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The University of Oklahoma, Ph.D., 1972
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GRADUATE COLLEGE

HOW MENTAL OPERATIONS ARE REFLECTED IN CHILDREN'S LANGUAGE THROUGH USE OF THE LAVATELLI EARLY CHILDHOOD CURRICULUM

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

BY

Helen Randolph Carter

Norman, Oklahoma

1972

HOW MENTAL OPERATIONS ARE REFLECTED IN CHILDREN'S LANGUAGE THROUGH USE OF THE LAVATELLI EARLY CHILDHOOD CURRICULUM

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TABLE OF CONTENTS

		Page
ACKNOWLEDGMENTS		iii
LIST OF TABLES		x
Chapter		
I.	INTRODUCTION	1
	Statement of the Problem	1
	Hypotheses	1
	Theoretical Framework	3
	Assumptions, Limitations and Definition of Terms	6
	Methodology	12
	Lesson Plan Outline	28
II.	REVIEW OF THE LITERATURE	42
	Cognition and Language	42
	Language	56
	Case Studies	59
	Conclusion	61
III.	CASE I--RON	63
	Demographic Data	63
	Pre-Tests	64
	Classification	70
	Number, Measurement, Space	73
	Seriation	76
	Lessons--All Types	79
	Post-Tests	82
IV.	CASE II--CAROLYN	90
	Demographic Data	90
	Pre-Tests	91
	Classification	97
	Number, Measurement, Space	100
	Seriation	103
	Lessons--All Types	105
	Post-Tests	109

Chapter | Page

V. CASE III--SUSAN 116

Demographic Data 116
Pre-Tests 117
Classification 123
Number, Measurement, Space 126
Seriation 130
Lessons--All Types 132
Post-Tests 137

VI. CASE IV--JERRY 143

Demographic Data 143
Pre-Tests 144
Classification 151
Number, Measurement, Space 154
Seriation 157
Lessons--All Types 159
Post-Tests 162

VII. CASE V--RENEE 171

Demographic Data 171
Pre-Tests 172
Classification 178
Number, Measurement, Space 181
Seriation 185
Lessons--All Types 187
Post-Tests 192

VIII. CASE VI--LON 198

Demographic Data 198
Pre-Tests 199
Classification 205
Number, Measurement, Space 208
Seriation 211
Lessons--All Types 214
Post-Tests 217

IX. CASE VII--CIDA 226

Demographic Data 226
Pre-Tests 227
Classification 233
Number, Measurement, Space 236
Seriation 239
Lessons--All Types 241
Post-Tests 245

Chapter Page

X. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS . . . 252

Statement of Problem 252
Hypotheses 252
Procedure and Methodology 253
Conclusions 286
Recommendations for Further Study 288

SELECTED BIBLIOGRAPHY 289

APPENDICES 292

LIST OF TABLES

Table			Page
1.	Ron	Case I	83
2.	Carolyn	Case II	110
3.	Susan	Case III	136
4.	Jerry	Case IV	163
5.	Renee	Case V	191
6.	Lon	Case VI	218
7.	Cida	Case VII	246

HOW MENTAL OPERATIONS ARE REFLECTED IN CHILDREN'S LANGUAGE THROUGH USE OF THE LAVATELLI EARLY CHILDHOOD CURRICULUM

CHAPTER I

INTRODUCTION

Statement of the Problem

The study was made to determine can empirical evidence (examples of children's language) be identified that support or contradict the theoretical assumptions of the Lavatelli Early Childhood Curriculum.

Hypotheses

Structured ECC Lessons

Experience in the Lavatelli Early Childhood Curriculum will result in an observed change in the use of language by children as mental operations are performed. Children's conversations during the Lavatelli Early Childhood Curriculum lessons will provide examples of children's syntactical structuring of language with modeling of syntactical structuring by the teacher eliciting responses, for the purposes of classification, number, measurement, space and seriation.

Unstructured ECC
Omission Lessons

Children's conversations during the Lavatelli Early Childhood Curriculum lessons will provide examples of children's syntactical structuring of language with omission of modeling of syntactical structuring by the teacher eliciting responses for the purposes of classification, number, measurement, space and seriation. There will be an observed change in the use of language as mental operations are performed during the unstructured omission lessons.

Unstructured Piagetian
Conservation Tasks

Children's conversations during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Length, and Area and the one Piagetian Changing of Criteria Task will provide examples of children's syntactical structuring of language with omission of modeling of syntactical structuring of language by the teacher eliciting responses. Examples of children's language will identify the children as conservers and non-conservers.

The Stanford-Binet Intelligence Scale Form L-M

Children's conversations during the Lavatelli Early Childhood Curriculum lessons will provide examples of children's syntactical structuring of language. The examples will

not necessarily be coordinated with the expectations from the results of the Stanford-Binet Intelligence Scale.

Theoretical Framework

Jean Piaget and Barbara Inhelder

The research of Jean Piaget, a Swiss psychologist and his colleague, Barbara Inhelder, on the development of cognitive processes dating over forty years suggest the following theory related to tracing intelligence from birth to adolescence: That intelligence is a specific instance of adaptive behavior coping with the environment, organizing and reorganizing thoughts and actions until reaching the adult stage of logical thinking. Initially, the adaptive behavior is random, diffuse, uses massive reflexes but through continuous progressing through stages and acting on the environment or interacting with the environment, mental structures change becoming more complex and eventually resulting in logical thinking. Two complementary processes of intelligence and adaptive behavior are assimilation and accommodation. Assimilation uses and incorporates stimuli from the environment and interprets such in light of past experiences. When the intake of stimuli does not quite fit the mental structure, the learner attempts to reorganize stimuli in view of past experiences. When the learned responses are no longer adequate and new behavior is required, the learner becomes involved in

accommodation. When the learner can assimilate in relation to the stimuli and interpret in view of past experiences he is involved in equilibration. When the learner attempts to reorganize thoughts and learned responses are no longer adequate, he becomes involved in disequilibration.[1]

The development of knowledge is a spontaneous process involved with embryogenesis. Embryogenesis involves the development of the body, the nervous system and mental structures. Every child is involved in such a development.

Learning is situational, contrived by a specialist (known as the teacher) and generally revolves around some didactic point. There are four aspects of learning: experience which is physical and experience which is logical--mathematical; maturation which refers to physical and the maturing of the nervous system about which we know very little. Maturation evolves out of experience--social transmission--the learner has to have some way of expressing his operations and thus language is the vehicle; equilibration is a combination of the previously cited experiences-experience, maturation and social transmission.[2]

Piaget's stages of development are: sensori-motor, from birth to two and a half years. The infant from seeing,

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[1]John L. Phillips, Jr., The Origins of Intellect Piaget's Theory (San Francisco: W. H. Freeman and Company, 1969), pp. 8, 9.

