without critics. Richard Snow at Stanford University has questioned Rosenthal's findings for over 30 years and the debate between them continues today (Rosenthal is at The University of California). A concise, pithy, and rather rancorous dialogue between them on this very topic appeared in a 1994 issue of Current Directions in Psychological Science, the journal of the American Psychological Society (Rosenthal, 1994; Snow, 1994). It's a revealing and enjoyable read!

THANKS FOR THE MEMORIES!

PERRY MASON: Hamilton, I believe that my client is telling the truth when she says she was nowhere near the scene of the crime.

HAMILTON BURGER: Perry, why don't we let the jury decide?

PERRY MASON: Because, Hamilton, I don't believe there is going to be a trial. You haven't got a case. All you have is circumstantial evidence.

HAMILTON BURGER: Well, Perry, I suppose this is as good a time as any to tell you. We have someone who saw the whole thing, Perry. We have an eyewitness!

And as the mysterious music crescendos, we know that this is going to be another difficult case for Perry Mason. Even though we are reasonably certain he will prevail in the end, the presence of a single eyewitness to the crime has changed a weak case into a nearly airtight one for the district attorney. Why do eyewitness reports provide such strong evidence in criminal cases? The reason is that attorneys, judges, juries, and the general public believe that the way in which a person remembers an event, must be the way it actually happened. In other words, memory is thought of as a process of replaying an event similar to a video or DVD. However, psychologists who study memory have now drawn into question that and many other common beliefs about the reliability of human memory.

One of the leading researchers in the area of memory is Elizabeth Loftus at the University of Washington. She has found that when an event is recalled it is not accurately re-created. Instead, what is recalled is a memory that is a reconstruction of the actual event. Loftus's research has demonstrated that reconstructive memory is a result of your use of new and existing information to fill in the gaps in your recall of an experience. She maintains that your memories are not stable, as we commonly believe, but that they are malleable and changeable over time. So if you tell someone a story from your vacation five years ago, you think you are re-creating the experience just as it happened, but you probably are not. Instead, you have reconstructed the memory using information from many sources, such as the previous times you've told it, other experiences from the same or later vacations, perhaps a movie you saw last year that was shot in the same place as your vacation, and so on. You know this is true if you have ever recounted an experience in the presence of another person who was with you at the time. You are often surprised by how your stories can totally disagree about an event you both experienced at the same time!

Usually, these alterations in memory are harmless. However, in legal proceedings, when a defendant's fate may rest on the testimony of an eyewitness, memory reconstructions can be crucial. For this reason, most of Loftus's research in the area of memory has been connected to legal eyewitness testimony. In her early research, she found that very subtle influences in how a question is worded can alter a person's memory for an event. For example, if witnesses to an automobile accident are asked, "Did you see a broken headlight?" or "Did you see the broken headlight?" the question using the word the produced more positive responses than the question using the word a, even when there had been no broken headlight. The use of the presupposes the presence of a broken headlight and this, in turn, causes witnesses to add a new feature to their memories of the event.

The article that is the focus of this discussion is one of the most often cited studies by Loftus because it reports on four related studies that took her theory one major step further. In these studies, she demonstrated that the wording of questions asked of eyewitnesses could alter their memories of events when they were asked other questions about the events at a later time. Keep in mind that this research influenced both memory theory and criminal law.

THEORETICAL PROPOSITIONS

This research focused on the power of questions containing presuppositions to alter a person's memory of an event. Loftus defines a presupposition as a condition that must be true in order for the question to make sense. For example, suppose you have witnessed an automobile accident and I ask you, "How many people were in the car that was speeding?" The question presupposes that the car was speeding. But what if the car was not actually speeding? Well, you might answer the question anyway because it was not a question about the speed of the car. Loftus proposed, however, that because of the way the question was worded, you might add the speeding
information to your memory of the event. Consequently, if you are asked other questions later, you will be more likely to say the car was speeding. Loftus hypothesized that if eyewitnesses are asked questions that contain a false presupposition about the witnessed event, the new false information may be incorporated into the witness's memory of the event and appear subsequently in new testimony by the witness.

METHOD AND RESULTS

For each of the four experiments reported, the method and results will be summarized together.

**Experiment 1**

In the first study, 150 students in small groups saw a film of a five-car chainreaction accident that occurs when a driver runs through a stop sign into oncoming traffic. The accident takes only four seconds and the entire film runs less than a minute. After the film, the subjects were given a questionnaire containing 10 questions. For half of the subjects, the first question was, "How fast was Car A [the car that ran the stop sign] going when it ran the stop sign?" For the other half of the subjects, the question read, "How fast was Car A going when it turned right?" The remaining questions were of little interest to the researchers until the last one, which was the same for both groups: "Did you see a stop sign for Car A?"

In the group that had been asked about the stop sign, 40 subjects (53%) said they saw a stop sign for Car A, while only 26 (35%) in the turned-right group claimed to have seen it. This difference was found to be statistically significant.

**Experiment 2**

The second study Loftus reported was the first in this series to involve a delayed memory test and was the only one of the four not to use an automobile accident as the witnessed event. For this study, 40 subjects were shown a three-minute segment from the film *Diary of a Student Revolution*. The clip showed a class being disrupted by eight demonstrators. After they viewed the film, the subjects were given questionnaires containing 20 questions relating to the film clip. For half of the subjects, one of the questions asked, "Was the leader of the four demonstrators who entered the classroom a male?" For the other half, the question asked, "Was the leader of the 12 demonstrators who entered the classroom a male?" All remaining questions were identical for the two groups.

One week after this initial test, the subjects from both groups returned and answered 20 new questions about the film (without seeing it again). The one question that provided the results of the study was, "How many demonstrators did you see entering the classroom?" Remember, both groups of subjects saw the same film and answered the same questions, except for the reference to 12 versus 4 demonstrators.

The group that had received the question presupposing 12 demonstrators reported seeing an average of 8.85. Those who had received the question asking about 4 demonstrators averaged 6.40. This was also a significant difference. Some of the subjects recalled the correct number of 8. However, this experiment showed that, on average, the wording of one question altered the way subjects remembered the basic characteristics of a witnessed event.

**Experiment 3**

This experiment was designed to see if false presuppositions inherent in questions could cause witnesses to reconstruct their memory of an event to include objects that were not there. The subjects (150 university students) watched a short video of an accident involving a white sports car and then answered 10 questions about the content of the video. One question included for half of the subjects was, "How fast was the white sports car going when it passed the barn while traveling along the country road?" The other half of the subjects were asked, "How fast was the white sports car going while traveling along the country road?" As in the previous study, the subjects returned a week later and answered 10 new questions about the accident. The question addressing the issue under study was, "Did you see a barn?"

Of those subjects who had previously answered a question in which a barn was mentioned, 13 (17.3%) of them answered Yes to the test question a week later, compared with only 2 (2.7%) in the no-barn group. Once again, this was a statistically significant difference.

**Experiment 4**

The final experiment reported in this article was a somewhat more elaborate study designed to meet two goals. First, Loftus wanted to further demonstrate the memory reconstruction effects found in Experiment 3. Second, she wondered if perhaps just the mention of an object, even if it was not included as part of a false
presupposition, might be enough to cause the object to be added to memory. For example, you are asked directly, "Did you see a barn?" when there was no barn in the film. You will probably answer No. But if you are asked again a week later, might that barn have crept into your memory of the event? This was the idea Loftus tested in the fourth experiment.

Three groups of 50 subjects viewed a three-minute film shot from the inside of a car that ends with the car colliding with a baby carriage pushed by a man. The three groups then received booklets containing questions about the film. These booklets differed as follows:

Group D: The direct question group received booklets containing 40 "filler" questions and five key questions directly asking about nonexistent objects; for example, "Did you see a barn in the film?"

Group F. The false presupposition group received the same 40 filler questions and five key questions that contained presuppositions about the same nonexistent objects, such as, "Did you see a station wagon parked in front of the barn?"

Group C: The control group received only the 40 filler questions.

One week later all the subjects returned and answered 20 new questions about the film. Five of the questions were the exact same key questions as were asked of the direct-question group a week before. So group D saw those five questions twice. The measurement used was the percentage of subjects in each group who claimed to remember the nonexistent objects.

Table 1 summarizes the findings for all three groups. Remember, there was no school bus, truck, center line on the road, woman pushing the carriage, or barn in the film. Combining all the questions, the overall percentages of those subjects answering "yes" to the direct questions one week later were 29.2% for the false-presupposition group, 15.6% for the direct-question group, and 8.4% for the control group. The differences between the direct-question group and the false-presupposition group for each item as well as for all the items combined were statistically significant. However, while there is a trend to indicate a similar effect of the direct questions over controls, these differences were not large enough to reach statistical significance.

**TABLE 1 Appearance of Nonexistent Objects in Subjects' Recall of Filmed Accident Following Direct Questions and False Presuppositions**

<table>
<thead>
<tr>
<th>DIRECT QUESTION</th>
<th>FALSE PRESUPPOSITION</th>
<th>PERCENT OF &quot;YES&quot; RESPONSES TO DIRECT QUESTION ONE WEEK LATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you see a school bus in the film?</td>
<td>Did you see the children getting on the school bus?</td>
<td>C  6  D  12  F  26</td>
</tr>
<tr>
<td>Did you see a truck in the beginning of the film?</td>
<td>At the beginning of the film, was the truck parked beside the car?</td>
<td>C  0  D  8  F  22</td>
</tr>
<tr>
<td>Did you see a center line on the country road?</td>
<td>Did another car cross the center line on the country road?</td>
<td>C  8  D  14  F  26</td>
</tr>
<tr>
<td>Did you see a woman pushing the carriage?</td>
<td>Did the woman pushing the carriage cross into the road?</td>
<td>C  26  D  36  F  54</td>
</tr>
<tr>
<td>Did you see a barn in the film?</td>
<td>Did you see a station wagon parked in front of the barn?</td>
<td>C  2  D  8  F  18</td>
</tr>
</tbody>
</table>

C = control group  
D = direct-question group  
F = false-presupposition group  
(From p. 568.)
DISCUSSION

Based on these and other studies, Loftus argued that an accurate theory of memory and recall must include a process of reconstruction that occurs when new information is integrated into the original memory of an event. The findings of these studies cannot be explained by assuming that recall simply involves a mental replaying of an event, even with varying degrees of accuracy. To illustrate, Figure 1 compares the traditional view of recall with the reformulated process proposed by Loftus. As you can see, the extra step of integrating new information into memory has been added. This new information, in turn, causes your representation of the original memory to be altered or reconstructed. Later, if you are asked a question about the event, your recall will not be of the actual original event, but of your reconstruction of it. Loftus contended that this reconstruction process was the reason that barns, school busses, trucks, women pushing baby carriages, and center lines in roads were all conjured up in subjects' memories when they were not part of the original experience. The false presupposition in the questions, provided a subtle form of new information that was unintentionally integrated into the original memory of the event.

**FIGURE 1** Recall of an event in response to a question.
In applying this idea to eyewitnesses in criminal investigations, Loftus pointed out that often witnesses are questioned more than once. They might be asked questions by police at the scene of the crime, interviewed by the prosecuting attorney assigned to the case, and again examined if they testify in court. During these various sessions of questions, it is not unlikely that false presuppositions will be made, probably unintentionally. There are innumerable ways in which this might happen. Common, innocent-sounding questions such as "What did the guy's gun look like?" or "Where was the get-away car parked?" have been shown to increase the chances that witnesses will remember a gun or a getaway car whether or not they were actually there (Smith & Ellsworth, 1987). So, while the attorneys, the judge, and the jury are making the assumption that the witness is re-creating what was actually seen, Loftus contends that what is being remembered by the witness is a "regenerated image based on the altered memorial representation" (p. 571).

RECENT APPLICATIONS

Several studies represent the ongoing influence of Loftus's impressive body of work on eyewitness testimony. One study citing her 1975 article examined how lawyers' complicated questions negatively affect eyewitness accuracy and confidence (Kebbell & Giles, 2000). All subjects watched identical videotaped events and were questioned a week later about what they saw. Half of the subjects were asked questions in confusing language (you know, that lawyer-speak of "Is it not true that...?"), while others were asked the same questions in simple language. The results were clear; the subjects receiving the confusing form of the questions were less accurate in their eyewitness reports and were also less confident of their answers than those in the straightforward-question condition.

Another fascinating study applied Loftus's work to reports of "fantastic memories," that is, memories that bear greater similarity to fantasy than reality, such as alien abductions, out-of-body experiences, ESP events, encounters with ghosts, and so on (French, 2005). Clearly, if these reports of memories were true, they would provide proof that these 'paranormal' occurrences are real. However, research tells us time and time again that such events have never been scientifically demonstrated. So, what accounts for the memories? The answer may be the fallibility and unreliability of human memory as discussed in this reading and, perhaps, the ability of our brains to create memories of events that never actually happened. As French points out, "a number of psychological variable that have been shown to correlate with susceptibility to false memories (e.g., hypnotic susceptibility, tendency to dissociate, etc.) also correlate with the tendency to report paranormal...experiences" (p. 153). We discuss this false memory issue next.

In addition to her ongoing work in the area of eyewitness testimony, Elizabeth Loftus is currently one of the leading experts in the heated controversy over repressed childhood memories. On one side of this new debate are those people who claim to have been abused, usually sexually, sometime in their past, but who have only recently, often with the help of a therapist, remembered the abuse because the traumatic memories have been repressed in their unconscious. On the other side are those who have been accused of this abuse, but who categorically deny it and claim that these memories have been either fantasized or implanted through the therapeutic process (see Carpy & Loftus, 1994, for a popular press review of the controversy). This falls squarely into the area of Loftus's memory research.

Loftus's book The Myth of Repressed Memory: False Memories and Allegations of Sexual Abuse (Loftus & Ketcham, 1994; also, see Pope, 1995, for a review) summarized her findings in this area and combined them into a cohesive argument. Basically, Loftus contends, and appears to have demonstrated in numerous studies, that repressed memories simply do not exist. In fact, she is at the forefront of psychologists who question the entire notion and existence of an unconscious. A main feature of Loftus's argument is that experimental evidence repeatedly demonstrates that especially traumatic memories tend to be the ones we remember both. And yet, clinicians often report these instances of repressed memories of abuse that rise to the surface during specific and intense forms of therapy. How can these two seemingly opposing views be reconciled? Well, Loftus suggests three possible memory distortions that might explain what clinicians see as repression (Loftus, Joslyn, & Polage, 1998). First, early sexual abuse may simply be forgotten, not repressed. She cites research demonstrating that when children do not understand the sexual nature of a potentially abusive event, it tends to be remembered poorly. Second, it is possible that people in therapy say they had forgotten a traumatic event, but, in reality, they never actually forgot it. Avoiding thinking about something is different from forgetting it. And finally, Loftus contends that some "people may believe that a particular traumatic event occurred and was repressed when, in fact, it did not happen in the first place. Under some circumstances, some combination of these distortions could lead to situations that are interpreted as repression" (p. 781).
You can imagine that Loftus's position on repressed and recovered memories is not without critics (e.g., Pezdek & Roe, 1997 Steinberg, 2000). After all, her rejection of the power of repression is directly opposed to models of psychology and the mind that have been around since Freud. Moreover, many therapists and victims have a very personal stake in the belief that one's memories of abuse can be repressed for years and later recovered. However, a careful reading of Loftus's thorough and careful scientific work should cause anyone to question this belief.

CONCLUSION

Elizabeth Loftus is considered by most to be the leading researcher in the areas of memory reconstruction and eyewitness inaccuracy. Her research in these areas continues. Her findings over the years have held up quite well to challenges and have been supported by other researchers in the field.

There is little doubt within the psychological and legal professions today that eyewitness reports are subject to many sources of error such as postevent information integration. It is because of the body of research by Loftus and others that the power and reliability of eyewitnesses in judicial proceedings is being seriously questioned. Loftus herself is one of the most sought-after expert witnesses (usually for the defense) to demonstrate to juries the care they must use when evaluating the testimony of eyewitnesses.

As Loftus herself puts it in her recent book, "I study memory and I am a skeptic" (Loftus & Ketcham, 1994, p. 7). Perhaps we all should be.

DISCOVERING LOVE

Sometimes it seems that research psychologists have gone too far. How can something such as love be studied scientifically? Well, however you define love, you'll have to agree that it influences a huge amount of our behavior. If we make that assumption, then it follows that psychologists would have to be interested in what it is, where you get it, and how it works.

