Essentials of Psychology and Life

10th Edition

Zimbardo

Essentials of Psychology and Life

10th Edition

by
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from earlier editions by
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Scott, Foresman and Company
Glenview, Illinois Dallas, Tex. Oakland, N.J.
Palo Alto, Cal. Tucker, Ga. London, England

Dedicated to my lovely sister Vera,
who confronts adversity with a serenity
that teaches us all to better appreciate
the beauty of life's every moment.

Library of Congress Cataloging in Publication Data

Zimbardo, Philip G
Essentials of Psychology and Life.

A revision of Psychology and life, brief 9th ed. (1976).

Bibliography: p.
Includes indexes.
1. Psychology. I. Ruch, Floyd Leon, 1903- joint author. II. Title. [DNLM: 1. Psychology. BF121 Z71p]
BF121Z54 1979 150 79-18172
ISBN 0-673-15184-0

Previously published as *Psychology and Life, Brief Ninth Edition.*
2345678910-RRW-858483828180

Acknowledgments for illustrations and quoted matter are included on pages XXXV–XXXVII at the end of the book. These pages are an extension of the copyright page.

Preface

Dear Reader:

I'm delighted your psychology teacher has given me this opportunity to share with you my enthusiasm for psychology as well as the knowledge I've gained in over twenty years of teaching introductory psychology. I love psychology; it is fascinating, challenging, and a source of much satisfaction. The more I observe people, the more questions I am led to ask about the human condition. The more I understand of it, the less I take for granted about the exquisite complexity that goes into making you unique and us different. What better way to spend one's life than being a professional "people watcher," investigating the mysteries of human nature?

I shudder to recall that I almost didn't make it—after my first psychology course. A total disaster! In my whole career as a student my lowest grade ever was in that Psych 1 course. I entered with great expectations and exited quietly depressed, feeling cheated. Most of the blame falls on the text. It was the enemy—a relentless adversary equipped to bore me nearly to death. The author had tried so hard to be serious and scientific, but succeeded only in being irrelevant to any of my personal or intellectual concerns. I was rescued in my senior year from an uncertain future as an accountant by a dedicated psychology instructor—and have never regretted the decision to devote my life to being a psychologist.

When it came time to write about psychology, collaborating with Floyd Ruch was a natural. Professor Ruch had written the first basic text designed for the beginning psychology student rather than to impress his professional colleagues. Since that first edition in 1937, *Psychology and Life* has become the model to be imitated by virtually all the other basic texts that followed. With the publication of the Tenth Edition in 1979, *P&L* ranks first in seniority among more than 160 introductory psychology texts. I hope my contribution to this classic work will help make it first also in student and faculty evaluations.

Essentials of Psychology and Life has been carefully designed to provide you with a comprehensive, in-depth view of what psychology is all about. I have tried to blend academic integrity, sound pedagogy, common sense, humanistic concerns, and a measure of fun. The most exciting areas of contemporary research

are represented, as are the classic studies that constitute the foundations of psychology.

I have tried to communicate directly to you as though you were a student in one of my own tutorials. I hope you will learn much and like most of what you discover. If you do, you will owe a debt of thanks to other generations of students who have used the past several editions of *Psychology and Life.* Thousands of them sent me detailed feedback about what they enjoyed, as well as constructive criticism. My respect for the value of this student input shows up throughout the Tenth Editions of *Psychology and Life* and *Essentials of Psychology and Life.* (Please carry on this tradition by sending in *your* evaluation on the form provided at the end of this book. It is best to mark down your reactions to each chapter immediately after you read it.)

Psychology is a broad, dynamic field, with shifting emphases and new discoveries about behavior and the mind. For example, while some of my colleagues study the physiological functions of the nervous system, others seek to discover why we forget and still others search for explanations of violence. While some research directions that seemed promising a while ago have proved disappointing, others have emerged with even greater promise. Therefore, in undertaking the task of informing you about the current state of this vast field of knowledge, I have called upon the expertise of many authorities. They have educated me, infused me with some of their enthusiasm for their individual fields of study, shared new ideas, corrected faulty ones, and shown how I might better communicate to you what psychologists have done and are doing. To each of them, I am grateful.

Critical evaluation, valuable insights, and new directions were provided by: Justine Owens, Megan Gunnar, Charles Swencionis, Grace Hagawara, Linda Solomon, and Michael Werb (Stanford University); Helen Joan Crawford (University of Wyoming); Raymond Paloutzian (University of Idaho); Randy Gallistel (University of Pennsylvania); Richard Bootzin (Northwestern University); Ola Selnes (Hennepin County Medical Center); Sharon Brehm (University of Kansas); Paul Ban and Jac Carlson (University of Hawaii); Susan Jackson and Karen Brattesani (University of California, Berkeley); Gary Frieden (University of Southern California); Keith Wescourt (Office of Naval Research); Don Kaesser (Des Moines Community College); Andrew Kish (Saddleback Community College); and Seymour Siegler (Brookdale Community College).

Karl Minke (University of Hawaii) improved every chapter through his keen appreciation of how best to deliver what psychologists know to an audience of students varying in background and interests.

