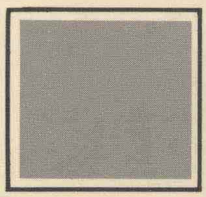

readings for PSYCHOLOGY

by **Robert E. Silverman**
New York University

APPLETON-CENTURY-CROFTS
educational division
MEREDITH CORPORATION

This book was printed on recycled paper.

72 73 74 75 76 / 10 9 8 7 6 5 4 3 2

Library of Congress Card Number: 72-186852

PRINTED IN THE UNITED STATES OF AMERICA

390-E-81005-3

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preface

This volume of readings is designed for use in an introductory psychology course. It includes a wide range of papers, representing the major research methodologies in psychology; the types of issues, procedural and theoretical, that concern psychologists; specific research findings that add to the body of knowledge; and applications of psychological principles in diverse settings. The emphasis is on applications of psychology, the practical uses of the concepts and principles a student learns about in his textbook.

Just as it is important that a textbook be readable, well organized, and clear, so it is necessary that ancillary readings be so. Thus, we have tried to cull, from the vast store of excellent research, material that is both significant to the discipline and clear enough to be readily understandable by the beginning student. The papers included in this book have been written by professionals for students as well as for practicing psychologists.

The papers are grouped in five sections—basic processes, complex processes, behavior pathology and treatment, social psychology, and applying psychology—so that they may be used to complement or supplement most types of introductory psychology courses. In one-year courses, selected readings from the various areas of emphasis will help to expand the student's grasp of what psychologists do, how they perform research, the issues which concern them, the facts they uncover, and the ways in which they put psychological principles to use.

In one-quarter or one-semester courses, the readings may be used to provide additional subject matter information—as optional outside reading assignments or as the basis for weekly discussion sessions. For example, the papers dealing with educational applications and industrial psychology may be introduced to amplify the discussions of learning, perception, or motivation, while papers illustrating uses of psychology in the community fit well with discussions of behavior pathology and social psychology.

The sequencing of papers is flexible. Several arrangements are suggested below; others are possible, depending on the instructor's orientation and objectives. Note that some papers appear in several of the suggested sequences; this is because they are approached in each case from different viewpoints. For example, B. F. Skinner's paper deals with methodology as well as with issues; either approach may be emphasized, depending on the instructor's needs.

I am grateful to the authors and the original publishers for permission to reprint these papers here.

suggested study groupings

a. papers stressing research methodology and research rationale

Skinner: A case history in scientific method; Hess: Imprinting; Verplanck: An introduction to some recent experiments on human behavior; Postman, Jenkins, and

Postman: An experimental comparison of active recall and recognition; Wood: Higher order memory units and free recall learning; Rock and Victor: Vision and touch: An experimentally created conflict between the two senses; Teitelbaum: "Appetite"; Shipley and Veroff: A projective measure of need for affiliation; Miller: Learning of visceral and glandular responses; Schachter and Singer: Cognitive, social and physiological determinants of emotional state; Krauss: Language as a symbolic process in communication: A psychological perspective; Hovland: Computer simulation of thinking; Richards: Mental test performance as a reflection of the child's current life situation: A methodological study; Forer: The fallacy of personal validation: A classroom demonstration of gullibility; Milgram: Behavioral study of obedience; Lacey, Smith and Green: Use of conditioned autonomic responses in the study of anxiety; Hastorf and Cantril: They saw a game: A case study; Brehm: Attitudinal consequences of commitment to unpleasant behavior; Homme, C'de Baca, Cottingham, and Homme: What behavioral engineering is; Rogers: Significant aspects of client-centered therapy; Baker: Maintaining the level of vigilance by means of artificial signals; Hockey: Noise and efficiency: The visual task; Wells and Lo Sciuto: Direct observation of purchasing behavior.

