

ZAICKOWSKY/ ZAICKOWSKY/ MARTINEK



GROWTH AND DEVELOPMENT

The child and physical activity

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GROWTH AND DEVELOPMENT

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To

Justin	Angela
Bryan	Tommy
	Anna

PREFACE

In writing *Growth and Development: The Child and Physical Activity* we have sought to provide a new dimension to the teaching of growth and development or "motor development" courses in professional physical education programs. Our experiences as students, teachers, and researchers have led us to believe that most schools of physical education in North America deal only with the physical or motor aspects of human development and leave the other domains to fragmented learning in other college courses or to chance. This statement can be supported merely by looking at the available texts in the area of child development. Those that are written by physical educators deal almost exclusively with *motor* development, while those written by general educators and psychologists deal almost exclusively with cognitive or social-psychological development, with perhaps a chapter set aside for physical-motor development. Most students of physical education fail to learn much about the cognitive and social-psychological development of children, and students in other disciplines fail to learn much about physical-motor development.

The plan of this text is to deal with child development in its totality. We see human development as a process in which psychomotor, cognitive, and affective or social-psychological factors all interact during a life span. Physical activity can have a profound effect on the development of these three domains at every stage of a youngster's development. For practical purposes the life span we have chosen to deal with in this book ranges from birth to adolescence, or that age period in which the parent and educator have the greatest influence. Since sex differences are an important aspect of child development and often interact with age, we

will devote considerable discussion to both age and sex differences. Most important, we will attempt to describe the effects physical activity has on the total development of boys and girls at the various stages of development.

This book has been written for undergraduate and graduate students who either aspire to or presently do work with children through the medium of physical activity. We hope, therefore, that the book will be helpful not only for students preparing for careers in physical education, but also for those in elementary and secondary teaching, recreation, child development, medicine, and the allied health professions.

This book has been divided into three parts representing the three domains of behavior. Part One deals with psychomotor development; Part Two, with cognitive development; and Part Three, with affective, or social-psychological, development. We begin each chapter with a theoretical overview of the topic, then describe age and sex differences, and finally discuss implications for physical education.

In each chapter we have described basic ideas and important research related to child development. We sought to cover major concepts while maintaining a balance among theory, research, and practical implications of developmental principles. Obviously it was not possible to cover every developmental concept within the three parts of this book. We trust that our selection fits your perceptions of important developmental concepts. We tried to communicate these concepts in a style that was readable and interesting for a diverse readership.

For those who are novices in the language of child development we hope that the Glossary will facilitate the learning of developmental

concepts. We also hope that the student projects at the ends of the chapters will foster an increased awareness of important concepts in child development.

Numerous people need to be thanked for helping to "pull off" this text. We would like to thank those individuals who made the initial reviews and offered recommendations. These include Drs. Elizabeth Umstead and Sandra Powers of the University of North Carolina at Greensboro, Dr. Arthur Miller of Boston University, and Dr. Koenraad Lindner of the University of Manitoba. Special thanks to Margaret

Read for writing the chapter on language development and to our patient and expert typists, Kathy and Linda. Finally, our deep appreciation goes to our families who were patient during the time it took to conceive and consummate this project and particularly to our children, who piqued our interest in the subject and to whom this book is dedicated.

Leonard D. Zaichkowsky
Linda B. Zaichkowsky
Thomas J. Martinek

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Chapter 1

INTRODUCTION



Tom Quimby

The study of child development is a relatively recent undertaking for many disciplines. Although the medical profession has been concerned with child development since the days of Hippocrates, little systematic research was conducted in the behavioral sciences until the early part of the twentieth century. At about that time psychologists became interested in studying the development of children, and as a result the 1920s and 1930s witnessed the publication of a wealth of normative data related to child development (Ames, 1937; Bayley, 1935; Gesell, 1928; Shirley, 1931). Since that time, however, many other disciplines such as sociology, anthropology, and education have realized the importance of studying the developing child from their own perspectives. Although Espenschade published work as early as 1940, physical educationists have only recently demonstrated a concerted effort to study the child. This evidence is exemplified by the increasing number of research articles and symposia, textbooks, and college courses dealing with child development.