Special thanks go to those colleagues and friends who assisted me by collaborating on drafting chapters or sections of chapters: Jeff Wine (Stanford University) for physiology, Hayne Reese (West Virginia University) for development, Richard Dolinsky (University of Toledo) for memory and language, Tom Bourbon (Stephen F. Austin State University) for perception, Richard Santee (University of California, Berkeley) for social psychology.

My publisher, Scott, Foresman, backed my efforts with a team of inspired editors whose wise counsel shaped much that is effective in this book, among them Sharon Barton, Linda Muterspaugh, and Kathy Wylie. Marguerite Clark knows how much I continue to value her invaluable input to my thinking. Louise Howe contributed her clarity of thought, sense of effective prose, and patience for my excesses. To John Staley go my thanks for his vision of the ideal introductory psychology text and his sensitive efforts in directing *Essentials of Psychology and Life* along those lines.

Rosanne Saussotte, my secretary, goes far beyond making my scribbles intelligible. She makes me ever aware that it is possible to always be compassionate and involved in the lives of other people regardless of how hard one is working.

My wife, my friend, my colleague, Christina Maslach (University of California, Berkeley) is the gentle force that informs so much of what I am and enriches all that I write. She assisted in many ways, with support, advice, and drafting sections of this book from materials that she has taught effectively to her own students. She shares the credit for whatever joy you find in the ideas that follow.

Where *Essentials of Psychology and Life* falls short of your expectations, I stand alone. With a little more help from my friends, including you, I promise to make the necessary improvements next time around. But for now, the table is set; enjoy.

Using this book wisely

You will get more out of the time you put into reading *Essentials of Psychology and Life* if you follow these recommendations:

- Set aside sufficient study time for this course.
- Study in a setting with minimum distractions.
- Begin each chapter by looking over the outline on the opening page of the chapter. It acquaints you with the topics to come and their relationship to one another.
- Read the Chapter Summary at the end of the assigned chapter. The summary will familiarize you with the themes of the chapter, basic concepts, and conclusions.
- Skim through the chapter, reading for general information.
- Now you are ready to dig in! Read closely and carefully. Read actively by underlining or taking notes. Good notes now will be of considerable value later on when studying for your examinations.

We have designed a number of features into each chapter to facilitate your comprehension and increase your enjoyment. Among them are:

- Major topics come under first-level headings (!large brown type). Note the styles of type used in the various levels of headings because they indicate the structure of the chapter and the relationships of the ideas. These headings organize the content for you and help you plan your reading for each period of study.
- Important terms and concepts are printed in *italic type* to highlight them.
- Detailed reports of interesting or critical research are printed in italicized sections.
- When a figure or illustration is mentioned in the text, it is followed by one of these symbols: ● ▲ ■ ◆ The same symbol appears with the caption of the appropriate chart or photo.
- Items of special interest are set apart from the body of the text for detailed presentation in *P&L Close-ups*. Each one appears on or close to the page in the text where it is cited, and should be read at that time even though you may have to pass over some material in order to get to it. I think you will find many of them are fun to read and contain interesting ideas.
- References to research, scholarly sources, and mass-media sources appear throughout the text. The authors' names and date of publication will be listed in parentheses (e.g., Zimbardo, 1979); complete citations are listed in the References at the end of the book in alphabetical order. These references establish the basis of our conclusions and also direct you to more complete information if you are especially interested in any given idea.
- You will find at the back of the book a full glossary of psychological terms and concepts used in *Essentials of Psychology and Life* (indicating the pages on which they are discussed); a subject index of all important concepts; and a name index of the individuals whose work I have cited.
- Think of this text as a valuable reference source, useful in later psychology courses or for term papers for other courses. For example, many psychology majors prepare for Graduate Record Examinations by reviewing this introductory psychology text. In short, I hope you will keep this book as part of your personal library of intellectual resource materials.

Note: Both the title and the approach of this book are represented by the symbol that appears on this page, a combination of the ancient Egyptian ankh, symbolic of *life*, with the Greek letter psi, ψ, which has come to stand for *psychology*.

Overview

Chapter 1 Unraveling the Mysteries of Human Behavior

Chapter 2 Adaptive Behavior: Conditioning and Learning

Chapter 3 Human Learning and Information Processing

Chapter 4 Language and Reasoning

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Chapter 13 Deviance, Pathology, and Madness

Chapter 14 Therapeutic Modification of Behavior

Chapter 15 Liking, Loving, and Sexual Relationships

Chapter 16 The Social Bases of Behavior

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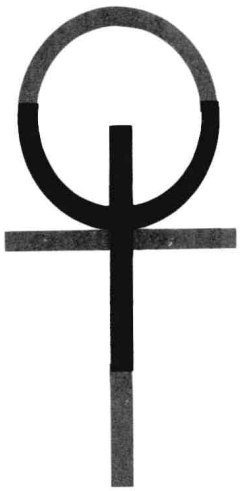


Prologue

Let us begin your introduction to psychology by examining a few of the ways in which contemporary psychologists have gone about seeking answers to their questions about human behavior. Each example represents one of the major areas of psychology that we will investigate in detail in subsequent chapters of the text. These particular studies have been selected because they illustrate something of the breadth of topics that make up the field of psychology, and, frankly, because I hope they will involve you directly in the exciting challenge that is psychology.

