



**Basic processes in  
ADULT DEVELOPMENTAL  
PSYCHOLOGY**

**Merrill F. Elias • Penelope Kelly Elias • Jeffrey W. Elias**

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*with 119 illustrations*



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**Basic processes in  
ADULT DEVELOPMENTAL PSYCHOLOGY**

*To our favorite cross-sectional  
sample:*

EARI.

MARY

MERRILL

RUTH

MARGE

“BIG” SUSAN

“LITTLE” SUSAN

ERIC

MIKE

BEN

## A WORD TO THE STUDENT

In many areas of adult developmental psychology, behavioral scientists simply do not have firm answers to important questions. Adult developmental psychology and aging research are relatively new in comparison with other areas of emphasis and interest within psychology. There are special problems with regard to control and research methodology. Thus many of the most important findings have to do with the way in which research should be conducted rather than with firm generalizations about behavior.

Sometimes data do not support generalizations and conclusions that all scientists would like to be true. There is always a danger of selecting data that support personally or socially popular generalizations. If researchers have a genuine desire to use their knowledge to improve the quality of life, they must avoid that trap. It is wise to be most suspicious of the popular generalizations because they are rarely subjected to the same rigorous tests that are applied to unpopular generalizations.

The important thing is to avoid being blinded by belief or logic. Both help scientists to generate and pursue important hy-

potheses; neither guarantees truth. In the final analysis, truth is dictated by facts on hand. Facts are derived from scientific information. Science is not truth. It merely provides a set of useful rules for collecting facts.

As behavioral scientists and teachers, we have examined some of the many facts, and we have reached conclusions. We are human, and thus our conclusions are unavoidably influenced by our perspectives and personal philosophies; they are affected by our experiences with significant persons and events. You may not agree with some conclusions. Good. A healthy disrespect for the weight of authority, even scientific authority, is important if we are to continue to learn more about changes in behavior across the life span. There is nothing final about a conclusion. It represents a stepping-stone to further research. Therefore if you disagree with one or more conclusions reached in this book, go into the laboratory, into the field, to the library, and examine the issues with as much care and objectivity as is humanly possible. If you will do this and thus generate more valid conclusions, we have accomplished our objectives.

## PREFACE

This book was written to help fill a growing need for textbooks dealing with basic behavioral processes in adult development. Historically, developmental psychology curricula have concentrated on children. As late as 1970 a review of the literature on developmental psychology that appeared in the *Annual Review of Psychology* included major discussions on infancy, childhood, and adolescence, but no major section was devoted to either adult development or aging. Until recently only a few developmental textbooks have covered more than the lower end of the life span.

Sidney Pressey, an innovator in many fields of psychology, was one of the first authors dealing with adult development psychology. In collaboration with Janney and Kuhlen (1939) he wrote *Life: A Psychological Survey*. The literature on adult developmental psychology and aging has increased appreciably since Pressey and his colleagues wrote their life-span book, although texts in this area are few in number compared to the many texts that deal exclusively with the years from birth to young adulthood. Many new texts in adult psychology will emerge as behavioral scientists become increasingly aware that psychological development continues well past the time that biological growth has ceased. This year one of the first, if not the first book, in introductory psychology that includes a chapter on aging will be published (Weiner and Rundquist, 1977).

The present text is written with a life-span developmental perspective, although there is an emphasis on the latter portion of the hu-

man life span that is dictated by the paucity of literature for the middle years. Philosophically, we embrace the idea that developmental psychology does not constitute the study of infants, children, college students, or retired persons at a particular stage of their life. Rather, behavioral processes must be studied for the entire life span and for many species. If psychology is to qualify as one of the *life sciences*, it must deal with the phyletic and historical antecedents of behavior for the human species and it must be dynamic; that is, it must deal with a growing, developing, and ever-changing organism.

Our emphasis on what has been commonly referred to as "the aging literature" may seem a contradiction to the life-span philosophy we so strongly endorse. It has been forced by the sheer impossibility of adequately reviewing the literature relevant to the entire life span in a book designed for a semester course. In the last ten years the research literature on adult developmental psychology and gerontology has grown immensely. Thus texts are, of necessity, becoming increasingly specialized and must become increasingly selective with regard to the literature they cover.

