STUDENT GUIDEBOOK
to accompany

INTRODUCTION to PSYCHOLOGY

2nd Edition

Peter S. Fernald
L. Dodge Fernald, Jr.
Paul Quinlan

STUDENT GUIDEBOOK
to accompany
INTRODUCTION
to PSYCHOLOGY
2nd Edition

Peter S. Fernald
University of New Hampshire

L. Dodge Fernald, Jr.
Cornell University

Paul M. Quinlan
Springfield (Mass.) Hospital

HOUGHTON MIFFLIN COMPANY • BOSTON
NEW YORK ATLANTA GENEVA, ILL. DALLAS PALO ALTO

PRINTED IN THE U.S.A.

Preface

The *Student Guidebook* is a supplement to the textbook, *Introduction to Psychology,* Second Edition, by Munn, Fernald, and Fernald. Each chapter in the *Guidebook* includes three parts: a Programed Overview, a Project, and a Self-Quiz. The Programed Overview, since it covers the major terms and concepts presented in the text, serves as an introduction and emphasizes "the forest rather than the trees." The Project offers the student an opportunity to analyze data and draw conclusions. It is designed to stimulate his interest and his capacity for critical thinking. The Self-Quiz, which contains 15 multiple-choice items, gives the student a chance to evaluate his understanding of material contained in the textbook prior to formal examination in the classroom.

The *Student Guidebook* was written with the participation and cooperation of introductory psychology students. All the Programs and most of the Projects were read and criticized by large groups of students, and various sections of the manuscript subsequently were deleted or revised according to their recommendations. As a result, we hope the *Guidebook* will "speak to" the student as it fulfills its chief purpose, that of helping him to master the text.

PSF

LDF

PMQ

Acknowledgments

All the programs in this book were read and evaluated by introductory psychology students at the University of New Hampshire. Their comments and criticisms, which were collected with the assistance of Richard B. Segal and Ann M. Harrison, contributed materially to the revision of the initial manuscript. The authors also are indebted to Joseph E. Russo and Janice A. Hansen for proofreading, and especially to Margaret W. Stevens who typed most of the manuscript.

To the Student

The *Student Guidebook* is designed to help you master concepts presented in the textbook, *Introduction to Psychology*, Second Edition, by Munn, Fernald, and Fernald. Like the textbook, the *Guidebook* contains 21 chapters. Each chapter consists of three parts: (1) a Programed Overview, (2) a Project, and (3) a Self-Quiz.

The Programed Overview

Programed instruction has been described as the educational revolution of this century, yet it is as old as the teachings of Socrates. In the Socratic method, the student was asked a series of relatively simple questions, the answer to each depending partly upon information acquired from previous questions. Thus, as the student answered correctly he added to his knowledge bit by bit, always building on existing information until eventually he was led to some significant conclusions.

Rationale of Programed Instruction

The characteristics of the Socratic method comprise the essential ingredients of modern programed instruction. Today they are called the methods of (a) small steps, (b) active participation and (c) immediate knowledge of results. Each of these principles, well supported by recent research in the psychology of learning, is essential to programed instruction.

Small Steps. None of us enjoys making mistakes. In fact, when we make too many mistakes, even on a pleasant task, we begin to dislike the task. Furthermore, we generally learn less from a mistake than from a correct response because a mistake does not tell us what to do, only what not to do. For these reasons, it is undesirable to make many mistakes while attempting to learn. Learning proceeds more efficiently and the learner maintains greater interest in the task when errors are kept to a minimum.

In programed instruction, errors are kept to a minimum through the principle of proceeding by small steps. The material is presented gradually, according to the student's readiness. The student is never asked questions which are beyond his fund of information; but as his competence increases, the questions become more difficult. Thus, the student learns increasingly complex material, but, as in Socratic discourse, he is asked only those questions which he is prepared to answer correctly. His preparation is the result of moving ahead in small steps.