[2]Jean Piaget, "Development and Learning," Journal of Research in Science Teaching, 2, No. 3, 1964.

hearing, touching and other senses, begins to assimilate and accommodate sensations about his physical world. As each new sensation appears, the mental structures change to accommodate the new information. The preoperational stage from two and a half years to seven years, the infant begins to give up arriving at answers on the basis of sensory data alone. He must transform, rearrange the data in his mind, perform actions upon what he perceives. Characteristics of the preoperational child are egocentrism--there is no world for the child but his world; irreversibility--the child cannot reverse; concreteness--the child responds to objects or material upon which he or she can act or interact. The child does not react positively to abstractions; states versus transformation--the child cannot see or hear states in a transformation. The child tends to remember what he sees or hears at the beginning or end but does not attend well to what happens in between; transductive reasoning--the child reasons from particular to particular. Centering--the child may center on an object, color, line or almost anything. The concrete stage of development--seven to eleven years--evidences real systems of action with definite structural properties. The child begins to utilize logico-mathematical experiences as well as physical experiences. He enters into concrete operations. The formal stage of development--eleven years to adulthood--is characterized by propositional thinking, identification of variables in problems, begins to

eliminate contradictions and states variables in terms of "if"--"then" relationships.[1]

Celia Stendler Lavatelli

Celia Stendler Lavatelli, University of Illinois, studied with Piaget at the University of Geneva and after extensive research at the University of Illinois developed the Lavatelli Early Childhood Curriculum. Celia Stendler Lavatelli designed the Early Childhood Curriculum to develop in four to six year olds the thought processes and appropriate language required to develop mental operations. The Early Childhood Curriculum provides experiences required to stimulate intellectual growth with a series of short, structured lessons to be conducted with small groups of children several times a week. The short structured lessons make provision for syntactical structuring of language by the teacher eliciting responses. The small groups of children work with concrete materials to foster the development of intellectual skills or operations in classification, number, measurement, space and seriation with appropriate language models described for each operation.

Assumptions, Limitations and Definitions of Terms

Assumptions

A basic assumption is that Jean Piaget's Developmental Theory and Model of Intellect are accurate enough to serve

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[1]Phillips, The Origins of Intellect, pp. 15, 104.

as a theoretical base for the Lavatelli Early Childhood Curriculum. His theory was and is questioned by some people.

A second assumption is that Celia Stendler Lavatelli's writings and research related to Piaget and the study of language are accurate enough to produce evidences of syntactical structuring of language by young children. The syntactical structuring of language refers to syntactical structuring as provided in the Lavatelli Manual.

A third assumption is that previous studies using the Lavatelli Early Childhood Curriculum have not added to the reliability and validity of Piaget's Theory applied to the Lavatelli Early Childhood Curriculum. There is limited research available regarding the use of the Lavatelli Early Childhood Curriculum.

Limitations

The removal of the children or subjects from the kindergarten classroom for teaching purposes resulted in the lack of reinforcement of syntactical structuring of language eliciting responses by the kindergarten teacher according to the intent of the Lavatelli Early Childhood Curriculum. The Lavatelli Early Childhood Curriculum materials were not available for the children or subjects to act upon or interact except when they were removed from the kindergarten room for the short structured or unstructured lesson.

An observation of the kindergarten teacher using the Flanders Interaction Analysis Instrument yielded a revised

indirect ratio of 0.78 which suggested that the teacher supported spontaneous communication behavior among pupils and the teacher. Results of this study may not be used to generalize for individuals and groups because of selection procedures and the design of the study.

Definition of Terms

Structured ECC Lessons refer to the lessons as designed by Lavatelli in the Early Childhood Curriculum to develop in four to six year olds the thought processes and appropriate language required to develop mental operations as related to classification, number, measurement, space and seriation. The appropriate language is syntactically modeled by the teacher, eliciting responses from the children or subjects.[1]

Unstructured ECC Lessons refer to the lessons as designed by Lavatelli in the Early Childhood Curriculum to develop in four to six year olds the thought processes and appropriate language required to develop mental operations as related to classification, number, measurement, space and seriation. The appropriate language is syntactically modeled by the teacher with omission from Lavatelli's script for syntactical modeling. The teacher does not elicit responses from the children.[2]

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[1]Celia Stendler Lavatelli, Piaget's Theory Applied to an Early Childhood Curriculum (Boston: American Science and Engineering, Inc., 1970), pp. 75, 76.

[2]Ibid., p. 71.

Unstructured Piagetian Conservation Tasks refer to the tasks developed by Jean Piaget related to the conservation of number, liquid amount, solid amount, length and area. The Conservation Tasks determine whether the children or subjects are conservers or non-conservers.[1]

A mental operation refers to the essence of knowledge; it is an interiorized action which modifies the object of knowledge. Knowledge is not a copy of reality. To know an object, to know an event, is to act on it. A mental operation is interiorized, reversible and never isolated. It is always linked to other operations, it is always a part of a total structure. A mental operation allows the knower to get at the structures of the transformation.[2]

Language refers to what appears when actions begin to be represented in thought. The child gradually learns to represent reality through the intermediary of symbols or signs; these may be words or mental images or imitations. When spoken sounds begin to have something of the same meaning to more than one person (the speaker and listener), oral language begins. Language is the vehicle for expression of thoughts. It is a symptom of underlying thought.[3]

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[1]John W. Renner, Robert R. Bibens, and Gene D. Shepherd, Guiding Learning in Secondary Schools (New York: Harper & Row Publishers, 1972), p. 94.

[2]Piaget, "Development and Learning," Journal of Research in Science Teaching (2, No. 3, 1964), pp. 176-186.

[3]Lavatelli, Piaget's Theory Applied, pp. 62, 63.

Syntactical structuring with modeling of language refers to the regulation of what is said by the teacher according to the script of the Lavatelli Early Childhood Curriculum. The teacher elicits responses from the children which imitate the syntactical structuring or modeling of language from the script.[1]

Omission of syntactical structuring of the language refers to the omission of Lavatelli syntactical structuring of the language according to the manual of the Early Childhood Curriculum. Syntactical structuring of the language is substituted from the script of the writer and/or teacher without eliciting imitation responses from the children.

Conserver refers to a child or subject who conserves. The child can hold a concept regarding an object in the cognitive structure while a second object like the first is distorted. He can see that the distorted object is still like the non-distorted object.[2]

Non-conserver refers to a child or subject who can not hold a concept regarding an object in the cognitive structure while a second object like the first is distorted. The child cannot see that the distorted object is still like the non-distorted object in many specific ways.[3]

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[1]Lavatelli, Piaget's Theory Applied, p. 46.

