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Piaget's theories - cognitive learning with implications to reading

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PIAGET'S THEORIES - COGNITIVE LEARNING
WITH IMPLICATIONS TO READING

by
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A RESEARCH PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE
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CHAPTER I

INTRODUCTION

Problem in General

The purpose of this paper is to study the theory of the cognitive development in children as proposed by Jean Piaget and then to consider the implications of this theory for teaching critical reading.

Importance of the Study

Teachers of beginning reading should be aware of the close relationship between teaching a child to read and developing this child's ability to think. Criscuolo states that "the essence of a discriminating and perceptive reader is the ability to think through and react to the material he reads."¹

It is essential that the ability to think be developed in a systematic manner and in accord with the child's natural development. In support of this, John Dewey pointed out that

The only way in which a person can reach the ability to make accurate definitions, penetrating classifications, and comprehensive generalizations is by thinking alertly and carefully on his own present level. Some kind of intellectual organization must be required, or else habits of vagueness, disorder, and incoherent 'thinking' will be formed. But the organization need not be that which would satisfy

¹ Nicholas P. Criscuolo, "A Plea for Critical Reading in the Primary Grades." Peabody Journal of Education, XLIII (September, 1965), 107.

the mature expert.²

To aid the child in his cognitive development a teacher must be aware of the child's capabilities at the various stages of his development. One must be cognizant of the stages at which these developments will most naturally take place.

Jean Piaget, an outstanding child psychologist, has written extensively on these developments of children with a special emphasis on the cognitive development. Fischer states that "the value of Piaget's theory and his work seems to be that it attempts an integrated understanding of the whole of the child's thought, not just fragments. He examines a child's stages of growth from all aspects, but with an especial interest in cognition, and the entire developmental sequence."³

Closely related to Piaget's theory on the stages of growth are his writings on the development of language in the child. Between the ages of 7 and 8 the child is gradually manifesting his desire to work with others, then his ego-centric talk decreases in importance and he moves into a more social type of conversation. This movement from the ego-centric talk to that of expressing his thoughts to others is of great importance to the fundamental structure and function of thought, and; consequently, to the process of beginning reading.

The specific purpose of this paper is to analyze the principles of Piaget regarding the cognitive development of children in order to determine

² John Dewey, How We Think, (Boston: D.C. Heath and Co., 1933), pp. 84-85.

³ Hardi Fischer, "Psychology of Piaget and its Educational Implications," International Review of Education, X (May, 1964), 432.

the implications for the teaching of beginning reading, especially for teaching critical reading at the primary level. To arrive at these principles the author (is considering) the stages of development as described by Piaget, the factors that influence the child's growth as he moves from one stage to another, and the development of language in the child in relation to these stages.

Using Piaget as base, the writer will address herself to the following questions:

- 1) What is knowledge? How does the child acquire knowledge? What happens to the mental processes during the acquisition of this knowledge?
- 2) How are these mental processes related to the development of the child's ability to think?
- 3) What are the stages in the child's development in which this thinking develops?
- 4) What factors influence the development from one stage to another?
- 5) What effect does the development of language have on the child's cognitive development?
- 6) What are the implications for the teaching of beginning reading, especially critical reading?

Method of Approach

This writer will make a thorough study of the literature that has been written during the past ten years and how a scholarship is related to Piaget's contributions to the field of the cognitive development of children. She will also examine Piaget's works, especially those dealing with the

development of child thought. From the contributions of Jean Piaget and from the writings of the many educators and psychologists who have studied Piaget, this writer proposes to set up principles regarding the cognitive development of children that have implications for the teaching of critical reading. She will discuss critical reading and the sequential skills of critical reading in the light of Jean Piaget's theory.

Limitations

Although the development of the ability to think is a goal of the total education program, this writer will limit herself to the area of critical reading. Her definition of critical reading will be taken from Nila B. Smith's Reading Instruction for Today's Children. Smith says that "critical reading includes literal comprehension and interpretation ... but it goes further than either of these in that the reader evaluates, that is, passes personal judgment on the quality, the value, the accuracy, and the truthfulness of what is read."⁴

When discussing the primary grades, this writer will include grades one and two, or children ranging in age from 5 or 6 to about 8. She will, therefore, only concentrate on those stages of development that have reference to children in grades one and two. Other age-groups or stages of development will be discussed insofar as they are needed to clarify, or to help the reader to understand better, the stages that are pertinent to children in grades one and two.

⁴ Dr. Nila B. Smith, Reading Instruction for Today's Children, (New Jersey: Prentice-Hall, Inc., 1963), p. 263.

This writer is aware of the fact that in Piaget's experiments with children, he simply tested their reactions to certain stimuli, but was not an educator. Huttenlocher concludes that "this procedure reflected his belief that the child's mode of functioning at each stage of his development is stable and not easily altered."⁵ However, Piaget was aware of the importance of the child's interaction with his environment. Stendler says that, for Piaget, "stages are convenient for helping us to think coherently about the course of development. His descriptions of stages are based upon changes in the child's comprehension of logic and emphasize sequence. They are not tied in any hard-and-fast way to age."⁶ This interpreter does agree with Piaget that the child progresses through certain stages of his thought development at specified times, but she will not consider these specified times to be strict limits. Other influences, such as opportunities to explore challenging situations, will undoubtedly lead to higher stages of development.

