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的发展产生巨大的推动作用。据统计，美国每年授予博士学位人数最多的学科是心理学，可见心理学在美国的重要和普及程度。心理学诞生在西方，心理学的高等教育也在西方积累了较丰富的经验，教材在内容、形式上都已经比较成熟，而且能够快速有效地跟进国际心理学科学发展的前沿趋势，这对于保持高等教育的水平有着举足轻重的作用。相比来看，我国内地一些地区心理学师资匮乏，一些自编教材低水平重复，对教、学质量均有很大负面影响，情况堪忧。

教育部高等学校心理学教学指导委员会是国家教育部设立的心理学高等教育指导、咨询机构，负责制定国家心理学高等人才培养的宏观战略和指导规范。根据教育部发展高等教育的有关精神，我们与国内外多家出版机构合作，作为一个长期的工程，有计划、分期分批地引进外版教材，以期推动我国心理学教学的快速高效发展。

培生教育出版集团在出版心理学教材方面富有经验，此次引进的教材均是培生多次再版，被实践证明为适合高等学校教学的优秀教材。特别是这些教材均经过国内著名专家学者鉴定并大力推荐，这对引进教材的质量起到了重要的把关作用。在此谨对这些专家学者表示特别的感谢和敬意！

希望这套教材对高校的心理学教学有所帮助，并祝愿我国的心理学高等教育事业蓬勃发展！

王垒

北京大学心理学教授

教育部高等学校心理学教学指导委员会主任

女性行为的特点及规律,促进了对性行为特点的科学认识,题目为“性动机”;Ekman 和 Friesen 对原始部落人们面部表情认知的研究,发现面部表情的跨文化特性,题目为“我能读懂你的脸”;Holmes 和 Rahe 通过总结个体生活中应激事件,编制出一个科学而又简便的社会再适应量表,题目为“生活、变化和应激”;Festinger 和 Carlsmith 通过对认识与行为不一致的探讨,揭示个体认知失调的内部规律,题目为“认知失调”。

(7)人格。包括了 Rotter 编制的内控和外控量表,题目为“你能主宰自己的命运吗?”Bem 编制衡量男女性别特征量表,深化了人们对男女心理的认识,题目为“男性化或女性化……还是双性化?”;Friedman 和 Rosenman 通过对心脏病人的分析研究,提出 A 型人格概念,使人们对性格与疾病的关系有进一步的认识,题目为“和心脏赛跑”;Triandis、Bontempo、Villareal、Asai 和 Lucca 等人将文化分为集体主义文化和个体主义文化,发现不同类型文化对人们行为有影响,题目为“个人与集体”。

(8)心理病理学。包括了 Rosenhan 等人以精神科大夫对精神病人诊断标准的研究,促进精神科大夫应该思考诊断的标准是否客观的问题,题目为“这儿,谁是疯子?”;Freud 从无意识心理学的角度,揭示了人们在日常生活中是如何应付各种挫折的,题目为“你再次获得防御”;Seligman 和 Maier 以动物为实验对象,发现多次失败会导致习得性无助,题目为“习得性抑郁”;Calhoun 以老鼠为对象研究了居住空间的拥挤程度对心理的影响,使人们对居住空间有了新的认识,题目为“拥挤导致行为失常”。

(9)心理治疗学。包括了 Smith 和 Glass 采用元分析的方法,对各种心理治疗效果进行了对比研究,结果发现各种治疗方法的效果与人们的想象不同,题目为“为自己挑选心理治疗师”;Wolpe 用系统脱敏法对恐惧心理的治疗,探讨了如何缓解人们的恐惧心理,题目为“缓解你的恐惧心理”;Rorschach 用墨迹图,对个体的心理做出诊断,题目为“投射出真正的你”;Murray 采用主题统觉测验,要求人们看图讲故事,以了解其人格特点,题目为“编个故事吧!”。

(10)社会心理学。包括了 LaPiere 采用现场实验法,发现人们说的与实际做的并不一致,题目为“言行不一”;Asch 用三条长短不同的线段,发现在群体压力下,对线段的判断如何出现失误的,题目为“从众的力量”;Darley 和 Latané 采用实验室实验,探讨了什么情况下人们不会立即伸出援助之手,题目为“你会伸出援手吗?”;Milgram 通过虚拟的实验室任务,

rights activists take the view that all living things are ordered in value by their ability to sense pain. In this conceptualization, animals are equal in value to humans and, therefore, any use of animals by humans is seen as unethical. This use includes eating a chicken, wearing leather, and owning pets (which, according to some animal-rights activists, is a form of slavery).

