

---

# Pro Rege

---

---

Volume 13 | Number 1

Article 2

---

September 1984

## Developmental Considerations for a Theory of Instruction

Ken Bussema

*Dordt College*

Follow this and additional works at: [https://digitalcollections.dordt.edu/pro\\_rege](https://digitalcollections.dordt.edu/pro_rege)



Part of the [Christianity Commons](#), and the [Educational Psychology Commons](#)

---

### Recommended Citation

Bussema, Ken (1984) "Developmental Considerations for a Theory of Instruction," *Pro Rege*: Vol. 13: No. 1, 2 - 16.

Available at: [https://digitalcollections.dordt.edu/pro\\_rege/vol13/iss1/2](https://digitalcollections.dordt.edu/pro_rege/vol13/iss1/2)

This Feature Article is brought to you for free and open access by the University Publications at Dordt Digital Collections. It has been accepted for inclusion in Pro Rege by an authorized administrator of Dordt Digital Collections. For more information, please contact [ingrid.mulder@dordt.edu](mailto:ingrid.mulder@dordt.edu).

# Developmental Considerations For A Theory Of Instruction

Kenneth Bussema  
Professor of Psychology



*Ken Bussema received the Ed.D. in Counseling Psychology from Northern Arizona University. Prior to his appointment to the Dordt faculty in 1974, Dr. Bussema served as a Counselor for the Bureau of Indian Affairs in Shonto, Arizona.*

Instructional theory, to be complete must address not only questions regarding pedagogy, curriculum, and educational objectives but also questions regarding the nature of the learner, the nature of learning, and the interpersonal context in which education occurs. Developmental psychology, with its focus on the qualitative and quantitative changes that occur within the individual from conception through old age, can provide valuable insights toward the shaping of an instructional theory, for it deals directly with the questions regarding the nature of the child, particularly in terms of the growth and development of the child's mind. Although the association of

educational theory and developmental theory is less direct regarding the dynamics of the learning context, a developmental understanding of the growth of self-understanding and social cognition can provide a framework from which to view the interpersonal context of learning-education. An understanding of developmental process involved in the child's formation of his self-concept can aid in understanding the child's growing understanding of the world. In this paper I will try to sketch a developmental understanding of these two developmental themes—cognitive development and the development of the self-concept—and discuss the implications for working towards

a Christian theory of instruction.

Before dealing directly with these two developmental themes, I will list some basic assumptions regarding a biblical view of the child to provide a framework from which to evaluate current developmental thinking. Fennema (1980), in his very helpful text, *Nurturing Children in the Lord*, begins his analysis of a biblical approach to discipline by specifying what he feels are the necessary implications of seeing the child as created by God. A biblical understanding of the child demands that we see the child as totally religious, relationally defined as an image bearer, uniquely created, and functionally whole. We must also view the child as rational, that is, "seeking a logical and orderly environment within which to live" (Fennema, 1980), as well as an active creative agent, accountable for his actions and choices, and suffering from the brokenness of the Fall. These descriptions along with others suggested by Fennema (1980) provide a foundation for the developmentalist; however, they provide a relatively static view of childhood and need to be amplified to help shape our understanding of the dynamic process of development.

A fundamental principle of development is that it is structured. The concept of structure operates on a number of levels. A structural view of development is perhaps most clearly seen at the genetic and physiological level. Genetically, development follows a very broad and comprehensive blueprint which influences in direct and subtle ways many aspects of the person ranging from intellectual capacity to personality dimensions. Physiological structure is operative in the development of the organs and systems of the body as well as in determining the pattern and sequence of motor development. A structural view also implies that development unfolds in certain prescribed sequences or stages, with certain skills or capabilities maturing and laying the foundation for further refinements and new capabilities to develop.

Structure in this sense follows what is

generally called the epigenetic principle (Lerner, 1976). This principle suggests that whenever development occurs, this development follows a predetermined ground plan in which certain systems or characteristics come to the foreground at various times followed by other characteristics building on the existing structures. The implications of this epigenetic view of development is that development can be properly understood only if one is aware of the context and characteristics of a particular developmental period. Thus to comprehend the development of the child's mind one must appreciate the peculiar qualities of the child's cognitive abilities at various ages or stages. Further, this view implies that the quality of development at any point is influenced by the quality of prior skill development, and that interference or disruptions in development can adversely affect later progress.

A final way in which development is structured is that it is governed or directed by certain universal principles. These principles are most clearly articulated in the area of cognitive development in the work of Piaget and for development in general in Hans Werner's orthogenetic principle. Piaget suggests that development follows the basic biological principles of assimilation and accommodation. Working from a biological model, Piaget defines assimilation as the process of interpreting new experiences in terms of preexisting ideas, a process parallel to the body's taking in nourishment. Accommodation, defined as the changing of an idea or of an internal structure to correspond with experiences, parallels the biological process of adaptation to the environment. Like Piaget, Werner, also working from a biological-evolutionary base, suggests that the basic characteristic of development reflects the processes of prenatal development. His orthogenetic principle states:

whenever development occurs, it proceeds from a state of relative globality and lack of differentiation

to a state of increasing differentiation, articulation, and hierarchic integration. (Werner, 1957 cited in Lerner, 1976)

These structural-governing principles of assimilation and accommodation and the orthogenetic principle form the basis for what has come to be known as the structural-developmental perspective. This perspective has proved to be an extremely useful influential model as can be seen in the work of theorists such as Piaget, Kohlberg, Flavell, Kagan, and Fowler. Adopting a structural developmental perspective seems helpful in formulating both developmental and instructional models. This can be done without necessarily reverting to the reduction of the basis for a structural view to a biological or evolutionary basis as Piaget and Werner have done. The principles of differentiation and integration can be seen as normative in their own right.