All persons are puzzles until at last we find in some word or act the key to the man, to the woman: straightway all their past words and actions lie in light before us.

Ralph Waldo Emerson
Journals

Psychology in action: questions and answers

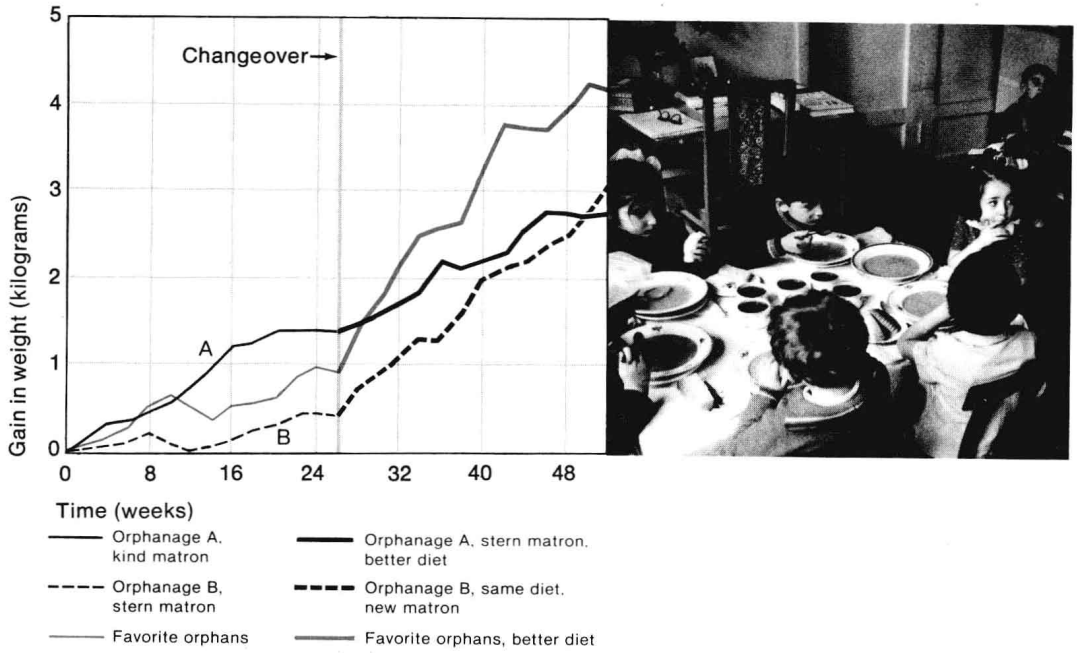
Are love and affection essential for survival? (Chapter Seven)

Is there an association between depriving an infant of love and affection and later illness? Are nutritious food and other good physical conditions the only requirements for normal growth and physical well-being? Another, more popular way to pose this basic question is: can someone die of a "broken heart"? Such questions focus our attention on the role of emotional deprivation in the process of development. They also touch upon the broader issue of how psychological and physical processes are related to each other.

Long before the science of psychology was born, Frederick II, a thirteenth-century ruler of Sicily and a master of languages, believed that every person was born already knowing the original human language. According to him, a child would begin to use this built-in language without any training or experience as soon as he or she was old enough. To test this *hypothesis* Frederick conducted an experiment. A group of foster mothers were put in charge of a number of newborn infants. They were to care for the babies in silence, never speaking to them or allowing them to hear human sounds. When at last they spoke, it would reveal, according to Frederick, the true natural language they had inherited, since nothing could be attributed to their upbringing. History gives us the sad results of this experiment: "But he labored in vain, because the children all died. For they could not live without the petting and the joyful faces and loving words of their foster mothers."

A fable? Folkore? Could emotional deprivation really have had such a profound effect? Writing in 1760, a Spanish churchman noted, "In the found-

The importance of quality of care is illustrated by these curves showing the weight gain of children in two German orphanages after World War II. The colored line shows the increasing weight gain of a group of the stern matron's favorites, whom she took with her when she moved. These data show that the normally expected gain in weight as children mature is slowed down when either the diet is poor or their care lacks emotional warmth.



ling home the child becomes sad, and many of them die of sorrow." Since the early years of this century, a number of studies have found signs of physical as well as psychological deterioration in young children who were hospitalized for long periods of time. One study of children in two postwar German orphanages traced the relationship of weight changes to quality of care. Although both groups of children received the same basic rations for the first twenty-six weeks, those in orphanage A, with a kind and loving matron, showed greater weight gain than those in orphanage B, where the matron was harsh and stern. This stern matron transferred to orphanage A at the same time a better diet was begun. At orphanage B the diet was not changed, but the weight gain increased sharply after the stern matron left. The data show that growth accelerates with a better diet of good food and loving care. ■

The most direct evidence for the link between emotional factors and physical development comes from an intensive study of six "thin dwarfs." Researcher Lytt Gardner (1972) studied children who were underweight and short. These undersized children also had retarded skeletal development with a "bone age" much less than their chronological age. All had come from family environments marked by emotional detachment and lack of affection between parents and children. Gardner showed that this condition, which has been called *deprivation dwarfism,* was indeed the physical consequence of emotional deprivation. He found that such children gain weight and begin to grow when they are removed from the hostile environment, and their growth again becomes stunted if the home environment is unchanged when they are returned to it. Since the growth problems reappear in children who are returned to a hostile situation, we have "experimental" evidence that deprivation dwarfism is indeed the consequence of emotional deprivation.