[2]Renner, Bibens, Shepherd, Guiding Learning, p. 95-100.

[3]Ibid., p. 95.

Classification refers to involvement of children in more than perceptual judgments. It demands mental operations. The learner must take in information and remake the information. Classification involves the properties common to a particular class and also involves including in the class all objects or experiences possessing the common properties defined by its inclusion and exclusion.[1]

Number refers to both class and seriation operations. Number involves activities related to one-to-one correspondence, materials and their division into sets of equal number, conservation of "continuous" and "discontinuous" quantities. The learner must take in information and also remake the information.[2]

Measurement refers to a change of position which may be effected by the moving eye comparing distant objects or the movement may be that of a common unit of measure which links distant objects together. Essential to measuring is the notion of unit iteration, of making or deciding upon a unit and repeating it. The learner must take in information and also remake the information.[1]

Space refers to how space is represented in thought. It is involved with the development of concepts of open and

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[1] Lavatelli, Piaget's Theory Applied, pp. 81-104.

[2] Ibid., pp. 105-112.

[3] Ibid., pp. 113-117.

closed figures, of geometrical shapes, or spatial perspective and of objects in a plane. The learner must take in information and also remake the information.[1]

Seriation refers to reestablishing relations between objects by ordering them in some way. The children or subjects look for differences; a series is really a chain of differences. Seriation imposes some kind of order upon objects or events. The learner must take in information and also remake the information.[2]

Methodology

Population and Sample

Seven subjects, ages five and six were randomly selected from the morning kindergarten class at Mark Twain Elementary School. Six of the subjects were approximately five years of age and one of the subjects was six years of age. The seven subjects included three boys and four girls. The racial composition of the seven subjects may be described as three Caucasian Americans, one Indian American, one Mexican American and two Negro Americans. Mark Twain Elementary School may be described as a Title I School which qualified for aid under Title I of the E.S.E.A. Act.

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[1] Ibid., pp. 117-128.

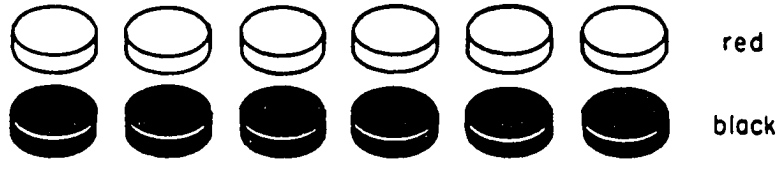
[2] Ibid., pp. 129-145.

Instruments

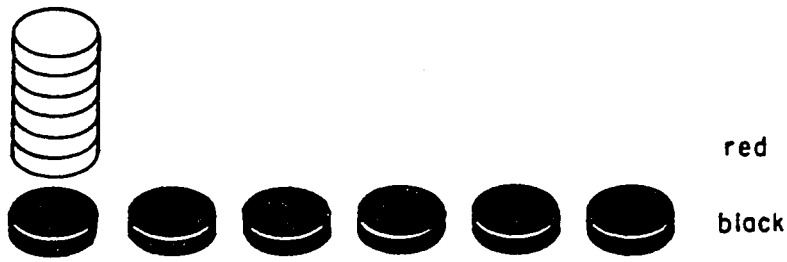
The Piagetian Conservation Tasks.--The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Length, and Area were administered at pre and post testing times on an individual basis. Appropriately selected Piagetian Conservation Tasks provided examples of childrens' language and also described the children or subjects as conservers or non-conservers.

Description of Conservation Tasks

Conservation of Number Task.--The child was asked to line up six black checkers in one row and six red checkers in another row. The child was asked if he agreed that there were the same number of red checkers as there were black checkers.



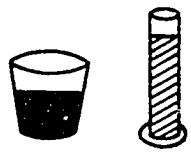
After he agreed that there were the same number of each, the child was asked to stack the red checkers, one on top of the other, and leave the black checkers as they were. After the checkers were rearranged, the child was asked if there were more red checkers, more black checkers, or if the numbers of black and red checkers were equal. If he responded that the numbers were equal, he conserved number.



Conservation of Liquid Task.--The teacher poured the same amount of water in two containers of equal size. For convenience, you may wish to color the water in one container red. The child was asked if he agreed that the containers were the same size and that they contained the same amount of liquid; the child was allowed to adjust the levels if he wished.



After he agreed that the amounts were equal, the child was asked to pour the clear liquid into a taller, thinner container and was asked if there was more colored water, more clear water, or if the amounts were equal. A response that the amounts were equal showed that the child conserved liquid; a response that there was more water in one of the containers demonstrated a lack of liquid conservation ability.



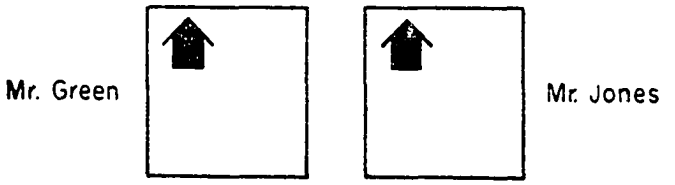
Conservation of Solid Amount Task.--This task presented two prepared pieces of clay containing the same amount of clay and rolled into balls of equal size. For convenience, you may wish to use two colors of clay, blue and red. The child was asked if he agreed that there was the same amount of blue clay as red clay; the child was allowed to make any adjustments in the balls he wished to in order to convince himself the balls were of equal size.



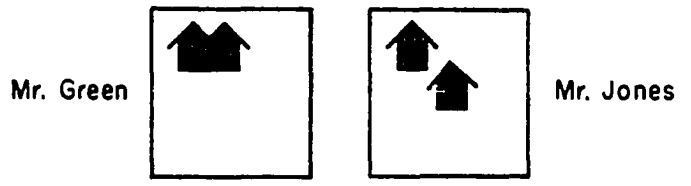
Next the piece of red clay was distorted by rolling it into what you may want to call a "snake." The child was asked if there was more clay in the ball, in the "snake," or if there was the same amount in each. Recognizing that the amount of the solid remains constant indicated solid amount conservation ability.



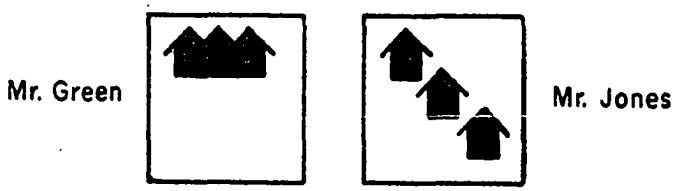
Conservation of Area Task.--The child was shown two fields of grass (green construction paper) of equal size; the teacher made sure that he satisfied himself that each field of grass was the same size before going on. The teacher explained that each field of grass was owned by a farmer; Mr. Green owned one and Mr. Jones owned the other. Both Mr. Green and Mr. Jones built a barn on their fields. A barn made of red construction paper or a toy barn was placed on each field and it was explained that the barns were the same size. The child was asked if there was still the same amount of grass which was not covered on each field, or if one or the other had more. The response was recorded.