b. papers with some stress on issues in psychology

Skinner: A case history in scientific method; Murphy: Psychology in the year 2000; Beach: The descent of instinct; Woodworth: Reinforcement of perception; Leibowitz: The learning process in perception; Postman, Bronson, and Gropper: Is there a mechanism of perceptual defense?; Leuba: The concept of optimal stimulation; Hebb: The motivating effects of exteroceptive stimulation; Schachter and Singer: Cognitive, social, and physiological determinants of emotional state; Miller: Learning of visceral and glandular responses; Brown and Lenneberg: A study of language and cognition; Greenspoon and Gersten: A new look at psychological testing: Psychological testing from the standpoint of a behaviorist; Anastasi: Psychology, psychologists, and psychological testing; Allport: Traits revisited; Bandura: The role of modeling in personality development; Szasz: The myth of mental illness; Gibson: The ontogeny of reading: Bruner: The will to learn; Strong: Satisfactions and interests.

c. papers which provide new data

Hess: Imprinting; Bettelheim: Personality formation in the kibbutz; Chesler: Maternal influence in learning by observation in kittens; Postman, Jenkins, and Postman: An experimental comparison of active recall and recognition; Wood: Higher order memory units and free recall learning; Weiner and Walker: Motivational factors in short term retention; Paivio, Yuille, and Rogers: Noun imagery and meaningfulness in free and serial recall; Teitelbaum: "Appetite"; Brown and Cohen: Avoidance and approach learning motivated by stimulation of identical hypothalamic loci; Valins: Emotionality and information concerning internal reactions; Schachter and Singer: Cognitive, social and physiological determinants of emotional state; Miller: Learning of visceral and glandular responses; Sampson: Birth order, need achievement, and conformity; Milgram: Behavioral study of obedience; Cohen and Ditman: Prolonged adverse reactions to lysergic acid diethylamide; Mann: The social psychology of waiting lines; Spiegel: Psychosocial factors in riots—old and new; Zajonc: Social facilitation; Latané and Darley: Bystander "apathy"; Jensen and Knecht: Type of message, personality, and attitude change; Scott: Attitude change

through reward of verbal behavior; Allyn and Festinger: The effectiveness of unanticipated persuasive communications; Hockey: Noise and efficiency: The visual task; Baker: Maintaining the level of vigilance by means of artificial signals.

d. papers stressing application of psychological principles

Szasz: The myth of mental illness; Leventhal: Use of a behavioral approach within a traditional psychotherapeutic context: A case study; Rogers: Significant aspects of client-centered therapy; McInnis and Ullman: Positive and negative reinforcement with short- and long-term hospitalized schizophrenics in a probability learning situation; Lang and Lazovik: Experimental densensitization of a phobia; Lazarus, Davison, and Polefka: Classical and operant factors in the treatment of a school phobia; Bruner: The will to learn; Keislar and McNeil: Teaching scientific theory to first grade pupils by auto-instructional device; Postman: Human learning and audiovisual education; Homme, C'de Baca, Cottingham, and Homme: What behavioral engineering is; Silverman: Using the S–R reinforcement model; Hockey: Noise and efficiency: The visual task; Baker: Maintaining the level of vigilance by means of artificial signals; Talbot and Miller: The struggle to create a sane society in the psychiatric hospital; Bard and Berkowitz: Training police as specialists in family crisis intervention; Keith Miller and Miller: Reinforcing self-help group activities of welfare recipients; Wells and Lo Sciuto: A direct observation of purchasing behavior.

contents

I basic processes

Psychology is neither a static nor a unified discipline. Those who study this science of human and animal behavior frequently differ as to which approach and which method should be used. Despite their differences, however, most psychologists agree that psychology involves systematic observation and systematic ordering—from the basic processes of development, learning, and perception through the more complex processes of individuals alone and in groups. The sixteen papers reprinted in this section are intended to provide the beginning student with a feeling for the underlying importance of the basic processes, as well as give him a glimpse at the various methods and approaches employed by psychologists.

B. F. Skinner and Gardner Murphy, for example, while adhering to different methodologies, both emphasize that scientific psychology is based on systematic observation. Further, they argue that students of the subject should never be constrained by their earlier preconceptions.

With these general guidelines of psychology in mind, the student begins his study of behavior with a discussion of individual development, the fundamental point of departure in describing the structure of behavior and the initial characteristics of the behaving individual. Of particular significance in studying development are genetics, maturation, and the role of early learning. Each factor contributes in different ways and different degrees to the individual's behavior.