Practical limitations on emphasis and scope present no major problem with regard to the learning of critical concepts. Critical concepts can be structured around a variety of emphases. In this book there is more of an experimental or research emphasis than that found in many of the early books on adult developmental psychology and aging. Many were oriented toward social gerontol-

ogy. Others were collections of generalizations with little reference to experimental methodology or specific experiments. Some dealt with life-span methodology in depth but provided little in the way of content in terms of specific studies. Nevertheless, they all furthered an understanding of adult development and aging because the authors approached the subject with a point of view that reflected their background and interests.

Our backgrounds include experimental and life-span developmental psychology, and we approach this book with that frame of reference. Experimental psychology is not a subdiscipline within psychology. Many areas of psychology are experimental in nature if one accepts a broad definition of experimentation as a systematic approach to the solution of a problem that embraces the concept of control. Experimental psychology is no more animal psychology or the psychology of perception than developmental psychology is the psychology of children. The experimental method is a tool for research. Development is a process. Aging is a natural consequence of growth, differentiation, and development.

Chapters 9 and 10 were prepared by Jeffrey W. Elias with final editing by M. F.

Elias for length and style consistency with other chapters in the book. Penelope K. Elias and M. F. Elias collaborated on the other chapters.

We would especially like to acknowledge certain people who directly contributed to this book: Mrs. Beverly J. Wood, who did most of the original artwork and cartoons and whose talent enabled her to execute these drawings, a task far beyond the limitations imposed by the right parietal areas of our respective right cerebral hemispheres; Dr. W. Gibson Wood for his help in the coordination of artwork; Drs. Jack Botwinick, Thomas Roderick, Kathleen Light, and Richard Sprott and many others who provided us with copies of their figures and permission to use them. We also thank those kind authors and publishers who gave us permission to use illustrations and quotes, and George and his friends who posed for the cartoons. Many thanks also go to Mrs. Nicole Maier for the endless hours spent typing the manuscript.

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## CONTENTS

- 1 Scope and orientation, 1
  - 2 Historical perspective: from decline to development, 3
  - 3 Developmental/experimental research methodology, 25
  - 4 Intelligence, 48
  - 5 Modifiers of intellectual performance, 74
  - 6 Motivation—drive, general activity, and incentive, 93
  - 7 Motivation—activity and disengagement in work, retirement, and leisure, 127
  - 8 Learning, 145
  - 9 Memory, 168
  - 10 Perception and psychomotor response, 182
  - 11 Hormones: elixirs of youth? 200
  - 12 Health and behavior, 221
  - 13 Genotype-environment interactions, 256
  - 14 Tools of the comparative behavior geneticist: answering how in developmental studies, 280
- References, 304**

## CHAPTER 1

# SCOPE AND ORIENTATION

To many students a book with an “experimental emphasis” promises endless summaries of experiments. This is neither the objective nor the format of this text. Rather, our objective is to impart knowledge of important methods for the study of adult developmental processes and important generalizations that have resulted from the application of experimental methods. We choose to build this knowledge within the concept of a topical organization that is familiar to the experimental psychologist. However, there is no neglect of the social aspect of adult development. New avenues of social-experimental research are suggested in hopes that they may complement research in naturalistic settings.

There is a greater emphasis on the animal literature than that which may be found in many adult development texts. This emphasis is not based on the intimate association of animals with experimental psychology. Rather, it is based on the potential value in allowing psychologists to study behavioral change over the entire life span of the animal in a very short time. One may do so in the context of designs that allow the manipulation of genetic factors and environment. However, the human literature remains the critical focus of discussion. The animal model serves when human data cannot be collected for ethical and moral reasons or when answers are not forthcoming from the human literature because manipulative strategies cannot be carried out or important life history variables cannot be controlled.

The second chapter deals with the history of psychology, not for the sake of history per

se, but to prepare the way for a better understanding of contemporary issues and attitudes toward older persons and aging research. When you read this chapter, you should get a better understanding of why developmental psychology was, and still is, used by many psychologists as a term that is synonymous with child psychology.