A second basic assumption regarding the development of a person that follows from a biblical view of human nature as well as a position predominant in developmental psychology from an empirical standpoint is that development is an interactive process. Stemming from the classic debate of nature vs. nurture, from the rejection of the early, simplistic behavioral idea of the passivity of man, and from the necessary assumption of viewing the child as accountable for his actions, is the view that the child actively participates in his own development. An interactionistic position implies that it is through the process of a person interacting with an environment or structure interacting with experience that development or change occurs.

This position also implies that the context in which development or learning occurs is an essential component. People are not autonomous; their growth, development, and well-being are intricately tied up with a multiplicity of interacting factors. One cannot assume that the child comes into the world with all the basic equipment necessary

and that development follows independent of other persons, environment, or experience, or that the child comes into the world as a blank slate upon which experience writes. The child's development incorporates both the maturation of inborn capabilities and structures and the dynamic influence of environment. Instructional theory must be built on a basic understanding of the child's capacities and the types of environments that foster healthy development.

Related to and implied in the interactionist assumption is the crucially important notion that man is a relationally defined creature. Perhaps the most important components of the context in which the development occurs are the persons with whom the child interacts. All aspects of a child's development, physical through emotional, are intricately tied up with interaction with others. The child's view of himself or herself, others, and the world at large is tremendously influenced by relationships with others. Further, from a biblical perspective the importance of relationships is made even richer and more inclusive when one considers the relationship between human beings and God on which their very existence depends.

Building on these assumptions of the structured, the interactive, and the relational qualities of development is the view that human beings are cognitive creatures. Cognitive, not merely in the sense that they are rational or capable of reason and logic, but in the sense that they operate out of a context in which they are continuously in the process of trying to make sense out of their existence. Such a cognitive view of human nature has a rich history in psychology and is currently becoming one of its major models. Kagan notes that "Cognitive processes seem to many psychologists to provide the central perspective from which the changing patterns of behaviors, motives, and affect should be viewed" (Kagan, 1976).

For our purposes in this discussion the assumption that the child is a "cognitive system" (Flavell, 1980) implies that the child is predisposed to formulate a logical, orderly

view of reality. All of the individual's thoughts, behaviors, affect, and motives flow from his developing view of reality. The child is seen as a purposive creature who tries to make sense out of his existence. Development then, in a sense, is the process through which the child comes to formulate this cognitive system or world-view. Taking this cognitive view of the child's development provides a useful bridge with which developmental theory and instructional theory can be interrelated.

In his analysis of nature and goals of the educational process from a Christian perspective, L. Reynolds (1979) suggests that the proper goal for education would be "that education should result in a more meaningful existence for those being educated." Recognizing that the notion of "meaningful existence" can be defined in a variety of ways, Reynolds suggests that "meaningful existence . . . would be man acting in such a way that would positively enhance the four relationships [self-others-world-God] in which he is inescapably involved." Education viewed in this manner correlates nicely with the developmental model that focuses on the child's formation of a cognitive system from which he or she attempts to make sense of his existence, determine actions, goals and feelings, and meet basic needs.

Furthermore, viewing both education and development in the context of man's defining relationships provides a means of overcoming a fundamental limitation of most development theories. Developmentalists have worked hard at discussing the process of development, but have often ignored motivational questions. Theories of cognitive development rely on a general disposition inherent in human nature that presses people toward making sense out of their experience; however, the goal of this process seems to be limited to striving for a more complete or internally consistent cognitive system. Such a view misses the fundamental religious nature of human beings, failing to recognize that their

meaning, purpose and direction in life is in obedient or disobedient response to the Author and Creator of all of life. Defining "meaningful existence" in the context of defining relationships allows us to incorporate the fundamental reason for our being as well as a basis from which to evaluate the validity of our world-and-life view.

Working from a cognitive view of development and the understanding of the goal of education to be the enhancement of the child's understanding of his or her existence within the context of his or her response to our Creator God, I will try to sketch an understanding of the process of cognitive development and the child's formation of a self-concept. With this understanding of development the educator can be better equipped to work toward the enhancement of the child's "meaningful existence" through the instructional process.

### Cognitive Development

Basic to an understanding of the process of cognitive development is the understanding of the meaning of the term cognition. This term should not be narrowly interpreted as intelligence or higher mental processes. Cognition refers to

the processes involved in the extraction of information from both the outside world and the internal environment, the application of existing knowledge to the construction of initial representations, the storage and retrieval of that information, the integration of new with old structures, the application of structures to deal with problems, and, most important the creation of new knowledge. (Kagan, 1976)

Cognitive development then involves the study of knowledge and the mental processes involved in its acquisition and utilization (Elkind, 1967). It's unfortunate that many psychologists and educators who make use

of cognitive developmental ideas often neglect the epistemological assumptions underlying these developmental theories. Piaget is unquestionably the dominant cognitive theorist and his theories have found a broad audience. Even in those attempts by Christians to formulate a developmental perspective, (e.g., Wilcox, 1979; or Cully, 1979) many have accepted Piaget without question. While it is true that Piaget has made a significant contribution, if we are to succeed in articulating a theory of instruction informed by a Christian developmental perspective, we must examine more closely Piaget's view of cognitive development. In the following section I will try to summarize Piaget's work, offer some critical comments, and then outline an approach to cognitive development more consistent with a biblical view of the child and adequate to handle the recent data on the infant's and child's cognitive processes.