Harry Harlow (1906-1981), a developmental psychologist, is considered by many to have made the greatest contribution since Freud in studying how our early life experiences affect adulthood. Most psychologists agree that your experiences as an infant with closeness, touching, and attachment to your mother (or primary caregiver) have an important influence on your abilities to love and be close to others later in life. After all, if you think about it, what was your first experience with love? It was the bond between you and your mother beginning at the moment of your birth. But what exactly was it about that connection that was so crucial? The Freudians believed that it was the focus around the importance of the breast and the instinctive oral tendencies during the first year of life (the famous oral stage). Later, the behaviorists countered that notion with the view that all human behavior is associated with our so-called primary needs, such as hunger, thirst, and avoidance of pain. Since the mother can fill these needs, the infant's closeness to her is constantly reinforced by the fact that she provides food for the infant. Consequently, the mother becomes associated with pleasurable events and, therefore, love develops. In both of these conceptualizations, love was seen as something secondary to other instinctive or survival needs. However, Harlow discovered that love and affection may be primary needs that are just as strong as or even stronger than those of hunger or thirst.

One way to begin to uncover the components of the love between an infant and mother would be to place infants in situations where the mother does not provide for all of the infant's needs and where various components of the environment can be scientifically manipulated. According to previous theories, we should be able to prevent or change the quality and strength of the bond formed between the infant and mother by altering the mother's ability to meet the infant's primary needs. For ethical reasons, however, it is obvious that such research could not be done on humans. Since Harlow had been working with rhesus monkeys for several years in his studies of learning, it was a simple process to begin his studies of love and attachment with these subjects. Biologically, rhesus monkeys are very similar to humans. Harlow also believed that the basic responses of the rhesus monkey relating to bonding and affection in infancy (such as nursing, contact, clinging, etc.) are the same for the two species. Whether such research with nonhuman subjects is ethical is addressed later in this section.

THEORETICAL PROPOSITIONS
In Harlow's previous studies, infant monkeys were raised carefully by humans in the laboratory so that they could be bottle-fed better, receive well-balanced nutritional diets, and be protected from disease more effectively than if they were raised by their monkey mothers. Harlow noticed that these infant monkeys became very attached to the cloth pads (cotton diapers) that were used to cover the bottoms of their cages. They would cling to these pads and would become extremely angry and agitated when the pads were removed for cleaning. This attachment was seen in the baby monkeys as early as one day old and was even stronger over the monkeys' first several months of life. Apparently, as Harlow states, "the baby, human or monkey, if it is to survive, must clutch at more than a straw" (p. 675). If a baby monkey was in a cage without this soft covering, it would thrive very poorly even though it received complete nutritional and medical care. When the cloth was introduced, the infant would become healthier and seemingly content. Therefore, Harlow theorized that there must be some basic need in these infant monkeys for close contact with something soft and comforting in addition to primary biological needs such as hunger and thirst. In order to test this theory, Harlow and his associates decided to "build" different kinds of experimental monkey mothers.

METHOD
The first surrogate mother they built consisted of a smooth wooden body covered in sponge rubber and terry cloth. It was equipped with a breast in the chest area that delivered milk and contained a light bulb inside for warmth. They then constructed a different kind of surrogate mother that was less able to provide soft comfort. This mother was made of wire mesh shaped about the same as the wooden frame, so that an infant monkey could cling to it in a similar way to the cloth mother. This wire mother also came equipped with a working nursing
breast and also was able to provide heat. In other words, the wire mother was identical to the cloth mother in every way except for the ability to offer what Harlow called contact comfort.

These manufactured mothers were then placed in separate cubicles that were attached to the infant monkeys' living cage. Eight infant monkeys were randomly assigned to two groups. For one group, the cloth mother was equipped with the feeder (a nursing bottle) to provide milk, and for the other group, the wire mother was the milk provider. I'm sure you can already see what Harlow was testing here. He was attempting to separate the influence of nursing from the influence of contact comfort on the monkeys' behavior toward the mother. The monkeys were then placed in their cages and the amount of time they spent in direct contact with each mother was recorded for the first five months of their lives. The results were striking, but we'll get to those shortly.

Following these preliminary studies, Harlow wanted to explore the effects of attachment and contact comfort in greater detail. Common knowledge tells us that when children are afraid, they will seek out the comfort of their mothers (or other primary caregivers). To find out how the young monkeys with the wire and cloth mothers would respond in such situations, Harlow placed in their cages various objects that caused a fearful reaction in them, such as a wind-up drum-playing toy bear. (To a baby monkey this bear, which is as big as the monkey itself, is very frightening.) The responses of the monkeys in these situations were observed and recorded carefully.

Another study Harlow developed was called the open-field test and involved placing young monkeys in a small, unfamiliar room containing various objects (wooden blocks, blankets, containers with lids, a folded piece of paper) that, under normal conditions, monkeys like to play with and manipulate. The monkeys who were raised with both the cloth and wire mothers were placed in the room with either the cloth mother present, no mother present, or the wire mother present. The idea here was to examine the tendency of the young monkeys to adapt to and explore this strange situation with or without the presence of the mother.

Finally, Harlow wanted to find out if the attachments formed between the monkeys and their surrogate mothers would persist after periods of separation. When the monkeys reached 6 months of age and were on solid food diets, they were separated for short periods from the mother, and then reunited in the open-field situation.

RESULTS

In the original experiment, you will remember that all the monkeys had access to both the cloth mother and the wire mother. For half the monkeys the cloth mother provided the milk and for the other half the wire mother did so. By now you've probably guessed that the monkeys preferred the cloth mother (wouldn't you?), but what was so surprising was the extreme strength of this preference even among those monkeys who received their milk from the wire mother. Contrary to the popular theories at the time of this research, the fulfilling of biological needs such as hunger and thirst was of almost no importance in the monkeys' choice of a mother. The huge influence of contact comfort in producing an attachment between infant and mother was clearly demonstrated. Figure 1 graphically illustrates this effect. After the first few days of adjustment, all the monkeys, regardless of which mother had the milk, were spending nearly all their time each day on the cloth mother. Even those monkeys who were fed by the wire mother would only leave the comfort of the cloth mother to nurse briefly and then return to the cloth-covered surrogate immediately.

The two groups of monkeys that were raised with only a cloth or wire mother further demonstrated the importance of contact comfort. While both groups of these infants ate the same amount and gained weight at the same rate, the infants in the wire mother condition did not digest the milk as well and experienced frequent bouts of diarrhea. This suggests that the lack of the soft mother was psychologically stressful to these infants.

The results of the frightening-object tests provided additional evidence of the young monkeys' attachment to the cloth mother. Whenever the monkeys found themselves faced with something frightening they would run to the cloth mother and cling to it for comfort and protection. As the monkeys' age increased, this response became even stronger. Again, it made no difference whether a monkey had received its milk from the wire or the cloth mother; when afraid, they all sought the security of the soft, cloth-covered surrogate.

You may have noticed in humans that when children feel safe and secure because of the presence of a parent, they are more curious and more willing to explore their environment. Often, they will investigate everything around them, provided they are still able to see the parent. Harlow's strange situation or open-field tests were designed to simulate this behavior in the monkeys in relation to the surrogate mothers. When placed into this strange room, all the monkeys immediately rushed to the cloth mother, clutched it, rubbed their bodies against it, and manipulated its body and face. After a while these infants "began to use the mother surrogate as a
source of security, a base of operations .... They would explore and manipulate a stimulus and then return to the mother before adventuring again into the strange new world" (p. 679).

Monkeys fed by cloth mother

<table>
<thead>
<tr>
<th>Age of monkey (in days)</th>
<th>Time spent with cloth mother</th>
<th>Time spent with wire mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>65</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>120</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>160</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

**FIGURE 1** Amount of time spent each day on the cloth and wire mothers.

However, when the infant monkeys were placed into the same room without the soft mother, their reactions were completely different. They would freeze with fear and engage in emotional behaviors such as crying, crouching, and thumb sucking. Sometimes they would run to the part of the room where the mother usually was and then run from object to object, screaming and crying. When the wire mother was present, they behaved exactly the same as in the no-mother condition. This was once again true of all the monkeys, regardless of the nursing condition (cloth vs. wire) in which they had been raised.

In the last part of this study, the monkeys were separated from the mother for various periods of time after they stopped nursing and were on solid-food diets (about five to six months of age). After the longest separation (30 days), when the monkeys were reunited with the cloth mother in the same open-field situation, the monkeys rushed to the mother, climbed on it, clutched it tightly, and rubbed their heads and faces on its body. They then played with the surrogate mother, which included biting and tearing at the cloth cover. The main difference was that the monkeys did not leave the mother to explore and play with the objects in the room as they had done before. Apparently, according to Harlow, the need for contact comfort was greater than the natural tendency for exploration. It should be pointed out, however, that these reunions only lasted about three minutes and that such exploration may have occurred if the sessions had been extended.

**DISCUSSION**

As Harlow points out, the studies reported in this article demonstrate the overwhelming importance of contact comfort in the development of attachment between infant monkeys and their mothers. In fact, this factor in bonding appears to be considerably more important than the mother's ability to provide life-sustaining milk to the infant.

One of the many reasons this research changed psychology is that the findings went against the grain of the popular beliefs of the behaviorists at that time, who focused on the reinforcement qualities of feeding as the driving force behind the infant-mother bond. However, as Harlow stated about his findings, "the primary function of nursing as an affectional variable is that of ensuring frequent and intimate body contact of the infant with the mother. Certainly, man cannot live by milk alone" (p. 677).
There is little question that Harlow believed that his results could be applied to humans, a question that is discussed shortly. In fact, he offered the possibility of his findings' practical applications to humans. He contended that as socioeconomic demands on the family increase, women would be entering the workplace with increasing frequency. This was of concern to many at the time of Harlow's research, since it was widely believed that the mother's presence for nursing was necessary for attachment and proper child rearing. He went on to state that, since the key to successful parenting is contact comfort and not the mammalian capabilities of women, the American male is able to participate on equal terms in the rearing of infants. This view may be widely accepted today, but when Harlow wrote this in 1958, it was revolutionary.

CRITICISMS AND SIGNIFICANCE OF THE FINDINGS

Harlow's claims notwithstanding, do you think it's appropriate to view humans as having the same attachment (or love) processes as monkeys? There has been some research to support the view that the attachment of human babies to their caregivers does indeed go well beyond simply fulfilling biological needs. It has been shown that greater skin-to-skin contact between a mother and her very young infant enhances attachment (Klaus & Kennell, 1976). However, the attachment process develops much more slowly in humans: over the first six months compared with the first few days for monkeys. In addition, only approximately 70% of children appear to be securely attached to an adult at one year old (Sroufe, 1985).

There are many people, past and present, who would offer criticisms of Harlow's work based on the ethics of performing such experiments on infant monkeys. The question raised is this: Do we as humans have the right to subject monkeys (or any animal) to potentially harmful situations for the sake of research? In the case of Harlow's research, there are sensible arguments on both sides. One of the ways science judges the ethics of such research is by examining the potential benefits to people and society. Whether you feel that this study was ethical or not, the findings have affected humans in several positive ways. Some of these relate to issues of institutionalized children, adoption, and child abuse.

Unfortunately, many children in our culture are forced to spend portions of their lives in institutional settings, either because their parents are unable to keep and care for them (orphanages), or because of their own various illnesses and other physical difficulties (hospital settings). Harlow's research has influenced the kind of care we try to provide for those children. There is now general acceptance that basic biological care in institutional settings is inadequate and that infants need to be in physical contact with other humans. Institutionalized children need to be touched and held by staff members, nurses, and volunteers as much as possible. Also, when not precluded by medical conditions, these children are often placed in situations where they can see and touch each other, thereby gaining additional contact comfort. While such attempts at filling attachment needs will never replace real parental care, they are clearly a vast improvement over simple custodial care.

The work of Harlow offered encouragement and optimism for nonmaternal caregivers to be effective parents. Since it appeared that nursing was secondary to contact comfort in the development and adjustment of infants, the actual mother of a child was no longer seen as the only proper person to provide care. Now fathers could feel more adequate to assume a larger role in the process. But beyond this, other nonparental caregivers, such as babysitters or day care-center workers, when necessary, could be seen as acceptable options. Moreover, these discoveries greatly enhanced the prospect of adoption, since it was recognized that an adoptive parent could offer a child just as much contact comfort as a biological parent could.

Finally, Harlow's early studies shed light on the terrible problem of child abuse. One surprising aspect of such abusive relationships is that in nearly all cases, the abused child seems to love and to be firmly attached to the abusive parent. According to a strict behaviorist interpretation, this is difficult to understand. But if attachment is the strongest basic need, as Harlow suggested, then this would far outweigh the effects of the abusive punishment. Harlow actually tested this in later studies. He designed surrogate mother monkeys that were able to reject their infants. Some emitted strong jets of air, while others had blunt spikes that would pop out and force the baby monkeys away. The way the monkeys would respond to this treatment would be to move a small distance away until the rejection ended. They would then return and cling to the mother as tightly as ever (Rosenblum & Harlow, 1963).

RECENT APPLICATIONS

Harlow's research continues to be cited frequently in studies on the influence of touch, bonding, attachment, and the effects of human contact on emotional and physical health. One such study examined the connection between
social isolation (lack of opportunities for close, meaningful, social contact with others) and physical health among adults who live in life situations marked by loneliness (Cacioppo & Hawkley, 2003). Findings indicated that adults lacking in social contact experienced everyday life events as more stressful, were at greater risk of high blood pressure, healed from injuries more slowly, and slept more poorly than people with healthy social connections.

Another study citing Harlow work demonstrated how skin-to-skin contact (cleverly referred to as *kangaroo care*) is critically important in the survival and development of premature infants and in establishing the infant-mother bond following premature births (Feldman & Eidelman, 1998). This is an important finding, in that hospitals caring for high-risk premature infants must work to balance a baby's need for physical contact and touch with other, equally compelling safeguards against potentially life-threatening infections that a premature baby's undeveloped immune system might be unable to fight.

Harlow's ideas have also been applied to psychotherapeutic settings. As humanistic and holistic approaches to counseling have developed over the past 40 years, the healing qualities of touch have played an increasingly central role (see LaTorre, 2000). As one psychotherapist explains:

> I have found that when touch is focused and intentioned, particularly in touch therapies such as acupressure and therapeutic touch, it becomes an important aspect in the therapeutic interaction. It deepens awareness and supports change. Rather than creating confusion, touch therapies when used appropriately enhance the psychotherapeutic interaction instead of detracting from it. The key word here is appropriate. Touch is a very powerful tool and should not be used lightly. (LaTorre, 2000, p. 105)

CONCLUSION

It would be a mistake to assume that Harlow had a monopoly on the definition of the nature of love. It is unmistakable, however, that his discoveries changed the way we view the connection between infant and mother. Perhaps, if this research has permeated, at least a little, into our culture, some good has come from it. For example, Harlow tells the story of a woman who, after hearing Harlow present his research, came up to him and said, "Now I know what's wrong with me! I'm just a wire mother" (p. 677).


HOW MORAL ARE YOU?

Have you ever really thought about your personal morality? What are the moral principles guiding your decisions in life? If you stop to think about it, experience tells you that people vary a great deal in terms of the morality of their thought and actions. Morals are generally defined by psychologists as attitudes and beliefs that people hold that help them decide what is right and wrong. Your concept of morality is determined by the rules and norms of conduct that are set forth by the culture in which you have been raised and that have been internalized by you. Morality is not part of your *standard equipment* at birth: You were born without morals. As you developed through childhood into adolescence and adulthood, you developed your ideas about right and wrong. Every normal adult has a conception of morality. But where did Human Development 143 this conception originate? What was the process by which it went from being a set of cultural rules to being part of who you are?

Probably the two most famous and influential figures in the history of research on the formation of morality were Jean Piaget (discussed previously) and Lawrence Kohlberg (1927-1987). Following Piaget's work, and before Kohlberg's, a period of 20 to 30 years passed during which child psychologists paid little attention to morality. Kohlberg's research at the University of Chicago incorporated and expanded upon many of Piaget's ideas about intellectual development and sparked renewed interest in this area of study. As others had done in the past, Kohlberg was addressing this question: "How does the amoral infant become capable of moral reasoning?"

Using the work of Piaget as a starting point, Kohlberg theorized that the uniquely human ability to make moral judgments develops in a predictable way during childhood. Moreover, he believed that there are specific, identifiable stages of moral development, related and similar in concept to Piaget's stages of intellectual development. As Kohlberg explained, "The child can internalize the moral values of his parents and culture and make them his own only as he comes to relate these values to a comprehended social order and to his own goals as a social self" (Kohlberg, 1964). In other words, a child must reach a certain stage of intellectual ability in order to develop a certain level of morality.

With these ideas in mind, Kohlberg set about formulating a method for studying children's abilities to make moral judgments. From that research came his widely recognized theory of moral development.

