

DOCUMENT RESUME

ED 100 488

PS 007 534

AUTHOR Sklar, Mark J.  
TITLE Is Piaget a Developmental or Learning Theorist?  
PUB DATE [69]  
NOTE 10p.

EDRS PRICE MF-\$0.75 HC-\$1.50 PLUS POSTAGE  
DESCRIPTORS \*Abstraction Levels; Child Development;  
\*Developmental Psychology; Developmental Tasks;  
\*Intellectual Development; \*Learning Theories;  
\*Mathematics Curriculum; Sequential Learning  
IDENTIFIERS \*Piaget (Jean)

ABSTRACT

The first section of this paper deals with the question of whether Piaget is a developmental or a learning theorist; the second section relates Piaget's research findings and developmental theory to a sequence of curriculum units in mathematics. It is suggested that Piaget makes no distinction between learning and development of cognitive structures, as he presents little information about specific variables which account for learning. The practical application of Piaget's research findings, however, is viewed as a way of providing more assessment information to the teacher concerning the intellectual functioning of children than the popularly used intelligence tests. Suggestions are made for employing Piaget's findings in the classroom in order to incorporate a sequence of curricular materials and appropriate units of curriculum based on the child's level of intellectual operations.  
(CS)

# IS PIAGET A DEVELOPMENTAL OR LEARNING THEORIST?

MARK J. SKLAR

U.S. DEPARTMENT OF HEALTH  
EDUCATION & WELFARE  
NATIONAL INSTITUTE OF  
EDUCATION

THIS DOCUMENT HAS BEEN REPRO-  
DUCED EXACTLY AS RECEIVED FROM  
THE PERSON OR ORGANIZATION ORIGIN-  
ATING IT. POINTS OF VIEW OR OPINIONS  
STATED HEREIN DO NOT NECESSARILY REPRESENT  
THE NATIONAL INSTITUTE OF  
EDUCATION POSITION OR POLICY.

In attempting to answer the question is Piaget a developmental or learning theorist this article will be divided into two parts. The first part will deal with this question as stated. The second part will analyze Piaget's developmental theory and its contribution to learning in today's schools.

Piaget has been characterized by his collaborator, Barbel Inhelder as "a zoologist by training, an epistemologist by vocation, and logician by method." This triple orientation - biological, epistemological, and logicomathematical - has to be kept in mind when confronting Piaget's ideas concerning the development of intelligence because they are continuously reflected in every aspect of his theories (Inhelder 1953-54).

On a general theoretical level, Piaget characterizes intelligence as an adaptive process. Cognitive development is seen by Piaget as evolving from a child's continuous interaction with his environment. The process whereby the organism adapts the environment to biologic systems already in existence, Piaget calls "assimilation." In this process of assimilation, the organism inwardly organizes the environment or its perception of the environment to its own biological systems. The methods which involve the outward adaption of the organism to the environment Piaget calls "accomodation." In the process of accomodation, the organism adjusts itself to environmental experiences or external reality. At all levels of biologic activity, the organism is constantly both assimilating and accomodating.

For Piaget, adaption involves the establishing of an "equilibrium" between the organism and the environment. The process of achieving equilibrium is an active one. Therefore, cognitive development as seen by Piaget, evolves from the child's active interaction with his environment where he is being molded, and

ED 100433

BEST COPY AVAILABLE

In turn, is modifying his surroundings. The acquisition of knowledge by a child is seen in terms of an emergent model with qualitatively different stages. Each stage is comprised of a period of formation and initiation, and a period of attainment or organization of mental operations. The attainment of one stage provides the starting point for the next. Thus, mental development is viewed as ongoing and evolutionary (Hunt, 1961).

According to Piaget, the order of the stages is constant; in that, attainment of the first stage consistently precedes the formation of the second stage. All children will go through the stages in the same order, but the rate of movement will vary among children. The stage of intellectual development a child is said to be in is defined by the most advanced performances of which he is capable. For Piaget, the fundamental categories of experience in a child are developed during the sensory-motor stage. As transition is made from the sensory-motor stage to the pre-operational stage, the former thought structures are integrated in the later structure (Brown, 1965).

BEST COPY AVAILABLE

From the preceding discussion, it is clearly evident that Piaget's theory of intelligence is above all developmental in nature. At the core of Piaget's developmental theory is the notion that the intellectual functioning of an individual is both quantitatively and qualitatively different at different stages of life. As a developmental theorist, Piaget has not been interested in individual variations; rather, he has sought to formulate the common processes which can be identified in children's thinking. Where Dewey emphasized "learning by doing," Piaget centered his interest on the "why" and "how" of a child's reasoning in finding a solution to a presented task. From the responses made by children to presented tasks, Piaget and his associates have sought to impose logic and structure in attempting to understand these responses.