The degree of influence of genetics and maturation on behavior is discussed in the papers by Hess, Bettelheim, and Beach. Hess deals specifically with behaviors which are acquired very early, and especially with the phenomenon known as imprinting. Bettelheim is concerned with the complex variables operating in the acquisition of social behavior. Beach critically examines the concept of instinctive behavior. While all three papers deal with heredity and environment, none argues about heredity *versus* environment. Each of the papers seeks an objective description of behavior as it develops and is acquired.

In any study of the developing individual, learning holds an important place, for it affects the ability of individuals to cope with their environments. Because human behavior is especially modifiable, knowledge of types of learning (whichever form it takes) enables the psychologist to adapt the individual's behavior so that he can better meet his experiences.

Many studies, both early and current, in learning deal with animal behavior as a simplified parallel to human behavior. Chesler, for example, has studied kittens and

how they learn from observing the behavior of their mothers. Verplanck applies the methodology of instrumental (operant) conditioning to the study of human behavior. The concepts and the experiments he describes have helped to pave the way for much of the work now going on in the experimental analysis of human behavior.

Postman *et al.*, Wood, Weiner and Walker, and Paivio *et al.* concentrate on the study of human verbal learning and retention. Postman, Jenkins, and Postman investigate the relationship between recall and recognition as measures of retention. Wood describes the kinds of associations formed during free-recall learning. Weiner and Walker deal with the effects of incentive motivation on retention. Paivio, Yuille, and Rogers study the effects on verbal discrimination learning of the image-arousing value of nouns, their frequency of usage, and their meaningfulness.

Perception is also a fundamental area of study. It contributes to and affects the individual's learning and overall behavior. The systematic investigation of perception has provided psychologists with principles which are used in the analysis of all forms of behavior, from specific questions about visual and auditory perception to broad questions about human social behavior.

R. S. Woodworth was among the first to deal with conditioning and perception. He adopted the position, set forth in the paper reprinted here, that conditioning entails the establishing of new perceptions. Leibowitz examines a number of examples of perceptual learning. Rock and Victor investigate an interesting perceptual problem emanating from a sensory conflict involving vision and the tactual senses. Postman, Bronson, and Gropper deal with a problem area, perceptual defense, which is not yet completely settled.

a case history in scientific method

B. F. Skinner

It has been said that college teaching is the only profession for which there is no professional training, and it is commonly argued that this is because our graduate schools train scholars and scientists rather than teachers. We are more concerned with the discovery of knowledge than with its dissemination. But can we justify ourselves quite so easily? It is a bold thing to say that we know how to train a man to be a scientist. Scientific thinking is the most complex and probably the most subtle of all human activities. Do we actually know how to shape up such behavior, or do we simply mean that some of the people who attend our graduate schools eventually become scientists?

Except for a laboratory course which acquaints the student with standard apparatus and standard procedures, the only explicit training in scientific method generally received by a young psychologist is a course in statistics—not the introductory course, which is often required of so many kinds of students that it is scarcely scientific at all, but an advanced course which includes "model building," "theory construction," and "experimental design." But it is a mistake to identify scientific practice with the formalized constructions of statistics and scientific method. These disciplines have their place, but it does not coincide with the place of scientific research. They offer *a* method of science but not, as is so often implied, *the* method. As formal disciplines they arose very late in the history of science, and most of the facts of science have been discovered without their aid. It takes a great deal of skill to fit Faraday with his wires and magnets into the picture which statistics gives us of scientific thinking. And most current scientific practice would be equally refractory, especially in the important initial stages. It is no wonder that the laboratory scientist is puzzled and often dismayed when he discovers how his behavior has been reconstructed in the formal analyses of scientific method. He is likely to protest that this is not at all a fair representation of what he does.