In Chapter II, the writer will review the recent literature that deals with Piaget's theories on the cognitive development of children. This review will also include literature in the area of primary reading that emphasizes the need for critical reading. Chapter III will be an analysis of Piaget's theories that deal with: (1) knowledge, (2) the processes used in acquiring knowledge, (3) the relation of these processes

⁵ Janellen Huttenlocher, "Children's Intellectual Development: Piaget's Position," Review of Educational Research, XXXV (April, 1965), p., 119.

⁶ Celia B. Stendler, "Aspects of Piaget's Theory That Have Implications for Teacher Education," The Journal of Teacher Education, XVI (September, 1965), p., 333.

to the development of a child's ability to think, (4) the stages in this development, (5) and the factors that influence the formation of these stages.

CHAPTER II

REVIEW OF THE LITERATURE

During the past ten years there has been a renewed interest in the works of Jean Piaget. This upsurge of interest in Piaget has met with mixed reactions from those interested in his theories. In this chapter, the author will review the literature of the past decade that deals with Piaget's emphasis on the cognitive aspect of the development of a child, his interpretation of the stages of development, and his contribution to the field of education. The author will also review that portion of the recent literature in the area of primary reading which emphasized the need for critical reading.

Piaget's theories have occasioned criticism because of the emphasis he had placed on the cognitive aspect of a child's development. Coles states that Piaget's "chief concern is with processes that relatively ignore not only social, cultural or economic influences, but even emotional ones."¹ It is true, Piaget has emphasized the cognitive aspect of the child's development, but as Eyl notes,

"His writings have concentrated on the cognitive aspect of behavior rather than on motivation and emotion, although he warns that neither of these should be overlooked. To pursue knowledge the child must have a motive, and the direction in which drives and emotions influence behavior necessarily depends on the framework made possible by the growth of intelligence."²

¹Robert Coles, "Piaget as God," Commonweal, LXXXVIII (April, 1968), 69-70.

²Sister Joseph Beatrice Eyl, S.C.N., "General Conditions of Child Thought: Deductions of Piaget," Catholic Educational Review, LXVI (March, 1968), 185.

Bruner points out that Piaget has been and is deeply concerned with knowledge as it exists at the different stages in the development of the child, but that he is considerably less interested in the processes that make growth possible. He says Piaget's great contribution in his "brilliant formal description of the nature of knowledge that children exhibit at each stage of development."³

Piaget's work concerning the stages of development has received various interpretations. Kohlberg says this is because "Enthusiasts for early cognitive stimulation often make reference to Piaget's ideas but adapt them to a viewpoint different than that held by him."⁴

Huttenlocher understands Piaget to be implying that children of certain chronological ages will necessarily be found in similar stages of development. She feels that Piaget, through his theory concerning the stages of development, is really placing limits on the child within which this child will somehow automatically develop. She concludes that, according to Piaget, the stages of development are not affected by education or experience. She says,

While the importance of the child's interaction with his environment is stressed, the rough designation of the ages at which particular modes of functioning appear suggest limits to educability within particular age ranges. In his experiments, Piaget tested the child's reactions to certain problems but did not attempt to teach. This procedure reflected his belief that the child's mode of functioning at each stage of development is stable and not easily altered.⁵

³ Jerome S. Bruner, Toward a Theory of Instruction, (Massachusetts: Harvard University Press; 1966), p. 7.

⁴ Lawrence Kohlberg, "Early Education: A Cognitive-Developmental View," Child Development, XXXIX (December, 1968), 1013.

⁵ Janelle Huttenlocher, "Children's Intellectual Development: Piaget's Position," Review of Educational Research, XLV (April, 1965), 114-120.

However, Piaget did not intend these stages of development to be considered as strict limits. This is verified by the fact that he speaks of factors that influence the development from one stage to another.⁶ Eyl brings out that, according to Piaget, the order in which a child passes through these stages of mental growth is fixed, but that his rate of progress is not.⁷ Senn also speaks in support of the view that Piaget's stages are not strict limits within which the child develops. He says,

Piaget believes that these phases may be accelerated to some extent by manipulating the environment but that such manipulation will only be effective up to a certain point. The environment is important but only as a child is able to pay attention to it, and this ability depends on the degree of assimilation which has taken place. However, the greater the variety of experiences a child copes with, the greater becomes his ability to cope.⁸

Everybody in education realizes that Piaget is saying something that is relevant to the teaching of children. For the most part he is understood to be underestimating the value of teaching. He is understood to be saying something like this: Children go through certain stages of intellectual development from birth through adolescence. These stages materialize, fully constructed, when their time has come, and there is little we can do to advance them. What we must do in education is to realize the limits of children's understanding at certain ages, and plan our teaching so it falls within these limits.⁹

Duckworth says that Piaget could only accept one idea from the above quote, i.e., that children do pass through stages. She emphasizes that Piaget "maintains good pedagogy can have an effect on this development."¹⁰

⁶Jean Piaget, "Development and Learning," Piaget Rediscovered, ed. Richard E. Ripple and Verne N. Rockcastle (Ithaca, New York: Cornell University, 1964), pp. 10-14.

⁷Eyl, 195.

⁸Milton J. E. Senn, M.D., "Early Childhood Education: For What Goals?" Children, XVI (January-February, 1969), 9.

⁹Ibid.