The third chapter discusses methods for life-span research. Research designs become much more complex when one studies changes in behavior over time or differences among persons of different ages. Adult developmental psychology is not merely the study of different age groups. Many of the acceptable designs for the study of behavior at a single time period are not acceptable for developmental research.

The most studied area of adult development, intelligence, is discussed in Chapter 4. Does it decline with age or is decline a methodological artifact? Do healthy persons show the same changes over time as do unhealthy persons? How do definitions of intelligence influence our thinking about decline as opposed to growth?

Chapter 5 examines the many factors that influence intelligence test scores and measures of learning ability. Here we grapple with the many factors that prevent us from obtaining a true picture of the intellectual capacity of persons at different stages of the life span.

Chapters 6 and 7 deal with perception, mental processing, and motor response in the context of experimental studies designed to answer which specific mental processes de-

cline and which remain stable or improve with increasing age. Here we focus on *input-throughput-output* concepts of information processing.

Chapter 8 discusses learning. There is considerable emphasis on the animal literature as it relates to learning across the life span. Limitations and advantages of animal models for life-span psychology are discussed. The literature on human learning is not neglected, since humans think and learn differently from animals by virtue of the ability to speak and communicate with words.

Motivational changes with advancing age are so important with respect to personal adjustment and the ability to survive and adapt to the environment that we devote Chapters 9 and 10 to this topic. Chapter 9 deals with motivation from the perspective provided by the experimental literature. Chapter 10 considers motivation in the social-molar sense, that is, it integrates the theme of "motivation" with studies of work, retirement, and leisure. It emphasizes the fact that important motivational variables at the human level are social in nature.

Chapter 11 deals with the emerging new field of behavioral endocrinology and aging. There is increasing evidence that changing patterns of hormone interaction with advancing age influence the behaviors of men and women. They can play a dramatic role in the onset of age-associated mental illnesses. Although the fountain of youth has not yet been discovered through the study of hormones, potential ways to improve the quality of life by alleviating symptoms of mental illness that accompany age-associated hormone imbalance have been discovered.

Chapter 12 considers the effect of physical

health and the biological systems on behavior. Nothing has emerged as a more critical topic in the literature on aging. It may well be that much of the decline in human abilities with age may be related to sickness, mental or physical, rather than decrements in the functioning of the brains of healthy persons with advancing age. This promises a brighter future as psychologists learn more about how to fight debilitating diseases of middle and old age.

Genetic and environmental interactions, as they influence behavior at various stages in the life span, are discussed in Chapter 13. This chapter does not presume that genetic factors control behavior. Genotype has no direct influence on behavior. It influences behavioral changes at various periods of the life cycle by virtue of its influence on the physiology of the organism. Paradoxically, the study of behavior genetics provides one of the most convincing arguments for the importance of environment. A truly life-span developmental psychology cannot ignore the influence of genotype on behavior across the life span. Development does not begin at birth; it begins at conception.

In Chapter 14 we introduce some of the behavior genetic methods available to comparative psychologists who may wish to make maximal use of animals and animal models in the study of *how* genotype influences behavior over the life span. A number of genetic tools are reviewed, and suggestions are made with regard to necessary genetic controls and manipulations for the investigation that utilizes genetic methods to create a physiological phenotype for purposes of study in a developmental context.

## HISTORICAL PERSPECTIVE

### from decline to development

It is tempting to skip a chapter on history. It would be a mistake to do so. This chapter sets the stage for the chapters that follow, and it establishes a historical framework for the student of adult development. A discipline can never be fully understood and appreciated unless one understands its history. In short, it is difficult to know where you are unless you know where you have been.

The history of adult development parallels the development of psychology in general. In some areas it has lagged behind, for example, language and cognitive development (see Riegel, 1973a). In other respects it has developed far ahead of other areas, for example, research designs that better enable measures of age changes as distinct from age differences (Riegel, 1973a). This is in part related to the fact that adult developmental psychology has not grown as a natural extension of child psychology.