But his protest is not likely to be heard. For the prestige of statistics and scientific methodology is enormous. Much of it is borrowed from the high repute of mathematics and logic, but much of it derives from the flourishing state of the art itself. Some statisticians are professional people employed by scientific and commercial enterprises. Some are teachers and pure researchers who give their colleagues the same kind of service for nothing—or at most a note of acknowledgment. Many are zealous people who, with the best of intentions, are anxious to show the nonstatistical scientist how he can do his job more efficiently and assess his results more accurately. There are strong professional societies devoted to the advancement of statistics, and hundreds of technical books and journals are published monthly.

Against this, the practicing scientist has very little to offer. He cannot refer the young psy-

Address of the President at the Eastern Psychological Association meetings in Philadelphia, April 1955.

B. F. Skinner: A case history in scientific method. *American Psychologist*, 1956, *11*, 221–233. Reprinted by permission of the author and the American Psychological Association.

chologist to a book which will tell him how to find out all there is to know about a subject matter, how to have the good hunch which will lead him to devise a suitable piece of apparatus, how to develop an efficient experimental routine, how to abandon an unprofitable line of attack, how to move on most rapidly to later stages of his research. The work habits which have become second nature to him have not been formalized by anyone, and he may feel that they possibly never will be. As Richter (5) has pointed out, "Some of the most important discoveries have been made without any plan of research," and "there are researchers who do not work on a verbal plane, who cannot put into words what they are doing."

If we are interested in perpetuating the practices responsible for the present corpus of scientific knowledge, we must keep in mind that some very important parts of the scientific process do not now lend themselves to mathematical, logical, or any other formal treatment. We do not know enough about human behavior to know how the scientist does what he does. Although statisticians and methodologists may seem to tell us, or at least imply, how the mind works—how problems arise, how hypotheses are formed, deductions made, and crucial experiments designed—we as psychologists are in a position to remind them that they do not have methods appropriate to the empirical observation or the functional analysis of such data. These are aspects of human behavior, and no one knows better than we how little can at the moment be said about them.

Some day we shall be better able to express the distinction between empirical analysis and formal reconstruction, for we shall have an alternative account of the behavior of Man Thinking. Such an account will not only plausibly reconstruct what a particular scientist did in any given case, it will permit us to evaluate practices and, I believe, to teach scientific thinking. But that day is some little distance in the future. Meanwhile we can only fall back on examples.

Some time ago the director of Project A of the American Psychological Association asked me to describe my activities as a research psychologist. I went through a trunkful of old notes and records and, for my pains, reread some of my earlier publications. This has made me all the more aware of the contrast between the reconstructions of formalized scientific method and at least one case of actual practice. Instead of amplifying the points I have just made by resorting to a generalized account which is not available, I should like to discuss a case history. It is not one of the case histories we should most like to have, but what it lacks in importance is perhaps somewhat offset by accessibility. I therefore ask you to imagine that you are all clinical psychologists—a task which becomes easier and easier as the years go by—while I sit across the desk from you or stretch out upon this comfortable leather couch.

The first thing I can remember happened when I was only twenty-two years old. Shortly after I had graduated from college Bertrand Russell published a series of articles in the old *Dial* magazine on the epistemology of John B. Watson's Behaviorism. I had had no psychology as an undergraduate but I had had a lot of biology, and two of the books which my biology professor had put into my hands were Loeb's *Physiology of the Brain* and the newly published Oxford edition of Pavlov's *Conditioned Reflexes*. And now here was Russell extrapolating the principles of an objective formulation of behavior to the problem of knowledge! Many years later when I told Lord Russell that his articles were responsible for my interest in behavior, he could only exclaim, "Good Heavens! I had always supposed that those articles had demolished Behaviorism!" But at any rate he had taken Watson seriously and so did I.

When I arrived at Harvard for graduate study, the air was not exactly full of behavior, but Walter Hunter was coming in once a week from Clark University to give a seminar, and Fred Keller, also a graduate student, was an expert in both the technical details and the sophistry of Behaviorism. Many a time he saved me as I sank into the quicksands of an amateurish discussion of "What is an image?" or "Where is red?" I soon came into contact with W. J. Crozier, who had studied under Loeb. It had been said of Loeb, and might have been said of Crozier, that he "resented the nervous system." Whether this was true or not, the fact

was that both these men talked about animal behavior without mentioning the nervous system and with surprising success. So far as I was concerned, they cancelled out the physiological theorizing of Pavlov and Sherrington and thus clarified what remained of the work of these men as the beginnings of an independent science of behavior. My doctoral thesis was in part an operational analysis of Sherrington's synapse, in which behavioral laws were substituted for supposed states of the central nervous system.