At one end of the spectrum, many people believe that research with animals is inhumane and unethical, and should be prohibited. However, nearly all scientists and most Americans believe that the limited and humane use of animals in scientific research is necessary and beneficial. Many lifesaving drugs and medical techniques have been developed through the use of animal experimental subjects. Animals have also often been subjects in psychological research to study issues such as depression, brain development, overcrowding, and learning processes. The primary reason animals are used in research is that to carry out similar research on humans clearly would be unethical. For example, suppose you wanted to study the effect on brain development and intelligence of raising infants in an enriched environment with many activities and toys, versus an impoverished environment with little to do. To assign human infants to these different conditions would simply not be possible. However, most people would agree that rats could be studied without major ethical concerns to reveal findings potentially important to humans (see the reading in this book on research such as this by Rosenzweig and Bennett).

The American Psychological Association, in addition to its guidelines on human subjects, has strict rules governing research with animal subjects designed to ensure humane treatment. These rules require that research animals receive proper housing, feeding, cleanliness, and health care. All unnecessary pain to the animal is prohibited. A portion of the APA's *Guidelines for the Ethical Conduct in the Care and Use of Animals* (2004) reads as follows:

> Animals are to be provided with humane care and healthful conditions during their stay in the facility. . . . Psychologists are encouraged to consider enriching the environments of their laboratory animals and should keep abreast of literature on well-being and enrichment for the species with which they work. . . . When alternative behavioral procedures are available, those that minimize discomfort to the animal should be used. When using aversive conditions, psychologists should adjust the parameters of stimulation to levels that appear minimal, though compatible with the aims of the research. Psychologists are encouraged to test painful stimuli on themselves, whenever reasonable (see //www.apa .org/science/anguide.html).

In this book, several studies involve animal subjects. In addition to the ethical considerations of such research, there are also difficulties in generalizing from animal findings to humans. These issues are discussed within each chapter that includes animal research. Each individual, whether a researcher or a student of psychology, must make his or her own decisions about animal research in general and the justifiability of using animal subjects in any specific instance. If you allow for the idea that animal research is acceptable under *some* circumstances, then, for each study involving animals in this book, you must decide if the value of the study's findings supports the methods used.

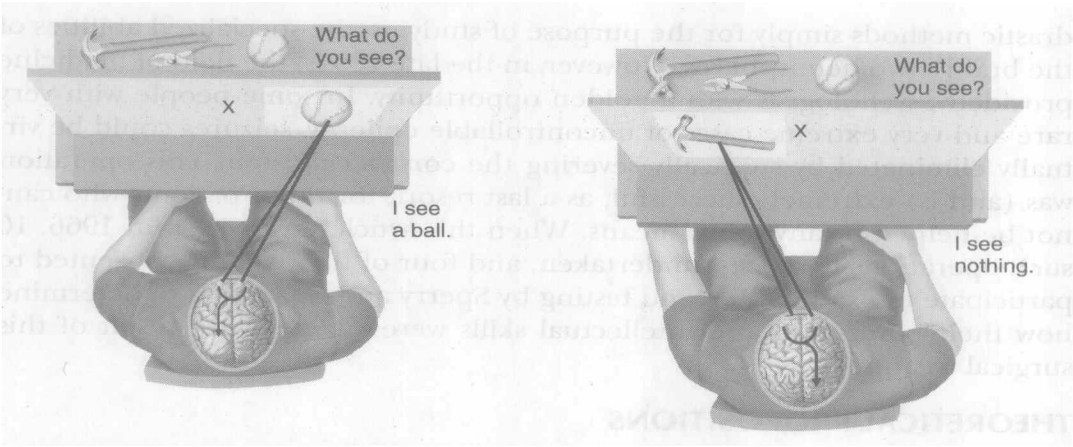

FIGURE 1 A typical visual testing device for split-brain subjects.

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. Gassaniga 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 hemi-

sphere 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.