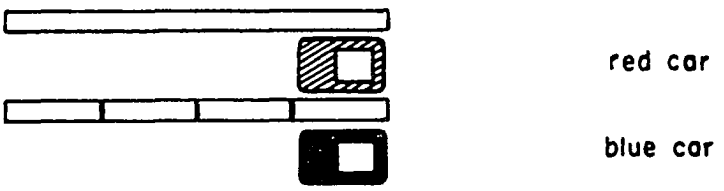
Next, the child was told that Mr. Green and Mr. Jones each built another barn; Mr. Green built his second barn right next to his first barn. Mr. Jones left a space of grass between his two barns. Again the child was asked if there was still the same amount of uncovered grass on each field.



The teacher explained to the child that Mr. Green and Mr. Jones each built a third barn and placed them in the same manner as they had before. The child was asked if there was still the same amount of uncovered grass on each field or if one or the other had more. A response that there was still the same amount of uncovered grass demonstrated the learner's ability to conserve area.

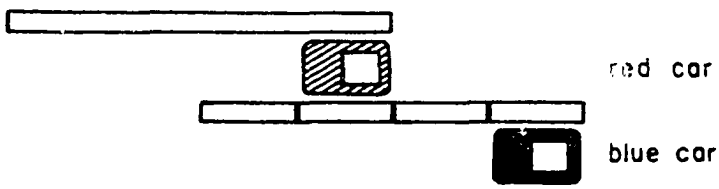


Conservation of Length Task.--This task required a wooden dowel 12" long and four dowels of the same diameter each 3" long. The exact lengths were not important, but the combined lengths of the four smaller dowels must equal the length of the long dowel. Two identical toy cars were also helpful. The long dowel and the pieces were placed parallel so that the combined length of the pieces just exactly equaled the length of the long piece.



The teacher made sure that the child agreed that the line of pieces was exactly the length of the long piece; the

child was allowed to make adjustments when necessary. The child was informed that the dowels represented roads and there was going to be a race. Identical toy cars were placed (may use a red one and a blue one) at the same ends of the roads and then this question was posed: "If the cars travel the same speed, which car, the red one or the blue one, reached the end of the road first; or did they reach the end of the roads at the same time?" The child generally agreed they reached the end of the roads at the same time; if he did not, it was discussed with him until the child agreed that they did. If he did not ultimately agree that the cars reached the ends of the roads at the same time, the task was abandoned. Next, two pieces of the four-piece road were moved as shown. The child was again asked the question about the race. If a child responded that the cars reached the ends of the roads at the same time, he conserved length.[1]



Changing of Criteria Task.--Cut geometric figures out of construction paper: twenty-four circles, diameters one

[1]Renner, Bibens, Shepherd, Guiding Learning, pp. 95-100.

inch, twelve red, twelve blue; twenty-four circles, diameter two inches, twelve red, twelve blue; twenty-four squares, side one inch, twelve red, twelve blue; twenty-four squares, side two inches, twelve red, twelve blue. The figures were placed on the table in front of the child without putting them into any special order. "Tell me what this is." "Can you put into piles the things that go together?" "Put everything that is very much the same into the same piles." "Can you separate the things that are different?"

"Now can you make just two piles and then put the things from the piles into these two boxes?" "How did you separate them?"

"Can you arrange the things differently and put them in two piles?" If the child reverts to his first criterion, say, "but you have already done that; can you find another way of putting the things together?" "How did you separate them?" "Why?"

"Is there still another way?" "Could you arrange things in another way?" If the child does not find the solution, the experimenter starts a classification by one of the two criteria that the child has not used in Part II. "Could you continue like this?" "Why did I put these together in this box and the other ones in that box?" Once the child has finished the classification, ask, "Why did you arrange them like this?" "What could you call these?"[1]

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[1]Lavatelli, Piaget's Theory Applied, p. 156.

The children's responses during the administering of the Piagetian Conservation Tasks and the Changing of Criteria Task were electrically recorded. The instrument for the transcribing and analyzing of language responses during the Piagetian Tasks is found in Appendix A.

The Stanford-Binet Intelligence Scale Form L-M.--The Stanford-Binet Intelligence Scale Form L-M was administered by a qualified examiner with appropriate training for administering. The Stanford-Binet Intelligence Scale Form L-M was administered for the purpose of describing the seven subjects as to potential success related to language and general mental development. The Stanford-Binet Intelligence Scale Form L-M was administered as a pre-test.

The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (Optional).--The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (optional) were administered at a pre and post testing time for the purposes of describing the subjects in relationship to the Word Meaning, Listening, Matching, Copying, Alphabet, Number and Draw-A-Man Sub-Tests. The Metropolitan Readiness Tests Form A, 1-6 yielded significant information as related to the pre-operational characteristics of the subjects based on Piaget's Theory.

The sub-tests of the Metropolitan Readiness Tests attempted to identify the characteristics important for success in first year work. Some of the most important

characteristics of first year readiness were identified as comprehension, use of oral language, visual perception and discrimination, auditory discrimination, richness of verbal concepts, knowledge of numerical and quantitative relationships, sensory motor abilities of the nature required in handwriting, writing of numerals and drawing and the ability to listen and follow directions. Attempts to attach significance to the subtest scores of individual pupils were not recommended, except in instances where the total score fell in the D or E category.[1]

Description of the Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (Optional)

The Word Meaning Test.--This test provided a measure of the child's ability to comprehend phrases and sentences. Words were chosen from standard kindergarten and primary word lists.

The Listening Test.--This test provided a measure of the child's ability to comprehend phrases and sentences. The child's ability to comprehend phrases and sentences tapped the child's knowledge of the world about him and sometimes required the drawing of inferences.

The Matching Test.--This test provided a measure of visual perceptual skills related to those involved in

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[1]Gertrude H. Hildreth, Nellie L. Griffiths, and Mary E. McGauvran, Manual of Directions Metropolitan Readiness Tests Forms A and B (New York: Harcourt, Brace & World, Inc., 1969), pp. 15, 16, 33.

discriminating word form in beginning reading. This test as described in the Manual has consistently correlated with beginning reading skills.

The Alphabet Test.--This test provided a measure of the child's ability to recognize letters of the alphabet as they were named. This test as described in the Manual has been identified as being one of the best predictors of success in the early stages of reading.