¹⁰Eleanor Duckworth, "Piaget Rediscovered," Arithmetic Teacher, XI (November, 1964), 496-499.

Piaget's theories have made a great impact in the field of education. Eyl points out that Piaget "has changed by a sizable number of experiments, the thought patterns of many educators, parents, and social workers as they consider anew the whys and wherefores of the behavior in very young children. More than this he has counteracted in many ways the too mechanistic approach to learning."¹¹

Brearly and Hitchfield, in their recent book, A Guide to Reading Piaget, have taken a number of Piaget's key concepts for the cognitive development of the child and have tried to guide teachers in applying these concepts in their dealings with children. These authors speak of the value of Piaget's works in this way:

For many years, people who have worked in child centered education have had philosophical theory and intuitive judgment to guide them, but have lacked scientific justification for what they were doing. Piaget is now providing scientific evidence from experiments, with concrete examples and demonstration from children's behavior for what was previously a matter of opinion.¹²

Sylvester states that Piaget's ideas have profoundly affected the revision of today's elementary school curriculum. He writes "we can ill afford to be uninformed about Piaget and his work for his ideas are the basis for many recommended courses of action in education today. Much of the emphasis on early childhood education and the investigation of the Head Start programs are attributed to the work of this famous psychologist."¹³

¹¹Eyl, 185.

¹²Molly Brearly and Elizabeth Hitchfield, A Guide to Reading Piaget (New York: Schocken Books, 1966), pp. xi-xii.

¹³Robert Sylvester, "Piaget: His Ideas Are Changing Our Schools," The Instructor, LXXVIII (February, 1969), 59.

The fact that Piaget, in his experiments, tests but does not teach should not be a source of criticism. Stendler speaks of Piaget in this manner, "he stoutly maintains in his lectures that he is not a pedagogue and that he does not concern himself with applications of his theory to problems of education. He acknowledges that there are, of course, implications for the education of children in what he has written, and he hopes that those in pedagogy will concern themselves with the task of searching out these implications."¹⁴

Several studies have been made of Piaget's theories in order to find implications for teachers on the elementary school level. One such study was made by O'Brien and Shapiro.¹⁵ They studied the building of the cognitive structure as evolving by stages from the sensorimotor activities through the concrete operations to the formal operations. From their study they found implications that Piaget's theories have educational practice, and related these implications to the teaching of problem solving in mathematics.

In a similar work, Picard¹⁶ also studied the stages of development, but examined more thoroughly the factors that influence these stages of development. Picard, however, related Piaget's theories that have implications for teaching to the entire field of elementary mathematics.

Kohlberg made a study of early education in the light of Piaget's ideas.

¹⁴Stendler, 330.

¹⁵Thomas C. O'Brien and Bernard J. Shapiro, "Problem Solving and the Development of Cognitive Structure," The Arithmetic Teacher, XVI (January, 1969), 11-15.

¹⁶Anthony J. Picard, "Piaget's Theory of Development with Implications for Teaching Elementary School Mathematics," School Science and Mathematics, LXIX (April, 1969), 275-280.

Though he concentrated on children of preschool age, Kohlberg did make an application of Piaget's theory to the teaching of reading and arithmetic that is pertinent to the present study. He states that any Piagetian would be "skeptical of claims of teaching arithmetical understanding to children below the age of concrete operations."¹⁷ Kohlberg implies that the conventional method of teaching reading would require a considerable cognitive-structure capacity, but that many methods could short-cut these requirements and promote early learnings on a simple discrimination-and-association basis.¹⁸

These writings do speak of the importance of Piaget's theories for today's educators. Eyl did make application for educators in general. Stendler noted that there were implications for teacher education, but did not spell them out. O'Brien, Shapiro, and Picard related implications of Piaget's theories to mathematics. However, none of these authors made specific reference to the implications in Piaget's works for the teaching of critical reading in the primary grades.

This author does believe there is a close relationship between helping a child develop his ability to think and teaching this child to read critically. Criscuolo states, "to read critically is to think critically."¹⁹ He says that a passive or superficial reaction to reading is never acceptable. He notes that critical reading has often been neglected or ignored in the primary grades because basal readers in these grades did not emphasize it.²⁰

Gray says that "thirty years' research has shown that elementary school children are capable of critical reading and critical thinking development.

¹⁷Kohlberg, 1036.

¹⁸Ibid., 1037

¹⁹Nicholas P. Criscuolo, "A Plea for Critical Reading," Peabody Journal of Education, XXXI (September, 1965), 107-112.

Yet there has been very little progress in developing critical reading in the elementary school."²¹

In accord with Piaget's idea that those in pedagogy search out implications for education of children in what he has written, and in accord with the stated need for critical reading in the primary grades, this writer will make a study of Piaget's theories of the cognitive development of children and note principles that have implications for the teaching of critical reading in the primary grades.

²¹Marian S. Gray, "Research and Elementary School Critical Reading Instruction," The Reading Teacher, XXII (February, 1969), 453.

CHAPTER III

PIAGET'S THEORIES

The purpose of this chapter is to analyze that portion of Piaget's theory on the cognitive development of children that treats (1) the stages of this cognitive development, (2) the factors which influence these stages, and (3) the place of language in the development of these stages. Piaget in his writings, has shown a great interest in knowledge as it exists at the different stages of a child's cognitive growth. So, this chapter will be prefaced with a description of Piaget's ideas on knowledge.

