

The cover features several black and white line drawings of human faces and figures. At the top left is a profile of a person with long, wavy hair. Below it is a profile of a person with short, curly hair. To the left of the title is a profile of a woman with short, wavy hair. Below that is a profile of a man wearing a cap. In the center is a profile of a man with a beard and short hair. Below that is a profile of a man with a beard and short hair. To the right of the title is a profile of a man with short, wavy hair. At the bottom right is a full-body sketch of a man with a beard, wearing a tunic and a belt, with his arms crossed.

HUMAN DIFFERENCES

LEWIS R. AIKEN

Human Differences

Lewis R. Aiken
Pepperdine University



1999

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Not ev'ryone's the same as some,
For folks are good and bad.
And once in a while you'll see a smile
On someone who is sad.

'Cause people are alike and not;
They are both right and wrong.
And if you come near, you may see fear
In someone who is strong.

To you I may look mean as sin,
But gaze at me anew,
And then you may see that old mean me
Is as kind as that old mean you.

So let's forgive the us we don't
And like the us we do,
Then time will soon tell if all goes well
With the not us and me and you!

—*Lewis R. Aiken*

Foreword

Research on human differences is a double-edge sword. On the one hand, a preoccupation with the differences among people can lead to stereotyping and provide support for prejudice and discrimination. This was the trap into which certain early pioneers in the mental testing movement fell, a trap set and sprung by those with an ethnocentric philosophy of life and a political agenda rationalized by eugenics. Of course, modern thinkers, whether liberal or conservative in their social and political viewpoints, are not immune to ethnocentrism. This is not surprising when one considers the universality of group pride, social competition, and outgroup hostility. It often seems, as some have argued, that humans have not really grown much in wisdom since Cro-Magnon times and each generation must rediscover tolerance and philanthropy.

On the other hand, it can be argued that a knowledge of human diversity is important in understanding and appreciating individuals and cultures that are different from one's own. In fact, a defensible point of view is that, because heterogeneity and hybridization have greater survival value than homogeneity and cloning, they should be encouraged and applauded rather than dwelt upon as causes of social friction.

This book is a mixture of concepts and findings from biology, sociology, economics, psychology, and many other natural and social sciences. But because the author is a psychologist, much of the book is about psychology. American psychology developed in the early part of the 20th century in the context of a socioeconomic system that was based on the principle of equity. According to this principle, the goods and services obtained by people should be commensurate with their abilities and efforts. In contrast to the principle of equity, adherence to the principle of equality results in the division of resources equally among individuals who perform many different, but necessary, tasks. Historically, Americans have seemingly straddled the fence between these two principles, a gymnastic exercise that might be simpler if all people were truly created equal.

A generation ago Leona Tyler (1978) proposed that we move away from psychological assessment mode based on the equity principle toward one

based on differentiation among people in terms of their complementary role skills. In this psychometric model, tests are used primarily for diagnosis and placement rather than selection and screening. People are assigned tasks that they perform best, but all occupations are accorded equivalent social status and rewards.

Civil rights legislation during the 1960s and 1970s helped to end discrimination in employment, education, and other social contexts, and efforts were made to achieve equality rather than continuing to adhere to the traditional notion of equity. In an attempt to compensate for the injustices and inequalities of the past, the government instituted affirmative action policies. In recent years, however, affirmative action programs have been severely criticized and rolled back in various quarters because of alleged inequalities in the treatment of different racial and other demographic groups.

Be that as it may, from a sociopolitical perspective few will deny that progress has been made in ensuring the civil rights of all American citizens, regardless of race, ethnicity, gender, nativity, religion, physical disability, or sexual orientation. Obviously the degree of progress has not been rapid enough to please everyone and perhaps too rapid for some. Few would probably deny, however, that minority groups and women are, on the whole, economically and socially better off today than they were two or three generations ago. Nevertheless, confusion and uncertainty remain with respect to how social justice can best be attained while maintaining intergroup harmony in an increasingly multicultural, pluralistic society.

No doubt there is comfort and security in stereotyping and ethnocentrism; everyone has an ego and we tend to think of the groups to which we owe allegiance as better than others. Like many other animal species, humans appear to be naturally aggressive and competitive, characteristics that are reinforced in games, school, work, and other endeavors throughout our lives. But whether we like it or not, the increased interaction among people with different psychical and psychological characteristics and different cultural backgrounds will demand ever more that we do our best to cooperate and attempt to fashion some kind of community from our diversity. As people of different nationalities, races, and backgrounds draw closer together, it may be that the differences between them will, to a large extent, disappear. Perhaps in a thousand years or so our descendants will all be of similar color, shape, and size. In a sense this may be desirable, in that it should make conflict less likely. For the present, however, we can delight in our diversity, and accept the fact that the world is generally a more interesting, and certainly a less disturbing, place when we tolerate, interact with, and learn from each others. We cannot, however, settle for mere tolerance. Rather, we must come to sincerely appreciate and like people who are different from ourselves while realizing that we are more similar than different in our needs, abilities, and aspirations.