Historically, the child psychologists have ignored the adult years as if they assume that development terminates at the end of adolescence (see Goulet and Baltes, 1970). Brackbill's (1971) survey of ninety-six four-year graduate training programs in developmental psychology revealed that only ten offered training in adulthood. On the other hand, many investigators who advocate a life-span approach to aging have neglected the early years of development in all but theoretical and methodological discussions. Ransom (1956) has provided data which indicate that one of the problems in establish-

ing a truly life-span approach to developmental psychology is related to the fact that the same investigators have not traditionally been involved in both child and adult developmental research. It is probably because of the different research interests of the child development and adult developmental psychologists that there have been so few developmental psychology texts that cover more than the periods of infancy, childhood, and adolescence.

Why have adult psychology and child psychology grown up in different ways and with different research emphases if adult and child psychology are both concerned with "developmental" processes? Why did child psychology develop first, more rapidly, and more fully in the United States than adult developmental psychology? Why has aging been described as a process of decline rather than development? To answer these questions, it is helpful to examine the influence of persons who helped create and promote these two areas of developmental psychology. It is also important to examine the social and political attitudes that existed during the various points in history when child psychology and adult psychology were developing.

Where does one begin such an examination? The obvious answer is to begin at the beginning, but it is really very difficult to know where the beginning is. In part, difficulty in marking the beginning of adult developmental psychology is related to the problems involved in establishing individuals

who may be credited with the first conception of an idea, a methodology, or data collection in a particular area of inquiry. Sometimes original ideas and concepts failed to gain recognition. In some instances they were not promoted. In others they were promoted at a time when society was not ready, for a variety of economic and ideological reasons, to accept or recognize them. Thus it is difficult to find agreement with regard to the criteria for describing who is a father or founder of a subject area. How did adult developmental psychology begin? Did it start with research in aging, with an official program, or with descriptions of the aging phenomenon?

### THE BEGINNING

Groffman (1970) traces the origins of adult developmental psychology descriptions and theories of adult development and aging in philosophy and literature in Europe, extending as far back as the Greeks and Romans. Apparently, the Greeks' concept of development was provided by Aristotle. Aristotle's concept was *teleological*. He conceived of development as movement from a lower to a higher level from birth *through the adult years*. Other references to adult development have been traced to the German philosophy of the eighteenth century as reflected in the novels and other literature of the time (Groffman, 1970).

### Tetens and life-span psychology

If science may be broadly defined as a *systematic approach to knowledge building*, the distinction of "father of adult developmental psychology and aging research" may well belong to J. N. Tetens (1736-1807). It was Tetens who first attempted to organize the European literature of his time into a publication that described the process of human development and change over the entire life span (Groffman, 1970).

Teten's book was philosophically oriented, and thus many of the propositions and generalizations put forth were not subject to experimentation and empirical test. Never-

theless, the book was of considerable value for two reasons. First, it represented one of the first, if not the first, comprehensive reviews of the current status of thinking about development across the life span. Second and more important, it anticipated the current emphasis on the life-span approach to the understanding of adult development and behavioral change.

*The life-span approach assumes that an understanding of behavior of any stage of development can be more fully appreciated by an understanding of the historical antecedents of that behavior.* Comparisons of behaviors at two different age groups provide a valuable description of age differences, but a complete understanding of how the behavior evolved can only result from the exploration of factors that contribute to age-related behavioral differences from the moment of conception. Although no single investigator can accomplish the enormous research task implied by the life-span approach, researchers working together to synthesize existing data and theories can provide a life-span account of behavioral processes. Tetens (1777) employed this strategy. However, his approach was historical and philosophical rather than empirical, in the sense of data collection.

### Quetelet: creativity and cross-sectional data collection

Adolph Quetelet (1796-1874), a Belgian statistician, is recognized as one of the first investigators to approach adult development and aging in a scientific manner (Birren, 1961). This distinction may well be deserved if science is defined in the conventional sense of data collection. Quetelet was clearly and unmistakably a scientist. He received the first doctorate in science from the University of Ghent in 1819 in mathematics, but like many of the early scientists, his interests extended far beyond one field. He was also a statistician, an astronomer, and had there been a discipline called psychology in the early nineteenth century, a social psychologist.