To begin with, a correct understanding of Piaget must not underestimate the strong biological basis underlying his assessment of cognitive development (Lerner, 1976). To Piaget, cognition is merely another instance of a biological system which like all biological systems operates according to two invariant laws—organization and adaptation. Organizationally Piaget insists that cognitive development is a structured process with structural changes occurring in an invariantly prescribed order. The construct of schemata and Piaget's well-known four stages of cognitive development are illustrative of his notion of organization. Piaget's universal laws of adaptation play a more direct role in cognitive development. Working from an evolutionary, interactionistic position, he saw the foundation of all knowledge and the process of coming to know as rooted in action—action of the individual on environment and conversely the environment's action of the individual (Lerner, 1976).

The impact of these person-environment transactions are explained by Piaget's com-

plementary adaptive principles of assimilation and accommodation. The child's early cognitive development stems from the early actions or reflexes he or she is capable of performing on the environment, and the gradual adjustment of these actions or reflexes to better correspond with the environment. This seesaw process of assimilation and accommodation does not occur haphazardly. Piaget postulates a further fundamental factor in development which he calls equilibration, a concept similar to the biological notion of homeostasis. "Cognitive adaptation like its biological counterpart consists of an equilibrium between assimilation and accommodation but we must strongly emphasize the fact that accommodation does not exist without simultaneous assimilation" (Piaget, 1970). Hence for Piaget a balance must be struck between these two adaptive tendencies; for every assimilation there must be a corresponding accommodation.

In essence, Piaget proposes that there is a general biologically based adaptive tendency that applies to the organism throughout its development. This factor—equilibration—is the moving force behind all cognitive development. There must be a balance between subject and object, between assimilation and accommodation. Whenever the organism alters the environment to incorporate it into its already existing internal structure there must also be a compensatory alteration of the organism's structure to match the objects in its external environment. There must be a balance in action—the basis of all knowledge—between the organism and its environment." (Lerner, 1976)

Arguing that cognitive development tends to move toward a balance of assimilation and accommodation, Piaget is faced with the question of why does development continue? Drawing again from biology, Piaget

suggests that cognition as a biological system is similar to digestion which continues to digest or in this case to assimilate. Piaget suggested that any cognitive structure developed through assimilation will continue assimilating, a process he calls functional-reproductive assimilation. And as we are aware biologically, even after a large meal we do get hungry once again; thus cognitive disequilibrium occurs requiring further adaptive accommodation. This movement from assimilation to accommodation resulting in equilibrium followed by continued assimilation which results in disequilibrium which requires additional accommodation provides the basic framework

tured as entering the world with only the capability of producing reflex actions. These reflexes through an intricate dance with the environment are slowly developing into mental representations of the self, others, and the environment, a process that takes up the first two years of life. Moving through six substages the infant develops a series of "circular reactions" which eventually differentiate the body from the rest of the world, and increasingly explore the environment.

A major cognitive acquisition of the period is the infant's grasping of object permanence, recognizing that objects exist independent of their perception of them. The

### **Despite Piaget's widespread acceptance and general recognition of some of the valuable insights he has provided, his theory must be criticized on a number of issues in addition to his questionable epistemology.**

for cognitive development through all stages of life (Lerner, 1976). What remains for Piaget to spell out are the particular properties of this process and the resulting cognitive structures at various ages or stages.

Before going on to examine these stages we should reflect upon the concordance of Piaget's fundamentally biological view of knowledge and the notion of "meaningful existence." In reducing all knowledge to action, action motivated to seek a balance between the organism and the environment and the avoidance of disequilibrium, Piaget offers little basis for a meaningful existence other than reducing knowledge or meaning to a category of the biological.

This reductionism is most clearly seen in Piaget's first stage of cognitive development, the Sensori-Motor period. The infant is pic-

major cognitive limitation of this period is their egocentrism. Infants are said to be egocentric in the sense that they lack the ability to differentiate between self and the external stimulus world (Lerner, 1976). Cognitive development must follow the gradual process of "decentering." Infants complete the sensori-motor period when they are capable of forming mental representations of actions without necessarily producing the action.

The second stage—the Preoperational Period—begins with the child's mental representation of the world through the primary vehicle of language. This stage begins at about age two and lasts until about age six. The preoperational child is most often described by what he or she cannot do. The preschooler lacks an understanding of conservation and is still egocentric to the

point of not being able to take another's perspective. The preoperational child's thinking is dominated by perception—seeing is believing—and possesses only an intuitive sense of logic. Not yet able to understand the rules of inference, grammar, or logic, the child moves into the third stage—Concrete Operations—beginning to understand conservation and developing a set of operations or rules that direct his thought. The child in this stage is less egocentric than the younger child, but is still limited to concrete problems and understanding. The final stage—Formal Operations—occurs when the adolescent can deal with abstraction and propositional reasoning.

Despite Piaget's widespread acceptance and general recognition of some of the valuable insights he has provided, his theory must be criticized on a number of issues in addition to his questionable epistemology. Essentially, Piaget can be criticized from at least four directions. One of the most serious limitations is his assumption that the basic mechanism of the formation of thought is action (Kagan, 1976). Piaget correctly recognizes the intricate interaction of thinking and doing, especially during infancy and early childhood; however, he goes beyond this interaction to assume that doing equals thinking. Such a reduction of cognitive processes eliminates the possibility of the infant's acquiring knowledge through the processes of observation and perception. For example, Super (1972) has demonstrated that three-month-old infants could remember over a 24-hour period a novel event they observed for only a few minutes. Data on the infant's capabilities suggest that from the beginning of life the child forms mental representations of events without any active manipulation (e.g. Kagan, 1976; Bower, 1982). This is not to suggest that active manipulation of objects does not aid in the learning process, but rather to point out the error of assuming that without acting the infant is incapable of knowing.