Speaking for professional social scientists in particular, Jones (1994) summarized the current attitude toward individual and group differences and his proposition of *affirmative diversity* in this way:

We have given much lip service to the notion of human diversity as a value and a good in society and in the world. But we have not, through disciplined inquiry, demonstrated exactly how diversity confers strengths to us as individuals and as a society. The goal of affirmative diversity is to legitimate and promote this inquiry and the values underlying it. (p. 43)

If this book makes some small contribution to the realization of this goal, then the author's time will have been well-spent.

—*Lewis R. Aiken*

Preface

It is arguable whether people are more alike than different, but they obviously differ from each other in many ways. Biologically, they differ in gender, race, size, strength, speed, agility, sensory acuity, endurance, health status, longevity, body chemistry, and attractiveness. Psychologically, they differ in general and specific cognitive abilities, creativity, interests, and in a host of personality variables. Sociologically, they differ in social standing, economic status, ethnicity, culture, religion, and politics. In terms of productivity, they differ in school grades, degrees earned, occupational/professional accomplishments, and other measures of success. Some of these variables are causes and some are effects of each other, but for the most part they are intermingled in a complex, multidimensional and multidirectional web.

The systematic investigation of individual differences, traditionally referred to as *differential psychology*, was inaugurated by Sir Francis Galton during the late 19th century. Galton viewed the study of individual differences in mental abilities and temperament as a natural outgrowth of his cousin Charles Darwin's research and theorizing on the evolution of species differences. The influence of Darwin's evolutionary biology was not limited to the biological sciences, but it had an effect on psychology, sociology, and other disciplines as well. Comparative psychology, developmental psychology, and the study of individual differences in general all bear the stamp of evolutionary thinking. Investigations in these fields have been conducted with an understanding that, although both physical and psychological variations among people are to some extent inherited, individual initiative and opportunity make definite contributions to the fulfillment of one's potentialities and help in overcoming limitations imposed by biological constitution and unfortunate experiences.

The study of the origins and outcomes of individual differences in psychological characteristics has been greatly facilitated by the construction and standardization of tests of intelligence, personality, and other psychological constructs. However, research on individual differences in cognitive abilities, personality traits, and psychomotor skills has been unsystematic and often a reflection of convenient measuring instruments and methodol-

ogy rather than sound thinking and appropriate research design. There has been no scarcity of hypotheses and theories concerned with human differences, but such speculations have not been very successful in predicting and explaining research findings and everyday observations. For this reason, this book is primarily an empirical treatise dealing with facts and statistics rather than theories. Brief overviews of theories of cognition and personality are given in chapter 6 and chapter 8, but readers who desire a comprehensive exposition of psychological theories must look elsewhere (e.g., Aiken, 1996b; Ewen, 1998; Ryckman, 1997; Flanagan, Glenshaft, & Harrison, 1997; Maddi, 1996).

Many conclusions derived from research on individual and group differences in psychological characteristics, particularly those concerned with the relationships of race and gender to cognitive abilities, have been highly controversial and widely debated. However, a spirit of forbearance and open-mindedness, together with the application of more sophisticated multivariate statistical procedures and data processing techniques, have increased the scope of such studies and yielded more defensible conclusions. Nevertheless, the nature–nurture debate and other topics of contention with respect to the origins and effects of human differences continue to be pursued.

There is a massive amount of popular and professional literature on the topic of individual differences, in journals such as *Learning and Individual Differences* and *Personality and Individual Differences*, in dozens of scholarly books, and in more popular sources. The International Society for the Study of Individual Differences serves as a forum and clearinghouse for such research. The majority of recent books on individual and group differences are, however, not integrated texts but collections of readings by multiple authors (e.g., Gale & Eysenck, 1992; Jonasses & Grabowski, 1993; Lubinski & Dawis, 1995; Trickett, Watts, & Birman, 1994). Unlike these sources, the present book is a unified compendium; though broad in scope, it is written by a single author, hopefully with clarity and continuity. Preparation of this volume has involved a great deal of selection and condensation of source material, but hundreds of references from a research literature consisting of thousands of published articles have been retained.