THEORETICAL PROPOSITIONS

When Kohlberg asserted that morality is acquired in developmental stages, he was using the concept of stage in a precise and formal way. It is easy to think of nearly any ability as occurring in stages, but psychologists draw a clear distinction between changes that develop gradually over time (such as a person's height) and those that develop in distinct and separate stages. So when Kohlberg referred to "structural moral stages in childhood and adolescence," he meant that (1) each stage is a uniquely different kind of moral thinking and not just an increased understanding of an adult concept of morality; (2) the stages always occur in the same step-by-step sequence so that no stage is ever skipped and there is never backward progression; and (3) the stages are prepotent, meaning that children comprehend all stages below their own and perhaps have some understanding of no more than one stage above. Children are incapable of understanding higher stages, regardless of encouragement, teaching, or practice. Furthermore, they prefer to function at the highest moral stage they have reached. Also implied in this stage formulation of moral development is the notion that the stages are universal and they occur in the same order, regardless of individual differences in experience and culture.

Kohlberg believed that his theory of the formation of morality could be explored by giving children at various ages the opportunity to make moral judgments. If the reasoning they used to make moral decisions could be found to progress predictably at increasing ages, this would be evidence that his stage theory was essentially correct.

METHOD

Kohlberg's research methodology was really quite simple. He presented children of varying ages with 10 hypothetical moral dilemmas. Each child was interviewed for two hours and asked questions about the moral issues presented in the dilemmas. The interviews were tape recorded for later analysis of the moral reasoning used. Two of Kohlberg's most widely cited moral dilemmas were as follows:
The Brother's Dilemma. Joe's father promised he could go to camp if he earned the $50 for it, and then changed his mind and asked Joe to give him the money he had earned. Joe lied and said he had only earned $10 and went to camp using the other $40 he had made. Before he went, he told his younger brother, Alex, about the money and about lying to their father. Should Alex tell their father? (p. 12)

The Heinz Dilemma. In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging 10 times what the drug cost him to make. He paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $1,000, which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. Should the husband have done this? (p. 17)

The subjects in Kohlberg's original study were 72 boys living in the Chicago suburbs. The boys were in three different age groups: 10, 13, and 16 years. Half of each group were from lower middle-class socioeconomic brackets; the other half were from the upper middle-class brackets. During the course of the two-hour interviews, the children expressed between 50 and 150 moral ideas or statements. Following are four examples quoted by Kohlberg of responses made by children of different ages to these dilemmas.

Danny, age 10, The Brother's Dilemma. "In one way it would be right to tell on his brother, or [else] his father might get mad at him and spank him. In another way it would be right to keep quiet, or [else] his brother might beat him up." (p. 12)

Don, age 13, The Heinz Dilemma. "It really was the druggist's fault, he was unfair, trying to overcharge and letting someone die. Heinz loved his wife and wanted to save her. I think anyone would. I don't think they would put him in jail. The judge would look at all sides and see the druggist was charging too much." (p. 19)

Andy, age 13, The Brother's Dilemma. "If my father finds out later, he won't trust me. My brother wouldn't either, but I wouldn't [feel so bad] if he (the brother) didn't." (p. 20)

George, age 16, The Heinz Dilemma. "I don't think so, since it says the druggist had a right to set the price. I can't say he'd actually be right; I suppose anyone would do it for a wife, though. He'd prefer to go to jail than have his wife die. In my eyes he'd have just cause to do it, but in the law's eyes he'd be wrong. I can't say more than that as to whether it was right or wrong." (p. 21)

Based on such statements, Kohlberg and his associates defined six stages of moral development and assigned the statements to one of the six stages. Additionally, there were six types of motives the subjects used to justify their reasoning, which corresponded to the six stages. It should be noted that each of the six stages of moral reasoning delineated by Kohlberg was intended to apply universally to any situation the child might encounter. The stages do not predict a specific action a child might take when faced with a real dilemma, but rather the reasoning the child would use in determining a course of action.

RESULTS

Kohlberg grouped the six stages he had found into three moral levels, outlined in Table 1. The early stages of morality, which Kohlberg called the "premoral" level, are characterized by egocentrism and personal interests. In stage 1, the child fails to recognize the interests of others and behaves morally out of fear of punishment for bad behavior. In stage 2, the child begins to recognize the interests and needs of others, but behaves morally in order
TABLE 1 Kohlberg's Six Stages of Moral Development

LEVEL 1. PREMORAL LEVEL

Stage 1. Punishment and obedience orientation (consequences for actions determine right and wrong)
Stage 2. Naive instrumental hedonism (satisfaction of one's own needs defines what is good)

LEVEL 2. MORALITY OF CONVENTIONAL ROLE-CONFORMITY

Stage 3. "Good boy–nic e girl" orientation (what pleases others is good)
Stage 4. Authority maintaining morality (maintaining law and order, doing one's duty is good)

LEVEL 3. MORALITY OF SELF-ACCEPTED MORAL PRINCIPLES

Stage 5. Morality of agreements and democratically determined law (society's values and individual rights determine right and wrong)
Stage 6. Morality of individual principles of conscience (right and wrong are a matter of individual philosophy according to universal principles)

(Adapted from p. 13.)

to get moral behavior back. Good behavior is, in essence, a manipulation of a situation to meet the child's own needs.

In level 2, conventional morality that is a part of a recognition of one's "role in interpersonal relationships comes into play. In stage 5, the child behaves morally in order to live up to the expectations of others and maintain relationships that contain trust and loyalty. It is during this stage, according to Kohlberg, that Golden Rule thinking begins and the child becomes concerned about the feelings of others. Stage 4 begins the child's recognition of and respect for law and order. Here a person takes the viewpoint of the larger social system and sees good behavior in terms of being a law-abiding citizen. There is no questioning of the established social order, but rather the belief that whatever upholds the law is good.

When a person enters level 3, judgments about morality begin to transcend formal societal laws. In stage 5, a recognition takes place that some laws are better than others. Sometimes what is moral may not be legal, and vice versa. The individual still believes that laws should be obeyed to maintain social harmony, but may seek to change laws through due process. At this stage, Kohlberg maintained, a person will experience conflict in attempting to integrate morality with legality.

Finally, if a person reaches stage 6, his or her moral judgments will be based upon the belief that there are universal ethical principles. "When laws violate these principles, the person behaves according to his or her ethical principles, regardless of the law. Morality is determined by the individual's own conscience. Kohlberg was to find in this and later studies that very few individuals actually reach stage 6. He eventually ascribed this level of reasoning to great leaders of conscience such as Gandhi, Thoreau, and Martin Luther King. Kohlberg claimed that a motivational aspect of morality was defined by the motive mentioned by the subject in justifying moral action. Six levels of motive were isolated, each congruent with one of the developmental types. They were as follows: (1) punishment by another; (2) manipulation of goods or rewards by another; (3) disapproval by others; (4) censure by legitimate authorities followed by feelings of guilt; (5) community respect and disrespect; (6) self-condemnation. (p. 13)

Finally, it was crucial to Kohlberg's stage theory that the different levels of moral reasoning advance with the age of the person. To test this, he analyzed the various stages corresponding to the children's answers according to the ages of the children. Figure I summarizes these findings: As the age of the subjects increased, the children used increasingly higher stages of moral reasoning to respond to the dilemmas. Other statistical analyses demonstrated that the ability to use each stage appeared to be a prerequisite to moving to the next-higher level.
DISCUSSION

In Kohlberg’s discussion of the implications of his findings, he pointed out that this new conceptualization clarified how children actively organize the morality of the world around them in a series of predictable, sequential stages. For the child, this was not seen simply as an assimilation and internalization of adult moral teachings through verbal explanation and punishment, but as an emergence of cognitive moral structures that developed as a result of the child’s interaction with the social and cultural environment. In this view, children do not simply learn morality, they construct it. What this means is that a child is literally incapable of understanding or using stage 3 moral reasoning before passing through stages 1 and 2. And a person would not apply the moral concepts of basic human rights found in stage 5 to solve a dilemma unless that person had already experienced and constructed the patterns of morality inherent in the first four stages. Further implications of this and later work of Kohlberg are discussed shortly.

CRITICISMS AND RECENT APPLICATIONS

As Kohlberg expanded and revised his stage theory of moral development over more than 30 years following this original study, it has received criticism from several perspectives. One of the most often cited of those is that even if Kohlberg was correct in his ideas about moral reasoning, this does not mean they can be applied to moral behavior. In other words, what a person says is moral may not be reflected in the person’s moral actions. Several studies have demonstrated a lack of correspondence between moral reasoning and moral behavior, while others have found evidence that such a relationship do exist. One interesting line of research related to this criticism focused the importance of situational factors, minimally addressed by Kohlberg, in determining whether someone will act according to his or her stage of moral reasoning (see Kurtines, 1986). Although some validity may attend this criticism, Kohlberg acknowledged that his theory was intended to apply to moral reasoning. The fact that situational forces may sometimes alter moral behavior does not imply that moral reasoning does not progress through the stages he described.

Another criticism of Kohlberg’s work has focused on his claim that the six stages of moral reasoning are universal. These critics claim that Kohlberg’s stages represent an interpretation of morality that is uniquely found in Western individualistic societies and, therefore, would not apply to the non-Western cultures that make up most of the world’s population (i.e., Simpson, 1974). However, in defense of the universality of Kohlberg’s ideas,
45 separate studies conducted in 27 different cultures were reviewed by Snarey (1987). In every study, researchers found that their subjects all passed through the stages in the same sequence, without reversals, and that stages 1 through 5 were present in all the cultures studied. Interestingly, however, in the more collectivist cultures (Taiwan, Papua New Guinea, and Israel), some of the moral judgments did not fit into any of Kohlberg's six stages. These were judgments based on the welfare of the entire community. Such reasoning was not found in the judgments made by American male subjects (see the reading on Triandis's research on individualistic and collectivist cultures later in this book).

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 has been Carol Gilligan (1982). She 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 5, 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 by Kohlberg to be at a lower moral level than men, it is because of an unintentional gender bias built into the theory.

Other 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 more complete discussion of these gender issues).

Kohlberg's early work on the development of moral judgment continues to be cited in studies from a wide range of disciplines. Not surprisingly, a significant proportion of current studies employing Kohlberg's model are found in the area of law and criminal justice. One very provocative study examined groups of individuals that you might logically expect to have very poorly developed moral reasoning abilities: rapists, child molesters, and incest offenders (Valliant et al., 2000). The researchers found that these criminals actually demonstrated fairly advanced levels of moral reasoning abilities, but also scored high on test for psychopathic deviance and paranoia. The authors interpret their findings as follows: "These results imply that rapists and child molesters have the ability to understand moral issues; however, given their personality orientation, they ignore these interpersonal values" (p. 67).

Another study citing Kohlberg's theory examined the accuracy of eyewitness testimony given by children (Bottoms et al., 2002). Children between the ages of three and six participated in a play session with their mothers. Half of the children were told not to play with certain toys in the room. However, when the researcher left the children's mothers urged them to play with the "forbidden" toys, but to "keep it a secret." Later the researchers interviewed the children and asked if they had played with the prohibited toys. "Results indicated that older children who were instructed to keep events secret withheld more information than did older children not told to keep events secret. Younger children's reports were not significantly affected by the secret manipulation" (p. 285). Often, children are told by adult- to keep secrets about adults' illegal or injurious activities. Understanding when their understanding of the use and meaning of secrecy may play an important role in the use of child eyewitness testimony in legal proceedings (see the reading on Loftus's research on eyewitness testimony elsewhere in this book).

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, few 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 .... [I] have 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. (p. 425)


I CAN SEE IT ALL OVER YOUR FACE!

Think of something funny. What is the expression on your face? Now think of something in your past that made you sad. Did your face change? Chances are it did. Undoubtedly, you are aware that certain facial expressions coincide with specific emotions. And, most of the time, you can probably tell how people are feeling emotionally from the expressions on their faces. Now, consider this: Could you be equally successful in determining someone's emotional state based on facial expression if that person is from a different culture—say, Romania, Sumatra, or Mongolia? In other words, do you believe facial expressions of emotion are universal? Most people believe that they are, until they stop and consider how radically different other cultures are from their own. Think of the multitude of cultural differences in gestures, personal space, rules of etiquette, religious beliefs, attitudes, and so on. With all these differences influencing behavior, it would be rather amazing if there are any human characteristics, including the emotional expressions that are identical across all cultures.

Paul Ekman is considered the leading researcher in the area of the facial expression of emotion. This early article details his research, which was designed to demonstrate the universality of these expressions. While the authors acknowledged in their introduction that previous researchers had found some evidence that facial behaviors are determined by culturally variable learning, they argued that this evidence was weak and that expressions of basic emotions are equivalent in all cultures.

Several years prior to this study, Ekman and Friesen had conducted research in which they showed photographs of faces to college-educated people in Argentina, Brazil, Chile, Japan, and the United States. All the subjects from every country successfully identified the same facial expressions as corresponding to the same emotions. The researchers presented their findings as evidence of universality in these expressions. However, as Ekman and Friesen themselves pointed out, these findings were open to criticism, since members of the cultures studied had all been exposed to international mass media (movies, magazines, television), which is full of facial expressions. What was needed to prove the universality of emotional expression was a culture that had not been exposed to any of these things. Imagine how difficult (perhaps impossible!) it would be to find such a culture today. Well, even in 1971 it wasn't easy.

Ekman and Friesen traveled to the Southeast Highlands of New Guinea to find subjects for their study among the Fore people who existed then as an isolated Stone Age society. Many of the members of this group had experienced little or no contact with Western or Eastern modern cultures. Therefore, they had not been exposed to emotional facial expressions other than those of their own people.

THEORETICAL PROPOSITIONS

The theory underlying Ekman and Friesen's study was that the specific facial expressions corresponding to basic emotions are universal. Ekman and Friesen stated it quite simply:

The purpose of this paper was to test the hypothesis that members of a preliterate culture who had been selected to ensure maximum visual isolation from literate cultures will identify the same emotion concepts with the same faces as do members of literate Western and Eastern cultures. (p. 125)

METHOD

The subgroup of the Fore who were the most isolated were among those referred to as the South Fore. The individuals selected to participate in the study had seen no movies, did not speak English or Pidgin, had never worked for a Westerner, and had never lived in any of the Western settlements in the area. There were 189 adults and 130 children chosen to participate, out of a total South Fore population of about 11,000. For comparison, there were also 23 adults chosen who had experienced a great deal of contact with Western society through watching movies, living in the settlements, and attending missionary schools.

Through trial and error, the researchers found that the most effective method of asking the subjects to identify emotions was to present them with three photographs of different facial expressions and read a brief description of an emotion-producing scene or story that corresponded to one of the photographs. The subject could then simply point to the expression that best matched the story. The stories used were selected very carefully to be sure that each scene was related to only one emotion and that it was recognizable to the Fore
Table 1 lists the six stories developed by Ekman and Friesen. The authors explained that the fear story had to be longer to prevent the subjects from confusing it with surprise or anger.

**TABLE 1 Ekman and Friesen’s Stories Corresponding to Six Emotions**

<table>
<thead>
<tr>
<th>EMOTION</th>
<th>STORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Happiness</td>
<td>His (her) friends have come and he (she) is happy.</td>
</tr>
<tr>
<td>2. Sadness</td>
<td>His (her) child (mother) has died and he (she) feels very sad.</td>
</tr>
<tr>
<td>3. Anger</td>
<td>He (she) is angry and about to fight.</td>
</tr>
<tr>
<td>4. Surprise</td>
<td>He (she) is just now looking at something new and unexpected.</td>
</tr>
<tr>
<td>5. Disgust</td>
<td>He (she) is looking at something he (she) dislikes; or he (she) is looking at something that smells bad.</td>
</tr>
<tr>
<td>6. Fear</td>
<td>He (she) is sitting in his (her) house all alone and there is no one else in the village. There is no knife, ax, or bow and arrow in the house. A wild pig is standing in the door of the house and the man (woman) is looking at the pig and is very afraid of it. The pig has been standing in the doorway for a few minutes, and the person is looking at it very afraid, and the pig won’t move away from the door, and he (she) is afraid the pig will bite him (her).</td>
</tr>
</tbody>
</table>

(Adapted from p. 126.)

Forty photographs of 24 different people, including men, women, boys, and girls, were used as examples of the six emotional expressions. These photographs had been validated previously by showing them to members of various other cultures. Each photograph had been judged by at least 70% of observers in at least two literate Western or Eastern cultures to be representative of the emotion being expressed.

The actual experiment was conducted by teams consisting of one member of the research group and one member of the South Fore tribe, who explained the task and translated the stories. Each adult subject was shown three photographs (one correct and two incorrect), was told the story that corresponded to one of them, and was asked to choose the expression that best matched the story. The procedure was the same for the children, except that they only had to choose between two photographs, one correct and one incorrect. Each subject was presented with various sets of photographs so that no single photograph ever appeared twice in the comparison.

The translators were given careful training to ensure that they would not influence the subjects. They were told that there was no absolutely correct response and were asked to not prompt the subjects. Also, they were taught how to translate the stories exactly the same way each time and to resist the temptation to elaborate and embellish them. To avoid unintentional bias, the Western member of the research team avoided looking at the subject and simply recorded the answers given.