Not only has a relationship between emotional deprivation and defective physical growth been demonstrated experimentally but a physiological link

between them has been found. Two structures in the brain are involved in this link with emotional starvation. A region called the *hypothalamus* (which plays a central role in emotional arousal) fails to have its usual stimulating effect on the *pituitary gland* (which secretes growth hormones). It is through such a mechanism that lack of love and human attention at critical, sensitive periods in the development of the infant can affect the body—producing deprivation dwarfism in those babies who manage to live at all. Gardner concluded: "Deprivation dwarfism is a concrete example—an 'experiment of nature,' so to speak—that demonstrates the delicacy, complexity and crucial importance of infant-parent interactions" (1972, p. 82).

The exact process by which deprivation dwarfism works is not yet known. However, it seems to be related to the impact of emotional strain on the production of pituitary and growth hormones. Most growth hormone is secreted during sleep, and these children may not sleep properly in their stress-filled homes. A recent study with infant rats shows clearly that maternal deprivation leads to an immediate suppression of growth hormone, which will increase when the rat pups are returned to the mother (Kuhn, Butler, & Schanberg, 1978). Apparently, maternal deprivation in infancy is bad for all living creatures. But can we extend this analysis to suggest that a person can really "die of a broken heart"? Psychologist James Lynch believes we can. After reviewing the evidence linking loneliness and isolation to health, Lynch asserts that "there is a biological basis for our need to form human relationships. If we fail to fulfill that need, our health is in peril" (Lynch, 1977, p. xiii). He points to the greater coronary death rate among widows than married women, among divorced men than married men. Cancer and strokes, as well as heart disease, occur twice as often among the divorced as among the married. The ultimate cause of death is, of course, a physical malfunction, such as a ventricular fibrillation. But in some still to be discovered way, the likelihood of that breakdown is increased when a person is isolated from the touch, trust, and tenderness of fellow human beings.

Would *you* obey a command to electrocute a stranger? (Chapter Sixteen)

Our next sample question is quite different but also is representative of a recurring issue in psychology. To what extent is behavior caused by characteristics inside the person, and to what extent is it caused by conditions in the environment? What made Eichmann and the other Nazis do what they did to the Jews? How was it possible for them to systematically destroy millions of people in the gas chambers of the concentration camps? How can civilized people—like *you*—understand the basis for such mass violence? Did some character defect lead the Germans to blindly carry out orders from their leaders, even if the orders violated their own values and beliefs?

What other explanation might there be? Is it conceivable that such behavior was not peculiar to the personalities of those who engaged in it in Nazi Germany? Could it be traced instead to factors in their environment? Might *you* have acted in the same way? Not a very pleasant thought, to be sure, but one that would suggest a very different approach to preventing such behavior in the future. If there are situations that increase the probability that you or I will act the way Eichmann did in Germany or Lieutenant Calley did at My Lai, then we want to identify those conditions. Only then can we avoid them or work to change them so they will not affect others. Solutions then would *not* be phrased in terms of what should be done with "problem people"—educate,

treat, isolate, imprison, destroy them. Rather, we should look for ways to change "problem situations" that might lead any of us to behave in undesirable ways.

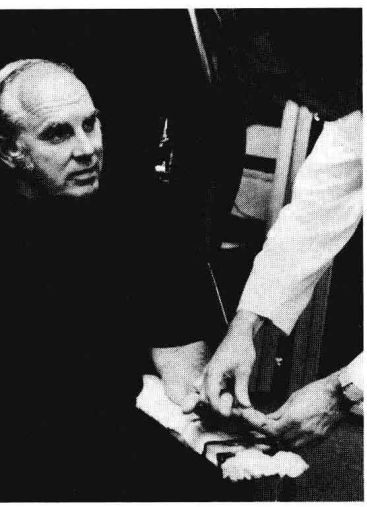
How might we investigate these alternative explanations? Often inner and outer forces are hopelessly entangled in natural situations where people behave in violent, antisocial ways. This is why a controlled experiment is called for to isolate the factors that might be at work. To rule out the possibility that evil deeds are the product of "evil personalities," the subjects for study must represent a cross section of normal, average citizens without prior histories of sadism or violence. To demonstrate the power of situational forces to make these "good" people act in evil ways, the researcher must create a believable setting in which aggression can occur, and also must devise an objective way to measure obedience to authority.