Active Participation. Simple though it sounds, we sometimes forget that the ballplayer learns baseball by playing baseball. Likewise, the child learns poetry by reciting poems, and he learns geometry by solving geometry problems. As Dewey asserted decades ago, "Learning is essentially learning-by-doing." The student who simply reads his chemistry book does not learn as well as the student who also solves equations or other chemistry problems does. To learn best, the student must actively participate in the task to be learned.

In programed instruction the student is required to participate actively. He cannot passively "go through the motions" of reading a program, because it contains incomplete sentences which must be completed before he can proceed to later sections. In short, active participation is required because the student must supply the information for himself, just as Socrates required his students to answer questions themselves. In programing, this principle of learning is called the principle of active participation.

Immediate Knowledge of Results. Several years ago in an isolated region of Turkey, one of the authors met a schoolteacher who had learned to speak English by studying textbooks for seven years entirely by himself. Until he met the author, this man had not heard a word of spoken English. Imagine his intense interest in discovering whether he could be understood, how well he could speak, and whether he could understand the spoken English of others. His spoken English was barely intelligible, for throughout his seven years of study he never had known whether his performance was correct or incorrect. Hence, he made many errors and practiced them continually for seven years.

Similarly, a student who tries to solve algebra problems, master a tennis stroke, or balance an accounting sheet without knowledge of results may be learning incorrect responses. Under these conditions, learning is grossly inefficient. In contrast, many laboratory studies have demonstrated that the sooner the learner is informed of his results, the greater the learning efficiency, even when the time intervals are as short as a few seconds.

In programed instruction, each incomplete statement is immediately followed by the correct answer or word(s) that complete(s) it. Thus each learner is able to assess his own performance and repeat or change his behavior as necessary. He repeats correct responses and discards an incorrect response in favor of an alternative. Because the correct response is presented immediately after each question, the learning process is characterized by our third principle, immediate knowledge of results.

How to Use The Programs

Programed instruction is different from the usual textbook, and therefore it must be used in a different manner. A glance at some of the programed overviews will show you that programed instruction does not consist of full pages of uninterrupted prose; instead, it contains a series of statements, each one called a *frame*. Each frame stands in a dependent relationship to those immediately preceding it, and in each one you are asked to complete a statement about the material contained in that frame or in preceding frames. Thus, a program is not *read*, like an ordinary book, but is *completed* by you as you write in the required answers. Once you have completed the statement in a particular frame, you are ready to proceed to the next frame, in which you will be asked again to supply a response.

It should be apparent, then, that working through a program requires greater concentration than reading a book. When reading, you may skim the passages if you wish; in completing a program your active participation is required. As a rule, therefore, you will discover that *you cannot use this programed instruction effectively for periods longer than 30 to 40 minutes,* which is the average time required to complete one program in this book. For optimal results, do not attempt more than one program in any one practice session. For longer programs, such as the ones in Chapter 3 (Statistical Methods) and Chapter 6 (Sensory Bases of Perception), you may wish to complete the program in two sessions. As in other types of learning situations, practicing when you are fatigued is inefficient and discouraging and generally leads to poor results.

For most effective use of this program, it is important that you follow these directions. First, tear out the perforated cardboard mask which is bound inside the back cover of this book. This mask is used to cover the correct response word(s) which complete(s) each frame. Cover the page and then move the mask downward until it is just below the first frame but covering the response word(s) in the left-hand margin. Using the mask as directed, work through the following series of frames, which will give you further instructions about the use of the programs.

1. Use the *mask* to cover the correct *response word(s)* in the left-hand margin.

As you read each frame and write your answer, the correct response words

mask

are out of view, since they are covered by the _____. (Write the missing word in the blank space.)

2. After writing your answer to each frame, check it against the correct

response

_____ word(s) in the left-hand margin.

3. Never "peek ahead," or the value of programed instruction is lost. Whenever you read a frame, use the _____ to cover the correct response _____.

mask

word(s)

4. Always write your answer in the space provided. If you do not, you lose the opportunity for *active participation.* A chief advantage of programed

active

instruction over reading a standard text is the student's _____ participation.