Remember that these were photographs of Western facial expressions of emotions. So, could the Fore people correctly identify the emotions in the photographs, even though they may never have seen a Western face before?

**RESULTS**

First, analyses were conducted to see if there were differences between males and females or between adults and children. The adult women were found to be more hesitant to participate and were considered to have had less contact with Westerners than the men. However, no significant differences in ability to correctly identify the emotions in the photographs were found between any of the groups.

Tables 2 and 3 summarize the percentage of correct responses for the six emotions by the least Westernized adults and the children, respectively. Not all subjects were exposed to all emotions, and sometimes subjects were exposed to the same emotion more than once. Therefore, the number of subjects in the tables do not equal the overall total number of participants. All of the percentages were statistically significant except when subjects were asked to distinguish fear from surprise. When this situation existed, many errors were made, and, for one group, surprise was actually selected a significant 67% of the time when the story described fear.
TABLE 2 Percent of Adults Correctly Identifying Emotional Expressions in Photographs

<table>
<thead>
<tr>
<th>EMOTION IN STORY</th>
<th>NUMBER OF SUBJECTS</th>
<th>PERCENT CHOOSING CORRECT PHOTOGRAPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness</td>
<td>220</td>
<td>92.3</td>
</tr>
<tr>
<td>Anger</td>
<td>98</td>
<td>85.3</td>
</tr>
<tr>
<td>Sadness</td>
<td>191</td>
<td>79.0</td>
</tr>
<tr>
<td>Disgust</td>
<td>101</td>
<td>83.0</td>
</tr>
<tr>
<td>Surprise</td>
<td>62</td>
<td>68.0</td>
</tr>
<tr>
<td>Fear</td>
<td>184</td>
<td>80.5</td>
</tr>
<tr>
<td>Fear (with surprise)</td>
<td>153</td>
<td>42.7</td>
</tr>
</tbody>
</table>

(Adapted from p. 127.)

Comparisons were made between the Westernized and non-Westernized adults. No significant differences were found between these two groups on the number who chose the correct photographs matching the emotion stories. There were also no differences found between younger and older children. As you can see in Table 3, the children appeared to perform better than the adults, but Ekman and Friesen attributed this to the fact that they only had to choose between two photographs instead of three.

TABLE 3 Percent of Children Correctly Identifying Emotional Expressions in Photographs

<table>
<thead>
<tr>
<th>EMOTION IN STORY</th>
<th>NUMBER OF SUBJECTS</th>
<th>PERCENT CHOOSING CORRECT PHOTOGRAPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness</td>
<td>135</td>
<td>92.8</td>
</tr>
<tr>
<td>Anger</td>
<td>69</td>
<td>85.3</td>
</tr>
<tr>
<td>Sadness</td>
<td>145</td>
<td>81.5</td>
</tr>
<tr>
<td>Disgust</td>
<td>46</td>
<td>86.5</td>
</tr>
<tr>
<td>Surprise</td>
<td>47</td>
<td>98.3</td>
</tr>
<tr>
<td>Fear</td>
<td>64</td>
<td>93.3</td>
</tr>
</tbody>
</table>

(Adapted from p. 127.)

DISCUSSION

Ekman and Friesen did not hesitate to draw a confident conclusion from their data: "The results for both adults and children clearly support our hypothesis that particular facial behaviors are universally associated with particular emotions" (p. 128). This conclusion was based on the fact that the South Fore had no opportunity to learn anything about Western expressions and, thus, had no way of identifying them unless the expressions were universal.

As a way of double-checking their findings, the researchers videotaped members of the isolated Fore culture portraying the same six facial expressions. Later, when these tapes were shown to college students in the United States, the students correctly identified the expressions corresponding to each of the emotions.
The evidence from both studies contradicts the view that all facial behavior associated with emotion is culture-specific, and that posed facial behavior is a unique set of culture-bound conventions not understandable to members of another culture. (p. 128)

The one exception to their consistent findings, that of the confusion subjects seemed to experience in distinguishing between expressions of fear and surprise, Ekman and Friesen explained by acknowledging that there are certainly some cultural differences in emotional expression, but this did not detract from the preponderance of evidence that nearly all the other expressions were correctly interpreted across the cultures. They speculated that fear and surprise may have been confused "because in this culture fearful events are almost always also surprising; that is, the sudden appearance of a hostile member of another village, the unexpected meeting of a ghost or sorcerer, etc." (p. 129).

IMPLICATIONS OF THE RESEARCH

This study by Ekman and Friesen served to demonstrate scientifically what you already suspected: that facial expressions of emotions are universal. However, you might still be asking yourself, "What is the significance of this information?" Well, part of the answer to that question relates to the nature-nurture debate about which human behaviors are present at birth and which are acquired through learning. Since facial expressions for the six emotions used in this study appear to be influenced very little by cultural differences, it is possible to conclude that they must be innate, that is, biologically hard-wired in at birth.

Another reason behavioral scientists find the notion of universal emotional expressions interesting is that it addresses issues about how humans evolved. In 1872, Darwin published a now-famous book called *The Expression of Emotion in Man and Animals*. He maintained that facial expressions were adaptive mechanisms that assisted animals in adapting to their environment and, therefore, increased their ability to survive. The idea behind this was that if certain messages could be communicated within and across species of animals through facial expressions, survival would be enhanced. For example, an expression of fear would provide a silent warning of imminent danger from predators; an expression of anger would warn less dominant members of the group to stay away from more powerful ones; and an expression of disgust would communicate a message of, "Yuck! Don't eat that, whatever you do," and prevent a potential poisoning. These expressions, however, would do the animals no good if they weren't universal among all the individuals making up the various species. Even though these expressions may now be less important to humans in terms of their survival-enhancement value, the fact that they are universal among us would indicate that they have been passed on to us from our evolutionary ancestors and have assisted us in reaching our present position on the evolutionary ladder.

A fascinating study demonstrated this leftover survival value of facial expressions in humans. The researchers (Hansen & Hansen, 1988) reasoned that if facial expressions could warn of impending danger, then humans should be able to recognize certain expressions, such as anger, more easily than other, less threatening expressions. To test this, they presented subjects with photographs of crowds of people with different facial expressions. In some of the photographs, all of the people's expressions were happy except for one that was angry. In other photographs, all of the expressions were angry, except for one that was happy. The subjects' task was to pick out the face that was different. The amount of time it took the subjects to find a single happy face in a crowd of angry faces was significantly longer than when they were to search a crowd of happy faces for a single angry face. Furthermore, as the size of the crowds in the photographs increased, the time for subjects to find the happy face also increased, but finding the angry face did not take significantly longer. This and other similar findings have indicated that humans may be biologically programmed to respond to the information provided by certain expressions better than others because they offered more survival information.

RECENT APPLICATIONS

Other more recent studies in various areas of research have relied on Ekman's early findings in attempting to improve our understanding of children and adults with developmental or learning disabilities. One such study found that children diagnosed with autism (a pervasive developmental disorder marked by language deficits, social withdrawal, and repetitive self-stimulation behaviors) appear to have difficulty recognizing the facial expressions that correspond to basic emotions (Bolte & Poustka, 2003). This difficulty was even more pronounced in families with more than one autistic child, and may help explain why many autistic individuals typically show difficulty interpreting emotional responses from others.
Ekman’s research on facial expressions has also played a fundamental role in cross-cultural psychology research. David Matsumoto, one of the leading researchers in this area, has made frequent use of Ekman’s concepts in his studies of intercultural interpretations of emotions and behavioral expectations (e.g., Matsumoto, Kasri, & Kook en, 1999). In addition, Matsumoto and Ekman have collaborated with other researchers on a study of cross-cultural gender differences in facial expressions (Biehl et al., 1997).

The influence of Ekman’s research, however, is not limited to humans. Ekman’s 1971 study has been cited in research on emotions in farm animals (Desire, Boissy, & Veissier, 2002). These researchers suggest that the welfare of farm animals depends, in part, on their emotional reactions to their environment. When individual animals feel in harmony with their environment, their welfare is maximized; however, "any marked deviation from the state, if perceived by the individual, results in a welfare deficit due to negative emotional experiences" (p. 165). Clearly one group of farm animals feels very harmonious with their environment because, as the ad campaign says, "great cheese comes from happy cows, and happy cows come from California."

Finally, another study citing Ekman’s 1971 article attempted to shed light on exactly how one specific facial feature, the eyebrows, contributes to facial recognition (Sadr, Jarudi, & Sinha, 2003). Previous research had centered more on the eyes and mouth, but these researchers found that the eyebrows may be more important than the eyes themselves. The authors concluded "that the absence of eyebrows in familiar faces leads to a very large and significant disruption in recognition performance. In fact, a significantly greater decrement in face recognition is observed in the absence of eyebrows than in the absence of eyes" (p. 285). So, if you are ever in need of an effective disguise, be sure to cover your eyebrows!

CONCLUSION

During the two decades following the early cross-cultural research on emotional expressions, Ekman has continued his emotion research both individually and in collaboration with Friesen and several other researchers. Within this body of work, many fascinating discoveries have been made. One further example of Ekman’s research involved what is called the facial feedback theory of emotional expressions. The theory states that the expression on your face actually feeds information back to your brain to assist you in interpreting the emotion you are experiencing. Ekman tested this idea by identifying the exact facial muscles involved in each of the six basic emotions. He then instructed subjects to tense these muscles into expressions resembling the various emotions. When they did this, Ekman was able to measure physiological responses in the subjects that corresponded to the appropriate emotion resulting from the facial expression alone, and not from the actual presence of the emotion itself (Ekman, Levensen, & Friesen, 1983).

Ekman has also extended his research into the area of deception and how the face and the body leak information to others about whether someone is telling the truth. In general, his findings have indicated that people are able to detect when others are lying at a slightly better than chance level when observing their facial expressions. However, when allowed to observe another’s entire body, subjects were much more successful in detecting lies, indicating that the body may provide better clues to certain states of mind than the face alone (see Ekman, 1985, for a complete discussion of this issue).

Ekman and his associates have provided us with a large literature on the nonverbal communication provided by facial expressions (see Ekman, 2003). And research in this area continues. There is little doubt that the studies will continue until we are successful in accomplishing the goal that was the title of Ekman and Friesen’s 1975 book Unmasking the Face.


Have you ever been in a position of having to do or say something that was contrary to your attitudes or private opinions? Chances are you have; everyone has at some time. When you behaved that way, what happened to your true attitude or opinion? Nothing? Well, maybe nothing. However, studies have shown that in some cases, when your behavior is contrary to your attitude, your attitude will change in order to bring it into alignment with your behavior. For example, if a person is forced (by the demands of an experiment) to deliver a speech in support of a viewpoint or position opposed to his or her own opinion, the speaker's attitudes will shift toward those given in the speech.

In the early 1950s, various studies explained this opinion shift as a result of (1) mentally rehearsing the speech and (2) the process of trying to think of arguments in favor of the forced position. In performing those mental tasks, the early theories argued, subjects convince themselves of the position they were about to take. In pursuing this line of reasoning further, additional studies were conducted that offered monetary rewards to subjects for giving convincing speeches contrary to their own views. It was expected that the greater the reward, the greater would be the resulting opinion change in the speaker. (Seems logical, doesn't it?) However, as one of many examples of how common sense is a poor predictor of human behavior, just the opposite was found to be true. Larger rewards produced less attitude change than smaller rewards. Based on the theories of learning that were popular at the time (operant conditioning, reinforcement theory, etc.), such findings were difficult for researchers to explain.

A few years later, Leon Festinger (1919-1989), a research psychologist at Stanford University, proposed the highly influential and now famous theory of cognitive dissonance, which could account for the seemingly discrepant findings. The word cognitive refers to any mental processes, such as thoughts, ideas, units of knowledge, attitudes, or beliefs; dissonance simply means out of tune. Therefore, Festinger suggested, you will experience cognitive dissonance when you simultaneously hold two or more cognitions that are psychologically inconsistent. When this condition exists, it creates discomfort and stress to varying degrees, depending on the importance of the dissonance to your life. This discomfort then motivates you to change something in order to reduce it. Since you cannot change your behavior (because you have already done it, or because the situational pressures are too great), you change your attitudes.

Festinger's theory grew out of reports of the rumors that spread throughout India following a 1934 earthquake there. In the areas outside the disaster zone, the rumors predicted that there would be additional earthquakes of even greater proportions and throughout an even greater portion of the country. These rumors were without any scientific foundation. Festinger wondered why people would spread such catastrophic and anxiety-increasing ideas. It occurred to him over time that perhaps the rumors were not anxiety-increasing, but anxiety-justifying. That is, these people were very frightened, even though they lived outside the danger area. This created cognitive dissonance: The cognition of fear was out of tune with the lack of any scientific basis for their fear. So, their spreading the rumors of greater disasters justified their fears and reduced their dissonance. They made their view of the world fit with what they were feeling and how they were behaving.

THEORETICAL PROPOSITIONS

Festinger theorized that normally in our society what you publicly state will be substantially the same as your private opinion or belief. Therefore, if you believe X, but publicly state not X, you will experience the discomfort of cognitive dissonance. However, if you know that the reasons for your statement of not X were clearly justified by pressures, promises of rewards, or threats of punishment, then dissonance will be reduced or eliminated. Therefore, the more you view your inconsistent behavior to be of your own choosing, the greater will be your dissonance.

One way for you to reduce this unpleasant dissonance is to alter your private opinion to bring it into agreement or consonance with your behavior (making the statement). Festinger contended that changes in attitudes and opinions will be greatest when dissonance is large. Think about it for a moment. Suppose someone offers you a great deal of money to state, in public, views that are the opposite of your true views, and you agree to do so. Then suppose someone else makes the same request, but offers you just a little money, and even though it hardly seems worth it, you agree anyway. In which case will your dissonance be the greatest? Logically, you would experience more dissonance in the less-money situation, because of insufficient justification for your attitude-discrepant behavior. Therefore, according to Festinger's theory, your private opinion will shift more in
the little-money condition. Let's see how Festinger (with the help of his associate James Carlsmith) set about testing this theory.

**METHOD**

Imagine you are a university student enrolled in an introductory psychology course. One of your course requirements is to participate for three hours during the semester as a subject in psychology experiments. You check the bulletin board that posts the various studies being carried out by professors and graduate students, and you sign up for one that lasts two hours and deals with measures of performance. In this study by Festinger and Carlsmith, as in many psychology experiments, the true purpose of the study cannot be revealed to the subjects, since this could seriously bias their responses and invalidate the results. The actual original group of subjects consisted of 71 male, lower division, psychology students.

You arrive at the laboratory at the appointed time (here, the laboratory is nothing more than a room). You are told that this experiment takes a little over an hour, so it had to be scheduled for two hours. Since there will be some time remaining, the experimenter informs you that some people from the psychology department are interviewing subjects about their experiences as subjects, and asks you to talk to them after participating. Then you are given your first task.

A tray containing 12 spools is placed in front of you, and you are told to empty the tray onto the table, refill the tray with the spools, empty it again, refill it, and so on. You are to work with one hand and at your own speed. While the experimenter looks on with a stopwatch and takes notes, you do this over and over for 30 minutes. Then the tray is removed and you are given a board with 48 square pegs. Your task now is to turn each peg a quarter of a turn clockwise, and repeat this over and over for 30 minutes more! If this sounds incredibly boring to you, that was precisely the intention of the researchers. This part of the study was, in the authors' words, "intended to provide, for each subject uniformly, an experience about which he would have a somewhat negative opinion." Undoubtedly, you would agree that this objective was accomplished. Following completion of the tasks, the experiment really began.

The subjects were randomly assigned to one of three conditions. In the control condition, the subjects, after completing the tasks, were taken to another room where they were interviewed about their reactions to the experiment they had just completed. The rest of the subjects were lured a little further into the experimental manipulations. Following the tasks, the experimenter spoke to them as if to explain the purpose of the study. He told each of them that they were among the subjects in group A, who performed the tasks with no prior information, while subjects in group B always received descriptive information about the tasks prior to entering the lab. He went on to say that the information received by group B subjects was that the tasks were fun and interesting and that this message was delivered by an undergraduate student posing as a subject who had already completed the tasks. It is important to keep in mind that none of this was true. It was a fabrication intended to make the next crucial part of the study realistic and believable. This was, in other words, the cover story.

The experimenter then left the room for a few minutes. Upon returning, he continued to speak, but now appeared somewhat confused and uncertain. He explained, a little embarrassed, that the undergraduate who usually gives the information to group B subjects had called in sick, there was a subject from group B waiting, and they were having trouble finding someone to fill in for him. He then very politely asked the subject if he would be willing to join in on the experiment and be the one to inform the waiting subject. The experimenter offered some of the subjects a dollar each for their help, while others were offered $20. After a subject agreed, he was given a sheet of paper marked For Group B on which was written, "It was very enjoyable, I had a lot of fun, I enjoyed myself, it was intriguing, it was exciting." The subject was then paid either $1 or $20 and taken into the waiting room to meet the incoming subject. They were left alone in the waiting room for 2 minutes, after which time the experimenter returned, thanked the subject for his help, and led him to the interview room, where he was asked his opinions of the tasks exactly as had been asked of the subjects in the control condition.