Stanley Milgram (1965, 1974), of the City University of New York, set out to investigate this intriguing question using such a procedure. Let us take a close look at the methods used in this study before we decide whether evil situations can really overpower good people or whether goodness triumphs over malevolent external pressures. Milgram's subjects were all volunteer adult males who were paid for taking part in the experiment. He began using Yale students as subjects but eventually expanded the sample to represent a cross section of the population varying widely in age, occupation, and education.

The subjects were told that the purpose of the study was to investigate the effect of punishment on memory. Every subject was told that he was to be a "teacher" and that his task was to administer punishment (an electric shock) to a "learner" whenever the latter made a mistake on a learning test. The learner, "Mr. Wallace," was a pleasant, mild-mannered man about fifty years old. It was made to look as though assignment to the two roles had been by a chance drawing of lots. After the subject-teacher himself received a sample shock of 45 volts, he watched as the learner was strapped into an "electric chair" in an adjacent room.

Now the experiment began. The subject was seated before a shock generator with thirty clearly marked switches ranging from "Slight Shock" (15 volts) to "Danger: Severe Shock" (450 volts). He was ordered to increase the shock to the next level each time the learner made an error or failed to respond. Since the learner made many errors, the level of punishment escalated rapidly.

The experimenter attaches the formidable-looking "shock" apparatus to the "learner."



The protests of the victim, heard over an intercom, rose with the shock level being administered. At 75 volts he began to moan and grunt; at 150 volts he demanded to be released from the experiment; at 180 volts he cried out that he could not stand the pain any longer. At 300 volts he insisted that he would no longer take part in the experiment and must be freed. He yelled out about his heart condition and screamed. If the subject hesitated or protested against delivering the next shock, the experimenter told him, "Teacher, you have no other choice; you must go on!" "Your job is to punish the learner's mistakes."

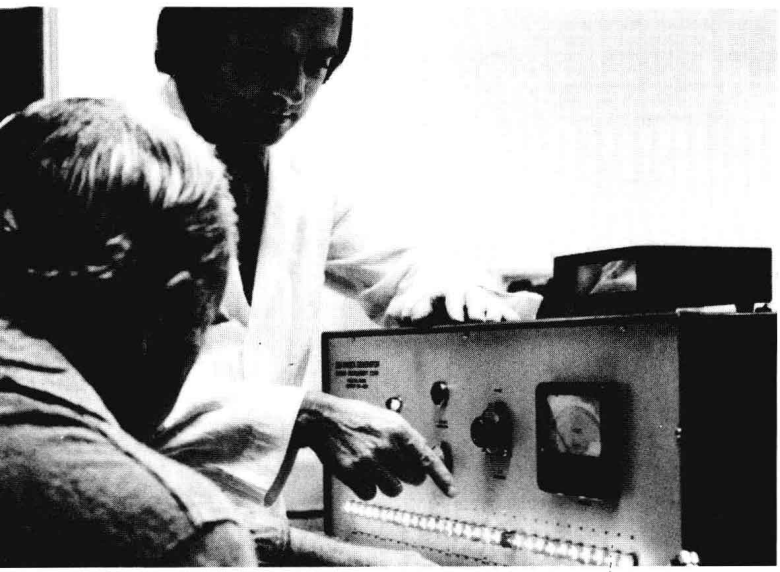
As you might imagine, the situation was not an enjoyable one for the subjects. In fact, it produced considerable anguish in many. To shock an innocent stranger at such high voltage levels obviously was an act of extreme violence against another human being. Most subjects complained and protested. As they became alarmed that they might even kill the learner if one of their shocks caused him to have a heart attack, they insisted they could not go on with their job. That the experimental situation produced considerable conflict is readily apparent from a sample of the transcript given here:

"180 volts delivered: 'He can't stand it! I'm not going to kill that man in there! You hear him hollering? He's hollering. He can't stand it. What if something happens to him? . . . I mean who is is going to take the responsibility if anything happens to that gentleman?' (The experimenter accepts responsibility.) 'All right.'

"195 volts delivered: 'You see he's hollering. Hear that. Gee, I don't know.' (The experimenter says: 'The experiment requires that you go on.')—'I know it does, sir, but I mean—huh—he don't know what he's in for. He's up to 195 volts.' . . .

"240 volts delivered: 'Aw, no. You mean I've got to keep going up with that scale? No sir, I'm not going to kill that man! I'm not going to give him 450 volts!'" (1965, p. 67)

After the ominous silence from the learner's room, trial after trial, some subjects would even call out to him to respond, urging him to get the answer right so they would not have to continue shocking him, all the while protesting loudly to the experimenter. When the learner stopped answering at all over the last series of trials, the experimenter insisted the "teacher" must go on. "Absence of a response must also be punished because the rule states that no response is an error just like a wrong response." And of course, rules are



◆

The experimenter instructs the subject in the use of the shock generator. How far do you think the average subject in Milgram's experiment actually went in administering the shocks? Suppose for a moment that you were the subject-teacher. How far up the scale would you go? Which of the thirty levels of shock would be the absolute limit beyond which you would refuse to continue? Indicate your estimates below.