5. If your answer is incorrect, mark a line through it, and then write the correct _____ _____ just above your incorrect answer.

response word(s)

6. Be sure to write the correct answer. If you do not do so, you have not

corrected your mistake and you have lost an opportunity for active

participation _____ in the program.

active participation

7. We learn by doing, that is, through _____ _____.

8. In programed instruction, learning occurs in *small steps.* Note that you wrote the word "active" in Frame 4, the word "participation" in Frame 6, and both words together in Frame 7. As is apparent, the principle of active

small participation, like other concepts or terms, is taught in _____ steps in programed instruction.

9. A great deal of information may be presented in a program, but the reader never feels overwhelmed, since the information is presented in small

steps _____.

10. Each frame requires some type of response that involves more than just reading. In most instances the student writes the missing words, but in other instances he underlines the correct alternative. As an illustration of the latter procedure, note that we have considered the programing principles of (small steps/immediate knowledge of results) and (repetition/

small steps
active participation active participation). (Underline the correct alternative in each set of parentheses.)

11. Receiving immediate knowledge of results is another principle of programed instruction. After you have written your answer, note the correct response

knowledge word, so that you obtain immediate _____ of results.

12. In programed instruction you quickly discover your errors, since you receive

immediate, results _____ knowledge of _____.

13. Always check your answer with the correct response word in the left-hand

immediate knowledge margin. This way you obtain _____ _____

of results _____ _____.

14. By now you have doubtless noted that some frames are partial repetitions of earlier frames. Do not ignore these frames because they seem "too easy," since *repetition* aids learning. Learning generally is not permanent without

repetition _____.

15. In each of the programs, terms and concepts are repeated; also there are several review frames, similar to the one following this frame. The programs

repetition

were designed in this manner because _____ is important in learning.

16. REVIEW: In programed instruction the material is presented gradually in

small steps

_____ _____ and the student writes the missing words,

active participation

a task that requires his _____ _____. By mov-

mask, response word

ing the _____ downward, the correct _____ _____

immediate knowledge

is revealed and the reader receives _____ _____

results

of _____. The same response word may be written several times,

repetition

since learning is facilitated by _____.

The programed overviews include most of the major terms and principles discussed in the textbook. However, *the programs should not be regarded as a substitute for the chapters in the text,* which contain far greater detail. Each programed overview serves ideally as an introduction to the principal contents of the chapter in the textbook and, for this reason, should be worked through first.

The Project

The purpose of the projects is to give you a feeling for "grass-roots" problem solving in psychology. Unlike the programs, which involve considerable memory and repetition, the projects emphasize critical thinking. You are asked to solve a problem, the solution to which involves psychological principles or findings. Your interests were foremost in the authors' minds as they designed and wrote the projects, and we hope that you will find them both engrossing and challenging.

In several of the projects you test yourself and then compare your performance with data collected from other introductory psychology students. In other projects you are presented with data taken from actual experiments or collected by the authors. In these instances you are asked to analyze the data and draw some conclusions. You then compare your findings with those of the actual experimenters or the authors.

Like the programed overviews, the projects are self-contained units which you can work on at your own rate. They should be completed after you have read the chapter in the textbook, although this sequence is not always essential. In some instances the projects are taken from laboratory studies; but in the form presented in this book, they require no laboratory equipment. Answers to the problems are contained in the discussion section at the end of each project. To obtain maximum benefit from the project, you should attempt to answer all questions *before* reading the discussion.

The Self-Quiz

The self-quizzes provide you with an opportunity to check your understanding of the chapters. They should be attempted only *after* you have thoroughly read the assigned chapters in the textbook. The 15 items presented in each self-quiz resemble items which may be used on quizzes or midterm and final examinations. The items are based on material in various parts of each chapter, and the specific pages relevant to each question are indicated. If you can answer 12 or more of the questions for each chapter, you have probably mastered most of the material in that chapter. If, on the other hand, you cannot answer most of the questions, you will want to reread and then review the chapter in the text.