The Number Test.--This test provided a measure of the inventory of the child's stock of number concepts, number knowledge, ability to manipulate quantitative relationships and recognition of an ability to produce number symbols and related knowledge, such as money concepts. The test is described in the Manual as symptomatic of a general mental alertness that will help the child in the first year of schooling.

The Copying Test.--This test provided a measure of the child's ability to manifest a combination of visual perceptions and motor control similar to the abilities needed in learning to write.[1] The child was expected to reproduce letters, numerals and figures.

The Draw-A-Man Test (optional) provided an estimate of general mental development. The detail and skill with

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[1]Ibid., pp. 15, 16.

which a child drew a man (woman, boy, girl) indicated the stage he had reached in perception and motor control.[1]

The Draw-A-Man Test (Optional).--This test provided a measure of the child's general intelligence or level of mental development. The test also provided an index to recognition of artistic abilities, motor skills and manual dexterity required in handwriting.[2]

These Metropolitan Readiness Tests Form A, 1-6 were examined for evidence of marking behavior of subjects that would support of contradict the theoretical assumptions of Jean Piaget as applied to the pre-operational child or subject. The marking behavior of each subject was analyzed in terms of the pre-operational characteristics of egocentrism, irreversibility, centering, concreteness, states versus transformation and transductive reasoning.

Description of the Yarn Color Test

Nine colors of yarn were placed in a box and each child or subject was asked to identify the color of yarn drawn from the box. The nine colors were black, blue, green, yellow, purple, orange, pink, red and white.

The Yarn Color Test.--This Yarn Color Test was administered on an individual basis to provide information related

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[1] Ibid., p. 33.

[2] Ibid., p. 10.

to identification of colors by each child or subject in as much as the Lavatelli Early Childhood Curriculum lessons involved many activities related to color. The results of the identification of colors by each child were used only for descriptive purposes and not with the intent of teaching the colors not identified at lesson times.

Description of Questionnaire for Determining Socio-Economic Status

This questionnaire was used to describe the socio-economic status of the family unit as indicated by the factor of parents' occupation, parents' education, ethnic group and type of housing. Warner found that there was a close relationship between socio-economic status as indicated by these single factors, and the social-class placement of a family unit.[1]

Questionnaire for Determining Socio-Economic Status.--This Questionnaire for Determining Socio-Economic Status was utilized for providing additional information regarding the subjects. The Questionnaire was utilized for descriptive purposes only as no ratings were established.

Description of Flanders Interaction Analysis

The Interaction Analysis system allows for the teacher to observe and analyze his own verbal classroom behaviors

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[1]Lloyd W. Warner, Marchia Meeker, and Kenneth Eells, Social Class in America: A Manual of Procedure for the Measurement of Social Status (Chicago: Science Research Associates, Inc., 1949).

related to direct or indirect influence on students. Indirect influence involves categories such as acceptance on the part of the teacher of students' feelings and ideas, positive reinforcement and phrasing of questions about content or procedure with the expectation that the student will answer. Direct influence involves categories of lecturing by the teacher, giving directions and commands, criticizing or justifying authority with the intent of changing student behavior from nonacceptable to acceptable patterns. The instrument also involves student-talk responses and the sources of the initiation of talk.[1]

The Flanders Interaction Analysis.--The Flanders Interaction Analysis was administered to determine whether the language used by the kindergarten teacher could be described as direct or indirect. An observer trained in the utilization of the instrument made the observation.

Procedure

Pre-Tests.--The seven subjects were administered all tests in the following order at pre-test time.

> The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length were administered individually. The time schedule for administering of the Piagetian Conservation Tasks was two days.

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[1]Edmund J. Amidon, and Peggy Amidon, Interaction Analysis Training Kit--Level I (Minneapolis, Minnesota: Association for Productive Teaching, 1967), pp. 2, 10.

The Stanford-Binet Intelligence Scale Form L-M was administered individually. The time schedule for administering of the Stanford-Binet Intelligence Scale Form L-M was four days.

The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (optional) were administered initially in a group situation. This procedure was abandoned because the children appeared to experience a high frustration level as they interacted with each other. Completion of the Tests was done individually. The time schedule for administering of the Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man (optional) was two weeks.

The Yarn Color Test was administered individually. The time schedule for administering of the Yarn Color Test was one day.

Post-Tests.--The seven subjects were administered three of the four tests at post-testing time. The Stanford-Binet Intelligence Scale Form L-M was not administered again.

The time schedule for administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length was two days as in pre-testing time.

The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (optional) were administered and completed in the group situation. The time schedule for administering of the Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (optional) was one week.

The Yarn Color Test was administered individually. The time schedule for administering of the Yarn Color Test was one day.

Seven Subjects.--The seven subjects were taught five days a week for a period of seven weeks. The seven subjects were taken from the kindergarten classroom to the Media Center

of Mark Twain Elementary School and became involved in the lessons seated on a large rug in the Media Center. The teacher was seated on the rug with the subjects.

Lessons of all types were electrically recorded using a Craig 2608 Portable Stereo Cassette Recorder with two microphones. Lessons for each of the seven subjects were transcribed within a week after having been electrically recorded. The instrument for the transcribing and analyzing of language responses for lessons--all types--is found in Appendix B. The transcriptions for each subject were placed on a form which described the speech event, the responses of the subject and the analyzation of the responses. Analyzation of responses for each of the seven subjects were tabulated at the end of the seven week period and data was recorded for each of the seven subjects on a separate matrix.

Lesson Plan Outline

Classification

Structured ECC Lessons.--

Set I	Identifying Properties of Objects
Set II	Multiple Classification--four Matrix puzzles requiring four separate lessons.
Set III	Complementary Classes

Unstructured ECC Lesson.--

Set IV	Class Inclusion

Structured ECC Lessons.--

Set V	Hindsight and Foresight
Set VI	Intersection of Classes
Set VII	Combinations and Permutations

Unstructured ECC Lesson.--

Set VIII	Continuation of Combinations and Permutations--Additional Activity

Piagetian Conservation of Changing of Criteria Task.--

The Piagetian Conservation of Changing of Criteria Task was administered before introducing Number, Measurement and Space.

Classification Time Schedule

L - Lavatelli
P - Piaget
C - Carter
O - Omission
CT - Conservation Task

Set I	Time I	L
Set II	Time II	L
	Time III	L
	Time IV	L
	Time V	L
Set III	Time VI	L
Set IV	Time VII	$L\text{-}C_{O_1}$
Set V	Time VIII	L

	Time IX $_{L}$
	Time X $_{L}$
Set VI	Time XI $_{L}$
Set VII	Time XII $_{L}$
Set VIII	Time XIII $_{L\text{-}C_{O_1}}$
	Time XIV $_{P_{CT}}$

Time allotment was two weeks and four days.