Quetelet was one of the first scientists to formulate quantitative methods for investigation of social phenomena as well as physical phenomena (Hankins, 1908, cited in Birren, 1961a). Most important, he combined his interest in social science with an interest in quantifying the changes that occur with advancing age. For example, he presented data relating the author's age to creativity in French and English drama (Birren, 1961a). This study was of great importance for two reasons: (1) it anticipated a later and more comprehensive study of creativity by Lehman in 1953; (2) its results emphasized the *developmental* aspect of adult aging rather than the *stagnation* view, which came to be popularized and perpetuated by misunderstanding and misuse of early testing results with adults. Quetelet presented evidence that dramatic talent in England and France began to develop after the twenty-first year, manifested itself between the ages of 25 and 35 years, and continued to increase vigorously until the age of 55 years. Only then is it characterized by gradual decline. In this early presentation of data, Quetelet makes an important point, which was emphasized many years later by Lorge (1936) and others (Riegel, 1973b)—whether one views adulthood as mental stagnation and the later years as abrupt mental decline depends partly on one's definition of mental ability and the choice of behaviors that are evaluated.

Quetelet was probably the first investigator to employ the *cross-sectional* method for empirical data collection, although Stern, an American statistician, has been credited as the first to actually use the term *cross-sectional* (Baltes and Goulet, 1970). Extensive use of the cross-sectional method has been forced on developmental psychologists by the inconvenient, but unavoidable, fact that investigators grow old at the same rate and sometimes faster than their human subjects. Of necessity, it has become an important tool in developmental psychology, particularly life-span developmental psychology, and thus it will be discussed in detail in

the following chapters. Briefly, in the *cross-sectional design*, data are collected from persons of different ages rather than following the same individual over a number of years, that is, the longitudinal approach. Cross-sectional data collection strategies are compromised because they deal with individuals who were born and reared at different points in history and thus differ in a variety of ways; for example, educational experiences, prenatal care, and diet. The *longitudinal approach*, or the collecting of data for the same persons over time, is confounded by educational, political, ideological, cultural, and other environmental changes as one grows older. Thus the cross-sectional approach attempts to measure *age differences*, whereas the longitudinal approach attempts to measure *age changes*. Neither approach does so in an absolute sense. Alternate designs and the methodological solutions will be discussed in detail in Chapter 3. Fortunately, Quetelet was aware of the fact that his cross-sectional data were influenced by sampling characteristics such as sex, geographical location, and socioeconomic status.

It is obvious from the foregoing material that Quetelet contributed significantly to the empirical science of adult development. In addition to his own contributions with regard to data collection across the life span, he had considerable influence on the work of quantitative social scientists who were to follow. Boring (1950:446-447) discusses this influence as it affected Francis Galton, another early social scientist.

### Galton: the index of correlation and eugenics

Galton (1822-1911) was a truly versatile scientist. He began his training in medicine in Birmingham as a result of his parents' wishes, and he received training in mathematics at Cambridge. When his father died, releasing him from his obligation to medicine, he traveled extensively and established such a reputation as a geographer that he was awarded a gold medal by the Royal Geo-

graphic Society in 1854. From an interest in geography, he moved into anthropology and the social sciences. Utilizing principles from Quetelet's earlier statistical work, he invented the index of correlation as a method of mathematically describing the relationship between two variables. Galton was not merely satisfied to develop statistical concepts. He was concerned with social conditions that existed in England, and he began to apply statistical concepts, measurement techniques, and experimental apparatus to the study of the aging process.

In 1879 he established the experimental psychology of adult development in Great Britain with the use of a whistle, which was placed on one end of a walking stick with a rubber bulb on the other end for its operation (Boring, 1950:485). Using this whistle, Galton made what is most likely the first report of decline in sensitivity to high-frequency tones in the elderly. As shall be seen in later chapters, experiments on hearing loss in the elderly have not, unfortunately, advanced much beyond this early psychophysical experiment.