Contents

1 Psychology and Science

Programed Overview

Psychology is the *science of human behavior.* However, it is not enough just to accept this phrase as a definition of psychology, for each of the underlined terms has specific meanings and implications that, if elaborated upon, make for a more exact understanding of the nature of psychology.

1. For example, consider the first term, science. In the past, science referred to the methods and findings of the *natural* sciences, such as biology, chemistry, astronomy, and so on. But today, the meaning of science is changed.

natural

First, it includes the behavioral sciences as well as the _____ sciences.

2. Second, and most important, science is identified chiefly in terms of *methods.* Thus, when we speak of science today we are referring primarily to

methods, behavioral

the (findings/methods) used by investigators in the _____ as well as natural sciences.

3. Actually, psychology is most accurately described as a *biosocial* science; it is concerned with both *biological* and *social* aspects of human behavior. Intense anger, for example, may involve changes in heart rate, muscle tension, and electrical conductivity of the skin, all of which represent (biological/social) factors.

biological

4. Also, anger may occur through frustrated relationships with others, and it may lead to various types of interpersonal reactions, such as arguing, stealing, and the like. These aspects of anger illustrate the significance of (biological/social) factors.

social

5. Since both biological and social factors are concerned, psychology is best

biosocial

described as a _____ science.

science

6. Returning to our definition of psychology, the _____ of human behavior, it is important to recognize that psychologists often study animals as well as humans.

7. To those not familiar with psychology, the study of animals may appear either irrelevant to the purposes of the discipline or inconsistent with its definition. However, psychologists recognize that the study of animal behavior often reveals important clues to the understanding of

human

_____ behavior.

human
animal

8. For example, human reactions to new drugs can frequently be predicted after first administering the drugs to animals. Thus, while the psychologist's ultimate purpose usually concerns (animal/human) behavior, the study of (animal/human) behavior often serves this end.

human behavior,
behavior

9. Returning again to the definition of psychology, the science of _____ _____, the third important term (behavior/science), also requires explanation.

would not

10. Some psychologists, called *behaviorists,* restrict their study to directly *observable* phenomena. For such psychologists, thinking, since it is not directly observable, (would/would not) be suitable for study.

behaviorist

11. It is unwise to infer that the crying individual is sad, according to the behaviorist, for such behavior could be an expression of many subjective states, including happiness, fear, and frustration. Therefore crying is crying and nothing more, according to the (behaviorist/phenomenologist).

behaviorist

observable

12. A very strict behaviorist might even prefer to use the word "lacrimation," meaning production of tears, rather than the word "crying," since the latter may erroneously suggest a subjective state. Thus, to insure precision in his study, the (behaviorist/phenomenologist) considers only _____ behavior.

experience

13. Other psychologists, called *phenomenologists,* emphasize the importance of *subjective experience.* The importance of a spanking, they suggest, lies not in observable or physical movements involved, but rather in the child's subjective _____ of the spanking.

subjective

phenomenologist

14. It is the child's _____ experience, such as "It didn't hurt and I'll do it again," or "Ouch, I'll never do that again" that count, according to the (behaviorist/phenomenologist).

behaviorist

phenomenologist

15. Objective, easily observed external events are emphasized by the (behaviorist/phenomenologist), whereas subjective, internal states as experienced by the individual under study are emphasized by the (behaviorist/phenomenologist).

phenomenology,
behaviorism (AO)*

16. For some psychologists, the two approaches, behaviorism and phenomenology, are incompatible, but other psychologists believe that _____ and _____ are complementary.

*(AO) means that the words for answers may appear in any order in the blanks.

science, human

behavior

methods

animals

biosocial

behaviorists

phenomenologists

experience

aim (goal)

understanding

description

predict

description

prediction

control

17. REVIEW: Psychology is the _____ of _____ _____. While earlier definitions of science referred to methods and findings, today the term refers primarily only to _____ of study. Humans are the primary concern of most psychologists, but _____ also are studied since their behavior frequently reveals important clues to human behavior. Because psychologists are concerned with biological and social aspects of behavior, they refer to their discipline as a _____ science. Psychologists who restrict their study to observable behavior are called _____. They differ from _____, who emphasize the role of subjective _____.