1. The average subject probably stopped at: _____ volts.

2. I would refuse to shock the other person beyond voltage level (circle one number):

0	*15*	*30*	*45*	*60*
75	*90*	*105*	*120*	*135*
150	*165*	*180*	*195*	*210*
225	*240*	*255*	*270*	*285*
300	*315*	*330*	*345*	*360*
375	*390*	*405*	*420*	*435*
450				

rules! So even when only the sounds of silence were heard from the learner's room, the teacher had to keep shocking him more and more strongly. But did he? Did they? Would you? (Stop! Before reading further, think about what your response would have been. ◆)

When forty psychiatrists were asked to predict the performance of subjects in this experiment, they estimated that most subjects would not go beyond 150 volts, that at 300 volts fewer than four percent of the subjects would still be obedient, and that only about 0.1 percent would go all the way up to 450 volts—obviously, only those few individuals who were abnormal in some way. How close are your predictions to theirs?

The majority of the subjects—students just like you, older people just like me—dissented, *but they did not disobey.* Nearly two thirds of the subjects (62 percent) kept pressing the levers all the way to the very last switch that delivered 450 volts, the maximum punishment possible! Even including the minority who refused to obey the authority's request, the mean maximum level of shock administered was nearly 370 volts. None of the subjects who got within

five switches of the end ever refused to go all the way. By then, their resistance was broken; they had resolved their own conflict.

Although the "victim" was in reality a confederate of the experimenter and his protests were tape-recorded, the subjects believed the shocks were real. And despite their belief that they were inflicting considerable, perhaps lethal, doses of pain to a nice elderly gentleman, the majority of normal, average people—62 percent of them—obeyed the commands of authority rather than the dictates of their conscience.

There is no such thing in man's nature as a settled and free resolve either for good or evil, except at the very moment of execution.

Nathaniel Hawthorne
Twice Told Tales

Personality tests administered to the subjects did *not* reveal any traits that differentiated those who obeyed from those who refused. Nor did the tests show any psychological disturbance or abnormality in the obedient "punishers." Thus, we are led to conclude from this research that under certain circumstances, forces in the situation may override our attitudes, values, and personality traits. These forces can lead us to do things that we could not imagine ourselves doing when we are not actually involved in the situation.

In these studies those situational forces are identified as: (a) the presence of a "legitimate" authority who assumes responsibility for the consequences of one's actions; (b) a victim who is physically remote; (c) acceptance of a subordinate role with functions governed by rules; (d) allowing oneself to become part of a social system where public etiquette and protocol are more important to maintain than one's personal values and private beliefs.

An experiment such as this one is valuable not only because it provides answers, but also because it raises new questions and compels us to rethink some of our assumptions about human nature. It shatters the myth that evil is alien to Everyman and Everywoman and lurks only in particular other people who are "different" from us. It is a convincing demonstration that the "Eichmann phenomenon" could be reproduced in the majority of ordinary American citizens under specifiable social conditions.

Eichmann did not hate Jews, and that made it worse, to have no feelings. To make Eichmann appear a monster renders him less dangerous than he was. If you kill a monster you can go to bed and sleep, for there aren't many of them. But if Eichmann was normality, then this is a far more dangerous situation.

Hannah Arendt
Eichmann in Jerusalem

You should also be wondering why you (probably) underestimated the percentage of people who would blindly obey. And what about your "illusion of invulnerability" that leads you to believe that *you* would have been able to resist the social forces in the experimental situation, even though the majority of your peers could not?

Could you specify conditions under which the majority of subjects might refuse to shock at all, or disobey long before dealing the ultimate blow to the victim? That is, how can we prevent or weaken this powerful social force that operates not only in the psychologist's laboratory but in our lives as well? Finally, you should be asking yourself who (or what) programmed these subjects to be so compliant to the commands of authority. The psychologist didn't; there was no prior training included in the research design. It wasn't necessary, since that had long since been completed for him by society. What particular experiences in our homes and schools prepare us to be "good little conformists" so readily manipulated by authority and rules? In Chapter Sixteen we shall look at some variations of Milgram's study as well as at other aspects of our relationships to other individuals and to society as a whole.

The methodology used in this study is *not typical* of the average experiment you may participate in as a research subject. It is rare for psychological research to involve deception or such a complicated scenario. And if you are disturbed by the ethics of such a study, you will be interested to know that many psychologists are too. In fact, a special Ethics Committee in the American Psychological Association (the leading professional organization of psychologists) has developed specific guidelines regarding this and other aspects of treatment of subjects in psychological experiments (1973). It is a tricky problem. Subjects must be safeguarded but without unduly hindering the

search for knowledge. We shall be concerned throughout our study of the science and application of psychology about the ethical and moral issues involved in experimentation, therapy, and other forms of intervention in our lives.

Can aggression be triggered just by stimulating the brain? (Chapter Eight)

The answer to our last question about obedience and aggression, though quite significant, was also rather broad and somewhat vague. Rules, roles, situational forces, social programming must be taken into account, defined, and analyzed before one can make reliable predictions about their influence on aggressive behavior. However, some psychologists prefer to deal with more specific answers to questions of more limited scope. A neuropsychologist studying how behavior is affected by brain functioning would investigate aggression from a very different perspective than the social psychological one we have just considered.