In 1884 Galton opened a demonstrational Anthropometric Laboratory at the International Health Exhibition. The laboratory was utilized to collect cross-sectional data on 9,377 males and females ranging in age from 5 to 80 years. It is important to note that although Galton was concerned with mental functioning, he did not use paper-and-pencil tests. He believed strongly that "apparatus-tests" of sensory discrimination were a valid measure of intellectual functioning. Consequently, he used methods from the psychophysical laboratory for the collecting of data on individual differences in mental functioning. He was particularly ingenious with regard to the invention of psychophysical apparatus. He developed a pendulum device for measuring reaction time, an apparatus that measured speed of a blow struck with the arm, an instrument for measuring discrimination of color depth, visual acuity testing cards, a set of tools that were used for color discrimination, a bar that could be

extended at variable distances to estimate visual extension, a disc to test judgments of perpendicular, and a set of three weights, each to test muscular sense. Originally the weights were made of cartridge cases, but later they were placed on the market finished beautifully in brass. Perhaps this is why the term *brass instruments* came to be used to describe the apparatus used by experimental psychologists. It is important to remember that the early testing of individual differences in adults was done with brass instruments. When child psychology began to flourish in America, these techniques were inadequate and inappropriate for testing the kind of mental ability that was of interest to educators—ability that predicts success in school.

Galton's interest in the collecting of anthropometric and psychophysical data over a wide age range may not have been necessarily related to an interest in developmental processes, per se. A review of Galton's contribution in Boring's *A History of Experimental Psychology* (1950:482-484) leads us to believe that Galton's cross-sectional data collection was stimulated by his concept of eugenics. *Eugenics* was viewed as a *scientific means of improving the quality and fitness of the human race by artificial selection for superior persons*. This goal was to be accomplished by discouraging, or even forbidding, persons of inferior strength and ability to marry or copulate. Ever since its introduction by Galton, eugenics has been repugnant to most, but not all, social and natural scientists. The fundamental problem in Galton's time and now is that there is by no means agreement with regard to the appropriate array of characteristics possessed by the superior person (Elias, 1973). Galton's selection of physical and mental strength as qualities that the "fit" person must possess may have reflected the strong emphasis on competition that was stressed in the British philosophy, ideology, and economics of his time (see Riegel, 1973a). These philosophies may still have an influence on society's current attitudes toward the worth of elderly adults. Un-

fortunately, the early association of genetics with eugenics may have slowed the growth of behavior genetics, particularly the behavior genetics of life-span development (Elias, 1973). Nevertheless, data collection across the life span was undertaken to document a *hypothesized* deterioration in mental and physical strength with successive generations. To gather baseline data against which to compare the results of his proposed "genetic" selection procedure, it was necessary to collect cross-sectional data across the life span. He did, indeed, collect such data. The information that he amassed at the International Health Exhibition, and later in his laboratory in the South Kensington Museum in London, which was maintained for six years, was still being analyzed forty years after the laboratory closed (Birren, 1961a). Many of these data were reported in his book entitled *Inquiries Into Human Faculty and Its Development* (1883).

#### THE EARLY YEARS: 1875-1920

Before discussing the series of events following Galton, it will be helpful to discuss two approaches to the interpretation of history: (1) the *personalistic* and (2) the *naturalistic*. Boring (1950: 3-5) distinguishes between the two views. *The personalistic interpretation of history emphasizes the contribution of great persons. The opposing conception, the naturalistic interpretation, emphasizes the preparedness of society to accept certain changes.* Social attitudes and cultural conditions must be in a state of readiness in order to be receptive to ideas of great persons. Taken to an extreme, the naturalistic view of history sees persons as inflexible agents or symptoms of historical change. On the other hand, the personalistic view ignores the antecedents of great persons. Many times a long chain of research is begun and carried out by a great number of persons. Then one individual, capitalizing on groundwork by predecessors, puts the pieces together and takes credit for the ultimate scientific discovery. Nevertheless, the work of the persons before him and the readiness of

the times to accept the findings or theoretical formulation are essential to its success.

#### Galton's influence

A strictly personalistic approach might predict that Galton's extensive collection of cross-sectional data would have stimulated further work in aging in British universities and ultimately the rapid growth of adult developmental psychology in America. However, Galton's emphasis on data collection for all age groups did not stimulate an emphasis on adult development in either British or American universities in the early 1900s.