Many scholarly books concerned with individual differences in characteristics, such as general intelligence, are essentially summaries of studies concerned with the relationships of hereditary and environmental factors to the development of the characteristic. Other books focus on a particular background variable, such as heredity, nutrition, or restricted experience, and attempt to trace the effects of the variable on assorted psychological characteristics. The research methods employed in these two approaches may involve selective breeding studies, controlled experiments, correlational analyses, and other procedures.

The structure of the present book represents a combination of the approaches just mentioned. Not only is every human being viewed as the product of a complex interaction between heredity and environment, but human characteristics are seen as being influenced by and in turn influenc-

ing what have been referred to as biological and experiential “background factors.” Behavior is determined by the biological makeup and experiences of a person, but those experiences, as well as the person’s physical structure and functioning, are affected by how he or she behaves.

The purpose of *Human Differences* is to examine and attempt to make sense of the mass of information and interpretation pertaining to the various ways in which individuals and groups differ from each other. A review of research findings and interpretations is provided in each of the areas defined by the various chapters. Before launching into a description of the research literature on individual and group differences, an overview of the historical and conceptual foundations of the topic is presented, along with the traditional and more recent methodological tools that have been brought to bear in such studies. In addition, a synopsis of genetic and other biological and biochemical factors that are important in shaping individual differences is provided. Chapters 1 through 4 deal with basic background material, setting the stage and providing perspective for a consideration of individual and group differences in the physical, psychological, and social variables discussed in chapters 5 through 10.

As the author of a number of books in psychology and related fields, I know that a first edition is immeasurably more difficult to prepare than a revision. This is particularly true when the author has to do it alone. With this volume, however, I have been lucky to receive the assistance of four outstanding professionals. To begin, my thanks go to Judi Amsel, whom I have known for years and always appreciated, for “signing me up.” Not only did Judi make many cogent suggestions for improving the book, but she was instrumental in having the first draft reviewed by Robert J. Sternberg of Yale University. Although I did not do everything that Professor Sternberg advised, I tried to do enough to make the manuscript acceptable to him. I hope that he approves of the finished product. Also deserving of acknowledgment are Kathy Scornavacca, my understanding and considerate production editor, who accomplished the laborious tasks of shepherding the manuscript through the production process and tolerating my idiosyncrasies, and Sara Scudder for proofreading the manuscript and finding most of my mistakes.

—Lewis R. Aiken

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CHAPTER ONE

Origins and Developments

Human beings may look alike, act alike, and think alike, but in one way or another everyone is different from everyone else. People differ not only in physical characteristics such as weight, height, hair and skin coloring, and facial features, but in their abilities, personality, and behavior as well. Even identical twins, who have identical heredities, are not exactly alike. They may appear initially like two peas in a pod, but on further acquaintance the two peas are seen to possess a number of dissimilarities. People are born different, and in many ways they become even more dissimilar as they grow older.¹ These differences enable us to distinguish among people, thereby serving as a basis for differential treatment of friends, acquaintances, and strangers.

Some futurists fantasize a world populated by armies of clones that would presumably be easier to train and control than the masses of individuals now inhabiting our planet. But in addition to being uninteresting, such large-scale conformity of appearance and action might very well result in mass extinction when conditions or circumstances changed radically and the clones did not possess the physical structures or abilities to deal with the changes.

From a Darwinian perspective, some individual differences, such as birth defects or physical disorders, decrease the chances of survival and reproduction. Other differences contribute to the individual's likelihood of surviving and perpetuating his or her own kind. The occurrence of severe climatic or environmental changes may pose a test of the survival value of individual characteristics. For example, introduction of a new strain of viruses or physicochemical conditions that individuals lack the necessarily equipment to deal with can easily decimate a population. This would seem less likely to occur, however, in a population consisting of individuals possessing a wide variety of physical and behavioral characteristics.

¹Furthermore, many of these differences are related, or appear in clusters. According to Berg's (1967) deviation hypothesis, for example, people who deviate from the norm in one way are likely to deviate in other ways as well.

A vast array of individual differences in structure and functioning can be found both within and between various plant and animal species.² From single-cell organisms at one extreme to whales and giant sequoias at the other, a wide range of sizes, shapes, and other characteristics can be observed. For example, there are both inter- and intraspecies differences among mammals in speed, strength, agility, emotionality, intelligence, and other behaviors. A common pastime among boys is to rank different animals on their aggressiveness and which ones would be most likely to win in a fight. Are lions better fighters than tigers? Are grizzlies better fighters than Texas longhorn steers? A similar game played by comparative psychologists has been to rank different animals on their intelligence. Over 2,000 years ago Aristotle attempted to rank different animal species on a scale of intelligence—a so-called *scala natura*. Many centuries later, G. W. Romanes (1883), the father of comparative psychology, made extensive comparisons of the learning abilities and other psychological characteristics of different species of animals. The intelligence of a variety of animals (crabs, fishes, turtles, dogs, cats, monkeys, human infants, etc.) was also studied by E. L. Thorndike (1898/1911). Thorndike initially believed that earthworms have absolutely zero intelligence and hence are at the bottom of the intelligence scale. However, after observing that earthworms could learn a simple maze after many trials, Thorndike concluded that they have some intelligence after all. Many other interspecies comparison studies of the abilities of animals to perform cognitive tasks such as problem solving and thinking were subsequently conducted by psychologists and biologists.