In addition to the mistake of discounting the possibility and importance of learning

through observation, Piaget's theory is inadequate to incorporate the recent discoveries of the fascinating array of abilities that the newborn demonstrates at birth or within the first months of life. Cohen (1979) in a literature review of infant cognitive and perceptual studies concluded that "it is clear from research . . . that infants at birth can perceive the world around them and from a very early age are organizing their perceptual experience." Infants have demonstrated a variety of abilities including the ability to indicate preferences, make discriminations, notice the connection between events, process more and more complex information very rapidly, have memory capabilities, and acquire concepts (Cohen, 1979; Bower, 1982). This research on the infant's cognitive capacity concludes that the child comes into the world predisposed to attempt to make sense out of the world and does this in ways much more sophisticated than through the simple reflex action that Piaget suggests.

Recent research has also challenged Piaget's view of the preoperational child which is based primarily on the assumption of egocentrism and the child's inability to understand conservation. Donaldson (1978) and Gelman (1979) have both summarized some very convincing studies that demonstrate that preschool age children are not as totally egocentric as Piaget suggests but rather that they are capable of appreciating and understanding the perspective of others. Gelman (1979) also cites numerous studies that demonstrate contrary to Piaget's theory that preschool children "have considerable cognitive abilities." Rather than listing what the young child cannot do, Gelman reports on investigations which look at preschoolers in their own right. Such studies have shown that preschoolers can understand number, classify according to taxonomic categories, classify animate and inanimate objects separately, use hierarchical classifications, are sensitive to temporal order, believe as adults do that cause precedes effects, and use rules to solve problems.



Such evidence suggests that the child is much more cognitively sophisticated and capable than Piaget observes. Children by the time they come to school show much skill as thinkers and language users and have a fundamental conceptualization of who they are and what the world is like (Donaldson, 1978). While it is true that their conceptualizations may be limited and at times dominated by perception rather than logic, it is incorrect to assume that the absence of fully developed and correct concepts indicates a lack of any conceptual ability.

The final limitation of Piaget's work which has been pointed out convincingly by Fowler (1981) is his neglect of the affective component of experience. Piaget builds a view of cognitive development devoid of feeling. Where is the joy of discovery so noticeable with young children, the smile when a task is mastered or the frustration of being unable to complete a desired task? How do we account for the desire to be right or the embarrassment of being proved wrong with a theory that ignores emotion? If it is true that from birth on, man is motivated to integrate whatever comes into his experience into a meaningful pattern, then the theory with which we explain this process must account for patterns that generate fear, joy, frustration, and all the other emotions that are so obviously a part of our experience.

In view of these limitations of Piaget's theory of cognitive development an alternative model may provide a more useful framework from which to examine the growth and development of the child's mind. Jerome Kagan, while acknowledging that he does not have a comprehensive theory, is working at formulating a view of cognitive development that can better handle the available data and fit more closely with our assumptions on the nature of the child.

What Kagan proposes is an approach that suggests cognitive development can best be understood by examining both cognitive processes based on the dynamic structural operations of the mind and the contents or

products of these processes. These processes and contents are conceptually tied together by the assumption that cognition involves the formation of a mental representation of experience within a particular context. These mental representations show qualitative developmental changes as a child matures and his or her cognitive operations become more proficient and integrated. Ault's (1977) helpful overview of Kagan's cognitive processing approach will be the basis of the following brief summary of Kagan's work.

Kagan suggests four categories for the contents of thought. These include schema, symbols, concepts, and rules. The term schema is given to the basic cognitive structure. Kagan defines schema as a mental representation of events in the world. In this approach schema are formed not only on the basis of action as Piaget suggests but also through observation and perception. Citing evidence which indicates that infants demonstrate preferences, notice discrepancies among events, and retain experiences, Kagan asserts that the infant begins building schema or mental representations from birth on.

Symbols are the second type of content or structure established. Symbols primarily involve the development of language which is used to help mentally represent events.

Concepts are the third type of cognitive content developed. Concepts are defined by the child's abstracting attributes or characteristics common to several events or objects. Developmentally concepts can be evaluated on the basis of their validity, status, accessibility, and relationships to one another. The process of conceptualization moves from the formation of rudimentary, global, and imprecise concepts during infancy to more refined and logically accurate concepts as a child matures. This model allows, then, for seeing the young child as possessing concepts such as number, time, or space at ages much earlier than Piaget observes.

The establishment of rules is Kagan's fourth category of cognitive contents. Rules are defined as recognizing the relationship be-

tween two or more concepts as illustrated in the child's learning the rules of grammar or mathematics. Rules also include the formation of problem-solving strategies with which the child learns to explore new experiences and acquire new understandings.

Kagan suggests four broad processes of cognition which are seen as built in or based on the structure and operation of the nervous system. The first two processes, called perception and memory, are defined in a manner common to most cognitive theorists. In this model perception refers to the extraction of meaning from, and the interpretation of experience. Kagan pays particular attention to the perceptual processes of attention and the changes that occur during infancy in the attentive capability and the process of recognizing discrepancies among events. Memory is defined simply as a process of retaining and retrieving past experiences and their mental representations. Kagan notes in his model the significant changes that occur in memory ability during the last six months of the first year and also between the ages of five to seven.