Number

Structured ECC Lessons.--

Set I Conservation of number with physical correspondence.

Set II Conservation of number without physical correspondence.

Unstructured ECC Lessons.--

Sets I and II combined for activities.

Piagetian Conservation Task of Number.--The Piagetian Conservation Task of Number was administered before introduction of Liquid and Solid Quantity.

Measurement

Structured ECC Lessons.--

Set III Conservation of Liquid Quantity

Set IV Conservation of Quantity with Visual Correspondence.

Unstructured ECC Lesson.--

Set IV Conservation of Quantity without Visual Correspondence.

The Piagetian Conservation Tasks of Liquid and Solid Amount were administered.

Space

Structured ECC Lessons.--

Set V Horizontal and Vertical Reference Points (omitted)

Set VI Conservation of Surface Area

Set VII Conservation of Length

Unstructured ECC Lessons.--

Sets VI and VII were combined for the activity.

The Piagetian Conservation Tasks of Area and Length were administered before introduction of Space.

Number, Measurement, Space Time Schedule

L - Lavatelli
P - Piaget
C - Carter
O - Omission
CT - Conservation Task

Set I	Time I	L
Set II	Time II	L
Sets I & II Combined	Time III	$L\text{-}C_{O_1}$
	Time IV	$P_{CT(Number)}$

Set III	Time V	L
Set IV	Time VI	L
Sets III & IV Combined	Time VII	$L\text{-}Co_2$
	Time VIII	P_{CT}(Liquid & Solid Amount)
Set VI	Time IX	L
Set VII	Time X	L
Sets VI & VII Combined	Time XI	$L\text{-}Co_3$
	Time XII	P_{CT}(Length and Area)
Set VIII	Time XIII	L
Set IX	Time XIV	L
	Time XV	$L\text{-}Co_4$
	Time XVI	P_{CT}(Area)

Time allotment was three weeks and one day.

Seriation

Structured ECC Lessons.--

Set I — Seriation of Length with Insertion of a New Unit.

Set II — Seriation of Two-Sets of Objects.

Unstructured ECC Lesson.--

Set III — Seriation of Length and Color.

Structured ECC Lesson.--

Set IV — Multiple Seriation.

Unstructured ECC Lesson.--

Set V Transitivity.

Seriation Time Schedule

L - Lavatelli
P - Piaget
C - Carter
O - Omission
CT - Conservation Tasks

Set I	Time I	L
Set II	Time II	L
Set III	Time III	$L\text{-}C_{O_1}$
Set IV	Time IV	L
Set V	Time V	$L\text{-}C_{O_2}$

Time allotment was one week.

Examples of Scripts for Unstructured ECC Lessons

Class Inclusion.--"Children select some roses from your bouquet of flowers." "Tell me what you are doing." "Describe your bouquet of flowers, Mary, John, etc." "Now each of you place your bouquet of roses in your vase." "What pretty bouquets of flowers!" "John, do all your roses look alike? Oh! You would like to take that one out." "You told me that some of you made bouquets of red roses and some made bouquets of yellow roses. What is it Mary?

You have red and yellow roses." "Take your bouquet of roses out of the vase and let's make a bouquet of daisies. What are you doing, Bob? Place them in your vase. I would like for each of you to tell me about your bouquet of daisies." "Now, take your bouquet of daisies out of the vase and make a bouquet of flowers. What are you doing? Would you like to play another game? Make a bouquet of yellow roses, red roses, white daisies and yellow daisies. Are the bouquets all alike? Why?" "Put all the flowers under your chair. Are there any roses left? Why?"

Combinations and Permutations.--"Here are three types of cars for you to play with. Now that you have finished playing with the cars, let's look at them. Could you put two cars together? That is fine! Make as many sets of two cars as you can. What are you doing? Tell me about your set of two cars and why you put them together."

Conservation of Number with and without one to one correspondence.--"We are going to play store again today. Here are some pennies for you to buy your toys. Each toy cost one penny and the toys are lined up here. Place each penny near the toy you are going to buy. What are you doing?" "We are now going to play store another way. Here are a pile of toys and over here a pile of pennies. Show me what you are going to do when you buy your toys. What are you doing?" "Here are some other objects. Oh! You know what they are. You said they were blue cubes. Do you need the other colored

cubes?" "What are you doing with the blue cubes? You are showing me the way to separate them. How many piles do you have? How do you know?" (The same script was used for red cubes.) "We will call the red cubes our red cake and the blue cubes our blue cake. Look how far I have pushed the cakes apart. Are the cakes the same size? How do you know?"

Conservation of Liquid Quantity and Solid Amount.--"I have made lemonade for you today in the large pitcher. Would each of you like me to pour you a glass of lemonade? Look at your glass of lemonade. What can you tell me about your glass and your lemonade?" "So you think Cheryl has more than you. How do you know this? Yes, each of you may pour your lemonade back into the pitcher and we will start again." "Here are your marbles and containers. Do you know a game to play using these marbles and containers? Would you show me how to play the game? What are you doing? Why? What could we say about the two containers of marbles?"

Conservation of Area and Length.--"Here are two fields of grass and some cars. In this field of grass park your car. What are you doing? In the other field of grass park three cars. What are you doing?" "Is there as much grass to mow in the field where you parked one car as in the field where you parked three cars? Why?" "John, I would like for you to build a tower out of the smaller blocks.

You may build the tower as you like. What are you doing? How did you know when to stop?" "How did you know to use the rods after you had built your tower?"

Conservation of Space.--"Some of you have place mats in front of you. Would you three set the table as you would at home using your utensils? What are you doing? Now the three of you sitting across the rug match what each of your friends has done. What are you doing?" "John, would you turn your place mat around slowly? What happened when you did this? Which hand are you talking about?" "Take your house, garage and tree and place them where you think they belong. What are you doing?"

Seriation.--"You have some pots of flowers, dolls and umbrellas and long strips. Play a game with these objects and place them in some kind of order. I wonder what you might do with them. What are you doing? Why did you place this flower pot with this doll and umbrella?"

Treatment of Data

The Piagetian Conservation Tasks.--The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Length and Area at pre and post testing time yielded examples of children's language which were analyzed according to an instrument which shall be mentioned later. The examples of children's language was used to provide information as to whether the subject could be described as a conserver or non-conserver.

The Stanford-Binet Intelligence Scale Form L-M.--The Stanford-Binet Intelligence Scale Form L-M described each of the seven subjects as to potential success related to language and general mental development. Examples of children's language and behavior during the administering of the Stanford-Binet Intelligence Scale Form L-M were described.