Can aggressive behavior be induced in experimental animals by electrical stimulation of particular areas of the brain? This question was recently posed by a team of psychologists at the University of British Columbia in Vancouver, Canada. John Pinel, Dallas Treit, and Louis Rovner (1977) became interested in answering this question because of reports of unprovoked aggressive behavior by people with epileptic seizures. Studies of such people hospitalized or imprisoned for their violent behavior have revealed tumors in the region of the brain above the ear—the temporal lobe. But finding this clinical pattern of association does not allow one to conclude that there is a cause-and-effect relationship. To learn if changes in temporal lobe functioning *cause* aggressive behavior, the researchers designed a controlled experiment in which the brains of rats were stimulated and their aggressive reactions observed.

Seventy-five rats underwent a surgical operation in which a tiny electric needle (electrode) was implanted in their brains. By means of this electrode, minute amounts of electrical current could be used to stimulate specific areas of the brain. In some of the animals, the electrode was placed in the temporal lobe region, for others a different brain region was used. After recovery from the operation (which all subjects underwent), the rats were handled each day for several weeks to ensure that they would be tame and not fearful. Thirty of the 75 subjects served as a *control group* and did not receive the stimulation, but in every other way were treated identically to the *experimental groups*. Subjects in the experimental groups received electrical stimulation in the selected brain site three times a day, six days a week for eight weeks.

At first, the stimulation produced no noticeable effects. But after a while, muscle spasms and convulsive reactions set in. In the last weeks convulsive seizures took place regularly in every one of the brain-stimulated subjects. (If the procedure continues for several months the rats begin to develop spontaneous epileptic seizures without electrical stimulation. Their reaction is comparable to that seen in human epileptic patients.) Aggressive reactions were measured at six different times, once on each of three days before the stimulation series began, and once after a day of no stimulation at the end of four, six, and eight weeks of training. Aggression was scored by rating each animal's resistance to being captured and also its reactivity to being tapped on the tail (rats find that unpleasant). The scorers did not know to which group any given subject belonged.

The results confirm and extend the observations made with human pa-

tients. Only temporal lobe stimulation caused significant increases in aggression. The control group (operated on and handled but not stimulated) reacted about the same on the posttests as they had on the pretests. The rats who were stimulated in a region other than the temporal lobe (caudate nucleus, if you are premed) also had seizures, but did *not* show the aggressiveness common to those with temporal lobe arousal.

This study is a good example of the use of animal subjects to investigate a problem of concern to humans. Ethical and humane considerations make it impossible to study the direct connection between epileptic seizures and aggression in humans by systematically inducing seizures and observing the results. The type of research this study represents—precise, carefully controlled procedures designed to yield specific answers—is characteristic of the approach of neuropsychologists and others in the "harder," more experimental, laboratory-based areas of psychology.

How unusual is it for someone (like me) to be shy? Can shyness be cured? (Chapter Eleven)

The intellectual puzzles that psychologists face come from a variety of sources. Some ideas emerge from their sensitive "people watching," others from attempts to evaluate a theory or one of its derivations. Some come from questions raised by prior research, still more are generated by problems in the society—like violence and prejudice. But ultimately, what is most exciting about being a psychologist comes from trying to understand the basic functioning of the mind and to discover the determinants of human action. With such knowledge in hand, psychologists are then able to develop tactics for behavior change and strategies for enhancing the human potential.

Not long ago, one of my students posed some psychological questions that had personal relevance to him. "How unusual is it for someone to be shy? What causes shyness? Is it a childhood stage most people outgrow? Can anything be done to help a shy person—like me?" My answer to such questions was simple and direct: "I don't know. Go to the library, look up *Shyness* in the card catalogue, read all the references listed, write a report on them. We'll discuss your findings, and you'll have the information you need."

It is important to recognize that psychologists cannot begin to develop tactics designed to change behavior or to improve the quality of life until they have a basic understanding of the problem. This is why most research projects begin with a search of the available literature. But in this case, the card catalogue was not very helpful: surprisingly, not much research had been done that could help answer the student's queries. There were studies of how individuals differed in the personality trait of shyness. But there was very little on the experience of shyness, what elicits it, how prevalent it is, what its consequences are, and so forth.

Aware that shyness is a serious personal problem for many of my students, friends, and relatives, I decided to accept this challenge to discover the whys and hows of shyness. Five years later, after surveying over 5000 people in eight different cultures, interviewing hundreds of shy and nonshy people, observing children in school settings from kindergarten through college, and conducting a dozen experiments, we have some answers to give to that student, and also to you. Shyness will be discussed in Chapter 11 in some detail. For now, let us touch on some of the highlights of our research into this complex and fascinating phenomenon. (See my book *Shyness* [Zimbardo, 1977] for more information.)

yes *no* "Do you consider yourself to be a shy person?"

yes *no* "If you are not shy now, were you ever a shy person?"