The third process Kagan calls the generation and testing of hypothesis which refers to the process of trying to make sense out of new or discrepant experiences through the application of the child's existing understanding. Essentially this means the child forms expectations about events based on past experience and as a child encounters new situations, he or she tests out these expectations. If the expectations are confirmed the child's understanding can be enlarged to include a broader range of events. If expectations are not confirmed, the child is seen as being motivated to arrive at a new understanding.

The fourth cognitive process Kagan calls evaluation which he defines as the degree to which the child pauses to assess the quality of his thinking. Kagan has worked primarily with this construct of evaluation in relation to his analysis of cognitive styles and in his suggestion of the formation of "executive process" which are thought to develop

during the period from four to eleven and function to guide the thought process. In addition to Kagan's applications of this cognitive process of evaluation, there are a number of further possible implications which make Kagan's model even more helpful. The capability of evaluating one's thought as well as one's actions allows for the incorporation of emotional and value aspects of human experience. Emotion, from a cognitive perspective, is viewed both as influenced by a person's assessment of a situation and at the same time influencing the thought process. Mastering a task is not only experienced as a confirmation of one's expectations and problem-solving strategy, but also has the quality of a positive evaluation of one's self, giving the feeling of satisfaction. Frustration can be understood as the emotional response to one's inability to solve a problem or not meeting one's expectations. Although much more work is needed to incorporate more fully emotional experience within this cognitive model, the assumption of a natural tendency to evaluate and appraise one's thought and action avoids the error of seeing thought and emotion as independent aspects of man's experience. Similarly, the biblical notion of man having "the law written in his heart" which speaks of man's need to evaluate himself in light of some standard, can be tied into this assumption of a basic cognitive capacity to evaluate. Although Kagan doesn't press his model this far, he does provide a framework from which the child's development of a "meaningful existence" can be understood.

In developing this cognitive processing approach Kagan is interested in tracking age-related changes, but he stops short of specifying specific stages. Development is viewed as the progressive maturation of the child's capacities with particular attention paid to points at which the child demonstrates significant advances or shifts in ability. Kagan focuses on some of the significant advances the infant makes during the second six months of life through the

second year, and the development of executive functions in the years from four to eleven.

Since the notion of executive functions relates most directly to the educational process, I will summarize these briefly. These functions are termed executive in the sense that they function to guide and direct the thought processes and are seen as superordinate to the processes themselves (Kagan, 1976). The executive processes are summarized as follows:

1. Recognizing the nature and difficulty of the problem and its requirements, adjusting effort to task difficulty.
2. Increased flexibility—the ability to discard inefficient solutions and search automatically for better solutions.
3. Activation of strategies of organization and reversal.
4. Controlling speed of information processing.
5. Control of distraction and anxiety.
6. Faith in the power of thought.
7. Desire for the elegant solution and the growth of a standard of intellectual competence.

Although these executive functions serve as a means of interpreting the qualitative changes that are well documented for the years between four and eleven, they have not been fully developed or incorporated into a comprehensive theory. They do, however, provide some useful guidelines for determining educational goals and objectives that go beyond specific content to be mastered. The cognitive processing model lends support for the educational necessity of helping the child learn to evaluate the thought process and emphasize problem-solving strategies.

The cognitive processing model as developed by Kagan along with the possible extensions of his theory discussed above can provide a useful framework from which to examine the process of cognitive develop-

ment. Kagan's theory, as well as most cognitive theories, however, has one serious limitation. The type of knowledge or understanding that the child acquires in the manner suggested by these structural-developmental theorists is rather narrowly conceived. Fowler (1981) in his book *Stages of Faith* picks up on this constricted view of knowledge and asserts that we must distinguish between two kinds of reasoning.

I have found it useful, in this regard, to make a distinction between two kinds of reasoning, one that describes the relatively narrow understanding of cognition with which Piaget works and another that characterizes the necessary combination of rationality and passionality that faith involves. The first I call the logic of rational certainty. This mode of knowing aims at objective understanding as a knowing free from all particular or subjective investigations. Its truths need to be impersonal, propositional, demonstrable, and replicable. The logic of rational certainty, however, is a misleading ideal when we speak about forms of knowing in which the constitution of the knowing self is part of what is at stake. The model of disinterestedness represented by scientific inquiry does not fit with the kind of knowing involved in moral reasoning or in faith's composition. It is to say this later mode of knowing proceeds in a manner in which the knowing self is continually being confirmed or modified in the knowing. For this later, more comprehensive form of knowing, I have chosen the term, the logic of conviction. (Fowler, 1981)

This distinction between logic and conviction seems also to underlie the current practice among cognitive theorists to specify distinct models of cognitive development and moral development, e.g. Kohlberg.

Therefore the type of meaningful existence that Kagan's model points to is one defined by logic, correspondence to reality, efficiency in solving problems, and objectivity. And although cognitive theories have been extended to incorporate more subjective knowing as in the understanding of self or others (e.g., Selman, 1974), these models miss the intricate role that conviction or belief plays in a human being's sense of meaning. Fowler seems to come close to recognizing the essential religiousness of man and the interrelatedness of belief and understanding when he speaks of "reasoning in faith," and yet his work may be better described as dealing with the reasonableness of faith.