The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (Optional).--The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (optional) at pre and post testing time were utilized to describe each of the seven subjects in terms of a letter rating and the interpretation of the letter rating according to the Manual of Directions of the Metropolitan Readiness Tests Form A and B. Other significant information was obtained through observation and analyzation of the marking behavior of each of the seven subjects in relationship to the suspected pre-operational characteristics of the subjects based on Piaget's Theory.

The pre-operational characteristics according to Piaget are listed as: egocentrism--child cannot take another person's point of view. The child views the world as his world. The child does not disequilibrate and if so, not easily; centering--child tends to center attention on one detail of an event--cannot shift his attention to other aspects of a situation; irreversibility--the child cannot

return to the point of origin; states versus transformation--the child cannot focus on a whole, rather the child focuses on successive states of a display; transductive reasoning--the child reasons from particular to particular. The child cannot reason from particular to general or general to particular. The child cannot think about his own thinking; concreteness--the child needs concrete objects upon which to act or interact. The child does not cope easily with abstractions.[1]

The Yarn Color Test.--The Yarn Color Test at pre and post testing time was utilized only for identification of colors by each of seven subjects. There was no provision made for teaching of colors not identified by each subject. However, the ECC lessons involved activities using color and only under specific circumstances was color taught if provided for in the ECC lessons.

Questionnaire for Determining Socio-Economis Status.--Information was obtained by the counselor of Mark Twain Elementary School. This questionnaire was used to provide certain demographic information that would describe each of the seven subjects. The questionnaire was used for descriptive purposes only and not to be rated in any way.

The Flanders Interaction Analysis.--The Flanders Interaction Analysis was used to determine the directness or

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[1]Phillips, Origins of Intellect, pp. 63-65.

indirectness of the kindergarten teacher's language. An observer trained in the utilization of the instrument made the observation.

The Language Responses of the Seven Subjects.--The language responses for each of the seven subjects were analyzed according to the following criterion:

Language Units refer to all the language responses for each of the seven subjects falling under the cycles of classification, number, measurement, space and seriation. The language responses included the elements of property, action, complementary classes, abstractions and restricted usage.

The Labeling Mode refers to a verbal tag. There was no evidence of a verb utterance resulting in an incomplete sentence.[1]

The Sentential Mode refers to a marriage of labels and verbs known as a complete sentence. The label "I" may be stated or understood.[2]

Property refers to a variety of attributes involving use of concrete words. Examples: red, blue, yellow, round, square, small, large, tall, short, thin, fat or a transformation of concrete words by the subjects. Examples:

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[1]Jerome S. Bruner, The Relevance of Education (New York: W. W. Norton & Company, Inc., 1971), p. 45.

[2]Ibid.

small-little; large-big; round-circle; etc.[1] One Property refers to use of one of the attributes described above occurring in the Labeling or Sentential Mode. Two Properties refers to the use of a combination of any two attributes related to concrete words occurring in the Labeling or Sentential Mode. Three Properties refers to use of three attributes related to concrete words occurring in the Labeling Mode or in the Sentential Mode.

Action refers to a language response in either the Labeling or Sentential Mode with one or more performances.[2] One Action refers to a single performance occurring in the Labeling or Sentential Mode. One action is noted through the absence of a transformation of a single performance. The subject is allowed to center on one performance. Two Actions refers to a transformation of a single performance involving coordinate performances occurring in the Labeling or Sentential Mode. Three Actions or More (+) refers to a transformation of a single performance involving successive performances in the Labeling or Sentential Mode.

Complementary Classes refers to the act of grouping objects into only two classes and the language unit reflecting the classes in the Labeling or Sentential Mode.[2]

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[1] Ibid.

[2] Ibid.

[3] Ibid.

Complementary Class Exclusion refers to a group of objects divided from its complement in a negative manner occurring in the Labeling or Sentential Mode. Example: Things that are not. The marked characteristic is negation. Complementary Class Inclusion refers to a group of objects divided from its complement in a positive manner occurring in the Labeling or Sentential Mode. Example: Things that are.[1] Complementary Class Inclusion-Exclusion refers to what is included and what is not included occurring in the same Labeling or Sentential Mode response.[2]

Abstractions refers to the use of abstract words as color, shape, size or any other transformation of concrete words occurring in the Labeling or Sentential Mode. Use of abstractions would indicate that the child was operating at the top of the hierarchy.[3]

Restricted Responses refers to repetitive use of conjunctions as so, then, because. Restricted Responses also refers to the limited use of subordinate clauses, difficulty in holding a formal subject through a normal speech sequence, limited use of adjectives, adverbs and limited use of impersonal pronouns as subjects or conditional clauses.[4]

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[1]Lavatelli, Piaget's Theory Applied, pp. 84-145.

[2]Ibid.

[3]Bruner, Relevance, pp. 42, 43.

[4]Lavatelli, Piaget's Theory Applied, p. 58.

No Response refers to refusal on the part of the subject to answer whether in Structured ECC Lessons or Unstructured ECC Lessons. No response does not involve the use of the ostensive mode of pointing.

Each language response of each subject during the structured and unstructured lessons was analyzed from the criteria then tabulated on the matrix. A specimen of the matrix may be found in Appendix C.

CHAPTER II

REVIEW OF THE LITERATURE

Cognition and Language

Jerome S. Bruner

Bruner (1966) suggested that if language does affect thought, it was very necessary to describe as nearly as possible the formal nature of any language under examination. Bruner further suggested that the linquistics must be clarified before the psychological basis for early appearance of language can be dealt with adequately. A formal linguistic description is not sufficient for a psychological explanation of the origin or nature of the child's behavior. Questions were asked concerning whether certain nongenerative gestural languages for the expression or communication of emotions appeared in children before the appearance of language proper. What determined the language behavior in any human being? If children were found in a particular culture to have a certain language characteristic or trait, the matter is not understood psychologically until it is known what, exactly, the culture "did" to encourage such behavior. The culture might have done something to discourage certain

other behaviors. It is further considered that the child's use of language is categorical. Words cover classes of things and these classes are, if examined closely, found to be rule-governed, making allowance for new members to be added. All human language, after it has passed the stage of "one-word" utterance, is characterized by grammar. It was suggested that all languages have a base grammar structure that make provisions for three basic properties to sentences; verb-object, subject-predicate and modification. There are no human languages whose sentences do not contain rules for these three basic sentential structures and there are no nonhuman languages that have them. Order, various kinds of markers, such as suffixes and function words were some of the devices described that languages use. All languages contain provision for transformation. Bruner defined transformation as the "rewrite" rules. Bruner suggested that the child moves from "one word" utterance to a syntactic component that gives words some kind of productive benefit. It is suggested that the first syntax is simple but is easily identifiable as a step beyond what went on before.

