

concerned with the understanding of human learning and performance to those concerned with the effects of rewards on the self-concept. Intrinsic motivation, the tendency to perform an activity for its own sake rather than for some (extrinsic) reward, is the conceptual variable of common concern for most of these investigators. And, though they may disagree about the reasons for the effects, they are unanimous in concluding that rewards can reduce intrinsic motivation.

What is particularly informative is that each of the research programs has had some success in stipulating the conditions under which rewards have detrimental effects. For example, both McCullers and McGraw report that rewards result in poor performance only when the task is initially intrinsically interesting and at the same time requires some sort of inventive mental processing. From Deci and Porac, Kruglanski, and Lepper and Greene we learn that rewards reduce intrinsic motivation, but only when the rewards are clearly contingent on participating in the activity and only when they do not convey information about competence at the activity.

Also of value are the introductory historical chapters, by McCullers and Kruglanski, which give the reader some appreciation of how the present investigators got involved in this work and why the work is theoretically important. In complementary fashion, the final chapters describe a variety of (sometimes speculative) implications and applications. Curiously, the very last chapter, by Lepper and Greene, goes to great lengths to explain that there may be little or no conflict between the school of thought presented in this volume and the school followed by the behavior modifiers. I find this an unfortunate way to conclude the book, and it leaves one with the feeling of having just heard a "shaggy dog" story. It is unfortunate because it neglects to mention that there is in fact an important conflict between the Skinnerian theory, with its emphasis on rewards as shapers of behavior, and one of the antecedents of the present work, Festinger's theory of cognitive dissonance, which says that, as long as overt behavioral compliance is obtained, the less the reward the greater the development of intrinsic motivation. It is also unfortunate because it detracts from the substantial contribution that the book makes to the study of intrinsic motivation.

JACK BREHM

*Department of Psychology,
University of Kansas, Lawrence 66045*

Inheritance and Environment

The Psychology of Individual and Group Differences. LEE WILLERMAN. Freeman, San Francisco, 1979. xii, 532 pp., illus. \$15. A Series of Books in Psychology.

Twenty years ago differential psychology occupied a well-established niche in the overall discipline of psychology, but the social upheavals of the next decade nearly obliterated it from view, especially as it related to intelligence. The possibility that inherent biological factors might contribute to individual differences was actively disputed or else simply dismissed.

Willerman's book marks a welcome return to a more balanced and integrative view. It deals with individual differences in a large number of behavior variables such as intelligence, school achievement, personality, and psychopathology, and it does so from a perspective that openly acknowledges the joint contributions of inheritance and environment. To quote from the preface, "One of my biases is to emphasize psychological traits that have some promise of being linked to biological phenomena. Such a view explicitly acknowledges the value of an interdisciplinary approach. . . . This book has a distinctly behavior genetic bias" (pp. 18-19).

Reflective of this interest, the book opens with a pair of chapters on statistics and genetics, to set the stage for the later analysis of genetic and environmental contributions to behavior. The chapters furnish a clear perspective on the origins and measurement of individual differences, especially with respect to estimating the strength of relationship among various kinship combinations. The material is necessarily complex, and, since the book is intended as a textbook, assistance from teachers will be an aid to grasping these main concepts.

The largest portion of the book is composed of chapters on individual differences in intelligence and educational achievement, including such ancillary topics as mental retardation and the unusually gifted. Willerman examines the main theories relating to intelligence, both historical and current, and then surveys the burgeoning data that speak to the proportional contributions of heritage and environment. Among other valuable features of this section is the resur-rection of the early adoption studies by Burks and Leahy, which remain landmarks for thoroughness and care.

There is also an extensive review of the many environmental variables ex-

pected to affect intelligence, including several enrichment programs. Willerman concludes that there is a substantial heritable component to IQ, and those cases showing the greatest receptiveness to environmental impact are instances of either extreme deprivation now redressed or participation in an enrichment program involving a major reorganization of the child's daily experience.

The chapter on educational achievement gives an informative overview of this subject, dealing with the distinction between intelligence and achievement, the various modes of instruction, the effects of busing and integration, the contribution of school facilities and teacher quality in comparison with family background, and the role of personality and motivational variables. The consensus seems to be that certain basic skills related to reading, writing, and arithmetic can be facilitated in the early grades by innovative programs and thus provide a better foundation for learning. Later academic performance, which depends more heavily on adequate conceptual ability, may not be as susceptible to educational innovations.

Subsequent chapters deal with individual differences in personality and psychopathology. Willerman gives full treatment to the theories of personality and the methods of measurement, and for psychopathology he provides a broad and intensive review of the syndromes themselves and the potential contribution of genetic and environmental factors. Predictably, studies involving twins, family pedigrees, and adopted children receive a special emphasis for assaying a genetic role in personality and psychopathology. Willerman makes it abundantly clear, however, that environmental factors play a powerful role in shaping personality or predisposing the individual toward psychopathology.

The final three chapters deal with overall group differences—by age, sex, and race, of which the last is clearly the most sensitive topic in the book. Willerman gives a thoughtful and guarded interpretation of ethnic differences in intelligence and academic achievement, touching not only on the preponderant black-white comparisons but also on the less frequent studies of Orientals, Indians, Jews, and Mexican-Americans. The differences are well established but the reasons much less so, and Willerman considers the possibility that both environmental and genetic factors are implicated. The prospect of biochemical therapy he holds forth, however, has much less to recommend it than a restructuring

of attitudes to promote acceptance of individuals at face value. Our obsession with intelligence and intellectual achievement has created a one-dimensional grading of social fitness, and recognition that other deeply rooted human qualities are equally to be valued is long overdue.