Fowler's solution to the limited range of knowing addressed by the cognitive theorists is to argue for a complimentary model of faith development. Fowler's (1981) *Stages of Faith* parallels Piaget and Kohlberg as well as incorporating the social-emotional dynamics of Erik Erikson. In developing this model, Fowler offers some very useful insights, particularly in regard to the importance of interpersonal relationships in the child's faith development. However, his solution misses the critical interdependency of faith and knowledge. As religious creatures our knowledge is intricately tied up in and founded on our faith. A complete understanding of the child's coming to know his world must stem from seeing the child and the world to be known as in relationship with a Creator God. Reasoning and faith from a biblical view would not dichotomize rationality and conviction but rather understand conviction, that is man's obedient or disobedient response to God, to be shaping and coloring the meaning, understanding and knowledge obtained.

The cognitive processing approach to cognitive development suggests a number of implications for the educator and instructional theory. The delineation of four basic categories of cognitive processes provides a method for analyzing educational tasks, and allows for the incorporation of understandings gained from the research on cognitive

process. Educational goals can be evaluated on the basis of the cognitive components of a task. Attention should be given to the perceptual aspects of the task. Questions such as what is the attention span of the child, or does the task fit within this span, need to be examined. Specific tasks designed to improve perceptual discrimination and attention (e.g. listening skills) would be helpful, especially with younger children. Students should be helped to understand the process of memorization as well as being required to commit information to memory. An awareness of the developmental changes in memory can assist the teacher in designing memory work that matches the child's ability as well as helping to distinguish the lack of skill from lack of effort. The process of generating and testing hypotheses is most directly related to instruction in problem solving. The child needs to be shown how imagination and examining a task from different perspectives can lead to more effective solutions. The child needs to be helped to become more aware of his or her expectations and strategies and how these affect his or her performance. Questioning the child about expectations should occur in evaluating his or her approach to solving problems, paying attention to the child's thought processes.

Children can be trained to be more active in the learning process through encouraging them to anticipate or question rather than passively wait for the answer or solution. Using study strategies such as SQ3R would be a direct application of research on cognitive processing.

The evaluative processes should also be more directly addressed in instruction. Children often fail to evaluate their work against some serviceable criterion, having learned to be dependent on their teacher to assess the quality of their thinking. Exercises in helping the child to learn to think about the thought process itself and those designed to enhance a reflective cognitive style should be used in designing educational tasks.

Moving beyond the specific cognitive

processes we can specify a more general implication of the cognitive process and approach. Perhaps most fundamental, we must recognize the importance of trying to understand the child's picture of himself or herself, of others, and of his or her world. Children's expectations, beliefs, and feelings play an important role in directing their behavior, determining their response to the teacher's motivations, and establishing their relationship with peers. The context in which the child approaches the learning task is as important as the task itself. We must extend instruction beyond the academic to incorporate interpersonal and social awareness. We must assist children in formulating their views of the world to see that their growing knowledge of the world, themselves, and their relationships with others is always in response to God.

### Self-concept

The second developmental theme I want to examine is the growth of self-understanding or the self-concept. The psychological investigation of the self-concept has a long and often controversial history; however, most of these investigations have not been developmental in nature. The controversy over the nature of the self, questions about whether there is such a thing as a self, and difficulty in empirically measuring the self-concept have resulted in a preponderance of literature on specific aspects of the self-concept, especially self-esteem (Wylie, 1974). The findings of these investigations on self-esteem have led to much discussion and many suggestions about enhancing a child's self-esteem and the adverse consequences of low self-esteem. Helpful as some of these suggestions might be, they are limited because the researchers studied self-esteem apart from an awareness of the whole process of self-understanding. A developmental model of self-understanding is necessary not only for the valid assessment of self-esteem, but also from the perspective that "self-understanding is a crucial con-

stituent of a person's understanding of his or her social world" (Damon and Hart, 1982). The concept of self provides a cognitive basis for one's identity as a unique individual and for one's special position and status within the world. The developmental process through which one achieves self-understanding thus plays a fundamental role in developing a "meaningful existence."

Traditionally self-concept has been viewed from what is referred to as the mirror theory. The mirror theory dates back to the work of individuals such as Baldwin, Meade, or Cooley, and also includes the more recent work of Lewis and Brooks-Gunn as well as being implicit in Kohlberg's theory of moral development (Damon and Hart, 1982). This view suggests that people come to know themselves through the interaction with others. That is, self and others are discovered simultaneously through the course of interactions between self and others. The self-concept thus develops along the same lines as the growth of understanding of the world and is composed of perceived evaluations and reactions that others demonstrate in response to the individual.

The mirror theory has recently been expanded in the work of Selman (Muus, 1982) and Lewis and Brooks-Gunn (1979) to a fairly comprehensive model of social and self-understanding. These theorists are building on the assumption that self-knowledge is a cognitive act. The self-concept a cognitive structure arising out of interaction with the world and is a component of social cognition which includes knowledge of self, knowledge of others, and the knowledge of one's relation to others. Piaget's model of cognitive development provides a framework for these theories which rely most heavily on his concept of egocentrism and the developmental process of decentration. The combined package of Piaget, Kohlberg, and Selman is exerting a great deal of influence among developmental psychologists. However, in spite of some very helpful insights, the similarities between knowing self and knowing others fall

short of providing a comprehensive understanding of the development of the self-concept.

Damon and Hart (1982) point out a number of problems with the social cognition approaches to the self-concept. Specifically they point to the problem of gaining as objective a perspective of one's self as one can of another. One literally cannot see himself or herself performing actions in the way he or she can view another. This difference in perceptual orientation toward self and others seems to create essential differences in how self and others are perceived. Additionally, the immediate or subjective experience that one has available for self-analysis is not available in observing others. In fact, the experience of empathy with another's feelings is difficult to achieve. "One simply is emotionally invested in the nature of one's own identity in a different way than in the nature of others' identities and this may well lead to differences in how personal information on the self and others is cognitively processed" (Damon and Hart, 1982).