If this whole procedure seems a bit complicated, it really is not. The bottom line is that there were three groups: one group who received $1 each to lie about the tasks, one group who were paid $20 each to lie about the tasks, and a control group who did not lie at all. The data from 11 of the subjects were not included in the final analysis because of procedural errors, so there were 20 subjects in each group.
RESULTS

The results of the study were reflected in how each of the subjects actually felt about the boring tasks in the final interview phase of the study. They were asked to rate the experiment as follows:

1. Were the tasks interesting and enjoyable? Measured on a scale of -5 (extremely dull and boring) to +5 (extremely interesting and enjoyable). The 0 point indicated the tasks were neutral, neither interesting nor uninteresting.

2. How much did you learn about your ability to perform such tasks? Measured on a 0 to 10 scale, where 0 means nothing learned and 10 means a great deal learned.

3. Do you believe the experiment and tasks were measuring anything important? Measured on a 0 to 10 scale, where 0 means no scientific value and 10 means great scientific value.

4. Would you have any desire to participate in another similar experiment? Measured on a scale of -5 (definitely dislike to participate) to +5 (definitely like to participate), with 0 indicating neutral feelings.

The averages of the answers to the interview questions are presented in Table 1. Questions 1 and 4 were designed to address Festinger's theory of cognitive dissonance, and the differences indicated are clearly significant. Contrary to previous research interpretations in the field, and contrary to what most of us might expect using common sense, those subjects who were paid $1 for lying about the tasks were the ones who later reported liking the tasks more, compared with both those paid $20 to lie and those who did not lie. This finding is reflected both in the first direct question and also in the $1 group's greater willingness to participate in another similar experiment (question 4).

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>CONTROL GROUP</th>
<th>$1 GROUP</th>
<th>$20 GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How enjoyable tasks were (-5 to +5)*</td>
<td>-0.45</td>
<td>+1.35</td>
<td>-0.05</td>
</tr>
<tr>
<td>2. How much learned (0 to 10)</td>
<td>3.08</td>
<td>2.80</td>
<td>3.15</td>
</tr>
<tr>
<td>3. Scientific Importance (0 to 10)</td>
<td>5.60</td>
<td>6.45</td>
<td>5.18</td>
</tr>
<tr>
<td>4. Participate in similar experiences (-5 to +5)*</td>
<td>-0.62</td>
<td>+1.20</td>
<td>-0.25</td>
</tr>
</tbody>
</table>

*Questions relevant to Festinger and Carlsmith's hypothesis. (from p. 207)

DISCUSSION

The theory of cognitive dissonance states, in Festinger's words:

1. If a person is induced to do or say something that is contrary to his private opinion, there will be a tendency for him to change his opinion to bring it into correspondence with what he has said or done.

2. The larger the pressure used to elicit the overt behavior, the weaker will be the above-mentioned tendency.

Festinger and Carlsmith's findings clearly support this theory. Festinger's explanation for this was that when people engage in attitude-discrepant behavior (the lie), but have strong justification for doing so ($20), they will experience only a small amount of dissonance and, therefore, not feel particularly motivated to make a change in their opinion. On the other hand, people who have insufficient justification ($1) for their attitude-discrepant behavior will experience greater levels of dissonance and, therefore, alter their opinions more radically in order to reduce the resultant discomfort. The theory may be presented graphically as follows:
QUESTIONS AND CRITICISMS

Festinger himself anticipated that previous researchers whose theories were threatened by this new idea would attempt to criticize the findings and offer alternate explanations for them (such as mental rehearsal and thinking up better arguments). In order to counter these criticisms, the sessions in which the subject lied to the incoming subject were recorded and rated by two independent raters who had no knowledge of which condition ($1 vs. $20) they were rating. Statistical analyses of these ratings showed no differences in the content or persuasiveness of the lies between the two groups. Therefore, the only apparent explanation remaining for the findings is what Festinger termed cognitive dissonance.

Over the years since cognitive dissonance was demonstrated by Festinger and Carlsmith, other researchers have refined—but not rejected the theory. The refinements were summarized by Cooper and Fazio (1984), who outlined four necessary steps for an attitude change to occur through cognitive dissonance. The first step is that the attitude-discrepant behavior must produce unwanted negative consequences. Festinger and Carlsmith’s subjects had to lie to fellow students and convince them to participate in a very boring experiment. This produced the required negative consequences. This also explains why when you compliment someone on their clothes even though you can’t stand them, your attitude toward the clothes probably doesn’t change.

The second step is that personal responsibility must be taken for the negative consequences. This usually involves a choice. If you choose to behave in an attitude-discrepant way resulting in negative consequences, you will experience dissonance. However, if someone forces you to behave in that way, you will not feel personally responsible and no cognitive dissonance will result. Although Festinger and Carlsmith’s article uses the phrase forced compliance in the title, the subjects actually believed that their actions were voluntary.

It has also been demonstrated that physiological arousal (the third step) is a necessary component of the process of cognitive dissonance. Festinger felt that dissonance is an uncomfortable state of tension that motivates us to change our attitudes. Studies have shown that, indeed, when subjects freely behave in attitude-discrepant ways, they experience physiological arousal. Festinger and Carlsmith did not measure this with their subjects, but it is safe to assume that physiological arousal was present.

Finally, the fourth step is that the person must be aware that the arousal experienced is being caused by the attitude-discrepant behavior. The discomfort the subjects felt in Festinger and Carlsmith’s study would have been easily and clearly attributed to the fact that they were lying about the experiment to a fellow student.

Festinger and Carlsmith’s conceptualization of cognitive dissonance has become a widely accepted and well-documented psychological phenomenon. Most psychologists agree that two fundamental processes are responsible for changes in our opinions and attitudes. One is persuasion— when other people actively work to convince you to change your views—and the other is cognitive dissonance.

RECENT APPLICATIONS

Social science research continues to rely on, demonstrate, and confirm Festinger and Carlsmith’s theory and findings. One interesting study found that you may experience cognitive dissonance and change your attitude about an issue simply by observing people whom you like and respect engaging in attitude discrepant behavior, without any personal participation on your part at all (Norton et al., 2003). The authors referred to this process as vicarious dissonance. In the study, college students heard speeches disagreeing with their attitudes on a controversial issue (a college fee increase). For some, the speech favored the increase was given by a member of their own college (their “ingroup”), while for others, the speech was made by a member of another college (their “outgroup”). When an ingroup member delivered the speech, the subjects’ experienced cognitive dissonance and decreased their negative attitudes toward the increase. In an even stronger demonstration of vicarious dissonance, the researchers found that the subjects did not even have to hear the speech itself; simply knowing that the ingroup member agreed to make the speech created enough dissonance to cause the hypothesized attitude change.
A fascinating study in a completely different vein used the theory of cognitive dissonance to explain why drug abusers continue to drive while under the influence, after completing a court-mandated treatment program for previous drug-and-driving infractions (Albery et al., 2000). Results indicated that offenders who continued to use drugs and drive, believed only alcohol posed a significantly greater risk behind the wheel, but not other drugs. Again, Festinger and Carlsmith's theory plays a central role in these findings, because driving while using drugs, after enduring a lengthy treatment program, would likely create a great deal of uncomfortable cognitive dissonance that could only be resolved by a major attitude shift about the drugs' effects (in this case, it would be called denial).

Finally, very important research based on Festinger's theory of cognitive dissonance, conducted by the psychologist Elliot Aronson at the University of California, Santa Cruz, focused on changing students' risky sexual behaviors (Shea, 1997). Sexually active students were asked to make videotapes about how condom use can reduce the risk of HIV infection. After making the tapes, half of the students were divided into groups and encouraged to discuss why college students resist using condoms and to reveal their own experiences of not using condoms. In other words, these subjects had to admit that they did not always adhere to the message they had just promoted in the videos; they had to face their own hypocrisy. The other students who engaged in making the videos did not participate in the follow-up discussions. When all the students were then given the opportunity to buy condoms, a significantly higher proportion of those in the hypocrisy group purchased them compared to the video-only group. More importantly, three months later, when the subjects were interviewed about their sexual practices, 92% of the students in the hypocrisy group said they had been using condoms every time they had intercourse compared to only 55% of those who participated in making the videotapes, but who were not required to publicly admit their attitude-discrepant behavior. This is a clear example of cognitive dissonance at work. The more you are forced to confront the discrepancy between your beliefs and your behavior, the more dissonance you experience, and the more you are motivated to change your behavior. Aronson, a strong proponent of the importance of cognitive dissonance in bringing about real-life behavioral change, explains that, "Most of us engage in hypocritical behavior all the time, because we can blind ourselves to it. But if someone comes along and forces you to look at it, you can no longer shrug it off" (Shea, 1997, p. A15).


ARE YOU THE MASTER OF YOUR FATE?


Are the consequences of your behavior under your personal control or determined by forces outside of yourself? Think about it for a moment: When something good happens to you, do you take credit for it or do you think how lucky you were? When something negative occurs, is it usually your responsibility or do you just chalk it up to fate? The same question may be posed in more formal psychological language: Do you believe that there is a causal relationship between your behavior and its consequences?

Julian Rotter, one of the most influential behaviorists in psychology's history, proposed that individuals differ a great deal in where they place the responsibility for what happens to them. When people interpret the consequences of their behavior to be controlled by luck, fate, or powerful others, this indicates a belief in what Rotter called an *external locus of control* (locus simply means location). Conversely, he maintained that if people interpret their own behavior and personality characteristics as responsible for behavioral consequences, they have a belief in an *internal locus of control*. In his frequently cited 1966 article, Rotter explained that a person's tendency to view events from an internal versus an external locus of control can be explained from a social learning theory perspective.

In this view, as a person develops from infancy through childhood, behaviors are learned because they are followed by some form of reinforcement. This reinforcement increases the child's expectancy that a particular behavior will produce the desired reinforcement. Once this expectancy is established, the removal of reinforcement will cause the expectancy of such a relationship between behavior and reinforcement to fade. Therefore, reinforcement sometimes is seen as contingent upon behavior, and sometimes it is not (see the discussion of contingencies in the reading on work of B. F. Skinner). As children grow, some will have frequent experiences in which their behavior directly influences reinforcement, while for others, reinforcement will appear to result from actions outside of themselves. Rotter claimed that the totality of your specific learning experiences creates in you a generalized expectancy about whether reinforcement is internally or externally controlled.

"These generalized expectancies," Rotter wrote, "will result in characteristic differences in behavior in a situation culturally categorized as chance-determined versus skill-determined, and may act to produce individual differences within a specific condition" (p. 2). In other words, you have developed an internal or external interpretation of the consequences for your behavior that will influence your future behavior in almost all situations. Rotter believed that your locus of control, whether internal or external, is an important part of who you are, a part of your personality.

Look back at the questions posed at the beginning of this chapter. Which do you think you are, an internal or an external? Rotter wanted to study differences among people on this dimension and, rather than simply ask them, he developed a test that measures a person's locus of control. Once he was able to measure this characteristic in people, he could then study how it influenced their behavior.

THEORETICAL PROPOSITIONS

Rotter proposed to demonstrate two main points in his research. First, he predicted that a test could be developed to measure reliably the extent to which individuals possess an internal or an external locus-of-control orientation toward life. Second, he hypothesized that people will display stable individual differences in their interpretations of the causes of reinforcement in the same situations. He proposed to demonstrate his hypothesis by presenting research comparing behavior of *internals* with that of *externals* in various contexts.

METHOD

Rotter designed a scale containing a series of many pairs of statements. Each pair consisted of one statement reflecting an internal locus of control and one reflecting an external locus of control. Those taking the test were instructed to select "the one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: Obviously there are no right or wrong answers" (p. 26). The test was designed so that subjects were forced to choose one statement for each pair and could not designate *neither or both*.

Rotter's measuring device endured many revisions and alterations. In its earliest form, it contained 60 pairs of statements, but by using various tests for reliability and validity, it was eventually refined and
streamlined down to 23 items. Added to these were six filler items, which were designed to disguise the true purpose of the test. Such filler items are often used in tests such as this because if subjects were able to guess what the test is trying to measure, they might alter their answers in some way in an attempt to perform better.

Rotter called his test the I-E Scale, which is the name it is known by today. Table 1 includes examples of typical items from the I-E Scale, plus samples of the filler items. If you examine the items, you can see quite clearly which statements reflect an internal or external orientation. Rotter contended that his test was a measure of the extent to which a person possesses the personality characteristic of internal or external locus of control.

**TABLE 1 Sample Items and Filler Items from Rotter's I-E Scale**

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>STATEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a.</td>
<td>Many of the unhappy things in people's lives are partly due to bad luck.</td>
</tr>
<tr>
<td>2b.</td>
<td>People's misfortunes result from the mistakes they make.</td>
</tr>
<tr>
<td>11a.</td>
<td>Becoming a success is a matter of hard work; luck has little or nothing to do with it.</td>
</tr>
<tr>
<td>11b.</td>
<td>Getting a good job depends mainly on being in the right place at the right time.</td>
</tr>
<tr>
<td>18a.</td>
<td>Most people don't realize the extent to which their lives are controlled by accidental happenings.</td>
</tr>
<tr>
<td>18b.</td>
<td>There is really no such thing as &quot;luck.&quot;</td>
</tr>
<tr>
<td>23a.</td>
<td>Sometimes I can't understand how teachers arrive at the grades I get.</td>
</tr>
<tr>
<td>23b.</td>
<td>There is a direct connection between how hard I study and the grades I get.</td>
</tr>
</tbody>
</table>

**FILLER ITEMS**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STATEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a.</td>
<td>Children get into trouble because their parents punish them too much.</td>
</tr>
<tr>
<td>1b.</td>
<td>The trouble with most children nowadays is that their parents are too easy with them.</td>
</tr>
<tr>
<td>14a.</td>
<td>There are certain people who are just no good.</td>
</tr>
<tr>
<td>14b.</td>
<td>There is some good in everybody.</td>
</tr>
</tbody>
</table>

(Adapted from pp. 13-14.)

Rotter's next step was to demonstrate that he could actually use this characteristic to predict people's behavior in specific situations. To do this he reported on several studies (by Rotter and others) in which scores on the I-E Scale (in various forms) were examined in relation to individuals' interactions with various events in their lives. These studies found significant correlations between I-E scores and situations such as those involving gambling, political activism, persuasion, smoking, achievement motivation, and conformity.

**RESULTS**

Following is a brief summary of the findings reported by Rotter of research in the areas mentioned in the previous paragraph. (See pp. 19-24 in the original study for complete discussion and citation of specific references.)

**Gambling**

Rotter reported on studies that looked at betting behavior in relation to locus of control. These found that individuals identified as internals by the I-E Scale tended to prefer betting on sure things and liked intermediate odds over the long shots. Externals, on the other hand, would wager more money on risky bets. In addition, externals would tend to engage in more unusual shifts in betting called the gambler's fallacy (such as betting more on a number that has not come up for a while on the basis that it is due).

**Persuasion**

An interesting study cited by Rotter used the I-E Scale to select two groups of students, one highly internal and the other highly external. Both groups shared similar attitudes, on average, about the fraternity and sorority system on the campus. Both groups were asked to try to persuade other students to change their attitudes about these organizations. The internals were found to be significantly more successful than externals in altering the attitudes of others. Conversely, other studies demonstrated that internals were more resistant to manipulation of their attitudes by others.
Smoking
An internal locus of control appeared to relate to self-control as well. Two studies discussed by Rotter found that (1) smokers tended to be significantly more external than nonsmokers, and (2) individuals who quit smoking after the original surgeon general's warning appeared on cigarette packs were more internally oriented, even though both internals and externals believed the warning was true.

Achievement Motivation
If you believe 'your own actions are responsible for your successes, it is logical to assume that you should be more motivated to achieve success than someone who believes success is more a matter of fate. Rotter pointed to a study of 1,000 high school students that found a positive relationship between an internal score on the I-E Scale and 15 out of 17 indicators of this achievement motivation. These included plans to attend college, amount of time spent on homework, and how interested the parents were in the students' school work. Each of these achievement-oriented factors were more likely to be found for students with an internal locus of control.

Conformity
One study was cited that exposed subjects to the conformity test developed by Solomon Asch, in which a subject's willingness to agree with a majority's incorrect judgment was evidence for conforming behavior (see the reading on Asch's conformity study). Subjects were allowed to bet (with money provided by the experimenters) on the correctness of their judgments. Under this betting condition, those found to be internals conformed significantly less to the majority and bet more money on themselves when making judgments contrary to the majority than did the externals.