Although progress is being made in teaching physical education students about child development, all too often the curriculum is concerned only with motor development. Child development is more than this; it also encompasses the cognitive or intellectual, as well as the social-psychological, development of the child. The latter two domains, often referred to as cognitive and affective, are generally taught in courses offered in psychology departments. This separation is most unfortunate, since this categorization has been constructed simply for the convenience of discussion and writing and is not due to a real, distinct separation of the domains. In reality these domains of behavior are intricately related and affect or interact with each other. Concentrating attention on only one aspect of development to the exclusion of the others is a serious mistake. This is particularly true for students who are learning about child development for the first time. Studying development in fragments produces a distorted picture of the developmental process.

This text attempts to amend existing practices in teaching about child development, particularly for those students studying movement be-

havior. How children develop in the three domains and how physical activity or movement experiences contribute to the developing child will be described and explained.

The thrust of this introductory chapter will be to describe the process of studying *total development*; provide some working *definitions* of terms commonly used in child development, a discussion of the more common *theories* of child development, and an explanation about the *methods of studying* child development; and discuss the *importance of studying* child development. An effort will be made to depart from the traditional encyclopedic text and be as informal as possible.

UNITS OF STUDY IN CHILD DEVELOPMENT

As mentioned earlier the area of study of child development is relatively new. Although young, the field has undergone tremendous change during the past decade. It is characterized today by a broadening in focus, from a local and regional focus to a *cross-cultural* one. Further, rather than using a single disciplinary approach (for example, psychology), the trend today is to use a *multidisciplinary* approach, that is, combining the efforts of sociology, anthropology, psychology, education, and medicine. Another significant trend today is to stress *experimental* studies rather than relying heavily on observational and descriptive studies in order to explain why certain changes occur.

Studies in child development differ considerably in terms of their focus; that is, researchers differ with respect to the domains, ages, and perhaps sex studied, as well as the method used to study the behavioral phenomena. The specific focus is generally dictated by the investigator's interest and expertise.

It was mentioned earlier that three domains have been conceptualized to deal with the complexities of human behavior. These include the cognitive, affective, and psychomotor. Generally writers about human behavior refer to the above classification; however, there are sometimes differences in words (for example, social-psychological for affective and physical-motor for psychomotor), and some writers use a fourth category. This fourth category adds the social

Table 1-1. Major developmental domains used in child development

Domain	Examples of types of behavior included
Cognitive (intellectual)*	Thought processes, language, memory
Affective (social-psychological)	Feelings, emotions
Social	Effect of society, institutions, groups
Psychomotor (physical-motor, biological)	Biological and motor processes

*Names in parentheses refer to alternative labels used in classification.

domain to the other three (Singer and Dick, 1974). The choice of classification lies in the author's particular preference and should not be interpreted as being a meaningful distinction, since the classification is used merely to facilitate communication about complex behavior. Table 1-1 shows the classifications.

In dealing with child development this text

will use the domain classifications of psychomotor, cognitive, and affective to be consistent with predominant usage. Periodically there will be references to social-psychological development instead of affective because there are occasions when social-psychological is more descriptive of the characteristics being discussed. Once again it should be stressed that these three domains *interact* in the development of the child; that is, they do not operate independently in a vacuum. Fig. 1-1 illustrates our conception of the interactive influence of the domains of behavior on child development.

It has been customary to describe *age-related changes* in development by using stages rather than specific ages. Table 1-2 provides the names of the various stages typically used in human development (from conception to death), as well as the approximate age range of each stage. Since this text is concerned with child development, those stages dealt with will be infancy through adolescence. One exception will be Chapter 2, where there is an overview of prenatal development.