But the part of my thesis at issue here was experimental. So far as I can see, I began simply by looking for lawful processes in the behavior of the intact organism. Pavlov had shown the way; but I could not then, as I cannot now, move without a jolt from salivary reflexes to the important business of the organism in everyday life. Sherrington and Magnus had found order in surgical segments of the organism. Could not something of the same sort be found, to use Loeb's phrase, in "the organism as a whole"? I had the clue from Pavlov: control your conditions and you will see order.

It is not surprising that my first gadget was a silent release box, operated by compressed air and designed to eliminate disturbances when introducing a rat into an apparatus. I used this first in studying the way a rat adapted to a novel stimulus. I built a soundproofed box containing a specially structured space. A rat was released, pneumatically, at the far end of a darkened tunnel from which it emerged in exploratory fashion into a well-lighted area. To accentuate its progress and to facilitate recording, the tunnel was placed at the top of a flight of steps, something like a functional Parthenon (Figure 1). The rat would peek out from the tunnel, perhaps glancing suspiciously at the one-way window through which I was watching it, then stretch itself cautiously down the steps. A soft click (carefully calibrated, of course) would cause it to pull back into the tunnel and remain there for some time. But repeated clicks had less and less of an effect. I recorded the rat's advances and retreats by moving a pen back and forth across a moving paper tape.

The major result of this experiment was that some of my rats had babies. I began to watch young rats. I saw them right themselves and

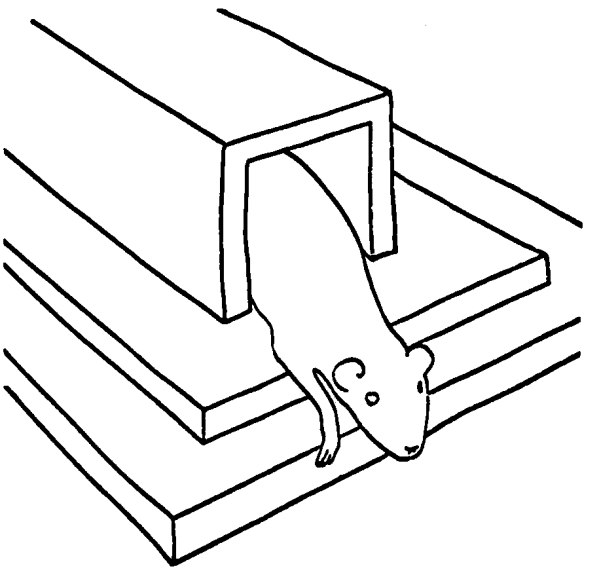

Figure 1

crawl about very much like the decerebrate or thalamic cats and rabbits of Magnus. So I set about studying the postural reflexes of young rats. Here was a first principle not formally recognized by scientific methodologists: When you run onto something interesting, drop everything else and study it. I tore up the Parthenon and started over.

If you hold a young rat on one hand and pull it gently by the tail, it will resist you by pulling forward and then, with a sudden sharp spring which usually disengages its tail, will leap out into space. I decided to study this behavior quantitatively. I built a light platform covered with cloth and mounted it on tightly stretched piano wires (Figure 2). Here was a version of Sherrington's torsion-wire myograph, originally designed to record the isometric contraction of the *tibialis anticus* of a cat, but here adapted to the response of a whole organism. When the tail of the young rat was gently pulled, the rat clung to the cloth floor and tugged forward. By amplifying the fine movements of the platform, it was possible to get a good kymograph record of the tremor in this motion and then, as the pull against the tail was increased, of the desperate spring into the air (Figure 3).