These are the opening questions in a self-report survey that was administered to many different groups of people. The survey went on to probe into the kind of people and situations that trigger shyness in the shy person. It asked about one's reactions when made to feel shy: physical reactions (blushing? sweating? heart pounding?), actions (eye contact? stuttering?), feelings (anxiety?), and thoughts (self-consciousness? inadequacies?). Finally, the questionnaire inquired about the consequences of shyness, both negative and positive.

What we discovered was that more than 40 percent of all those surveyed labeled themselves as "shy people." That would mean four out of every ten people you meet, perhaps 84 million Americans, think of themselves as currently shy. The figure escalates to over 80 percent if those who are now shy are combined with those previously shy. In every one of the eight cultures studied, shyness is reported to be a common experience—with a low of about 30 percent in Israel and a high of 60 percent in Japan. Thus shyness is prevalent, widespread, and maybe even a universal psychological experience.

The table indicates the average replies of nearly a thousand college students to questions about what makes them shy. ■ Interestingly, when an independent team of market researchers asked 3000 U.S. inhabitants "What are you most afraid of?" guess what was the worst human fear? Darkness was in twelfth place, fear of flying came in eighth, 19 percent of the people were afraid of sickness and death, putting those fears in sixth place. Two biggies were financial problems and fear of insects, each with 22 percent indicating them as worst fears. The runner-up fear was heights, which made 32 percent of those surveyed stay on the ground. But the number one, worst human fear of all was—"Speaking before a group," a fear shared by 41 percent of the people (Wallechinsky, Wallace, & Wallace, 1977).

Shyness is a form of social anxiety—a people phobia. It is a learned reaction in which the shy individual becomes overly self-conscious, filled with discomforting thoughts about negative evaluation from others. It is judged to be an undesirable "personal problem" by the majority of people who are shy.

■

What makes you shy?

Situations	Percentage of Shy Students	Other People	Percentage of Shy Students
Where I am focus of attention—large group (as when giving a speech)	73%	Strangers	70%
Of lower status	56%	Opposite sex	64%
Social situations in general	55%	Authorities by virtue of their knowledge	55%
New situations in general	55%	Authorities by virtue of their role	40%
Requiring assertiveness	54%	Relatives	21%
Where I am being evaluated	53%	Elderly people	12%
Where I am focus of attention—small group	52%	Friends	11%
One-to-one different sex interactions	48%	Children	10%
Of vulnerability (need help)	48%	Parents	8%
Small task-oriented groups	28%		
One-to-one same sex interactions	14%		

Shyness can start at any age and last a lifetime. Our research reveals that shyness not only interferes with an adequate social life, but when it is strongly felt, shyness can impair one's memory, inhibit sexual enjoyment, and limit career opportunities. The experience of shyness alienates some people from all human contact.

Once having discovered this (and other) information about the nature and consequences of shyness, then what? The obvious next question is, can the knowledge generated by the research be used to overcome shyness? The issue then becomes one of how best to apply what we know to make changes in people who are unhappy being shy. The concern for treating individuals in a therapeutic setting has traditionally been the province of clinical psychologists and psychiatrists. They are the practitioners who apply psychological theories and research findings to help people who have serious problems coping with life.

We created our own experimental shyness clinic to put our ideas into practice, and evaluate them. In small group settings, shy people were guided toward changing one or more aspects of their functioning, depending on the way shyness affected them. Some shy people require training and practice in social skills (smiling, making eye contact, the art of conversation, etc.). Others receive training in self-control of anxiety through relaxation techniques. Low self-esteem frequently accompanies shyness; when it does, therapy involves lessons in building self-confidence. For other shy people the treatment may be directed at better understanding social cues others are providing and also learning what is expected in given social and work settings. Finally, one aspect of this shyness therapy centers upon changing the label of "shyness" itself. Are *you* a shy person or are there some unpleasant situations that give rise to feelings of shyness in you? If your shyness is specific to certain situations, then maybe you are not shy after all. Maybe there is something wrong with those situations where you feel put on the spot, critically evaluated, and not accepted for yourself. If so, perhaps some therapy ought to be directed toward changing undesirable situations, as well as undesirable thought and response patterns in people.

In Chapter 10 you will have a greater opportunity to see how psychologists go about the task of understanding normal personality. The study of madness and abnormal reactions (Chapter 13) will interest us, as will the kinds of therapy being used to modify the patterns of thinking, feeling, and acting of those of us who cannot make an adequate adjustment (Chapter 14). Going beyond the research findings, in Chapter 12 we will also consider together some issues and offer advice on personal adjustment for the "garden variety" psychological problems faced by college students.

Does your memory of a story depend on which character you identify with? (Chapter Five)

Not all psychologists are professionally concerned about such dramatic issues as those we have posed thus far. For many of them, the foundation of psychology rests more on understanding the basic processes by which people learn new information, integrate the new with the familiar, remember some of it, forget some of it, and perhaps distort the rest of it to fit their particular biases. The study of learning, cognition, and the way people process information is at the very core of contemporary psychology.