In view of the limitations of these approaches to self-concept based on the mirror theory, Damon and Hart outline a model of self-concept development incorporating this self-other distinction along with the perspective that the self is a cognitive structure which is basic to one's identity and personality. I will summarize this model in the following paragraphs.

Damon and Hart approach their task by both reviewing the data on self-concept development and reviewing the historical roots of the self-concept literature in William James' theory (1890). James' discussion of the self suggested making a distinction between the self as "me" and the self as "I." The primary components of the "me" are the various characteristics that define the self as known. The "I" for James was the "self as knower," the subjective aspect of self that organizes and interprets experience. This distinction between the objective self and the subjective self has persisted through years of

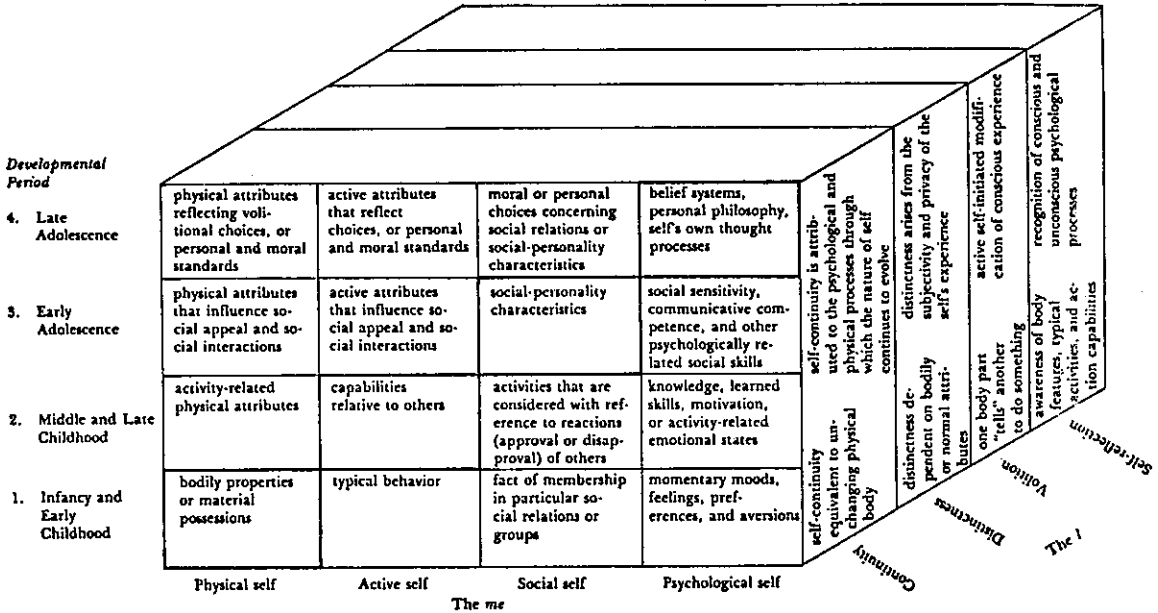
subsequent analysis of the self. However, the bulk of psychological work has been in the direction of studying the objective self which is more empirically assessible. The subjective self which James suggested be left to the philosophers has been investigated primarily through the processes of self-reflection and identity. Damon and Hart have tried in their model to incorporate both the objective and subjective selves as dynamically interacting.

In their review of literature on the investigations of self-understanding from infancy to adolescence, Damon and Hart found four consistently reported patterns:

1. the shift from physicalistic to psychological self-conception
2. the emergence of stable social personality characterizations of the self
3. the increasing volitional and self-reflective nature of self-understanding
4. the tendency toward a conceptual integration of diverse aspects of the self into a unified self-system (Damon and Hart, 1982)

These developmental patterns tend to follow the general developmental principle of movement from the more global and undifferentiated awareness of self to increasing differentiation and organization.

Damon and Hart's model of self-concept development from infancy through adolescence is summarized in the following diagram. The division of self as object component of the self-concept follows W. James (1890), adding the active self and relabeling James' spiritual self as psychological. Additional categories could be included such as the creative or vocational selves for a more comprehensive model; however, such categories have not typically been investigated. The shift from the spiritual self to the psychological self should not be viewed as a reduction of the spiritual to the psychological, but rather the label psychological is used to refer collectively to the aspects of learning, attitudes and emotions. Although it was probably not



Source: W. Damon & D. Hart, The development of self-understanding from infancy through adolescence. *Child Development*, August 1982. Reprinted with permission.

their intention, the omission of a separate category called the spiritual self avoids the error of trying to see man's spiritual nature as a specific aspect of his life.

Each of the four categories of the objective self are further delineated along developmental lines. This allows for the recognition of patterns of changes both within a category moving from a more superficial conceptualization to more abstract and interrelated conceptualizations, and across categories which lessens the likelihood of reducing the self-concept to a single category at a given developmental level. It is essential to realize, for example, that although infants' understanding of themselves is largely in physical terms, they are at least in a global way experiencing themselves as social beings.

Damon and Hart's inclusion of the self as subject (the right side of the cube) represents a significant advance in understanding self-concept development. The authors have elaborated on James' suggestions regarding the self as subject by incorporating four dimensions central to the understanding of identity. The dimensions of continuity (am I the same person from day to day), distinc-

tiveness (what separates me from others), volition (recognition of the self as an agent with intentionality), and self-reflection are conceptualized as developing across a continuum rather than following specific age-related shifts. The self-reflective dimension allows very nicely for the inclusion of the idea of children's implicit or explicit recognition of themselves in relation to both others and to God. Including the volitional aspect acknowledges the fundamental intentionality of man which is demanded from a biblical view of the child as a responsible agent. The cubic shape of the diagram emphasizes the inseparable nature of the self-concept as well as the dynamic interplay among the dimensions along which children can evaluate themselves, as well as a process of evaluating.