It may be helpful to adapt a naturalistic view to explain the sequence of events that retarded the growth of adult developmental psychology. First, at the turn of the century, Great Britain gave little support to the development of psychology within universities. Applied psychology in industry received far more support in Great Britain than academic psychology. Boring (1950:48) has commented that at the Oxford International Congress of Psychology in 1923 it was easier to find a British psychologist affiliated with a coal mine than with a psychological laboratory. Second, the slow growth of academic psychology meant that there were few university-based psychologists in Great Britain who would carry on Galton's interest in adult development and influence students. Galton did not educate graduate students who could continue his work with its emphasis on laboratory experimentation and cross-sectional data collection over the life span. In contrast, Willhelm Wundt, a German psychologist with a strong belief in general laws of behavior, provided formal training for many American psychologists, and his thinking had an immediate influence on their early expression of ideas about what psychology should be.

#### Wundt

Many American students traveled to Wundt's laboratory in Leipzig (formally founded in 1879). The movement to Leipzig did not reflect a desire to study abroad as



much as a need for formal graduate research training in experimental psychology. Aside from William James' single room for psychological experimentation at Harvard University in 1875, there were no formal psychology laboratories or departments in the United States until 1881, when one was established at Johns Hopkins University (Boring, 1950: 324). Thus an American student who wanted to take his Ph.D. in a viable laboratory had to travel to Germany to take it under "Professor Wundt." Many of the American psychologists who turned out to be the most highly influential in American psychology in the early 1900s (e.g., G. Stanley Hall, J. McKeen Cattell, E. W. Scripture, Frank Angell) took advantage of this opportunity.

How fortunate it might have been for the early advancement of adult developmental psychology if Wundt, like Galton, had been concerned with the study of individual differences. Wundt, however, considered them an annoyance. Boring (1950:533-539) tells us that Wundt wanted to study what were referred to as general laws of behavior in the adult. Galton's data revealed individual differences which varied in magnitude depending on age, but Wundt argued that both the aging phenomenon and individual differences phenomenon did not reflect the *normal* state of affairs, which was demonstrated only by using highly practiced subjects. In contrast, his American student, J. McKeen Cattell, took the position that individual differences were the normal state of affairs. Boring (1950:505) states that despite Cattell's interest in studying individual differences and his disagreement with Wundt over what constituted "normal behavior," the American psychologists, including Cattell, came back from Leipzig with a high degree of motivation to infuse Wundt's "new" experimental psychology into the American university system.

Thus at the beginning of the century the stage was set for the development of an American version of Wundt's brand of academic psychology, which was concentrated

on experimentation at one time period of adult life and thus was episodic rather than developmental in nature. The mature adult would be the prototype for infants, children, adolescents, and the elderly. This prediction is very reasonable within the context of a personalistic view of historical events. This is not what transpired, at least not for long.

To be sure, Wundt-like laboratories of "psychophysiology," concentrating on the "normal" adult, were established in American universities, but in a short time the psychology of children, spreading like wildfire in the United States, brought the laboratory psychologist into the field and the child into the laboratory. Furthermore, it fanned the flames of interest in individual differences, but with a new brand of mental measurement, which in a short period of time rejected the "brass instruments" of the psychophysiology laboratory for the paper-and-pencil tests. Child psychology continued to dominate American psychology through two world wars and to such an extent that one could only conclude from examining textbooks and published materials, as well as course curricula in American colleges and universities, that development ceases to occur after adolescence.

How could child psychology have had such an influence that it moved the laboratory psychologists away from the study of the "average" adult to the study of individual differences in children? One possible answer is that children made an excellent captive subject pool, once they were made available in the public school system. One cannot deny the tendency of the pragmatic American psychologist to fit the problem to the available subject population. Nevertheless, the convenience hypothesis is not entirely sufficient to explain the rapid development of child psychology laboratories in the early 1900s.

### Functionalism and G. Stanley Hall

Both Boring (1950:533-539) and Charles (1970:35) provide an interesting account of the interacting social and ideological forces,