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

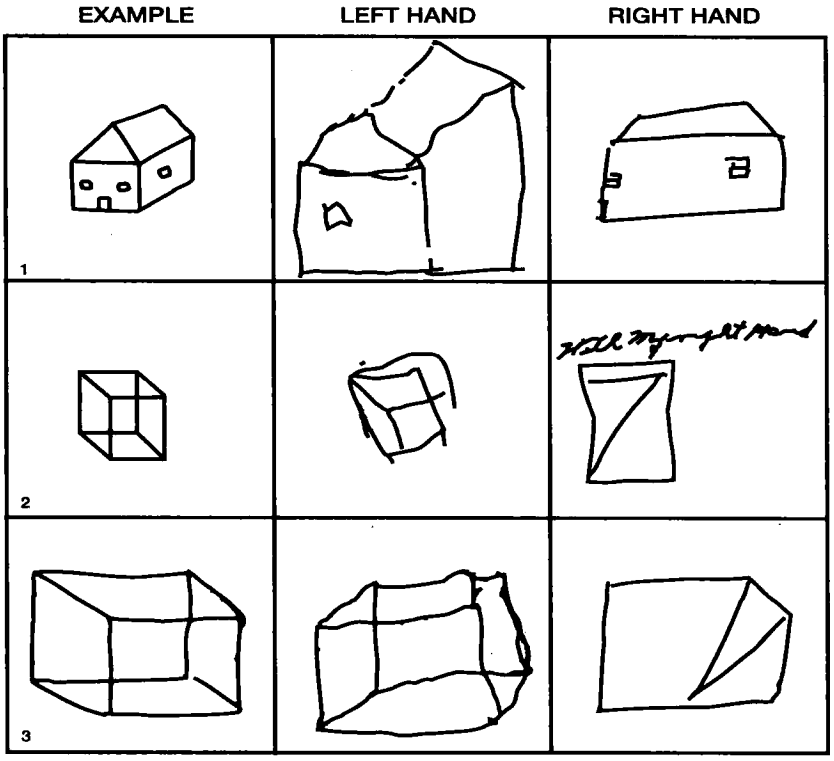

FIGURE 2 Drawings made by split-brain patients. (Adapted from "The Split Brain in Man," by Michael S. Gazzaniga.)

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!

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 hemispheres? It's something to think about . . . with *both* of your hemispheres.

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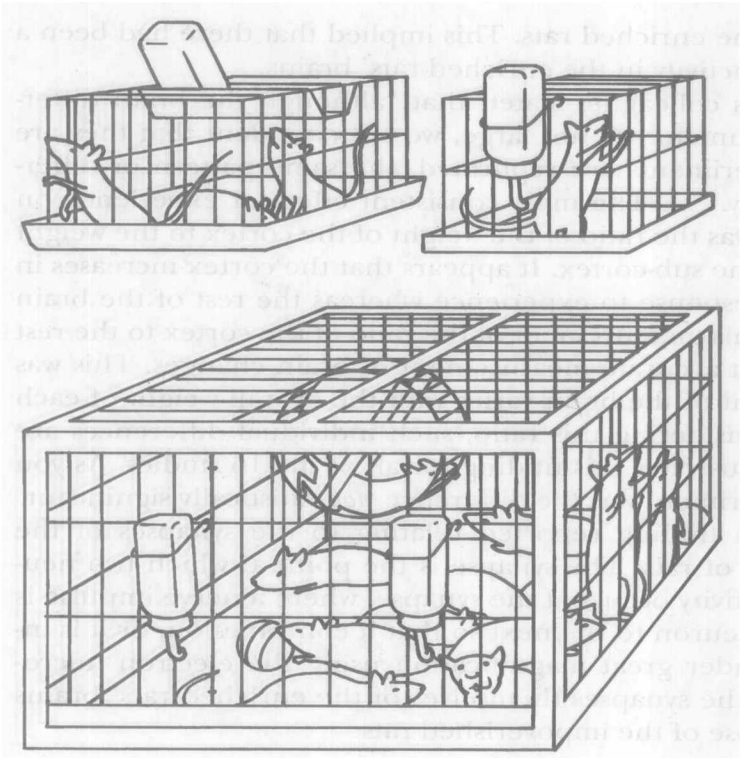

FIGURE 1 The three cage environments.

rotransmitter activity. In this latter measurement, there was one brain enzyme of particular interest called *acetylcholinesterase.* This chemical is important because it allows for faster and more efficient transmission of impulses among brain cells.