As a result of Piaget's investigations employing anecdotal (Not empirical) methods, he has proposed four major periods of intellectual development related to the progression of thinking in young children. Briefly, the first period of sensory-motor intelligence (0-18 months), deals with the child's learning to coordinate various perceptions and overt movements. The child during this period learns to perform a wide variety of successful responses which result in practical satisfaction, but there is nothing approaching representational thought during this period. The second major period, that of preoperational intelligence (18 months - 7 years), is concerned with the child's acquisition of language and understanding of the sequence of events. The third period, that of concrete operations (7-11 years), deals with the child's learning to organize and classify information and his capabilities in concrete problem solving. The child during this period learns flexibility and the reversibility of thought in action. The fourth period, that of formal operations (11 years and onward), is concerned with the individual's development of highly abstract and formal logical systems. At this stage, the individual becomes capable of forming true theories about the nature of the world and of utilizing hypothetical-deductive reasoning (Hunt, 1961). While Piaget has set down usual ages for each period of development, he does not contend that these are absolutely fixed. In presenting his developmental theory, Piaget simply holds that the periods are ordered, and that they will in all cases succeed one another as described.

BEST COPY AVAILABLE

In essence, Piaget has given us a developmental picture of intelligence. Piaget's system, moreover, makes no distinction between learning and development of cognitive structures. The mind is seen as a dynamic system, with intellectual development marked by the progressive disappearance of earlier systems of thought in favor of new higher-order systems. He thus tends to say very little about the precise ways in which the various cognitive structures actually become established.

That is, he has presented very little information about specific variables which account for learning. While a few researchers have provided findings to demonstrate that the stage-dependent thought processes are somewhat less neat and orderly than Piaget would like to believe, it must still be concluded that Piaget's stages of cognitive operations have generally been confirmed by empirical investigations.

**BEST COPY AVAILABLE**

Piaget's Contribution to Learning in the School

During the past half-century, Jean Piaget and his colleagues have integrated logicomathematical and psychological methods in attempting to find the common processes which can be identified in children's thinking. This section will attempt to relate the relevance of Piaget's research findings and apply his findings to a sequence of curriculum units in mathematics based on his developmental theory. While many empirically oriented psychologists have criticized Piaget's lack of experimental sophistication and his anecdotal approach used to obtain the data from which he proposed his theory on the stages, sequences, and age norms of cognitive development in children, this reviewer is nevertheless of the opinion that the practical application of his research findings are capable of providing more assessment information to the teacher concerning the intellectual functioning of children than do the popularly used intelligence tests.

Piaget's developmental system emphasizes different types of intellectual functioning at different points in the life span; whereas, the popularly used intelligence tests deal primarily with content rather than functioning of the intellect. Most intelligence tests currently used assume that the individual improves at certain tasks (i.e. remembering numbers) from early childhood onward and that the same intellectual operations generally are manifested at all age levels.

A majority of items included on intelligence tests were originally derived

on a trial-and-error basis and not because they were representative of central intellectual processes characteristic of various age levels. Added to the prior noted shortcoming is the tendency of the intelligence tests to give equal credit to children who give the correct response to an arithmetical problem, even though their processes of solution may have differed greatly. It may be readily concluded from the aforementioned weaknesses, that intelligence tests provide the classroom teachers with relatively limited information for assessing a child's readiness to profit from various educational experiences and to adjust his program of instruction accordingly.

#### BEST COPY AVAILABLE

Many of the shortcomings of intelligence tests may be bridged by the classroom teacher who employs Piaget's findings to incorporate a sequence of curricular materials and appropriate units of curriculum based on the child's level of intellectual operations. Piaget's system can be applied to the problems involved in placing of specific content areas at appropriate grade levels and in determining the most appropriate ordering of materials within these areas. In order to demonstrate the value of Piaget's research findings, this reviewer will provide examples of appropriate subject content for the teaching of number concepts.

If one uses Piaget's developmental system for a curricular sequence, the primary aim in teaching number concepts to children operating at the preoperational thought level should be to develop their "keenness of perception." Perceptual tasks would be applied to an increasing number of characteristics of a single object as well as to increasing number of objects, and their relationship to each other (Kaya, 1961). Piaget's data on the preoperational level indicates that a child's understanding of the concepts "before and after" or sequence of events has its foundation in this developmental period. Therefore, instruction in simple addition would require that the teacher supply the child with manipulative

materials using many of the child's sensory channels to relate the concepts of simple addition. Another important aspect would be to create a variety of situations where the number concepts gained might be perceived more readily, and applied by the child using concrete materials (Stephens, 1966).