As interesting as comparisons of animals' abilities may be, this book is limited to the description and discussion of human differences, both within and between demographic groups. Within this restricted domain, attention is given to biological, psychological, and social differences and how those differences affect human behavior. The approach, however, is holistic, recognizing that the physiological, cognitive, and behavioral characteristics manifested by individual humans do not act alone but rather interact in shaping a particular person.

First and foremost, this book emphasizes the uniqueness of the individual. Although the body and mind of a given person operate according to the same natural principles or laws as those of other people, everyone is a unique whole in his or her own right. Consequently, the uniqueness or individuality, as well as the general biological and psychosocial principles that apply to all people, must be taken into account to obtain a clear understanding of why a person behaves in a certain way.

INDIVIDUALISM

The social theory of *individualism*, which maintains that the highest political and social value is the welfare of the individual, goes back at least to an-

²The longevity, or length of life, of animals varies from a few hours in adult mayflies and a few days in fruit flies and houseflies to more than 100 years in some humans, tortoises, and certain large birds. Even greater longevity occurs among plants: Italian cypress trees can live for 2,000 years and bristlecone pine trees for 5,000 years or more.

cient Greece. According to this doctrine, people should be free to exercise their self-interests through independent action. In contrast, advocates of *collectivism* believe in centralized socioeconomic control.

Greek philosophers such as Plato (c. 427–347 B.C.) and Aristotle (384–322 B.C.) advocated individualism in thought and action and had much to say about human differences. As described in the *Republic*, Plato's ideal state was one in which people are selected, perhaps by means of aptitude tests, to perform tasks for which they are best suited. Aristotle's interest in individual and group differences was revealed in his comments in the *Ethics* and *Politics* concerning gender and ethnic differences in mental and moral characteristics. Like their successors, however, Plato and Aristotle realized the need to place limits on human behavior. Whenever the goals of the individual conflict with those of the society of which he or she is a member, social disharmony is the result. The writings of 20th-century psychologists also point out the problems of unbridled individualism. Although it is not synonymous with egoism, or extreme self-centeredness, individualism can lead to feelings of alienation, loneliness, worthlessness, depression, and other symptoms of mental or behavioral disorders. Psychologists recognize that a stable sense of individual identity develops not from preoccupation with the self but rather from cooperative and supportive interactions with other people.

The emphasis on individual abilities and rights that characterized Athenian democracy did not persist through the Middle Ages in Europe. Until the revival of Greek culture and thinking during the Renaissance, prevailing political, social, and religious forces emphasized autocratic control. The individual was seen first and foremost as a member of a group or class (e.g., the peasantry, clergy, nobility, artisans, etc.) and inseparable from it. Rather than being a person who happened to perform a particular occupation, an individual's identity was viewed as synonymous with the role prescribed for members of that occupation (Fromm, 1941).

The Middle Ages was a time of unquestioning faith and a struggle to survive and do one's duty toward the church and state. Earthly existence was merely a preparation for Heaven—a reward that would come only from neglecting the self and practicing obedience toward God and accepted social institutions. However, the 16th century witnessed the beginning of a gradual return to the ancient Greek perspective on the value and worth of the individual. The growth of capitalism and the attendant Protestant ethic stimulated the belief that every person is to some extent separate from others and self-sufficient. Unlike the deterministic “veil of tears” perspective that prevailed in the Middle Ages, the philosophy of life during the Renaissance and the Enlightenment periods was that individuals can influence their situation and circumstances. Freed from the constraints of intolerance and censorship, people can use their abilities to understand themselves and the world in which they live. Such knowledge can then be applied to improve one's situation and that of other people.

Traditional, nativistic theological doctrine had held that life is a battle between good and evil—that people are born in sin and hence basically evil with only a hope and not a guarantee of salvation and a happy afterlife. In

contrast, philosophers such as Jean-Jacques Rousseau, John Locke, and Voltaire saw human beings not as innately bad but rather as being made bad by the social circumstances in which they exist. According to this idea, if you want to shape or change an individual's behavior, you must control his or her social environment.