Did Rosenzweig and his associates find differences in the brains of rats raised in enriched versus impoverished environments? Here are their results.

RESULTS

Results indicated that the brains of the enriched rats were different from the impoverished rats in many ways. The cerebral cortex of the enriched rats was significantly heavier and thicker. The cortex is the part of the brain that responds to experience and is responsible for movement, memory, learning, and all sensory input (vision, hearing, touch, taste, smell). Also, greater activity of the nervous system enzyme acetylcholinesterase, mentioned previously, was found in the brain tissue of the rats with the enriched experience.

While there were no significant differences found between the two groups of rats in the number of brain cells (called neurons), the enriched environment produced larger neurons. Related to this was the finding that the ratio of RNA to DNA, the two most important brain chemicals for cell

growth, was greater for the enriched rats. This implied that there had been a higher level of chemical activity in the enriched rats' brains.

Rosenzweig and his colleagues stated that "although the brain differences induced by environment are not large, we are confident that they are genuine. When the experiments are replicated, the same pattern of differences is found repeatedly. . . . The most consistent effect of experience on the brain that we found was the ratio of the weight of the cortex to the weight of the rest of the brain: the sub-cortex. It appears that the cortex increases in weight quite readily in response to experience whereas the rest of the brain changes little" (p. 25). This measurement of the ratio of the cortex to the rest of the brain was the most accurate measurement of brain changes. This was because the overall weight of the brain varies with the overall weight of each individual animal. By considering this ratio, such individual differences are canceled out. Figure 2 illustrates this finding for all of the 16 studies. As you can see, in only one experiment was the difference *not* statistically significant.

Finally, there was a finding reported relating to the synapses of the brains of the two groups of rats. The synapse is the point at which two neurons meet. Most brain activity occurs at the synapse, where a nerve impulse is either passed from one neuron to the next so that it continues on, or it is inhibited and stopped. Under great magnification using the electron microscope, it was found that the synapses themselves of the enriched rats' brains were 50% larger than those of the impoverished rats.

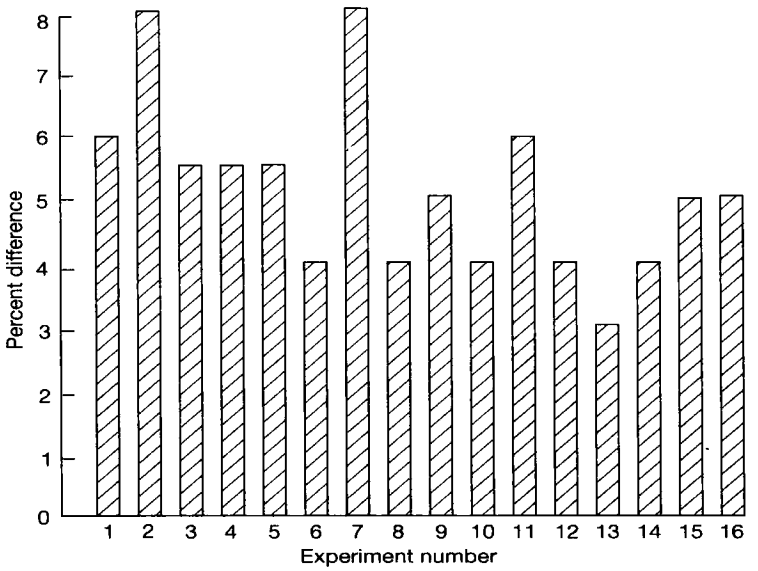

FIGURE 2 Ratio of cortex to rest of brain: Enriched compared with impoverished environment. (Results in experiments 2 through 16 were statistically significant.) (Adapted from p. 26.)

to try to apply rat findings to monkeys or humans. And, although they report similar findings with several species of rodents, they admit that more research would be necessary before any assumptions could be made responsibly about the effects of experience on the human brain. They proposed, however, that the value of this kind of research on animals is that "it allows us to test concepts and techniques, some of which may later prove useful in research with human subjects."

Several potential benefits of this research were suggested by the authors in their article. One possible application was in the study of memory. Changes in the brain due to experience might lead to a better understanding of how memories are stored in the brain. This could, in turn, lead to new techniques for improving memory and preventing memory loss due to aging. Another area in which this research might prove helpful was in explaining the relationship between malnutrition and intelligence. The concept proposed by the authors in this regard was that malnutrition may make a person unresponsive to the stimulation available in the environment and consequently may limit brain development. And, the authors noted, some concurrent research suggested that the effects of malnutrition on brain growth may be either reduced by environmental enrichment or enhanced by deprivation.