Knowledge

"Knowledge is not a copy of reality."¹ In these few words, Piaget has summarized an important part of his theory on knowledge. He insists that if a person is to know an object, he doesn't simply look at it and make a mental copy of it. Rather he must act on it, i.e., modify and transform the object, understand the process of its transformation and as a consequence understand how the object is constructed. Piaget calls this process an operation. An operation, he says, is the very essence of knowledge. He describes operations as:

actions which are internalizable, reversible, and coordinated

¹ Lawrence Kohlberg, "Early Education: A Cognitive-Developmental View," Child Development, XXXIX (December, 1968).

into systems characterized by laws which apply to the system as a whole. They are actions, since they are carried out on objects before being performed on symbols. They are internalizable, since they can also be carried out in thought without losing their original character of actions. They are reversible as against actions which are irreversible.²

Fundamental to any learning or acquisition of knowledge is Piaget's concept of adaptation, which is the striving of a person to find an equilibrium between himself and his environment. This adaptation depends upon two interrelated processes: assimilation and accommodation. Assimilation is the action of the person on his environment; accommodation, the action of the environment on the person. The processes always act together. Maier says that assimilation is always balanced by the force of accommodation, while accommodation is possible only with the function of assimilation.³

Piaget speaks of the role of adaptation in all of a person's thinking.

He says,

Every response, whether it be an act directed towards the outside world or an act internalized as thought, takes the form of an adaptation or, better, of a re-adaptation. The individual acts only if he experiences a need, i.e., if the equilibrium between the environment and the organism is momentarily upset, and an action tends to re-establish the equilibrium, i.e., to re-adapt the organism.⁴

As Piaget says, "Our task is therefore clear: we must now reconstruct the development of intelligence, or its stages of formation, until we are able to account for the final operational level whose form of equilibrium

²
Jean Piaget, Logic and Psychology (New York: Basic Books, Inc., 1960), p. 8.

³
Henry W. Maier, Three Theories of Child Development (New York: Harper and Row, Pub. Inc., 1965), p. 86.

⁴
Jean Piaget, Psychology of Intelligence (New York: Harcourt, Brace, and Company, 1950), p. 4.

we have just been describing. . . . the developmental explanation can only consist in showing how, at each stage, the mechanisms provided by the factors already in existence make for an equilibrium which is still incomplete and the balancing process itself leads to the next level."⁵

Stages of Development

Piaget feels that an understanding of the stages of development is a basic prerequisite for any insight into the cognitive development of a child.

He says,

Learning cannot explain development, but the stages of development can in part explain learning. Development follows its own laws, . . . , and although each stage in the development is accompanied by all sorts of new learning based on experience, this learning is always relative to the developmental period during which it takes place, and to the intellectual structures, whether completely or partially formed, which the subject has at his disposal during this period.⁶

Sensory-Motor Stage

This paper does not deal directly with the sensory-motor stages, but it is an important stage in a child's cognitive development, because, as Picard states, "all knowledge is built on the fundamental learning of this period."⁷ Sylvester says that during this stage the child "develops the basic practical knowledge that serves as the structure of his future

⁵ Millie Almy, Young Children's Thinking: Studies of Some Aspects of Piaget's Theory, with a Foreword by Jean Piaget (New York: Teachers College Press, 1967), p. v.

⁶ Barbel Inhelder and Jean Piaget, The Growth of Logical Thinking from Childhood to Adolescence, with a Translator's Introduction by Anne Parsons (New York: Basic Books, 1958), pp. xi-xiii.

⁷ Picard, 276.

experience with the outside world."⁸

Flavell describes the sensory-motor intelligence that characterizes this stage as:

capable only of linking, one by one, the successive actions of perceptual states with which it gets involved. Piaget likens it to a slow-motion film which represents one static frame after another but can give no simultaneous and all-encompassing purview of all the frame. . . .

Sensory-motor intelligence, being an intelligence of action rather than to the quest for knowledge or truth as such.⁹

Preoperational Stage

The second stage, the preoperational stage, is so called because the child has not yet acquired the ability to use operations. This stage extends from about 2 years to 6 years of age. In this stage we find most first-grade children, and possibly some in second grade. Therefore, a thorough study of this stage will be very important to this paper.

This stage is characterized by representational intelligence as compared to the sensory-motor intelligence of the previous stage. According to Piaget, the requirement for representation is the 'symbolic function,' i.e., the ability to differentiate signifiers from significates and thereby to become capable of evoking the one to call forth or refer to the other. The symbolic function is acquired through specialized developments of accommodation and assimilation. An important developmental product of accommodation, that is important to this stage, is imitation. Flavell

⁸Sylvester, 59.

⁹John H. Flavell, The Developmental Psychology of Jean Piaget, New Jersey: D. Van Nostrand Co., Inc., 1963.

describes this imitation as:

the active accommodatory replication by the subject of some external event serving as model. . . . with the growth and refinement of the capacity to imitate, the child is eventually able to make internal imitations as well as external, visible ones. He is able to evoke in thought, as opposed to actually carrying out in reality, imitations made in the past. This internal imitation takes the form of an image, broadly defined, and this image constitutes the first signifier (the significate being here the action, object, or word of which the image is a reduced and schematic replicate).