Individualism flourished particularly in 18th- and 19th-century Britain, France, and the United States of America. The democratic political structures of these countries, which emphasized freedom and equality (in theory if not always in fact), contributed to that growth.³ Sustaining this individualism by freeing people from the shackles of poverty and disease were the industrial, scientific, medical, and educational advances of the time. These advances put health, wealth, and wisdom in the hands of more people, allowing them to realize their desires and achieve whatever they would. The self-made man, who attained wealth by his own efforts rather than by inheritance, became more common and widely admired. It was thought that, given sufficient drive and ambition plus a bit of luck, all things were possible.

SCIENTIFIC BEGINNINGS

The 19th century was a time of rapid developments in the natural sciences—notably astronomy, physics, chemistry, biology, and geology. Furthermore, developments in mathematics and engineering provided methods and tools for the growth of both pure and applied science. Emerging from progress and issues in the physical and biological sciences was a new scientific psychology.

The Personal Equation and Reaction Time

In 1795, Maskelyne, royal astronomer at the Greenwich Observatory in England, became concerned when he discovered that his own observations of stellar transit times did not agree with those of his assistant, Kinnebrook. When Kinnebrook failed to correct this error, Maskelyne concluded that his assistant lacked the ability to make accurate determinations of stellar transit times, and so poor Kinnebrook was discharged. The matter might have rested there if it had not come to the attention of the astronomer Friedrich Bessel at Königsburg two decades later. After examining the data from the Greenwich Observatory and making additional observations of his own, Bessel concluded that rather than being due to simple mistakes by Kinnebrook, the disagreement between the two astronomers was caused by individual differences in their response times. In other words, each man

³Intermingled with the social atmosphere of freedom and individualism was a moralistic tone that stressed proper social conduct, obedience to God, and conformity to the will of the community. This Puritanism was especially pronounced among early New Englanders, but also permeated other areas of the nation and often came into conflict with an equally strong libertinism.

was filtering his sensory experiences—in this case, the time required for the passage of a star between cross-hairs on a telescope—through his own unique personal equation. Correcting for the personal equation of an observer became the practice in astronomy during subsequent decades. Invention of the chronoscope did away with many of these errors of observation in astronomy, but the concept of a personal equation continued to be of interest to physiologists and psychologists during the latter half of the 19th century. Numerous studies of variations in the personal equation with sense modality (vision, audition, touch, taste, smell, etc.), stimulus intensity, and other conditions were conducted.

Investigations of the personal equation by psychologists took the form of reaction time experiments, studies of so-called *mental chronometry*. These studies were concerned with determining the time required for various mental processes by application of a subtractive procedure. As described by the Dutch physiologist Frans Donders and illustrated in Fig. 1.1, the procedure involved the measurement of three different kinds of reaction time. To measure Donders' A (simple) reaction time, a single stimulus (S_1) is presented; the subject is told to make a specified response (R_1) to the stimulus as rapidly as possible. To measure Donders' B (choice) reaction time, one of two different stimuli (S_1 or S_2) is presented; the subject is told to make one specified response (R_1) to one of the stimuli (S_1) and another specified response (R_2) to the other stimulus (S_2). To measure Donders' C reaction time, one of two stimuli (S_1 or S_2) is presented; the subject is told to make a specified response (R_1) to only one of the stimuli (S_1) and ignore the other stimulus. After completing a number of trials using each of the three procedures, three mean reaction times—A, B, and C—are computed. Next three derived times are determined: baseline, identification, and selection. Reaction time A is referred to as *baseline time*, the difference between reaction time C and reaction time A is *identification time*, and the difference between reaction time B and reaction time C is *selection time*. These three times vary with the individual, the sense modality, and other conditions under which they are determined.⁴

Innumerable investigations employing Donders' procedure were conducted at Wilhelm Wundt's (1832–1920) Leipzig laboratory and elsewhere during the late 19th century to determine the time for certain mental events. Unfortunately, these studies, which also employed the method of introspection (a "looking into" one's mind and reporting on subjective impressions) failed to confirm the validity of Donders' method for this purpose. However, the Donders method and extensions of it are still widely employed. One extension is S. Sternberg's (1969) additive factors method, which breaks down total reaction time (RT) into a series of successive information-processing stages (also see Biederman & Kaplan, 1970).

⁴A computer program for measuring Donders' A, B, and C reaction times and then deriving baseline time, identification time, and selection time is available from the author. Send a self-addressed stamped mailer and 3¼ inch diskette to: Lewis R. Aiken, PhD, 12449 Mountain Trail Court, Moorpark, CA 93021.