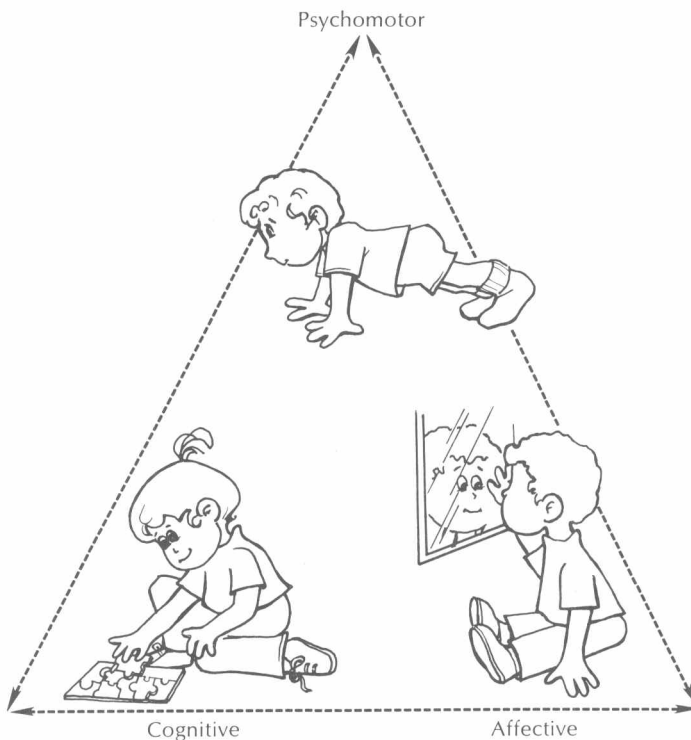


Fig. 1-1. Schematic illustration of interaction between domains of behavior.

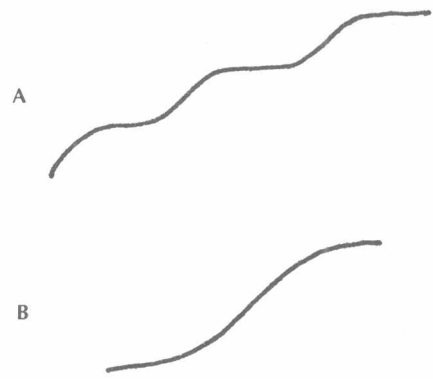
Table 1-2. Stages used in human development

Name of stage	Approximate age range
1. Prenatal	Conception to birth
2. Infant	Birth to 2 years
3. Early childhood	2 to 5 years
4. Late childhood	5 to 10 years
5. Adolescent	10 to 18 years
6. Adult	18 to 40 years
7. Middle age	40 to 60 years
8. Old age	60 years and over

A note on the use of stages in this book is in order here since the word has several connotations. Stage theory is used simply to provide suitable age categories in describing the development of children, and it is not advocated as a theory concerning the course of development. In developmental psychology "stage theory versus sequential theory" is a constant source of debate between theoreticians because they represent contrasting views on the nature of development. Proponents of stage theory say that the course of development is segmented, or divided into stages. At each stage new abilities appear. It is generally thought that later stages evolve from preceding ones and that all children go through these stages in the same order, although the rate of progression may differ. Stage theory could be represented by curve *A* shown in Fig. 1-2. Other theoreticians see children developing in a continuous manner by gradual increments. They fail to recognize the existence of definable stages. This view may be represented by curve *B* shown in Fig. 1-2.

In studying child development, researchers in addition to being concerned with age-related changes are concerned with possible *sex differences*. That is, they will ask questions like, Do boys and girls develop differently with respect to specific skills in the three domains? Do they develop at different rates? Is there a possible *interaction* between sex, age, and the various domains in the development of certain behaviors? Our conception of this relationship is shown in Fig. 1-3.

The word interaction has been mentioned before, and since it has a number of different

**Fig. 1-2.** Curve *A* represents stage theory; curve *B* represents theoretical position that growth is continuous and gradual.

meanings, its various definitions should be clarified. In layman's language interaction usually refers to communicative interaction, for example, we are having an interaction with you. As used in the earlier paragraph interaction meant that several factors combined their influences in affecting behavior. Specifically it was said that the three domains of behavior interacted in the development of human behavior. But suppose we made the statement, "Growth is influenced by several interacting forces." What is being said is that growth may be determined by heredity, nutrition, and exercise, among other factors. The extent of each contribution, however, is unknown. All that is known is that heredity, nutrition, and exercise contribute to growth in some unique pattern.

In speaking of age and sex interactions, it is meant that differences between boys and girls (in physical development or some performance measure) depend upon age. The data in Fig. 1-4 (Hunsicker and Reiff, 1966) show that for the 50-yard dash, boys at 10 years run the distance in 8.3 seconds, while girls at that age run the distance in 8.5 seconds. These values are quite close and for practical purposes could be considered equal. However, at 15 years of age the boys run the distance in 6.9 seconds, while the girls have a time of 8.3 seconds, a substantial difference. Here sex most likely interacts with age, or boys perform better than girls on the 50-yard dash, but *it depends* upon the age. At 10 years they are virtually the same, but at 15 years the difference favors the boys.