Once the capacity to evoke image-signifiers is established, the child can of course use them as anticipative outlines of future actions. . . . past accommodations are evoked in the present as internal images, which, in turn are the anticipative mediators or actions not yet performed.¹⁰

In the sensory-motor stage assimilations and accommodations were always in the present. In the preoperational stage earlier assimilations and accommodations interfere with those of the present. This factor contributes to mental growth because now the child not only assimilates and accommodates to objects in the present perceptual field as he did in the sensory-motor stage, but he also assimilates the present data to the earlier significates or data and accommodates to this earlier data through the medium of the evoked imitative image.¹¹

Though the child in this stage has attained representational thought, his process of thinking is still very ego-centric. This is manifested in a variety of ways. He does not easily separate his own goals from the means for achieving them. When his attempts to manipulate reality are met with frustration, he tries to correct them by intuitive regulations; he does not

¹⁰ Ibid., pp. 152-153.

¹¹ Ibid., pp. 153-154.

yet have the ability to use operations. Parsons cites the example of the balance scale problem. The preoperational child simply expects the scale to stay in place when he corrects a disequilibrium by hand. He may, from an intuitive feeling for symmetry, add weight on the side where it lacks, but he may equally well add more weight on the overloaded side, believing that more action will automatically lead to success. This he believes because he is not yet able to distinguish his actions from the results of his actions; his physical actions really dominate his mental operations. Hence, he is unable to conceive or even to look for possible contradictions in his actions; he is not yet aware that there might be another solution to the problem; he has only one outlook, i.e., his own.¹²

Piaget calls the first, primitive concepts used by a child in this stage precepts. Precepts are action-ridden, imagistic, and concrete. The reasoning by which the preoperational child links his various precepts, i.e., proceeding from particular to particular, is called transductive reasoning. Piaget says that the child's conclusions may be correct, but that this is no guarantee that the mechanism used for arriving at these conclusions was logical rather than transductive.¹³

If the child in the preoperational stage would happen to use categories, he does not do so systematically. He is limited to associating randomly two elements at a time. His thinking contains neither proof nor hypothesis. He may use an apparent hypothesis, for example, "Maybe, it's because." But this statement makes no reference to verification and it

¹² Inhelder and Piaget, p. xii.

¹³ Flavell, pp. 160-161.

simply replaces or fills in the real world with imagery.¹⁴

Another important characteristic of preoperational thought is its irreversibility. The child cannot travel along a cognitive route, i.e., pursue a series of reasonings or follow a series of transformations. His thought is "irreversible in the sense that the permanent possibility of returning (the inverse operation) to an unchanged initial premise (the identity element in the system) is denied him."¹⁵

Bruner sums up this stage by saying that the child's "mental work consists principally in establishing relationships between experience and action; his concern is with manipulating the world through action."¹⁶

Concrete Operational Stage

This stage extends from 6 or 7 to about 11 years of age. Flavell says that the child in this stage "acts as though his primary task were to organize and order what is immediately present."¹⁷ The concrete operational child operates on the plane of representation as did the sensory-motor child. Flavell notes that the difference is that the concrete operational child "seems to have at his command a coherent and integrated cognitive system with which he organizes and manipulates the world around him. Much more than his younger counterpart, he gives the decided impression of possessing a solid cognitive bedrock, sometimes flexible and plastic and yet consistent and enduring, with which he can structure the present in terms of the past without undue strain and dislocation, that is, without the ever-present tendency

¹⁵
Flavell, p. 159.

¹⁶
Jerome S. Bruner, The Process of Education, (Cambridge: University Press, 1960), p. 34.

¹⁷
Ibid., p. 204.

to tumble into the perplexity and contradiction which mark the pre-schooler.¹⁸

At the preoperational stage the child was not capable of any proof; now at the concrete operational level he does not feel the need for it, but he can furnish it if he is asked. The verification he conceives at this level amounts to accumulating facts until more or less complete certainty is reached, but without going beyond the general, i.e., without introducing necessary links by isolating these facts from their contextual interdependence and deducing the relations thus isolated.¹⁹

The preoperational child does have a tendency toward the organization of integrated systems, i.e., an orientation toward certain forms of equilibrium. But the only instruments available to him are perceptual or representational regulations. The child in the concrete operational stage has the actual operations. However, these operations must be carried out in the concrete.²⁰ The equilibrium attained by concrete thought covers only a relatively narrow field. Piaget says that from the standpoint of form, concrete operations consist of nothing more than a direct organization of immediately given data. From the standpoint of content, concrete thought has the limiting characteristic that it cannot be generalized immediately to all physical properties. Instead, it proceeds from one factor to another, sometimes with a time lag of several years between the organization of one and the next.²¹

18

Flavell, p. 165.

19

Inhelder and Piaget, p. 42.

20

Ibid., pp. 113, 246-247.

21

Ibid., pp. 248-249.

Concrete thought remains essentially attached to empirical reality, but it is characterized by an extension of the actual in the direction of the potential. For example, to classify a set of objects means that one constructs a set of class inclusions, such that at a later point new objects can be included in systematic relationship with those already classified and such that, in this way new class inclusions are continually possible.²²

At the concrete level the child does not formulate any hypotheses.