This model of self-concept development along with the cognitive processing approach to cognitive development suggests that the process of instruction needs to take into account children's growing understanding of who they are and what they can do. As children compare themselves to others, evaluate their abilities, and become more conscious of their values and beliefs, their

self-concept becomes a more important organizing and directing influence on behavior and thought. An understanding of the importance of the self-concept and the process of its development can assist the educator in designing appropriate educational experiences which are aimed at furthering children's grasp of who they are and what it means to respond obediently to God in their interactions with others and in their exercising dominion over the creation. Obviously these two developmental themes provide only a partial and somewhat speculative picture of who the child is and how he or she develops. Further work integrating the development of social relationships, maturational factors, and physiological changes is necessary to present a more comprehensive view of development. I hope that the two developmental themes examined here will provide some understanding of how developmental psychology can help articulate a theory of instruction.

## References

- Amelie, C.; *The Identities of Persons*, University of Calif. Press: Los Angeles, 1976.
- Ault, Ruth; *Children's Cognitive Development*, Oxford: New York, 1977.
- Bennank, C.; "A Cognitive Approach to Listening and Action," *Journal of Psychology and Theology*, 16:29-36, 1976.
- Bower, T.G.R.; *Development in Infancy* (2nd ed.), W.H. Freeman: San Francisco, 1982.
- Broughton, J.M.; "Psychology & The History of the Self: From Substance to Function," in R. Riebor & S.K. Salizinger (eds.) *Psychology: Theoretical-Historical Perspectives*, Academic Press: New York, 1980.
- Cohen, Leslie; "Our Developing Knowledge of Infant Perception & Cognition," *American Psychologist*, 34:894-899, 1979.
- Cully, Iris; *Christian Child Development*, Harper & Row: San Francisco, 1979.
- Damon, W. & Hart, D.; "The Development of Self-Understanding From Infancy Through Adolescence," *Child Development*, 53:841-864, 1982.
- Donaldson, Margret; *Children's Minds*, W.W. Norton: New York, 1978.
- Elkind, David; "Egocentrism in Adolescence," *Child Development* 38:1025-1034, 1967.
- Elliot, J. (ed.); *Human Development and Cognitive Processes*, Holt: New York, 1971.
- Fennema, Jack; *Nurturing Children in the Lord*, Presbyterian & Reformed Pub.: Phillipsburg, PA, 1980.
- Flavell, John; *Cognitive Development*, Prentice-Hall: New Jersey, 1977.
- Fowler J.W.; *Stages of Faith*, Harper & Row: San Francisco, 1981.
- Gelman, Rochel; "Preschool Thought," *American Psychologist*, 34:900-905, 1979.
- Hamlyn, D.W.; *Experience and the Growth of Understanding*, Routledge & Kegan Paul: London, 1978.
- James, William; *Principles of Psychology*, Holt: New York, 1890.
- Kagan, Jerome; "Cognitive Development," *Journal Supplemental Abstract Service*, 1976.
- Kagan, Jerome; "The Emergence of the Self," *Journal of Child Psychology & Psychiatry*, 23:363-381, 1982.
- Lerner, Richard; *Concepts and Theories of Human Development*, Addison-Wesley: Massachusetts, 1976.
- Lewis, M. & Brooks-Gunn, J.; *Social Cognition & the Acquisition of Self*, Plenum Press: New York, 1979.
- Madge, Violet; *Children in Search of Meaning*, Morehouse-Barlow: New York, 1965.
- Mischel, Theodore; *The Self: Psychological & Philosophical Issues*, Rowman & Littlefield: Toronto, 1977.
- Montemayor, R. & Eisen, M.; "The Development of Self Conceptions from Childhood to Adolescence," *Developmental Psychology*, 13:314-319, 1977.
- Muus, Rolf; "Social Cognition: Robert Selman's Theory of Role Taking," *Adolescence*, 67:499-526, 1982.
- Neisser, Ulric; *Cognition and Reality*, Freeman: San Francisco, 1976.
- Piaget, J.; *The Psychology of Intelligence*, Routledge & Kegan Paul: London, 1950.
- Piaget, J.; In P.H. Mussen (ed.) *Carmichael's Manual of Child Psychology*, Wiley: New York, 1970.
- Piaget, J.; *Genetic Epistemology*, Columbia University Press: New York, 1970.
- Reynolds, Larry; "Instruction in the Small Liberal Arts College," Unpublished Manuscript, 1979.
- Selman, R., & Byrne, D.; "A Structural-Developmental Analysis of Role Taking in Middle Childhood," *Child Development*, 45:803-806, 1974.
- Smillies, David; "Rethinking Piaget's Theory Of Infancy," *Human Development*, 25:282-294, 1982.
- Super, C.M.; "Long-Term Memory in Early Infancy," Unpublished Doctoral Dissertation, Harvard University, 1972.
- Wilcox, Mary; *Developmental Journey*, Abingdon: Nashville, 1979.
- Wylie, Ruth; *The Self-Concept* (rev. ed.), University of Nebraska Press, 1974.
- Zuck, Roy B. & Clarke, Robert E.; *Childhood Education in the Church*, Moody Press: Chicago, 1975.