The units of study in child development are therefore numerous. Besides the study of age-

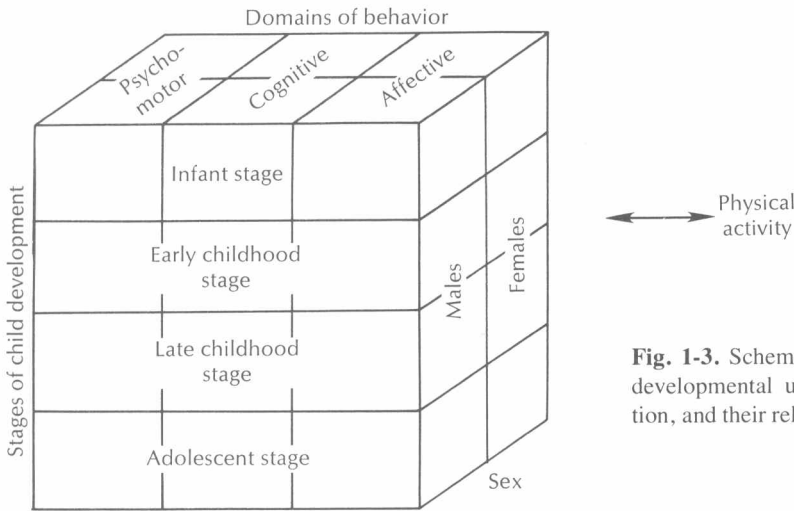


Fig. 1-3. Schematic illustration of significant developmental units of study, their interaction, and their relationship to physical activity.

related changes, scientists may be interested in investigating possible sex differences and quite likely restrict themselves to a particular domain of behavior. The concern in this text is with age and sex differences across all three domains and, most importantly, with how physical activity influences these three factors (age, sex, domains). As Fig. 1-3 illustrates, it is also quite possible that these factors influence one's participation and performance in physical activity.

LANGUAGE OF CHILD DEVELOPMENT

Whenever students are introduced to new subject matter, they usually have the problem of having to learn the vocabulary associated with it. This is true for every specialized field, whether it be medicine, law, agriculture, sports, or child development. Reference has already been made to some important concepts, such as domains of behavior and interaction. Here are some other basic terms and concepts used in child development.

Development is the product of growth, maturation, heredity, and learning.

Maturation refers to changes in body size, shape, and skill throughout a life span. In its pure form maturation determines development without any external influences, such as learning. However, we should point out that there are few cases of pure maturational influences in development. In reality, learning or environmental effects interact with maturation in the

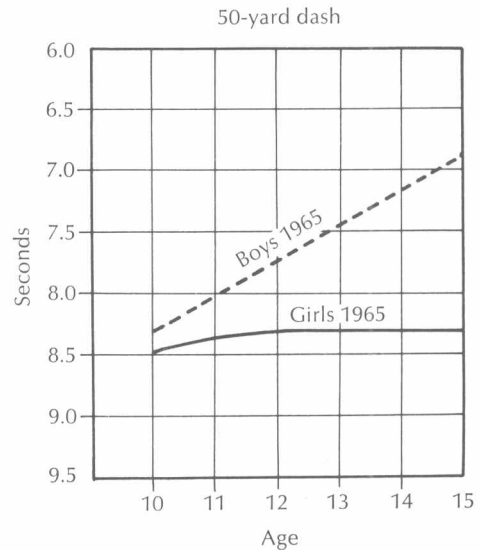


Fig. 1-4. Example of possible interaction between age and sex in motor performance.

development of a child. Probably the closest pure form of maturational effects occurs when the fetus grows in the mother's womb.

Growth is oftentimes used synonymously with maturation; however, they do not mean exactly the same thing. Growth refers to observable step-by-step change in quantity, such as body size. Arms get bigger (growth), and there is growth in skill or even vocabulary. These changes may be due to maturation, but not necessarily. Other effects such as exercise and diet may serve to increase arm size, and

learning probably produces the growth in vocabulary.

Heredity refers to a set of qualities that are fixed at birth and hence predetermine certain individual characteristics. Every normal human body is made up of 46 chromosomes arranged in 23 pairs. These chromosomes in turn are made up of thousands of genes that serve to determine eye color, amount of hair, intelligence, personality, and so forth. Heredity thus accounts for many individual traits and characteristics. However, it is also true that these traits and characteristics are modified by the environment. For example, body build is determined by and large by heredity, but it is possible to effect change in this predisposition by working with weights, using steroids, and eating specific diets. Similarly, intelligence is developed by environmental factors interacting with heredity (although there are some who believe intelligence is almost exclusively determined by heredity).