During the concrete thought level period, Piaget holds that the process of organization and classification of information begins to occur in children at a conscious level. As in the preoperational period, children operating on the concrete level are superior at solving problems of concrete nature in contrast to the abstract. The best teaching method would encourage the student to interact concretely as much as possible with the materials being mastered. The teacher of a child operating on the concrete level would stress problem solving and the development of understanding as a basis for the arithmetic program. In place of rote learning that " $2 + 2 = 4$ ", the teacher would ask "why do two and two equal four?" In so doing, the instruction would aim at developing flexibility and reversibility in the thought processes of the child (Cawley & Goodman, 1969).

The mathematics program for a child operating on the concrete thought level would concentrate on teaching numbers as symbols appropriate for dealing with quantities. The child at this level should be presented with opportunities to order various quantities in a meaningful fashion; in order that, he may discover the relationship among quantities such as the "one-to-one correspondence" with our number system. Piaget's data indicates that multiplication should be introduced into the curriculum at this time. If multiplication is attempted earlier with a child using preoperational thought processes, he may not grasp the systematic nature of multiplication unless it is retaught later (with greater difficulty). After multiplication is taught, Piaget's findings indicate that teaching of subtraction should follow. Subtraction requires the grouping of objects and then removal of some of the objects. According to Piaget, the thought processes required in

subtraction are of a higher level than multiplication; therefore, the teaching of the processes required for multiplication should always precede subtraction (Friedus, 1966).

The teaching of division and fractions would follow subtraction. The best approach for a teacher seeking to clarify the principles involved in fractions would require that the student himself divide an object into various combinations of component parts. In addition, Piagetian theory maintains that one of the basic ways in which a child learns is through the continuous interaction with his peers; therefore, number problems using manipulative materials should be presented as group projects enabling the student to pit his thought against those of others. Likewise, the pupils should be encouraged to note the similarities and differences in processes required for the computation of various arithmetical problems. To sum up, in the stage of concrete thought, such operations as observation, analysis, synthesis, and evaluation of real and observable variables need to receive emphasis in the mathematics curriculum content.

The formal thought level is characterized by a shift in thinking from reality to possibility. Rather than generalizing from observable variables to principles and rules which are real, the child in this stage can think abstractly, formulate hypotheses, engage in deductive reasoning, and test his hypotheses to find out if they are valid. At this stage of hypothetico-deductive reasoning a great deal of abstract manipulation of variables occurs. The mathematics curriculum content, therefore, should encourage the student in finding new problems and/or alternate solutions. The formal operations stage is the most conducive to original thinking. In creating and testing his mathematics problems, the child should be given the greatest amount of intellectual freedom to invent new and unfamiliar relations (Kaya, 1961).



Piaget's formulation of the above three stages implies that a majority of children will eventually go through all of these stages. However, individual differences among children will be observed in the rate of development through these stages. It therefore becomes the teacher's responsibility to insure that each child be provided with an individual program of instruction based on his developmental needs. This reviewer believes that the child's developmental needs can be better served utilizing the Piagetian system than the popularly used intelligence tests.

## REFERENCES

BEST COPY AVAILABLE

- Brown, R., Social Psychology. New York, The Free Press, 1965.
- Cawley, J.F. & Goodman, J.O., Arithemetical problem solving, Exceptional Children, 36, 1969, 83-91.
- Friedus, E., The needs of teachers for specialized information on number concepts, in The Teacher of Brain-Injured Children. ed. by W.M. Cruickshank, Syracuse, Syracuse University Press, 1966.
- Hunt, J. McV., Intelligence and Experience, New York, Ronald Press, 1961.
- Inhelder, B., Les attitudes experimentales de l'enfant et de l'adolescent. Bull. Psychol., Paris, 1953-1954, 7, 272-282., in The Mentally Retarded Child, Robinson, H. & Robinson, N. New York, McGraw-Hill, 1965.
- Kaya, E., A curricular sequence based on psychological process rather than subject content. Exceptional Children, 37, 1961, 425-426.
- Stephens, W.B., Piaget and Inhelder, "Application of theory and diagnostic techniques to the area of retardation," Education and Training of the Mentally Retarded, 1966, 1, 75-87.