The goals or *aims* of various scientists differ. The immediate aim of some scientists is simply to *describe* the phenomena they are studying. For others, the immediate aim is to *predict* or *control.*

18. Regardless of their immediate aims, the ultimate _____ of all science is understanding.

19. While the ultimate aim of all science is _____, it is important to note that we can cite three different levels or stages of achievement associated with this aim: description, prediction, and control. The first, description, is the initial step in any science. Darwin, who classified the animal kingdom, stands out as one of the most famous examples of a scientist whose chief aim was (prediction/description).

20. While concerned with description, Galileo also was interested in prediction. By studying and measuring various properties of heavenly bodies he was able to (predict/control) their course of travel.

21. Each successive stage presupposes the previous stage. For example, before a scientist can predict, he must first describe. Thus prediction always implies (description/control).

22. Similarly, control implies both description and _____.

23. A physicist who guides the flight of a space capsule over many thousands of miles, and a geneticist who selectively breeds organisms to produce predicted outcomes, illustrate the third and highest level of understanding, namely, (description/control).

24. Although not present in every science, the three levels of understanding, _____, _____, and _____ may be seen in psychology.

description, prediction, control (AO)

25. For example, a psychologist who labels certain kinds of behavior as aggressive or passive, impulsive or controlled, is engaged in (prediction/control/description).

description

26. The industrial psychologist who uses tests to select the most promising candidates for a position is concerned with (prediction/description/control).

prediction

27. Once selected, he may use special techniques such as incentive plans, bonuses, and the like to elicit greater productivity, more sales, and so on. Here he attempts, often successfully, to (predict/control/describe) behavior.

control

28. To summarize, three levels of understanding in psychology are _____, _____, and _____.

description, prediction, control (AO)

29. It is easy to disregard the fact that science rests upon *assumptions.* While several could be mentioned, two _____ are basic to all science.

assumptions

30. One assumption is that there is a discoverable *orderliness in nature.* In other words, nature is assumed not to be chaotic. The facts that starvation produces weakness and fatigue and that molecular activity decreases when the temperature is decreased suggest that there is _____ in nature.

orderliness

nature

31. In addition to the assumption of orderliness in _____, science rests upon another _____, namely, *limited causality.*

assumption

32. This assumption states that any given event is related not to every other possible event, but rather to only a limited number of other events. We need not know about the speed of light or the favorite pastime of the Eskimo in order to discover what produces hunger or thirst in an infant, according to the assumption of limited _____.

causality

33. Only events within the infant or immediately surrounding him would, in most instances, have anything to do with his hunger or thirst, according

limited causality

to the assumption of _____ _____.

orderliness in nature

34. A powerful blow to the body always results in pain. This example illustrates the assumption of (orderliness in nature/limited causality).

limited causality

35. Swimming behavior of fish doubtless is unrelated to language and symbolic activities of humans. This example illustrates the assumption of (orderliness in nature/limited causality).

36. It is important to remember that for any given experiment, psychological or otherwise, many assumptions typically are involved. However, two assumptions are basic to any scientific endeavors, namely, that there is a dis-

orderliness, nature, limited causality

coverable _____ in _____ and _____

_____.

understanding

aim (goal)

description

37. REVIEW: While the ultimate aim of science is _____,

there are different levels of achieving this _____. The initial step

or aim of any scientific work is _____, which involves classifying the events under study. Sometimes the scientist can both describe and forecast future events, in which case he is engaging in descrip-

prediction

tion and _____. A high level of understanding is achieved when the scientist can not only describe and predict but can also

control

_____ the objects of his study. Underlying any scientific en-

assumptions

deavor are two basic _____: one is that there is discov-

orderliness, nature

erable _____ in _____; the other is that of

limited causality

_____ _____.

In the following frames we consider how psychologists deal with aspects of the organism, such as fatigue, fear, and sadness, *which cannot be directly observed.* Most relevant to our discussion will be the terms *inference, construct, operational definition,* and *theory.*

observation inferences

38. In scientific thinking a distinction is made between an *observation* and an *inference.* An inference is based upon observation, but it is a statement about the internal state of the organism. Our knowledge of crying or lacrimation is based upon (inference/observation), while sadness or frustration are studied as (inferences/observations).