DISCUSSION
As part of his discussion, Rotter posed possible sources for the individual differences he found on the dimension of internal-external locus of control. He referred to several studies that addressed the issue of possible causes. Three potential sources for the development of an internal or external orientation were suggested: cultural differences, socioeconomic differences, and variations in styles of parenting.

One study cited found differences in locus of control among various cultures. In an isolated community in the United States, three distinct groups could be compared: Ute Indians, Mexican Americans, and Caucasians. It was found that those individuals of Ute heritage were, on average, the most external, while the whites were the most internal. The Mexican Americans scored between the other two groups on the I-E Scale. These findings, which appeared to be independent of socioeconomic level, suggested ethnic differences in locus of control.

Rotter also referred to some early and tentative findings indicating that socioeconomic level even within a particular culture may relate to locus of control findings. These findings suggested that a lower socioeconomic position predicts greater externality.

Styles of parenting were implicated by Rotter as an obvious source for learning to be internal or external. While he did not offer supportive research evidence at the time, he suggested that parents who administer rewards and punishments to their children in ways that are unpredictable and inconsistent would likely encourage the development of an external locus of control (this is discussed in greater detail shortly).

Rotter summarized his findings by pointing out that the consistency of the results leads to the conclusion that locus of control is a definable characteristic of individuals that operates fairly consistently across various situations. Furthermore, the influences on behavior produced by the internal-external dimension are such that it will influence different people to behave differently when faced with the same situation. In addition, Rotter contended that locus of control can be measured, and that the I-E Scale is an effective tool for doing so.

Finally, Rotter hypothesized that those with an internal locus of control (i.e., those who have a strong belief that they can control their own destiny) are more likely than externals to (1) gain information from the situations in their life in order to improve future behavior in those situations or similar ones, (2) take the initiative to change and improve their condition in life, (3) place greater value on inner skill and achievement of goals, and (4) be more able to resist manipulation by others.

SUBSEQUENT RESEARCH
Since Rotter developed his I-E Scale, hundreds of studies have examined the relationship between locus of control and various behaviors. Following is a brief sampling of a few of those as they relate to rather diverse human behaviors.
In his 1966 article, Rotter touched on how locus of control might relate to health behaviors. Since then, other studies have examined the same relationship. In a review of locus-of-control research, Strickland (1977) found that individuals with an internal focus generally take more responsibility for their own health. They are more likely to engage in more healthy behaviors (such as not smoking and adopting better nutritional habits) and practice greater care in avoiding accidents. Additionally, studies have found that internals generally have lower levels of stress and are less likely to suffer from stress-related illnesses.

Rotter's hypotheses regarding the relationship between parenting styles and locus of control have been at least partially confirmed. Research has shown that parents of children who are internals tend to be more affectionate, more consistent with discipline, and more concerned with teaching children to take responsibility for their actions. Parents of externally oriented children have been found to be more authoritarian and restrictive, and do not allow their children much opportunity for personal control (see Davis & Phares, 1969, for a discussion of those findings).

A fascinating study demonstrated how the concept of locus of control may have sociological and even catastrophic implications. Sims and Baumann (1972) applied Rotter's theory to explain why more people die in tornados in Alabama than in Illinois. These researchers noticed that the death rate from tornados was five times greater in the South than in the Midwest, and they set out to determine why. One by one they eliminated all of the explanations related to the physical locations, such as storm strength and severity (the storms are actually stronger in Illinois), time of day of the storms (an equal number occur at night in both regions), type of business and residence construction masonry is as dangerous as wood-frame, but for different reasons), and the quality of warning systems (even before warning systems existed, Alabama had the same higher death rate).

With all the obvious environmental reasons ruled out, Sims and Baumann suggested that the difference might be due to psychological variables and proposed the locus-of-control concept as a likely possibility. Questionnaires containing a modified version of Rotter's I-E Scale were administered to residents of four counties in Illinois and Alabama that had experienced a similar incidence of tornados and tornado-caused deaths. They found that the respondents from Alabama demonstrated a significantly greater external locus of control than did those from Illinois. From this finding, as well as from responses to other items on the questionnaire relating to tornado behavior, the researchers concluded that an internal orientation promotes behaviors that are more likely to save lives in the event of a tornado (such as paying attention to the news media or alerting others). This stems directly from the internals' belief that their behavior will be effective in changing the outcome of the event. In this study, Alabamians were seen as 'less confident in themselves as causal agents, less convinced of their ability to engage in effective action .... The data ... constitute a suggestive illustration of how man's personality is active in determining the quality of his interaction with nature' (Sims & Baumann, 1972, p. 1391).

RECENT APPLICATIONS

To say that hundreds of studies have incorporated Rotter's Locus of Control theory since his article appeared in 1966 may have been a serious understatement. In reality, there may have been thousands! A search of the three years prior to the publication of this text reveals no citations of this study in the professional literature; looking at the previous six years, the total is over 700. Such a great reliance on Rotter's theory speaks clearly to the broad acceptance of the impact and validity of the internal-external personality dimension. Following are a few representative examples from the great variety of recent studies citing his pioneering work.

Do you tend to feel sorry for yourself when you are stressed and things don't go your way? Psychologists call such a response, self-pity. A study by Stober (2003) examined how self-pity is linked to other personality characteristics such as, anger, loneliness, and internal-external control beliefs. One of the study's strongest findings was a connection between self-pity and locus of control. "With respect to control beliefs, individuals high in self-pity showed generalized externality beliefs, seeing themselves as controlled by both chance and powerful others" (p. 183). In addition, self-pity was shown to be associated with depression, which is linked, in turn, to an external locus of control (Yang & Clum, 2000). This connection is addressed in greater detail in the discussion of Seligman's learned helplessness.

Often, when Rotter's research on locus of control is being discussed, the subject of religious faith arises. Many religious people believe that it is desirable and proper at times to place their fate in God's hands; yet within Rotter's theory, this would indicate an external locus of control with its negative connotations. A fascinating recent study in the Journal of Psychology and Religion addressed this very issue (Welton, Atkins, Ingle, & Dixon, 1996). Using various locus-of-control scales and subscales, subjects were assessed on their degree of internal locus of control, perceived control by powerful others, belief in chance, and belief in God control. The advantages associated with an internal locus of control were also found in the subjects scoring high on the God control
dimension. The authors contend that if a person has an external locus of control as measured by Rotter's scale, but the external power is perceived as a strong faith in a supreme being, they will be less subject to the typical problems associated with externals (i.e., powerlessness, depression, low achievement, low motivation for change).

A great deal of important cross-cultural research has relied heavily on Rotter’s conceptualization of the internal-external locus of control dimension of personality. For example, one study from Russian researchers examined locus-of-control and right-wing authoritarian attitudes in Russian and American college students (D'yakonova & Yurtaikin, 2000). Results indicated that among the American students greater internal locus of control was correlated with higher levels of authoritarianism, while no such connection was found for the Russian subjects. Another cross-cultural study relied on Rotter's I-E Scale to examine the psychological adjustment to the diagnosis of cancer in a highly superstitious collectivist culture (Sun & Stewart, 2000). Interestingly, findings from this study indicated that 'even in a culture where supernatural beliefs are widespread, an [internal locus of control] relates positively and 'chance' beliefs relate negatively with adjustment' to a serious illnss such as cancer (p. 177). Research areas other than those discussed earlier that have cited Rotter's study include posttraumatic stress disorder, issues of control and aging, childbirth methods, coping with anticipatory stress, the effects of environmental noise, academic performance, white-collar crime, adult children of alcoholics, child molestation, mental health following natural disasters, contraceptive use, and HIV and AIDS prevention research.

**CONCLUSION**

The dimension of internal-external locus of control has been generally accepted as a relatively stable aspect of human personality that has meaningful implications for predicting behavior across a wide variety of situations. The phrase relatively stable is used because a person's locus of control can change under certain circumstances. Those who are externally oriented often will become more internal when their profession places them in positions of greater authority and responsibility. People who are highly internally oriented may shift toward a more external focus during times of extreme stress and uncertainty. Moreover, it is possible for individuals to learn to be more internal, if given the opportunity.

Implicit in Rotter's concept of locus of control is the assumption that internals are better adjusted and more effective in life. Although most of the research confirms this assumption, Rotter, in his later writings, sounded a note of caution (see Rotter, 1975). Everyone, especially internals, must be attentive to the environment around them. If a person sets out to change a situation that is not changeable, frustration, disappointment, and depression are the potential outcomes. When forces outside of the individual are actually in control of behavioral consequences, the most realistic and healthy approach to take is probably one of an external orientation.


THE POWER OF CONFORMITY

Do you consider yourself to be a conformist, or are you more of a rebel? Most of us probably like to think that we are conformist enough to not be considered terribly strange or frightening, and nonconformist enough to demonstrate that we are individuals and capable of independent thinking. Psychologists have been interested in the concept of conformity for decades. It is easy to see why when you remember that psychology tries to study the influences on human behavior. The differences in the amount to which people conform can help us a great deal in predicting the behavior for various individuals.

When psychologists talk about conformity, they refer to an individual's behavior that adheres to the behavior patterns of a particular group of which that individual is a member. The usually unspoken rules or guidelines for behavior in a group are called *social norms.* If you think about it, you can probably remember a time in your life when you behaved in ways that were out of sync or in disagreement with your attitudes, beliefs, or morals. Chances are you were in a group in which everyone was behaving that way, so you went along with them. This indicates that sometimes conformity is a powerful force on our behavior and can even at times make us do things that conflict with our attitudes, ethics, and morals. Therefore, conformity is clearly very worthy of interest and study by behavioral scientists. It was not until the early 1950s that someone decided to make a systematic study. That someone was Solomon Asch. His experiments offered us a great deal of new information about conforming behavior and opened many doors for future research.

THEORETICAL PROPOSITIONS

Suppose you are with a group of people that you see often, such as friends or coworkers. The group is discussing some controversial issue or political candidate. It quickly becomes clear to you that everyone in the group shares one view, which is the opposite of your own. At one point the others turn to you and ask for your opinion. What are you going to do? The choices you are faced with are to state your true views and risk the consequences, to agree with the group consensus even though it differs from your opinion, or, if possible, to sidestep the issue entirely.

Asch wanted to find out just how powerful the need to conform is in influencing our behavior. Although conformity often involves general and vague concepts such as attitudes, ethics, morals, and belief systems, Asch chose to focus on a much more obvious form: perceptual conformity. By examining conforming behavior on a simple visual comparison task, he was able to study this phenomenon in a controlled laboratory environment.

If conformity is as powerful a force as Asch and many others believed, then researchers should be able to manipulate a person's behavior by applying group pressure to conform. This is what Asch set about testing in a very elegantly designed series of experiments, all incorporating a similar method.

METHOD

The visual materials consisted simply of pairs of cards with three different lengths of vertical lines (called *comparison lines*) on one and a single standard line the same length as one of three comparison lines on the other (see Figure 1). Here is how the experimental process worked. Imagine you are a subject who has volunteered to participate in a *visual perception study.* You arrive at the experiment room on time and find seven other subjects already seated in a row. You sit in the empty chair at the end of the row. The experimenter reveals a pair of cards and asks you to determine which of the three comparison lines is the same length as the standard line. You look at the lines and immediately decide on the correct response. Starting at the far end of the row away from you, each subject is asked individually for his or her answer. Everyone gives the correct answer, and when your turn comes you give the same obviously correct answer. The card is changed, the same process happens, and—once again, no problem—you give the correct answer along with the rest of the group. On the next trial, however, something odd happens. The card is revealed and you immediately choose in your mind the correct response. (After all, this is not very difficult.) But when the other subjects give their answers, they all choose the wrong line! And they all choose the same wrong line. Now, when it is your turn to respond again, you pause. You can't believe what is happening. Are all these other people blind? The correct answer is obvious. Isn't it? Have you gone blind? Or crazy? You now must make a decision like the one described above with your friends or coworkers. Do you maintain your opinion (after all, the lines are right in front of your nose), or do you conform and agree with the rest of the group?
As you have probably figured out by now, the other seven "subjects" in the room were not subjects at all, but confederates of the experimenter. They were in on the experiment from the beginning and the answers they gave were, of course, the key to this study of conformity. So, how did the real subjects in the study answer?

RESULTS

Each subject participated in the experimental situation several times. Approximately 75% of them went along with the group's consensus at least once. For all trials combined, subjects agreed with the group on the incorrect responses about one-third of the time. Just to be sure that the line lengths could be judged accurately, each individual in a control group of subjects was asked to individually write down his or her answer to the line comparison questions. Subjects in this group were correct 98% of the time.

DISCUSSION AND RELATED RESEARCH

The powerful effects of group pressures to conform were clearly demonstrated in Asch's study. If individuals are willing to conform to a group of people they hardly know about a clearly incorrect judgment, how strong must this influence be in real life, where groups exert even stronger forces and issues are more ambiguous? Conformity as a major factor in human behavior, the subject of widespread speculation for years, had now been scientifically established.

Asch's results were extremely important to the field of psychology in two crucial ways. First, as discussed above, the real power of the social pressure to conform was demonstrated clearly and scientifically for the first time. Second, and perhaps even more important, this early research sparked a huge wave of additional studies that continue right up to the present. The body of research that has accumulated since Asch's early studies has greatly elaborated our knowledge of the specific factors that determine the effects conformity has on our behavior. Some of these findings follow:

1. **Social support.** Asch conducted his same experiment with a slight variation. He altered the answers of the confederates so that in the test condition one of the seven gave the correct answer. When this occurred, only 5% of the subjects agreed with the group consensus. Apparently, a single ally is all you need to "stick to your guns" and resist the pressure to conform. This finding has been supported by several later studies (see, e.g., Morris & Miller, 1975).

2. **Attraction and commitment to the group.** Later research has demonstrated that the more attracted and committed you are to a particular group, the more likely you are to conform to the behavior and attitudes of that group (see Forsyth, 1983). If you like the group and feel that you belong with them (they are your reference group) your tendency to conform to that group will be very strong.

3. **Size of the group.** At first, research by Asch and others demonstrated that the tendency to conform increases as the size of the group increases. However, upon further examination, it was found that this connection is not so simple. While it is true that conformity increases as the size of the group increases, this only holds for groups up to six or seven members. As the group size increases beyond this number, conformity levels off, and even decreases somewhat. This is shown graphically in Figure 2. Why is this? Well, Asch has suggested that as the group becomes large, people may begin to suspect the other
members of working together purposefully to affect their behavior and they become resistant to this
obvious pressure.

![FIGURE 2 The relationship between group size and conformity. (Adapted from p. 35.)](image)

4. **Sex.** Do you think there is a difference between men and women in their tendency or willingness to conform? Early studies that followed Asch's work indicated that women seemed to be much more willing to conform than men. This was such a strong and frequently repeated finding that it entered the psychological literature as an accepted difference between the sexes. However, later research drew this notion into question. It appears that many of the early studies (conducted by men) inadvertently created testing conditions that were more familiar and comfortable for men in those days than for women. Psychologists know that people will tend to conform more when placed in a situation where the appropriate behavior is unclear. Therefore, the finding of greater conformity among women may have simply been a systematic error caused by subtle (and unintentional) biases in the methods used. More recent research under better controlled conditions has failed to find this sex difference in conformity behavior (see Sistrunk & McDavid, 1971, for a discussion of these gender-related issues).

Numerous additional areas related to the issue of conformity have been studied as well. These include, cultural influences, the amount of information available when making decisions about conforming, social norms, personal privacy, and many others.

**CRITICISMS**

Asch's work on conformity has received widespread support and acceptance. It has been replicated in many studies, under a wide variety of conditions. A line of criticism commonly heard concerns whether Asch's findings can be generalized to situations in the real world. In other words, does a subject's answer in a laboratory about the length of some lines really have very much to do with conforming behavior in life? This is a valid criticism to make for all research about human behavior that is carried out in a controlled laboratory setting. What this criticism says is, "Well, maybe the subjects were willing to go along with the group on something so trivial and unimportant as the length of a line, but in real life, and on important matters, they would not conform so readily." It must be pointed out, however, that although real-life matters of conformity can certainly be more meaningful, it is equally likely that the pressures for conformity from groups in the real world are also proportionately stronger.

**RECENT APPLICATIONS**

An article examining why young adults continue to engage in unsafe sexual practices demonstrates how Asch's work continues to influence research on important social issues (Cerwonka, Isbell, & Hansen, 2000). The researchers assessed nearly 400 students between the ages of 18 and 29 on various measures of their HIV/AIDS knowledge risk behaviors (such as failure to use condoms, multiple sex partners, alcohol and other drug use, and sexual history). Numerous factors were shown to predict high-risk sexual behaviors, including conformity to peer group pressures. You can see how an understanding of how conformity pressures affect people's choice about their sexual behaviors might be a valuable tool in fighting the continuing spread of HIV.