The limitations of the book may be briefly noted. The extensive review of studies and theories bearing on each subject comes at the expense of a clear flow and unifying theme in the writing, and at times the reader may feel his or her comprehension more swamped than sharpened. The chapter on theories of intelligence is a case in point—Willerman touches on all the major theorists and the recurring brush-fire arguments between them, plus the difficulties faced by each theory, but even the reader experienced in this area may sense a lack of anchoring and information overload in trying to come to grips with the material.

Further, a personal opinion of this reviewer is that heritability coefficients are more frequently misleading than informative and for this reason should generally be omitted from the analysis of human abilities. Willerman mentions their limitations (p. 110) but then routinely uses them for comparison and interpretation of different studies. The coefficient gives an artificial sense of precision that is rarely justified by the underlying data; heritability coefficients may be nominally high or low for reasons that have more to do with the reliability of the data than with the presence or absence of genetic effects.

On balance, this is a book to be received appreciatively and recommended. The coverage is very extensive—indeed, at times the book reads like the *Annual Review of Psychology*—and some vexing topics are dealt with in straightforward fashion. The book has the virtue of a coherent framework afforded by the author's behavior-genetic orientation, and it helps to revitalize differential psychology as a cogent subject of inquiry. The writing is comprehensible and the interpretations circumspect—indeed, the occasional temporizing about results may be attributed to a special caution in drawing conclusions about presumptive genetic influences. The book is basically an excellent one, and we can be indebted to Willerman for bringing into the open several thorny issues concerning human abilities that demand thoughtful and informed attention.

RONALD S. WILSON

*Child Development Unit,
University of Louisville Medical School,
Louisville, Kentucky 40232*

Origins of the Sense of Security

Patterns of Attachment. A Psychological Study of the Strange Situation. MARY D. SALTER AINSWORTH, MARY C. BLEHAR, EVERETT WATERS, and SALLY WALL. Erlbaum, Hillsdale, N.J., 1978 (distributor, Halsted [Wiley], New York). xviii, 392 pp. \$24.95.

In the elaboration of the ethological perspective on social development *Patterns of Attachment: A Psychological Study of the Strange Situation* is the most important contribution since the publication of *Attachment* by John Bowlby, who introduced this perspective, in 1969. In the present volume, Ainsworth and her three coauthors describe the studies that have tested several major postulates of this approach to the study of infant social development.

Both Bowlby and Ainsworth have attempted to explain the processes of early social bonding (that is, the formation of affectionate attachments between infants and parents) by way of a theory that is more consistent with the principles of contemporary biology and psychology than is either social-learning or psychoanalytic theory. They propose that human infants are born with a genetically determined predisposition to seek the proximity of the adult figures who would, "in the environment of evolutionary adaptedness," protect and care for them. Parents, in turn, are supposedly predisposed to respond with behaviors that complement the infants' behaviors. The importance of these complementary behavioral predispositions is especially clear during the first few months, when the immobile infants can "achieve" proximity only by summoning adults (for example by vocalizing or crying). The ethologists propose that infants become attached to those persons who most consistently and extensively interact with them. The nature of the attachments formed to specific individuals depends in large part on the way in which each person has responded to the infant's behaviors and signals in the preceding months.

Despite Bowlby's background as a clinician, his presentation of the ethological attachment theory emphasized species-specific patterns and thus downplayed the emergence of individual differences. Complementing Bowlby's masterly syn-

thesis, Ainsworth has focused her attention for more than a decade on the development of individual differences in infant-parent relations. The primary contribution of the present book has to do with the assessment of such differences.

The "strange situation" referred to in the book's subtitle is an experimental procedure developed by Ainsworth and Wittig some ten years ago. Its purpose is to permit observation, in a standardized situation, of the way each infant organizes its attachment behavior around its attachment figure. In the strange situation, the infant is introduced, in a fixed sequence, to several everyday events (being in an unfamiliar room, the entrance of a strange adult, and being separated briefly from the attachment figure) that are likely to elicit fear or anxiety and thus an intensification of attachment behavior. The manner in which the infant responds to these events—especially the way in which it responds to reunion with the attachment figure following a brief separation—has been the primary focus of concern.

Drawing primarily upon four studies involving a total of 106 infant-mother dyads, Ainsworth *et al.* first document, by delineating the behavioral trends they found, that the stressors indeed affected infant attachment behavior in the predicted fashion. They then focus on the different ways in which the infants responded to stress. The normative pattern, characteristic of "securely attached" infants, involved active exploration in the mothers' presence, proximity-seeking and reduced exploration in the presence of the stranger, distress and disruption of exploration in the mothers' absence, and proximity- and contact-seeking upon reunion following the brief separations. The securely attached infants fell into one of four subgroups, all of which were characterized (more or less) by these patterns of behavior.

Two patterns of behavior are considered by Ainsworth *et al.* to characterize "insecure" infant-mother attachment relationships. The avoidant pattern (which included two subgroups) was notable for the manner in which infants failed to greet their mothers upon reunion or else mingled avoidant behaviors