Piaget explains why:

He begins by acting; although in the course of his action he tries to coordinate the sequence of recordings of the results he obtains, he structures only the reality on which he acts. But if the reader objects that these cognitive organizations are in fact hypotheses, we would answer that in any case they are hypotheses that do no more than outline plans for possible actions; they do not consist of imagining what the real situation would be if this or that hypothetical condition were fulfilled, as they do in the case of the adolescent.²³

Piaget says that a child's thinking will become logical only through the organization of systems of operations. He gives five logical operations (additive composition, associativity, reversibility, identity, and tautology), which he says, underlie the system of class concepts and relations. He says that the passage from intuition to logical thought is effected during the concrete operational stage. He emphasizes that these operations do not occur independent of each other.²⁴ Flavell says,

This is the central meaning of Piaget's holism in the domain of cognitive operations; the isolated operation can never be the proper unit of analysis, because it gains all its meaning from the system of which it is a part. A given operation,

22

Ibid.

23

Ibid., pp. 250-251.

24

Jean Piaget, Six Psychological Studies (New York: Random House, 1967), pp. 48-54.

put into concrete effect in the here and now, always presupposes a structural system which includes other, related operations, for the moment latent and inactive but always potentially actualizable themselves and, above all, always a force governing the form and character of the operation which is momentarily on stage.²⁵

An understanding of the logical operations of additive composition, associativity, reversibility, identity, and tautology are important to this study, because only if they are developed properly, will the child's thinking develop logically. During the concrete operational stage these operations emerge and together form a total structure which mirrors the child's thinking. They are the fundamental structure of the elementary logic of classes and relations.²⁶ Stendler explains them briefly. Additive composition enables the child to combine elements to form a whole. With associativity the child realizes that he can reach the same goal by different paths. A change in one dimension can be compensated for by change in another. Reversibility, one of the most crucial operations, teaches the child that every change he carries on mentally is reversible. When the child is able to perform the identity operation, he knows two sets must be the same if there is a one-to-one correspondence between the parts, and provided all the parts have been accounted for. Tautology affirms for the child the equivalence of members of a class. For example, a class of red objects is still red if more red objects are added.²⁷

In discussing these logical operations, Piaget does refer to the ages in which this writer is especially interested. He says that as of age seven or eight, systems of logical operations do

25
Flavell, p. 167.

26
Piaget, Six Psychological Studies, pp. 48-54.

27
Stendler, 331.

not yet bear on propositions as such but on the classes and relations of objects themselves; and they are organized apropos of the real or imagined manipulations of these objects. This first set of operations, which we shall call 'concrete operations,' involves only the additive and multiplicative operations upon classes and relations which result in classifications, seriations, correspondences, etc. These operations do not cover the logic of classes and relations in its entirety but only the elementary groupings.²⁸

In this stage one sees the child move from actual operations toward potential operations; one also sees the total structure that evolves as the logical operations develop. Flavell sums up the outlook of the child as he gradually moves from the concrete operational stage to the formal operational stage. He says the child now views the structures of the concrete operations as "parking lots whose individual parking spaces are now occupied and now empty; the spaces themselves endure, however, and lead their owner to look beyond the cars actually present towards potential, future occupants of the vacant or to-be-vacant spaces."²⁹

Formal Operational Stage

Flavell describes this stage as "the crowning achievement of intellectual development, the final equilibrium state toward which intellectual evolution has been moving since infancy."³⁰ In this stage, which begins at about the age of 11 or 12, the adolescent, rather than reasoning with directly-given data alone, begins to reason with propositions and hypotheses. This formal logic is also operational, but is based on a different structure than concrete operations; it is formed on propositions rather than present reality.

28

Piaget, Six Psychological Studies, p. 92.

29

Flavell, p. 203.

30

Ibid., 202.

The adolescent is not satisfied with empirical events alone; he regards them as just one aspect of a larger domain, the domain of the possible.³¹

In formal thought there is a reversal of the direction of thinking; present reality is now secondary to possibility. Conclusions are deduced from premises whose truth status is regarded only as hypothetical at first; only later are they empirically verified. Thinking proceeds from what is possible to what is empirically real.³² Piaget says that "the real power of propositional logic lies. . . . in the combinatorial power which makes it possible for reality to be fed into the set of possible hypotheses compatible with the data."³³

Factors Which Influence the Stages of Development

Piaget notes that the order of succession of these stages of development is constant, but the chronological age of these stages may vary a great deal.³⁴ This can be explained by the four factors, maturation, experience, social transmission and equilibration, which are very important in the formation of this development.

Piaget says that maturation, experience, and social transmission are fundamental, but insufficient in themselves. Picard explains this insufficiency:

The child is mentally passive with respect to the first three factors. He is, in effect, receiving information from them

31

Inhelder and Piaget, p. 251.

32

Ibid., pp. 251-252.

33

Ibid., p. 253.

34

Piaget, "Development and Learning," p. 10.

but he is merely storing it.