Environmental effects. It has been suggested thus far that development is often influenced by the interaction of heredity and environmental factors. What are these factors? They can perhaps be highlighted by asking the following questions: What are the effects of raising a child in a poverty environment? How does a poor diet affect the physical development of a child? What is the effect of growing up in an environment where the mother and father are professional athletes? Research based on these questions has given some definite information about environmental effects. That is, it is known that a poverty environment and a poor diet can retard development. Similarly, growing up in an athletic environment will probably predispose a child to athletic endeavors.

Although the environment affects development in several ways, its principal effect is through its influence on the *learning* that takes place within each child. Learning is described as a relatively permanent change in the behavior of an individual. Thus, behavioral changes due to disease, drugs, fatigue, and the like are excluded from learned behavior. Following is an example in which learning takes place in the environment. Children learn to throw a ball at a relatively young age (about 2 years). It is true

that the child must possess enough physical maturity to execute the throwing response, but by and large the skill is learned. How? The process is quite complex; however, it could be a result of specific experiences that involve observation (modeling) of another person throwing and positive reinforcement when an object is thrown, for example, “good girl” or “good boy” by a parent, or simply the intrinsic reward of feeling and seeing the ball thrown.

The above terms are but a small number in the vocabulary of developmentalists. When important new terms emerge in subsequent chapters, they will be defined. There is also a glossary at the end of the text (Appendix B).

THEORY IN CHILD DEVELOPMENT

According to Mandler and Kessen, “Theories are sets of statements, understandable to others, which make predictions about empirical events” (Mandler and Kessen, 1959, p. 142). To add to this definition it might be said that theory is usually a summary of known “facts” and conjecture that serves to organize large amounts of information in a meaningful way. It would be chaotic and most frustrating if there were no theory to explain a variety of human behaviors. If a theory was lacking, it would be necessary to constantly describe the many small events that make up behavior. A further function of theory is that it guides additional research. Thus it is possible to gather empirical data that support the theory, suggest modifications of it, or even reject it.

A number of theoretical positions about the development of behavior have been postulated. Five major theoretical views of development will be discussed: the maturational, the cognitive, the psychoanalytic, the humanistic, and the behavioral or learning theory. It is rare that any one theory is accepted by everyone, since in one way or another a given theory is incomplete. This “incompleteness” is due primarily to the desire of the theorist to explain a slightly different facet of child development. For example, psychoanalytic theory concerns itself with the development of personality (primarily), whereas cognitive theory attempts to provide explanatory principles for the development of thinking. Nonetheless, it is important that stu-

dents of child development be cognizant of the existing theories and their interrelationships so that they can formulate their own perspectives.

Maturational theory

Although maturational theory is not widely accepted today, brief mention of it will be made mainly because it played a significant role in the evolution of the study of child development. In the 1930s Gesell at Yale University advanced his theory of development, which emphasized the role of maturation. Although he recognized that a child's behavior is affected by experience, he argued that a child's development is determined biologically.

Gesell's work prompted a great deal of "normative-descriptive" research. That is, numerous children were observed and assessed during their early years, and from these data developmental norms were established. Thus, although maturational theory receives little support today, it has made a significant contribution to child psychology in that much of the knowledge about early motor skill development comes from research that dealt with maturational theory.

Cognitive theory

Cognitive psychologists who conduct developmental research are primarily interested in the development of intelligence, thinking, and language. In essence their interest focuses on the cognitive section of Fig. 1-1. There is no argument that Piaget is the one researcher who has made the greatest contribution to understanding cognitive development in children. Although Piaget (1952) has been conducting research and writing about child development since the 1920s, it is only recently that North American psychologists have accepted this Swiss psychologist's work. The reason his work was initially frowned upon was that he failed to use methods of "scientific research" that followed an experimental model. Rather, Piaget developed much of his theory from *observing* children. In recent years, however, verification of Piaget's work has been done using experimental methods.

Basically Piaget concerns himself with explaining similarities among children rather than

individual differences. He points out that children throughout the world go through the same stages of developing solutions to cognitive problems. Piaget believes that this discovery of solutions occurs largely because of the child's interaction with the environment. Further, according to Piaget, the child is not a passive recipient of events in the environment; rather, the child seeks out experiences. Although Piaget does not downplay the significance of maturation in cognitive development, he does not view all of development as an unfolding of biological processes.