Another fascinating study incorporated Asch's 1955 article to examine why men are less likely than women to seek help, even when they are in dire need of it (Mansfield et al., 2003). This article begins with the following (old) joke: "Why did Moses spend 40 years wandering in the desert? Because he wouldn't ask for directions" (p. 93). This joke is funny because it taps into a stereotype about men and help-seeking. Of course, failure to ask for directions usually does not cause serious problems, but men also tend to resist seeking medical and mental health care, and that can be dangerous or even fatal. The authors suggest that one of the primary forces preventing men from seeking help is conformity. "In the context of help seeking, men may be disinclined
to seek help if they believe they will be stigmatized for doing so. If a man greatly admires the people in his life who discourage or speak badly of seeking help, he will be less likely to seek help himself (p. 101).

On a final note, culture appears to play an especially important role in conformity (Bond & Smith, 1996). Research in collectivist countries, such as Japan or India, has consistently found higher levels of conformity than in individualistic countries, such as the United States. Such findings add to the ever-growing body of evidence that psychological research must never overlook the impact of culture on virtually all human behaviors.

TO HELP OR NOT TO HELP

One of the most influential events in the history of psychology and psychological research was not an experiment or a discovery made by a behavioral scientist, but a news item about a violent and tragic event in New York City that was picked up by most media news services across the United States. In 1964, Kitty Genovese was returning to her apartment in a quiet, middle-class neighborhood in Queens after closing the Manhattan bar that she managed. As she left her car and walked toward her building, she was viciously attacked by a man with a knife. As the man stabbed her several times, she screamed for help. One neighbor yelled out his window for the man to "leave that girl alone," at which time the attacker began to walk away. But then he turned, knocked Genovese to the ground, and began stabbing her again. She continued to scream until finally someone telephoned the police. The police arrived two minutes after they were called, but Genovese was already dead and her attacker had disappeared. The attack had lasted 35 minutes. During police investigations, it was found that 38 people in the surrounding apartments had witnessed the attack, but only one had eventually called the police. One couple (who said they assumed someone else had called the police) had moved two chairs next to their window in order to watch the violence. Genovese's killer, Winston Moseley, now in his late 60s, remains incarcerated at a maximum-security prison in upstate New York.

If someone had acted sooner to help Genovese, she probably would have survived. New York City and the nation were appalled by the seeming lack of caring on the part of so many neighbors who had failed to try to stop this violent act. People attempted to find a reason for this inaction. The alienation caused by living in a large city was blamed; the neighborhood of Queens was blamed; basic human nature was blamed.

The Genovese tragedy sparked the interest of psychologists, who set out to try to understand what psychological forces might have been at work to prevent all those people from helping. There is an area of psychology that studies what behavioral scientists call *prosocial* behavior, or behavior that produces positive social consequences. Topics falling into this research area include altruism, cooperation, resisting temptation, and helping. If you witness an emergency situation in which someone may be in need of help, there are many factors that affect your decision to step in and offer assistance. John Darley at New York University and Bibb Latane at Columbia, both social psychologists, were among those who wanted to examine these factors. They theorized the behavior of helping in emergencies, *bystander intervention* (or in this case, nonintervention).

Have you ever been faced with a true emergency? Contrary to what you may think from watching television and reading newspapers, emergencies are not very common. Darley and Latane estimated that the average person will encounter fewer than six emergencies in a lifetime. This is good and bad: good for obvious reasons; bad because if and when you find yourself facing an emergency, you will have to decide what to do, without the benefit of very much experience. Society dictates that we take action to help in emergencies, but often, as in the famous Genovese case, we do not. Why is this? Could it be because we have so little experience that we do not know what to do? Is it because of the alienation caused by urban living? Or are humans, by nature, basically uncaring?

Following the Genovese murder, Darley and Latane analyzed the bystanders' reactions. They theorized that the large number of people who witnessed the violent event decreased the willingness of individuals to step in and help. They decided to test their theory experimentally.

THEORETICAL PROPOSITIONS

Your common sense might tell you that the more bystanders there are in an emergency, the more likely someone will intervene. But Darley and Latane hypothesized just the opposite. They believed that the reason no one took steps to help Kitty Genovese was a phenomenon they called *diffusion of responsibility*. That is, as the number of bystanders in an emergency increases, the greater is the belief that "someone else will help, so I don't need to." Have you ever witnessed an accident on a busy street or arrived at the scene of one soon after it has happened? Chances are that as you drove by you made the assumption that someone surely has called the police or ambulance by now, and therefore you did not feel the personal responsibility to do so. But imagine discovering the same accident on a deserted country road with no one else around. Would your response be different? Mine probably would be, too.

The concept of diffusion of responsibility formed the theoretical basis for this chapter's study. The trick was to re-create a Genovese-like situation in the laboratory so that it could be manipulated and examined systematically. Darley and Latane were very ingenious in designing an experiment to do this.
METHOD

For obvious reasons, it would not be practical or even possible to reproduce the events of the Kitty Genovese murder for experimental purposes. Therefore, a situation needed to be devised that would approximate or simulate a true emergency so that the intervention of bystanders could be observed. In this experiment, Darley and Latane told students in an introductory psychology class at New York University that they were interested in studying how students adjust to university life in a highly competitive, urban environment and what kinds of personal problems they were experiencing. The students were asked to discuss their problems honestly with other students, but to avoid any discomfort or embarrassment, they would be in separate rooms and would speak with each other over an intercom system. This intercom, they were told, would only allow one student to speak at a time. Each student would be given two minutes, after which the microphone for the next student would be activated for two minutes, and so on.

All of this was a cover story designed to obtain natural behavior from the subjects and to hide the true purpose of the experiment. The most important part of this cover story was the way the students were divided into three different experimental conditions. The subjects in group 1 believed that they would be talking with only one other person; those in group 2 believed there would be two other people on the intercom; and the group 3 subjects were told that there were five other people on the line. In reality, each subject was alone and all the other voices were on tape.

Now that the size of the groups was varied, some sort of emergency had to be created. The researchers decided that a very realistically acted epileptic seizure would be interpreted by most people as an emergency. As the discussions over the intercom system between the subjects and the other "students" began, subjects heard the first student, a male, tell about his difficulties concentrating on his studies and problems adjusting to life in New York City. He then added, with some embarrassment, that he sometimes had severe seizures, especially when under a lot of stress. Then the conversation switched to the next student. In group 1, the actual subject's turn came next, whereas in the other two conditions, the subject heard one or more other students speak before his or her turn. After the subject spoke it was the first student's turn again. This is when the emergency occurred. The first student spoke normally as before, but then began to have a seizure (remember, this was all on tape). Latane and Darley quote the seizure in detail in a later report as follows:

I-er-um-I think I-I need-er-if-if could-er-er somebody er-er-er-er-er-er give me a little-er-give me a little help here because-er-I-er-I'm-er-h-h-having a a a real problem-er right now and I-er-if somebody could help me out it would-it would-er-er s-s-sure be good ... because-er-ther-er-ag cause I-er-I-uh-I've got one of the-er-sei—er-er-things coming on and-and-and I could really use some help so if somebody would-er give me a little h-help uh-er-er-er-er c-ould somebody er help er-uh-uh-uh [choking sounds] ... I'm gonna die-er-er help-er-er-er [chokes, then quiet]. (pp. 95-96)

To the subjects, this was clearly an emergency. There was no question that the "student" was in trouble and needed help immediately. In order to analyze the responses of the subjects, Darley and Latane measured the percentage of subjects in each condition who helped the student in trouble (helping was defined as leaving the cubicle and notifying the experimenter of the problem). They also measured the amount of time it took subjects to respond to the emergency and try to help. Subjects were given four minutes to respond, after which the experiment was terminated.

RESULTS

The findings from this study offered strong support for the researchers' hypothesis. As subjects believed there were a greater number of others present, the percentage who reported the seizure quickly, that is, as the attack was occurring, decreased dramatically (see Figure 1). Among those who eventually helped, the amount of delay in helping was greater when more bystanders were present. For group 1, the average delay in responding was less than one minute, whereas for group 3 it was over three minutes. Finally, the total number of subjects who reported the seizure at all, either during or after it occurred, varied among the groups in a similar way. All of the subjects in group 1 reported the emergency, but only 85% of group 2 and 60% of group 3 did so at any time during the four-minute period.
DISCUSSION

As in the real-life case of Kitty Genovese, you might think that the subjects in this study were simply uncaring toward the victim having the seizure. However, Darley and Latane are quick to point out that this was not the reason for the inaction of subjects in groups 2 and 3 (or of Genovese's neighbors). All the subjects reported experiencing a great deal of anxiety and discomfort during the attack and showed physical signs of nervousness (trembling hands, sweaty palms). The researchers concluded, therefore, that the reason for their results must lie in the difference in the number of other people the subjects believed were present. Whenever your behavior is changed because of the presence of others, this is called social influence. Obviously, social influence played a significant role in this study. But we are still left wondering why. What was it about the presence of others that was so influential?

Darley and Latane claimed to have demonstrated and supported their theory of diffusion of responsibility. As the number of people in the group increased, the subject felt less personal or individual responsibility to take action. It was easier in groups 2 and 3 for the subjects to assume that someone else would handle the problem. In a related point, it is not only the responsibility for helping that is shared when others are present, but also the potential guilt or blame for not helping. Since helping others is considered to be a positive action in our culture, refusing or failing to help carries shameful connotations. If you are the only person present in an emergency, the negative consequences of not helping will be much greater than if others are there to bear some of the burden for nonintervention.

Another possible explanation for this type of social influence is something that psychologists have termed evaluation apprehension. Darley and Latane contended that part of the reason we fail to help when others are present is that we are afraid of being embarrassed or ridiculed. Imagine how foolish you would feel if you were to spring into action to help someone who did not need or want your help. I remember a time when, as a teenager, I was swimming with a large group of friends at a neighbor’s pool. As I was about to dive from the board I saw the neighbor’s 13-year-old daughter lying facedown on the bottom of the pool. I looked around and no one else seemed to be aware of, or concerned about, this apparent emergency. Was she drowning? Was she joking? I wasn’t sure. Just as I was about to yell for help and dive in for the rescue, she swam lazily to the surface. I had hesitated a full 30 seconds out of the fear of being wrong. Many of us have had experiences such as this. The problem is, they teach us the wrong thing: helping behavior carries with it the possibility of looking foolish.

SIGNIFICANCE OF THE FINDINGS

From this and other studies, Darley and Latane became the leading researchers in the field of helping behavior and bystander intervention. Much of their early work was included in their book The Unresponsive Bystander: Why Doesn't He Help? (Latane & Darley, 1970). In this work, they outlined a model for helping behavior that has become widely accepted in the psychological literature on helping. They proposed five steps you probably would go through before intervening in an emergency:

1. You, the potential helper, must first notice that an event is occurring. In the study this chapter examines, there was no question that such notice would occur, but in the real world, you may be in a hurry or your attention may be focused elsewhere, and you might completely fail to notice the event.
2. You must interpret the situation as one in which help is truly needed. This is a point at which fear of embarrassment exerts its influence. Again, in the present study, the situation was not ambiguous and the need for help was quite clear. In reality, however, most potential emergencies contain some degree of doubt or ambiguity, such as in my swimming pool example. Or, imagine you see a man stagger and pass out on a busy city sidewalk. Is he sick or just drunk? How you interpret the situation will influence your decision to intervene. Many of those who failed to help in the Genovese case claimed that they thought it was a lover’s quarrel and did not want to get involved.

3. You have to assume personal responsibility. This will usually happen immediately if you are the only bystander in the emergency. If others are also present, however, you may instead place the responsibility on them. This step was the focus of this chapter’s experiment. The more people present in an emergency, the more diffused the responsibility, and the less likely help will occur.

4. If you assume responsibility, you then must decide what action to take. Here, if you do not know what to do or you do not feel capable of taking the appropriate action, you will be less likely to help. In our present study, this issue of competence did not play a part, since all that the subject had to do was report the seizure to the experimenter. But if a crowd were to witness a pedestrian run over by a car, a member of the group who was a doctor, a nurse, or a paramedic would be more likely to intervene because he or she would know what to do.

5. Finally, after you’ve decided what action to take, you have to take it. Just because you know what to do doesn’t guarantee that you will do it. Now you will weigh the costs and benefits of helping. Are you willing to personally intervene in a fight in which one or both of the participants has a knife? What about victims of accidents-can you help them, or will you make things worse by trying to help (the competence issue again)? If you get involved, can you be sued? What if you try to help and end up looking like a fool? Many such questions, depending on the situation, may run through your mind before you actually take action.

Figure 2 illustrates how helping behavior may be short-circuited or prevented at anyone of these stages.

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SUBSEQUENT FINDINGS AND RECENT APPLICATIONS

Both the Kitty Genovese murder and the experiment we have been discussing here involved groups of onlookers who were cut off from each other. What do you suppose would happen if the bystanders could see and talk to each other? Would they be more likely to intervene when they could be judged by others? Darley and Latane
believed that in some cases, even groups in close contact would be less likely than individuals to help. This would be especially true, they theorized, when the emergency is somewhat ambiguous.

For example, imagine you are sitting in a waiting room and smoke begins to stream in through a vent. You become concerned and look around at the others in the room. But everyone else appears quite calm and unconcerned. So, you think your reaction to the smoke must be exaggerated, and you decide against taking any action. Why? Because if you take action and are wrong (maybe it wasn't smoke, just steam or something from the next room), you will feel sheepish and embarrassed. However, you don't realize that everyone in the room is feeling the same as you and hiding it just as you are, to avoid embarrassment! Meanwhile, no one is doing anything about the smoke. Sound unbelievable? Well, it's not.

Latane and Darley (1968) tested this idea in a slightly later study by creating the situation just described. Psychology students volunteered to participate in interviews to "discuss some of the problems involved in life at an urban university." When they arrived for the interview, they were seated in a room and asked to fill out a preliminary questionnaire. After a few minutes, smoke began to pour into the room through a vent. The smoke was a special mixture of chemicals that would not be dangerous to the subjects. After several minutes, the smoke became so thick that vision in the room was obscured. The researchers timed the subjects to see how long they would wait to report the smoke. Some of the subjects were in the room alone; others were with either two or three confederates, believed by the subject to be other participants, who behaved very passively when the smoke appeared. Once again, Latane and Darley's results supported their theory. Fifty-five percent of the subjects in the alone condition reported the smoke within the first two minutes, while only 12% of the subjects in the other two groups did so. Moreover, after four minutes, 75% of the alone subjects had acted, but no additional subjects in the other groups ever reported the smoke.

Beyond their specific findings, Darley and Latane's groundbreaking research on helping behavior and diffusion of responsibility continues to influence a wide array of studies on very topical issues. For example, an article applied Darley and Latane's findings to issues of child abuse and domestic violence (Hoefnagles & Zwikker, 2001). The goal of the study was to shed light on the characteristics of individuals who witness child abuse. The researchers analyzed nearly 700 records of bystanders (other than human services professionals) who reported incidents of child abuse. Their investigation revealed the bystanders to be a very diverse group of both male and females in various age groups, including many children. Various characteristics of the bystanders, including sex, age, and their perceptions of what they saw and heard were shown to influence their interpretation of the abusive event and their confidence that the event was truly abusive. This knowledge is an important factor in working to intervene in and reduce the incidence of child abuse and domestic violence.

Another study demonstrated the cognitive power of the bystander effect and diffusion of responsibility. In a recent study titled, Crowded Minds: The Implicit Bystander Effect, by a team of researchers that included Darley, found that merely imagining being in a group changed helping behavior (Garcia, et al., 2002). In this study, subjects were asked either to imagine that they were part of a group of people or alone with one other person. Then, all subjects were asked to donate to a charity. The participants who imagined themselves in the presence of others donated significantly less money, and felt less personal accountability than those who imagined being alone with one other person. These findings imply that our brains immediately "leap" at the chance to assume less individual responsibility when we are part of a group.

CONCLUSION

The results of this body of research may seem rather pessimistic, but you should recognize that these studies deal with extremely specific situations in which people fail to help. Frequent examples may be found every day of people helping other people, of altruistic behaviors, and heroic acts. Darley and Latane's research is important, however, not only to explain a perplexing human behavior, but to help change it. Perhaps, as more people become aware of the bystander effect, they will make the extra effort to intervene in an emergency, even if others are present. In fact, research has demonstrated that people who have learned about the bystander effect, are more likely to help in emergencies (Beaman et al., 1978). The bottom line is this: Never assume that others have intervened or will intervene in an emergency. Always act as if you are the only person there.


Reading 40: OBEY AT ANY COST?

If someone in a position of authority over you ordered you to deliver an electrical shock of 350 volts to another person, simply because the other person answered a multiple-choice question incorrectly, would you obey? Neither would I. If you met someone who was willing to do such a thing, you would probably think of him or her as cruel and sadistic. This study by Stanley Milgram of Yale University set out to examine the idea of obedience to authority and produced some disturbing findings.
Milgram's research on obedience joins Zimbardo's prison study (see Reading 37) as one of the most famous in all psychology's history. It is included in every general psychology text and every social psychology text. If you talk to students of psychology, more of them are familiar with these studies than any others. Out of this study came a book by Milgram (1974) on the psychology of obedience, as well as a film about the research itself that is widely shown in college and university classes. Not only is this experiment referred to in discussions of obedience, but it has also influenced the entire debate about ethics of involving human participants in psychological research.