With respect to the fourth factor, the child is mentally active. He is attempting to assimilate and accommodate the information about the first three factors into his existing structure of knowledge.³⁵

Stendler defines Piaget's idea of the first factor. She says maturation is "a ripening of neural structures with age."³⁶ She says maturation is a part of every transformation that takes place during a child's development, but alone it cannot account for the changing mental structures. The Martinique studies by Pinard and Laurendeau, showing a four-year delay in maturation development over the Geneva norms, reveal that maturation alone does not guarantee that children of a certain age will have reached a certain stage in their logical development. Stendler also showed from the Dennis Studies in Teheran that maturation is dependent upon experience. This study showed that babies in an orphanage, who had been confined to cribs and were terribly limited in motor experience were shockingly retarded in the age of onset of walking.³⁷

The second factor, experience, is a basic factor in the development of cognitive structures, but again not sufficient to explain everything. Piaget says there are some concepts, for example, conservation of substance, which appear at the beginning of the concrete operational stage, but are such that they could not be drawn from experience.³⁸

Piaget emphasizes that the third factor, social transmission, is also fundamental to the development of cognitive structures, but again not sufficient, "because the child can receive valuable information via language

35

Picard, 277-278.

36

Stendler, 334.

37

Ibid., 334-335.

38

Piaget, "Development and Learning," pp. 11-13.

or via education directed by an adult only if he is in a state where he can understand this information. That is, to receive the information he must have a structure which enables him to assimilate this information.³⁹

The fourth factor, equilibration or self-regulation, Piaget notes, is added to the three preceding ones, but is fundamental in that the first three factors must be equilibrated among themselves. More important, "it is in the act of knowing, that the subject is active, and consequently, (when he is) faced with an external disturbance, he will react in order to compensate and thus he will tend towards equilibrium."⁴⁰ Stendler states that for Piaget, "this is the critical factor. The three previously mentioned factors are necessary, but it is the mental activity of the subject when confronted with cognitive conflict and operating to compensate it that determines the development of logical structures."⁴¹

Language Development

Is an understanding of the development of language in a child vital to the understanding of a child's cognitive development? Piaget says that "for the child to think is to deal in words."⁴² In another place he notes that intelligence "is enabled through the bond established by language between thoughts and words to make an increasing use of concepts. . . . the fact then of telling one's thought, of telling it to others, or of keeping silence and

39

Ibid., p. 13.

40

Ibid.

41

Stendler, 335.

42

Jean Piaget, The Child's Conception of the World (London: Routledge and Kegan Paul LTD, 1967), p. 86.

telling it only to oneself must be of enormous importance to the fundamental structure and functioning of thought in general, and of child logic in particular.⁴³

From these two statements of Piaget one can readily see the importance of an understanding of the language development in a child. Lovell says that "thought comes before language; the latter is fitted onto thought that already exists. But once the child can use language, thought is extended over an immensely increased range."⁴⁴

In his book, The Language and Thought of the Child, Piaget attempted to answer the question, "What are the needs which a child tends to satisfy when he talks?"⁴⁵ On first glance, it would seem that the purpose of language is to communicate one's thoughts to others. But, in reality, this is not true. When individuals speak to themselves, they often experience no need or desire to communicate their thoughts to others. This type of language Piaget calls egocentric. It is usually found in children up to the ages of 6 or 7. This speech is egocentric because the child makes no attempt to place himself at the point of view of his hearer. He neither bothers to know to whom he is speaking nor whether he is being heard.⁴⁶

Piaget says that before the age of 7 or 8, the child may be able to give explanations or demonstrations to his equals, but does not spontaneously

43

Jean Piaget, The Language and Thought of the Child (New York: World Publishing Co., 1955), p. 45.

44

Kenneth Lovell, "Developmental Processes in Thought," The Journal of Experimental Education, XXXVII (Fall, 1968), 15.

45

Jean Piaget, The Language and Thought of the Child, New York: World Publishing Co., 1955), p. 1.

46

Ibid., pp. 2-9.

do so because his language is still saturated with egocentrism.

Piaget notices a close connection between the child's language development and his ability to relate to other children. Up until the age of about 5, the child always works alone. From 5 to about 7½, little groups of two are formed. Between the age of 7 and 8, the desire to work with others manifests itself. It is just at this age that egocentric talk loses some of its importance and higher stages of conversation take place between children.⁴⁷

Piaget calls this higher stage of conversation socialized speech, and is noted in the child between the ages of 7 and 8. It can be found at an earlier age, but usually not before the age of five. Piaget divides socialized speech into 5 types: (1) adapted information, (2) criticism, (3) commands, requests, or threats, (4) questions, and (5) answers. The child has passed the stage of collective monologue to that of adapted information when he adopts the point of view of his hearer, and when the latter is not chosen at random. This stage gives rise to dialogue because the child wishes to be understood and presses his claim if he does not gain his point.⁴⁸ Piaget says that "as soon as the child informs his hearer about anything but himself, or as soon as, in speaking of himself, he enters into collaboration or simply into dialogue with his hearer, there is adapted information. So long as the child talks about himself without collaborating with his audience or without evoking a dialogue, there is only collective monologue."⁴⁹

⁴⁷ Ibid., p. 41.

⁴⁸ Ibid., pp. 19-20.

⁴⁹ Ibid., p. 21.

One final thought on children's language deals with whether or not they understand each other better because they are used to the same way of thinking.

Piaget says,

One of the characteristics of children's conversations is that each imagines he is understanding and listening to the others, even when he is doing nothing of the kind.

How then are we to characterize the stage of understanding between children before the age of 7 or 8? It is no paradox to say that at this level, understanding between children occurs only in so far as there is contact between 2 identical mental schemas already existing in each child. In other words, when the explainer and his listener have had at the time of the experiment common preoccupations and ideas, then each word of the explainer is understood, because it fits into a schema already existing and well defined within the listener's mind. In all other cases the explainer talks to the empty air. He has not, like the adult, the act of seeking and finding in the other's mind some basis on which to build anew.⁵⁰

This ability to communicate with each other is closely bound up with objectivity of thought. The effort to understand other people and communicate one's thought objectively does not appear in children before the age of 7 or 7½.