Piaget's views of the developing child have had a significant impact on contemporary research in child development from both a theoretical and practical perspective. For instance, Bruner and others (1966) have made important theoretical contributions that stemmed from Piaget's early work, and Kohlberg (1964) has relied heavily on Piagetian theory to explain moral development in children. From a practical standpoint Piagetian theory has had a significant effect on teaching styles in the classroom. Piaget's emphasis on informal, experiential learning has led to a deemphasis of highly structured, didactic approaches to teaching in many contemporary classrooms. The cognitive theory of Jean Piaget will be discussed in depth in Chapter 6.

Psychoanalytic theory

Psychoanalytic theory concerns itself primarily with explaining the development of personality and changes in interpersonal relationships. The developer of this theory was Sigmund Freud, an Austrian psychiatrist; however, others such as Erik Erikson and Anna Freud have built upon Freud's initial theory. The basic concepts associated with psychoanalytic theory include Freud's personality structure of the *id* (unconscious impulses), *ego* (conscious thinking process), and *superego* (conscious associated with values), as well as stages of development including oral, anal, phallic, latency, adolescence, and maturity.

Freud's interest centered on abnormal functioning in adults, so his theory was concerned with explaining various ways in which these abnormalities could arise. In Freud's view per-

sonality followed a fixed developmental pattern with stages brought about in part by maturational changes in the body. Freud believed that the critical factors in the development of a healthy personality were the type of treatment a child received at each stage in development and the type of relationship the child had with the mother.

Erikson (1963) extended Freud's work by proposing eight stages (from birth to death) in the development of personality. Erikson suggests that during each of these stages the individual must resolve an emotional or interpersonal problem. For example, in stage 1 the basic issue is whether the child will develop a sense of trust or mistrust. According to Erikson this development will depend upon the kind of relationship the child has with parents and other adults. The resolution of the conflicts in stage 1 in turn affects the outcomes of the subsequent stages of development.

Psychoanalytic theory has received considerable criticism from its nonproponents mainly because the concepts associated with it are difficult to objectify and as a result are not easily subjected to scientific inquiry. On the other hand, psychoanalytic theory has made significant contributions to knowledge in child development. In addition the theory helped explain that what happens early in life is of utmost importance for the development of a healthy personality. Relationships with parents and significant others help determine ego (self-concept) and superego (conscience).

Humanistic theory

Humanistic psychology is a rather recent theoretical development in psychology. It basically developed from the work of Maslow (1968) and Rogers (1951), who felt that many psychological processes could not be adequately explained either by psychoanalytic theory or learning theory. Included in the list of unexplainable processes were creativity, love, self-concept, autonomy, and identity.

The core feature of humanism is that it is concerned with affection for mankind, man's dignity, man's mental health, respect for individuality, and an intense interest in man's behavior as a human being. It may also be said that hu-

manists are primarily *process* oriented rather than *product* oriented. That is, although they are concerned with the attainment of a goal (product), what matters most is the manner (process) in which they achieve that goal.

Although humanistic psychology is a rather new force, it has produced interesting practical changes in both psychology and education. In psychology humanism brought about new forms of therapy, both individual and group. Further, there has been a shift from animal experimentation and experimentation with pathological subjects to experimentation with "normal, healthy" individuals. This experimentation is also different from that of the behaviorists because the focus in humanism is more on the individual than on average group performance.

Behavioral or learning theory

Learning theory states that all human behavior is governed by laws and therefore can be predicted and controlled. Much of the groundwork for learning theory goes back to the early 1900s; however, the development of concepts used in discussions of modern-day learning theory can be attributed largely to the work of Skinner. Skinner developed what is known as the operant conditioning model for describing human behavior. Operant conditioning basically says that human behavior is under the control of environmental reinforcers (both primary and secondary) and that human behavior can be altered by controlling the type and amount of reinforcement an individual receives.

Several theorists from the learning theory school have focused their attention on child development. Some of these include Bijou and Baer (1961), who use the operant conditioning paradigm to explain behavior in children; Sears and co-workers (1957), who use learning theory principles to account for the development of aggression and dependency in children; and Bandura (1962), who argues on behalf of observational learning. According to Bandura virtually all of what children learn comes from observing others.

Although each learning theorist has somewhat different perspectives on the development of behavior, they have many elements in common. First, they use well-established principles