RELATED RESEARCH AND RECENT APPLICATIONS

This work by Rosenzweig, Bennett, and Diamond served as a catalyst for continued research in this area. Over the more than 25 years since the publication of their article, these scientists and many others have continued to confirm, refine, and expand their findings.

For example, it has been found that learning itself is enhanced by enriched environmental experiences and that even the brains of adult animals raised in impoverished conditions can improve when placed in an enriched environment (see Bennett, 1976, for a complete review).

Some evidence exists to indicate that experience does indeed alter brain development in humans. Through careful autopsies of humans who have died naturally, it appears that as a person develops a greater number of skills and abilities, the brain actually becomes more complex and heavier. Other findings come from examinations during autopsies of the brains of people who were unable to have certain experiences. For example, in a blind person's brain, the portion of the cortex used for vision is significantly less developed, less convoluted, and thinner than in the brain of a person with normal sight.

Marian Diamond, one of the authors of the original article, has applied the results of work in this area to the process of human intellectual development throughout life. She says, "For people's lives, I think we can take a more optimistic view of the aging brain. . . . The main factor is stimulation. The nerve cells are designed for stimulation. And I think curiosity is a key factor. If one maintains curiosity for a lifetime, that will surely stimulate neural tissue and the cortex may in turn respond. . . . I looked for people who were ex-

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ARE YOU A "NATURAL"?

Bouchard, T., Lykken, D., McGue, M., Segal, N., & Tellegen, A. (1990). Sources of human psychological differences: The Minnesota study of twins reared apart. *Science, 250,* 223–229.

This study represents a relatively recent and ongoing fundamental change in the way many psychologists view human behavior in its broadest sense. You can relate to this change in a personal way by first taking a moment to answer in your mind the following question: "Who are you?" Think for a moment about some of your individual characteristics: your "personality traits." Are you high strung or "laid back"? Are you shy or outgoing? Are you adventurous or do you seek out comfort and safety? Are you easy to get along with or do you tend toward the disagreeable? Are you usually optimistic or more pessimistic about the outcome of future events? Think about yourself in terms of these or any other questions you feel are relevant. Take your time. . . . Finished? Now, answer this next, and, for this reading, more important question: "*Why* are you who you are?" In other words, what factors contributed to "creating" this person you are today?

If you are like most people, you will point to the child-rearing practices of your parents and the values, goals, and priorities they instilled in you. You might also credit the influences of brothers, sisters, grandparents, aunts, uncles, and peers, teachers, and other mentors who played key roles in molding you. Still others of you will focus on key life-changing events such as an illness, the loss of a loved one, or the decision to attend a specific college, choose a major, or take a particular life course that seemed to lead you toward becoming your current self. All of these influences share one characteristic: they are all *environmental* phenomena. Hardly anyone ever replies to the question "Why are you who you are?" with, "I was born to be who I am; it's all in my genes."

Everyone acknowledges that physical attributes, such as height, hair color, eye color, and body type are genetic. More and more people are realizing that tendencies toward many illnesses such as cancer, heart disease, and high blood pressure have significant genetic components. But almost no one thinks of genes as the main force behind who they are *psychologically.* This may strike you as odd when you stop to think about it, but in reality there are very understandable reasons for our "environmental bias."

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 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 camouflaged 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

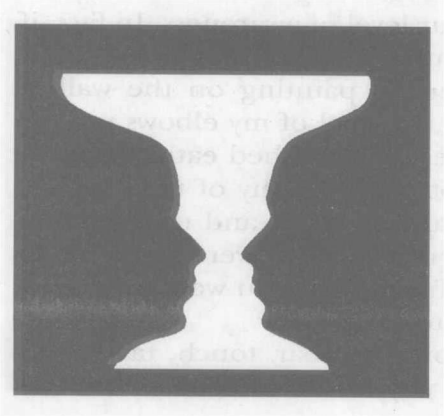

FIGURE 1 Figure-ground relationship—a reversible figure. From Charles G. Morris, *Understanding Psychology,* 7th ed., p. 101. Copyright 1990. Reprinted by permission of Prentice Hall.