39. Whenever one guesses, on the basis of overt behavior, about the internal state of an organism, he is making an _____.

inference

40. To illustrate further, consider the driver of a speeding car. The ideas that the driver is "eager to get somewhere," "fearful of being caught," or "preoccupied by thoughts other than driving" are all (inferences/observations), while the speed of the car is an (inference/observation).

inferences
observation

41. Insofar as possible psychology is behavioristic in that it depends upon _____ rather than inferences.

observations

42. However, if psychology dealt exclusively with observations, some of man's important aspects which cannot be directly observed (thinking, feeling, perceiving, and many others) would not be considered. But psychologists recognize the importance of inferring these important phenomena, which are referred to as hypothetical constructs or simply *constructs.* To illustrate, psychologists believe that anxiety is an important area for study, and and since it cannot be directly observed, is regarded as a _____.

construct

43. Indicate, by underlining, which of the following are constructs.

running	nervous	sitting
tired	elated	activity

tired, nervous, elated
(Running, sitting, and activity, since they may be observed directly, are not constructs.)

44. Whereas much of the subject matter in other sciences concerns concrete, tangible phenomena, such as anatomical parts or physical objects that may be directly observed, the study of human beings involves many intangible phenomena, called _____, that (can/cannot) be directly observed.

constructs, cannot

45. The difference between a construct and an inference is important. A construct is considerably broader, and is used either to clarify or to suggest relationships among *several* observations. An inference, since it is based upon only *one* observation, suggests no such relationships. Inferences, because they involve (one/several) observation(s), are considered less comprehensive and complex than _____.

one

constructs

46. When studying states that cannot be observed directly within the organism, psychologists usually are not satisfied to rely on inferences, because inferences involve (only a single/several) observation(s). Instead, they prefer to use constructs, which involve (only one/several) observation(s).

only a single
several

47. By way of illustrating the difference between inferences and constructs, consider the student who repeatedly misses English class. One inference is that he is forgetful; another is that he dislikes the professor. Still another is that he dislikes the subject matter. Forgetfulness, dislike of the professor, and dislike of English, *insofar as they do not attempt to relate several observations,* are all (inferences/constructs).

inferences

48. If we were to learn that the student regularly attends his classes immediately before and after his English class, we could then discard the inference that the student (is forgetful/dislikes the professor/dislikes English).

is forgetful

49. And should we note that the student is on the editorial staff of the college newspaper and a frequent contributor, we might question the inference that he dislikes (the professor/English).

English

50. Should we hear him complain about the poor quality of the faculty, we might place (more/less) confidence in the inference that he dislikes the professor.

more

51. Suppose that he complains bitterly to the Dean when reassigned to a new advisor, who is his English teacher. At this point, one might suggest a construct of "dislike of the English professor." Unlike an inference, which may be based on (one/several) observation(s), this construct is based on (one/several) observations.

one
several

52. Furthermore, a construct suggests and often clarifies relationships among the various observations. By employing _____, the various observations "make sense."

constructs

53. Because they cannot be observed directly, constructs require *operational definitions.* This means that they are defined in terms of certain observable operations. Thus, constructs become observable and an integral part of science through the use of _____ definitions.

operational

54. Anxiety is an example of a construct. Anxiety cannot be observed directly, but one can infer its presence on the basis of various operational definitions. To illustrate, measured pulse rate or muscle tension, amount of finger tremor, or possibly one's score on an anxiety questionnaire could serve as an operational _____ of anxiety.

definition

55. To illustrate further, since one cannot perceive intelligence directly, like anxiety, it is a(n) (operational definition/construct).

construct