If a teacher can fix this moment of objectivity, she will be able to determine that critical period when understanding between children is desired and possible.⁵¹

In this chapter, the writer has tried to analyze that portion of Piaget's theory on the cognitive development of children that has reference to children from about 5 or 6 to about 8 years of age.

50

Ibid., p. 120.

51

Ibid., p. 124.

CHAPTER IV

CONCLUSION

Summary

The purpose of this study has been to analyze Piaget's theory regarding the cognitive development of children, and to consider the implications of this theory for the teaching of critical reading. To achieve this goal, the researcher made a study of Piaget's works, especially those dealing with the development of a child's thought. She also studied the recent literature that was related to Piaget's contributions to the field of the cognitive development of children. Since this study was primarily concerned with children in grades one and two, the writer studied those aspects of Piaget that referred to (1) knowledge, (2) the processes used in acquiring knowledge, (3) the relation of these processes to the development of a child's ability to think, (4) the stages in this development, (5) the factors that influence the development of these stages, and (6) the role of language in a child's cognitive development.

The author then discussed the implications of Piaget's theory, for the teaching of critical reading. Since a number of authors have various connotations for critical reading this writer limited herself in this paper to Smith's interpretation of critical reading and its skills. The writer, following Smith, set up the skills according to the levels of literal comprehension, interpretation, and critical reading. She then related Piaget's theory to

these various skills.

Even though Piaget was not directly concerned with educational practice, he admitted there were educational implications in what he had written and he hoped that those in pedagogy would search out these implications.¹ This researcher derived from his theory the following principles which were applicable to the teaching of critical reading:

- 1) Since the child learns by experiencing what he has acted on, he must have many opportunities to manipulate concrete objects. Mere verbal instruction will be ineffective.
- 2) The child acts only if he experiences a need, and must, therefore, be actively involved in creating situations in which needs will materialize.
- 3) Each new bit of learning must be accommodated into something the child has already assimilated.
- 4) Each child progresses through the four stages of development at his own rate.
- 5) The child, before the age of 7, is capable only of transductive reasoning, i.e., moving from the particular to the particular.
- 6) Social interaction with one's peers is an important factor in the development of a child's thoughts.
- 7) A child's thought and language are closely related; the language of the child is the vehicle through which his

¹ Supra, pp. 12-13.

thoughts are expressed to others. As the child's thought progresses, so will his language.

This study has shown that Piaget's writings have important implications for the development of the skills of critical reading at the levels of literal comprehension, interpretation, and critical reading. The study has also demonstrated that critical reading, if developed in accord with Piaget's ideas on the cognitive development of children, can be taught. This writer noted a close interrelationship between Piaget's description of the evolvement of a child's thought and the gradual development of the skills at each of the three levels of critical reading.

Recommendations

According to the study of 60 basal readers, made by Williams in 1959, the skills of critical reading were not taught in a systematic manner.² In light of the findings of the present study, this author recommends that a study be made of the basal readers that have been published within the last five years, to see whether the skills of critical reading have been included in a systematic manner.

As stated earlier, "the value of Piaget's theory and his work seems to be that it attempts an integrated understanding of the whole of the child's thought, not just fragments. He examines it from all aspects, but with an especial interest in cognition, and the entire developmental sequence."³ Therefore, this writer recommends that Piaget's theories regarding the cogni-

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Supra, p. 15.

3

Fischer, 432.

tive development of children be studied for their possible use as a basis for future curriculum revisions. This author especially recommends that Piaget's theories be studied for their implications for the teaching of elementary reading, mathematics, and science.

This writer spoke of Piaget's theory that social interaction with one's peers is an important factor in raising the level of speech and thought. Therefore, this writer recommends that studies be made, in the light of Piaget's findings, on the advantages and disadvantages of homogeneous groupings.

Conclusion

Piaget, in a speech at Cornell University in 1964, stated,

The principal goal of education is to create men who are capable of doing new things, not simply repeating what other generations have done--men who are creative, inventive, and discoverers. The second goal of education is to form minds which can be critical, can verify, and not accept everything they are offered. The great danger today is of slogans, collective opinions, ready-made trends of thought. We have to be able to resist individually, to criticize, to distinguish between what is proven and what is not. So we need pupils who are active, who learn early to find out by themselves, partly by their own spontaneous activity and partly through materials we set up for them; who learn early to tell what is verifiable and what is simply the first idea to come to them.⁴

It would seem to this author that the teacher who understands Piaget's theory of the cognitive development of the child, and who uses this understanding in her efforts to teach critical reading would be making great strides toward the attainment of the goal of education as described by Piaget.

⁴

Piaget, "Piaget Rediscovered," p. 5.

Piaget has brought forth some important things about children, and anyone who says important things about children ultimately must be important to educators. Teaching is the manipulation of the students' environment in such a way that his activities will contribute to his development. It should be obvious by now that the effects of a given environment on a child is as much a function of the child as of the environment. If a teacher knows that, his behavior will be affected by his conception of what students are like. Indeed, his very definition of teaching will be so determined.

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