Now, baby rats have very little future, except

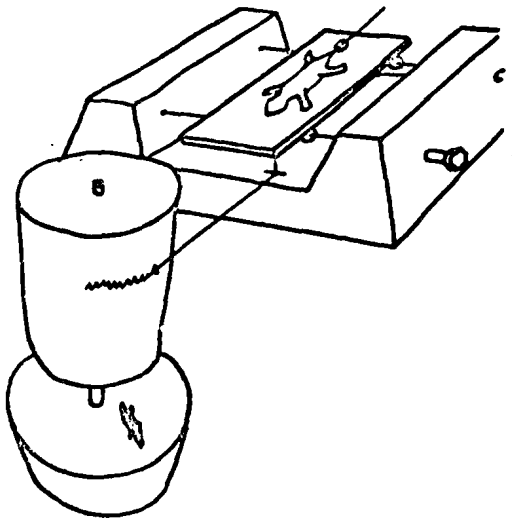

Figure 2

as adult rats. Their behavior is literally infantile and cannot be usefully extrapolated to everyday life. But if this technique would work with a baby, why not try it on a mature rat? To avoid attaching anything to the rat, it should be possible to record, not a pull against the substrate, but the ballistic thrust exerted as the rat runs forward or suddenly stops in response to my calibrated click. So, invoking the first principle of scientific practice again, I threw away the

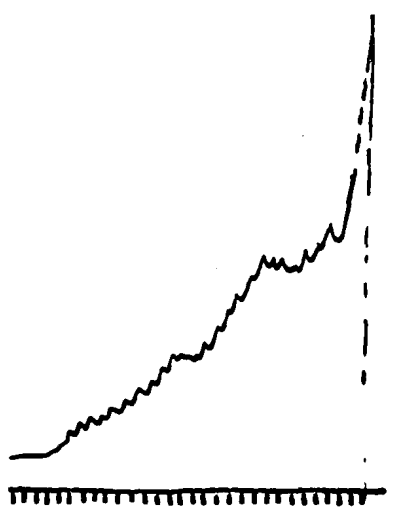

Figure 3

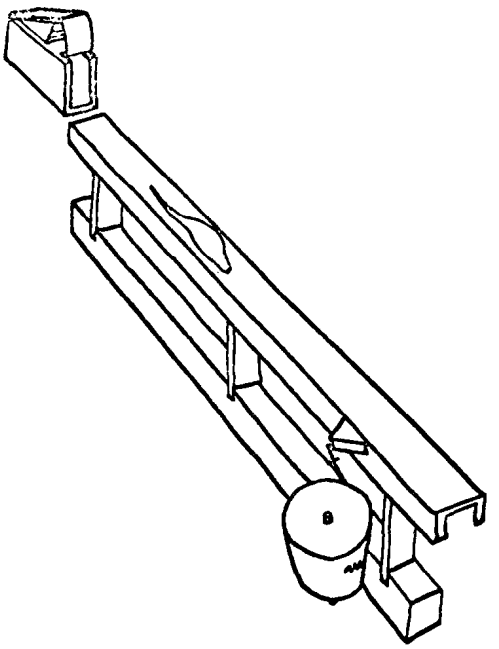

Figure 4

piano-wire platform, and built a runway, eight feet long. This was constructed of light wood, in the form of a ∪ girder, mounted rigidly on vertical glass plates, the elasticity of which permitted a very slight longitudinal movement (Figure 4). The runway became the floor of a long tunnel, not shown, at one end of which I placed my soundless release box and at the other end myself, prepared to reinforce the rat for coming down the runway by giving it a bit of wet mash, to sound a click from time to time when it had reached the middle of the runway, and to harvest kymograph records of the vibrations of the substrate.

Now for a second unformalized principle of scientific practice: Some ways of doing research are easier than others. I got tired of carrying the rat back to the other end of the runway. A back alley was therefore added (Figure 5). Now the rat could eat a bit of mash at point C, go down the back alley A, around the end as shown, and back home by runway B. The experimenter at E could collect records from the kymograph at D in comfort. In this way a great many records were made of the forces exerted against the substratum as rats ran down the alley and occasion-