Milgram's idea for this project grew out of his desire to investigate scientifically how people could be capable of carrying out great harm to others simply because they were ordered to do so. Milgram was referring specifically to the hideous atrocities committed during World War II and also, more generally, to the inhumanity that has been and is perpetrated by people following the orders of others. Milgram believed that in some situations, the human tendency to obey is so deeply ingrained and powerful that it cancels out a person's ability to behave morally, ethically, or even sympathetically.

When behavioral scientists decide to study some complex aspect of human behavior, their first step is to find a way to gain control over the behavioral situation so that they can approach it scientifically. This can often be the greatest challenge to a researcher, because many events in the real world are difficult to re-create in a laboratory setting. Milgram's problem was how to create a controlled situation in which one person would order another person to injure a third person physically, without anyone actually getting hurt. Now there's a researcher's challenge!

THEORETICAL PROPOSITIONS

Milgram's primary theoretical basis for this study was that humans have a tendency to obey other people who are in a position of authority over them even if, in obeying, they violate their personal codes of moral and ethical behavior. He believed that, for example, many individuals who would never intentionally cause someone physical harm would inflict pain on a victim if ordered to do so by a person whom they perceived to be a powerful authority figure.

METHOD

The most ingenious portion of this study was the technique Milgram developed to test the power of obedience in the laboratory. Milgram designed a rather scary-looking shock generator: an electronic device with 30 toggle switches labeled with voltage levels starting at 30 volts and increasing by 15-volt intervals up to 450 volts (see Figure 40-1). These switches were labeled in groups such as slight shock, moderate shock, and danger: severe shock. The idea was that a participant could be ordered to administer electric shocks at increasing levels to another person. Before you conclude that Milgram was truly sadistic himself, this was a very realistic-looking simulated shock generator, but no one ever actually received any painful shocks.
The participants for this study were 40 males between the ages of 20 and 50. They consisted of 15 skilled or unskilled workers, 16 white-collar sales- or businessmen, and 9 professional men. They were recruited through newspaper ads and direct-mail solicitation asking for volunteers to be paid participants in a study about memory and learning at Yale University. Each man participated in the study individually. To obtain an adequate number of participants, each man was paid $4.50 (remember, these were 1963 dollars, worth about $30 today). All participants were clearly told that this payment was simply for coming to the laboratory, and it was theirs to keep no matter what happened after they arrived. This was to ensure that participants knew they could withdraw at any time and did not feel coerced to behave in certain ways because they were worried about not being paid.

In addition to the participants, two other key participants were part of the study: a confederate (a 47-year-old accountant) posing as another participant and an actor (dressed in a gray lab coat, looking very official) playing the part of the experimenter.

As participants arrived at the social interaction laboratory at Yale, each was seated next to another "participant" (the confederate). Obviously, the true purpose of the experiment could not be revealed to participants because this would completely alter their behavior. Therefore, the experimenter told each participant a cover story explaining that this was a study on the effect of "punishment on learning." The participants then drew pieces of paper out of a hat to determine who would be the teacher and who would be the learner. This drawing was rigged so that the true participant always became the teacher and the accomplice was always the learner. Keep in mind that the "learner" was a confederate in the experiment, as was the person playing the part of the experimenter.

The learner was then taken into the room next door and was, with the participant watching, strapped to a chair and wired up with electrodes (complete
with electrode paste to "avoid any blisters or burns") connected to the shock generator in the adjoining room. The learner, although his arms were strapped down, was able to reach four buttons marked a, b, c, and d to answer questions posed by the teacher from the next room.

The learning task was thoroughly explained to the teacher and the learner. Briefly, it involved the learner memorizing connections between various pairs of words. It was a rather lengthy list and not an easy memory task. The teacher-participant would read the list of word pairs and then test the learner’s memory of them. The teacher was instructed by the experimenter to administer an electric shock each time the learner responded incorrectly. Most important, for each incorrect response, the teacher was instructed to move up one level of shock voltage on the generator. All this was simulated so realistically that no participant suspected that the shocks were not really being delivered.

The learner-confederate’s responses were preprogrammed to be correct or incorrect in the same sequence for all the participants. Furthermore, as the amount of voltage increased with incorrect responses, the learner began to shout his discomfort from the other room (in prearranged, prerecorded phrases, including the fact that his heart was bothering him), and at the 300-volt level, he pounded on the wall and demanded to be let out. After 300 volts he became completely silent and refused to answer any more questions. The teacher was instructed to treat this lack of a response as an incorrect response and to continue the procedure.

Most of the participants would turn to the experimenter at some point for guidance on whether to continue the shocks. When this happened, the experimenter ordered the participant to continue, in a series of commands increasing in severity:

Command 1: Please continue.
Command 2: The experiment requires that you continue.
Command 3: It is absolutely essential that you continue.
Command 4: You have no other choice: you must go on.

A measure of obedience was obtained simply by recording the level of shock at which each participant refused to continue to deliver shocks. Because 30 switches were on the generator, each participant could receive a score of 0 to 30. Participants who went all the way to the top of the scale were referred to as obedient subjects, and those who broke off at any lower point were termed defiant subjects.

RESULTS

Would the participants obey the commands of this experimenter? How high on the voltage scale did they go? What would you predict? Think of yourself, your friends, people in general. What percentage do you think would deliver shocks all the way through the 30 levels, all the way up to "450 volts—danger: severe shock"? Before discussing the actual results of the study, Milgram asked
a group of Yale University senior psychology majors, as well as various colleagues, to make such a prediction. The estimates ranged from 0% to 3%, with an average estimate of 1.2%. That is, no more than 3 people out of 100 were predicted to deliver the maximum shock.

Table 40-1 summarizes the “shocking” results. Upon command of the experimenter, every participant continued at least to the 300-volt level, which was when the confederate banged on the wall to be let out and stopped.

<table>
<thead>
<tr>
<th>Level of Shock Delivered by Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF VOLTS TO BE DELIVERED</td>
</tr>
<tr>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Slight shock</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>45</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>Moderate shock</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>90</td>
</tr>
<tr>
<td>105</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>Strong shock</td>
</tr>
<tr>
<td>135</td>
</tr>
<tr>
<td>150</td>
</tr>
<tr>
<td>165</td>
</tr>
<tr>
<td>180</td>
</tr>
<tr>
<td>Very strong shock</td>
</tr>
<tr>
<td>195</td>
</tr>
<tr>
<td>210</td>
</tr>
<tr>
<td>225</td>
</tr>
<tr>
<td>240</td>
</tr>
<tr>
<td>Intense shock</td>
</tr>
<tr>
<td>255</td>
</tr>
<tr>
<td>270</td>
</tr>
<tr>
<td>285</td>
</tr>
<tr>
<td>300</td>
</tr>
<tr>
<td>Extreme intensity shock</td>
</tr>
<tr>
<td>315</td>
</tr>
<tr>
<td>330</td>
</tr>
<tr>
<td>345</td>
</tr>
<tr>
<td>360</td>
</tr>
<tr>
<td>Danger; severe shock</td>
</tr>
<tr>
<td>375</td>
</tr>
<tr>
<td>390</td>
</tr>
<tr>
<td>405</td>
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<td>420</td>
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<td>XXX</td>
</tr>
<tr>
<td>435</td>
</tr>
<tr>
<td>450</td>
</tr>
</tbody>
</table>

(Source: Adapted from Milgram, 1963, p. 376.)
answering. Most surprising is the number of participants who obeyed orders to continue all the way to the top of the scale.

Although 14 participants defied orders and broke off before reaching the maximum voltage, 26 of the 40 participants, or 65%, followed the experimenter's orders and proceeded to the top of the shock scale. This is not to say that the participants were calm or happy about what they were doing. Many exhibited signs of extreme stress and concern for the man receiving the shocks and even became angry at the experimenter. Yet they obeyed.

The researchers were concerned that some of the participants might suffer psychological distress from the ordeal of shocking another person, especially when the learner had ceased to respond for the last third of the experiment. To help alleviate this anxiety, after the participants finished the experiment, they received a full explanation (called a "debriefing") of the true purpose of the study and of all the procedures, including the deception that had been employed. In addition, the participants were interviewed as to their feelings and thoughts during the procedure and the confederate “learner” was brought in for a friendly reconciliation with each participant.

DISCUSSION

Milgram's discussion of his findings focused on two main points. The first was the surprising strength of the participants' tendency to obey. These were average, normal people—not sadistic, cruel individuals in any way—who agreed to participate in an experiment about learning. Milgram points out that from childhood these participants had learned that it is immoral to hurt others against their will. So why did they behave this way? The experimenter was a person in a position of authority, but if you think about it, how much authority did he really have? He had no power to enforce his orders, and participants would lose nothing by refusing to follow orders. Clearly it was the situation that carried a force of its own that somehow created an atmosphere of obedience.

The second key observation made during the course of this study was the extreme tension and anxiety manifested by the participants as they obeyed the experimenter's commands. Again, it might be expected that such discomfort could be relieved simply by refusing to go on, and yet this is not what happened. Milgram quotes one observer (who watched a participant through a two-way mirror):

I observed a mature and initially poised businessman enter the laboratory smiling and confident. Within 20 minutes he was reduced to a twitching, stuttering wreck who was rapidly approaching a point of nervous collapse.... At one point he pushed his fist into his forehead and muttered, "Oh, God! Let's stop it." And yet he continued to respond to every word of the experimenter and obeyed to the end. (p. 377)

Milgram listed several points at the end of the article to attempt to explain why this particular situation produced such a high degree of obedience. In summary, from the point of view of the participant, his main points were that (a) if it is being sponsored by Yale, I must be in good hands, and
who am I to question such a great institution; (b) the goals of the experiment appear to be important, and therefore, because I volunteered, I'll do my part to assist in the realization of those goals; (c) the learner, after all, also voluntarily came here and he has an obligation to the project, too; (d) hey, it was just by chance that I'm the teacher and he's the learner—we drew lots and it could have just as easily been the other way around; (e) they're paying me for this, I'd better do my job; (f) I don't know all that much about the rights of a psychologist and his participants, so I will yield to his discretion on this; and (g) they told us both that the shocks are painful but not dangerous.

SIGNIFICANCE OF THE FINDINGS

Milgram's findings have held up quite well in the 40-plus years since this article was published. Milgram himself repeated the procedure on similar participants outside of the Yale setting, on unpaid college student volunteers, and on women participants, and he found similar results each time. In addition, he expanded further on his findings in this study by conducting a series of related experiments designed to reveal the conditions that promote or limit obedience (see Milgram, 1974). He found that the physical, and therefore emotional, distance of the victim from the teacher altered the amount of obedience. The highest level of obedience (93% going to the top of the voltage scale) occurred when the learner was in another room and could not be seen or heard. When the learner was in the same room with the participant and the participant was required to force the learner's hand onto a shock plate, the rate of obedience dropped to 30%.

Milgram also discovered that the physical distance of the authority figure to the participant also influenced obedience. The closer the experimenter, the greater the obedience. In one condition, the experimenter was out of the room and telephoned his commands to the participant. In this case, obedience fell to only 21%.

On a more positive note, when participants were allowed to punish the learner by using any level of shock they wished, no one ever pressed any switch higher than no. 2, or 45 volts.

CRITICISMS

Although Milgram's research has been extremely influential in our understanding of obedience, it has also had far-reaching effects in the area of the ethical treatment of human participants. Even though no one ever received any shocks, how do you suppose you would feel if you knew that you had been willing to shock someone (possibly to death) simply because a person in a lab coat told you to do so? Critics of Milgram's methods (e.g., Baumrind, 1964; Miller, 1986) claimed that unacceptable levels of stress were created in the participants during the experiment. Furthermore, it has been argued that the potential for lasting negative effects existed. When the deception was revealed to participants at the end of their ordeal, they may have felt used, embarrassed, and possibly distrustful of psychologists or legitimate authority figures in the future.
Another line of criticism focused on the validity of Milgram’s findings (e.g., Brief et al., 1995; Orne & Holland, 1968). One commonly cited basis for this criticism was that because the participants had a trusting and rather dependent relationship with the experimenter, and the laboratory was an unfamiliar setting, obedience found there did not represent obedience in real life. Therefore, critics claim, the results of Milgram’s studies were not only invalid, but because of this poor validity the treatment his participants were exposed to could not be justified.

Milgram responded to criticisms by surveying participants after they had participated. He found that 84% of his participants were glad to have participated, and only 1% regretted the experience. In addition, a psychiatrist interviewed 40 of the participants who were judged to have been the most uncomfortable in the laboratory and concluded that none had suffered any long-term effects. As to the criticism that his laboratory findings did not reflect real life, Milgram said, "A person who comes to the laboratory is an active, choosing adult, capable of accepting or rejecting the prescriptions for action addressed to him" (Milgram, 1964, p. 852).

The Milgram studies reported here have been a focal point in the ongoing debate over experimental ethics involving human participants. It is, in fact, arguable whether this research has been more influential in the area of the psychology of obedience or in policy formation on the ethical treatment of humans in psychological research (as summarized in this book’s Preface).

RECENT APPLICATIONS

The breadth of influence that Milgram’s obedience project continues to exert on current research can best be appreciated through a brief annotated selection of recent studies that have been primarily motivated by Milgram’s early methods and findings. As has been the case every year since the early 1960s when Milgram carried out his studies, these studies are divided between attempts to refine and elaborate on people’s tendency to obey authority figures and the omnipresent debate about the ethics of using deception in research involving human participants.

Thomas Blass, a leading authority on the work and career of Stanley Milgram, and author of a biography of Milgram, The Man Who Shocked the World (Blass, 2004), has reviewed all the research and social implications stemming from Milgram’s obedience studies (Blass, 1999; 2002). In general, Blass has found universal support for Milgram’s original findings, but, more importantly, he suggests that obedience rates have not changed significantly during the 40-plus years since Milgram first published his findings. This is contrary to many people’s intuitive judgments that Americans in general have become less respectful of authority and more willing to rebel and fight back when ordered to perform behaviors with which they disagree.

Another question that often arises about Milgram’s early studies concerns gender and the fact that all his original participants were male. Do you think, overall, that men or women would be more likely to obey an authority
Blass's review of later studies by Milgram and numerous others found no difference in obedience rates for males versus females. (For more details about the history and influences of Milgram's work, see Blass's Web site at http://www.stanleymilgram.com.)

A very pertinent application of Milgram's findings examined the psychological experience of "execution teams" charged with carrying out the death sentence in Louisiana State prisons (Osofsky & Osofsky, 2002). The researchers interviewed 50 correctional officers who were directly involved with executions. They found that, although exposed far more than most people to trauma and death, the participants were not found to be clinically depressed. They reported relying on religious beliefs, identification with their peer group, and their ability to diffuse responsibility to deal with painful emotions. "Nevertheless, the officers experience conflicted feelings and frequently report having a hard time carrying out society's 'ultimate punishment'" (p. 358).

On the ethics side, a study employed Milgram's research in examining potentially thorny ethical issues for social science research conducted on the Internet (Pittenger, 2003). Today, a great deal of research is conducted via the World Wide Web, and the number of such studies is likely to increase significantly in the future. Pittenger contends that researchers must be alert to potential ethical violations relating to invasion of privacy, obtaining informed consent, and using deceptive tactics online. "The Internet offers unique challenges to researchers," Pittenger writes. "Among these are the need to define the distinction between private and public behavior performed on the Internet, ensure mechanisms for obtaining valid informed consent from participants, performing debriefing exercises, and verifying the validity of data collected" (p. 45).

An important question is this: What should be done to protect participants from irresponsible, deceptive practices in psychological research, while at the same time allowing for some deception when absolutely necessary for scientific advancement? A study by Wendler (1996) suggested that participants in studies involving deception be given an increased level of "informed consent." (See the discussion of this concept in the Preface to this book.) This enhanced informed consent would inform you of the study's intention to use deception before you agree to be a participant in the experiment, although you would not be aware of the exact nature of the deception. "This 'second order consent' approach to acceptable deception," claims Wendler, "represents our best chance for reconciling respect for participants with the occasional scientific need for deceptive research" (p. 87).

CONCLUSION

Milgram historian Thomas Blass's (2002) remarks in a biographical review of Milgram's life and work provide a fitting conclusion to this reading:

We didn't need Milgram to tell us we have a tendency to obey orders. What we didn't know before Milgram's experiments is just how powerful this tendency is.
And having been enlightened about our extreme readiness to obey authorities, we can try to take steps to guard ourselves against unwelcome or reprehensible commands (p. 73).