Bruner suggested that the strong motoric element or sensorimotor element that persists in the child's first year of life could possibly interfere with "reflectiveness" in young children, appearing to delay language development and linquistic development. It is believed that when the child cannot inhibit the sensorimotor acting out of responses, he

cannot organize a center sufficient for language or at least for any language more complicated than the "one word" utterance. There is quite a gap between the "one word" utterance and a syntactic component with the semantic features being rarely used by the child for providing structure to his experience. The child's inability to use the superordinate rule of categorization consistently or inability to organize what he knows in a hierarchical organization is apparent.[1]

Bruner (1970) described language as being at a high level of generality. The generality was described as both semantic and syntactic. According to Bruner many of the experiments or research involved with the relationship of language to cognition have addressed themselves to the semantic. The semantic refers to the richness of the lexicon. The lexicon is referred to as the vocabulary of any one language at a single level of generality--its words rather than any structural relation among them.

A syntactic is involved with numbers of level of generality that can be encoded by the vocabulary or lexicon of a given language for a particular domain. Included in a syntactic are the properties of language that relate to the logical structure of thought.

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[1]Jerome S. Bruner, Rose R. Olver, and Patricia M. Greenfield, et al., Studies in Cognitive Growth (New York: John Wiley & Sons, Inc., 1966), pp. 3, 4, 44, 45.

Bruner strongly suggested that factors other than lexicon determine the bases of dimension of equivalence, that a specific lexicon may influence the "band width" of the individual categories that constitute the dimensions. It was further suggested that the equivalence of two spatially separated stimuli was affected by lexical conditions as that of two temporally separated stimuli. He concluded by saying that "equivalence" and recognition have much in common.

Bruner led us to believe then that, in order for the child to use language as a vehicle of thought, he must first bring the world of experience under the regulation of principles of organization that are in some way compatible with the structural principles of syntax.

Bruner continued to address himself to the idea that if linguistic categories organized in hierarchies are to have relevance to the "real world," then experience itself must be organized in this way. It is Bruner's belief that at the present, experience is not organized in this way. Bruner stated that his position was that language is derived from the same basic root of which symbolically organized experience grows.[1]

Bruner posed the question or considered the role of superordinate words in conceptual thought. The Wolof language, for example compared to English and French has neither

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[1]Ibid., p. 43.

the word "color" nor the word "shape." Bruner suggested that it is clear, however, that lack of the word "color" does not hinder color groupings from being formed.

Bruner's Hierarchical Structure.--

colors		shapes		functions	
yellow	orange	round	not round	to eat	to tell time
clock-- banana	orange	orange-- clock	banana	orange-- banana	clock

If this hierarchical organization corresponds to the type of structure generated by the child for a specific task, then use of the superordinate words "color" or "shape" should indicate that the child is operating at the top of the hierarchy. This suggested that if a child were pressed, he would be able to supply more than one kind of attribute. At play are color groupings, shape groupings, functional groupings. Should the child center on use of shape groupings or color groupings, he is possibly operating one level lower in the hierarchy.

Bruner defined a concept by what it excludes as well as by what it includes, by its contrast class. The concept of color comes into being through contrast with an opposing idea. An opposing concept to color per se cannot be a specific color: just as "round" is related only to "squares," or "rectangles," "hexagons," etc. An opposing concept to shape per se cannot be a specific shape.

If Bruner's reasoning was correct, it is safe to say that if a child used an abstract word like "color" or "shape" he would also vary his choice of grouping attributes when asked to make a first and second choice of pairs. If the child only used the word "red" then it would be expected that he form only color groupings. If a child used a superordinate word, his chances of grouping by a variety of attributes were twice as great as the child who utilizes no superordinate words.[1]

Herbert Ginsburg and Sylvia Opper

Ginsburg and Opper (1969) reviewed Piaget's findings related to language. Piaget discovered several varieties of communicative and non-communicative language as "egocentric" speech. The "egocentric" speech may be divided into three types. One type is repetition where the child mimics something he has heard. This type is sometimes referred to as copying speech. A second type of egocentric speech is the monologue. This monologue occurred when the child was alone and talked aloud at great length. This monologue clearly was not communicative. A third type of egocentric speech was the collective monologue. This type occurs when two or more children are together and one is involved in a soliloquy with no one listening. The child speaking may intend to interest the others in his his remarks, but the egocentric

[1]Bruner, Relevance, pp. 42, 43.

nature of the monologue prevents the other children from understanding him.

The communicative speech was referred to by Piaget as "socialized." The child had the ability to take into consideration the point of view of the listener and attempted to make himself understood. However, while socialized speech might be described as communicative; children do not attempt to explain events to one another and they do not speak in terms of causes of events. Children do not engage in giving proof or logical justification for what they have said.

Piaget offered a number of hypotheses regarding the non-communicative nature of the child. Piaget suggested that a child repeats for the pure joy of repeating, the sheer enjoyment of using words. Piaget would describe this as functional assimilation which is the tendency to repeat schemes and to exercise them. Piaget suggested that repetition is not motivated by the desire to communicate but by the need to exercise verbal schemes.

Piaget hypothesized regarding the monologue that it served the purpose of wish fulfillment. When the child discovers his actions were not adequate for producing an intended result, he used words to achieve his goal. Piaget also suggested that words and actions, at this age for the child were not yet fully differentiated.

Piaget hypothesized regarding the collective monologue in much the same way as monologue. Sometimes the

child in a group situation merely repeated what another child said because of functional assimilation.[1]

Celia Stendler Lavatelli

Lavatelli (1970) stressed the importance of children being able to use language to meet cognitive demands. She listed some of the cognitive demands as: ability to make comparisons; to draw inferences; to distinguish cause-and-effect relationships; to take classes apart and then exhibit the ability to put them together again; to talk about things and events that are present as well as things and events that are not present. Lavatelli further suggested that each of the mental operations required the use of a particular syntactical structure for expression. Use of the syntax in an appropriate situation would not teach the operation but may lend support to the operation.[2]

Jean Piaget

Piaget has continuously argued against the position that logical mathematical structures are derived in some unique way from linguistic forms. Piaget's position is that the logical mathematical structures existed before the appearance of language. Piaget consistently has supported the idea

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[1]Herbert Ginsburg and Sylvia Opper, Piaget's Theory of Intellectual Development, An Introduction (New Jersey: Prentice-Hall, Inc., 1969), pp. 89, 90, 91.

[2]Lavatelli, Piaget's Theory Applied, p. 64.

that at about the end of the first year or the beginning of the second year, there is a sensori-motor intelligence that is a very practical type of intelligence. This practical intelligence has its own logic--a logic of actions.

In sensori-motor intelligence Piaget suggested that there is a logic of inclusion, a logic of ordering and a certain logic of correspondency which he proposes are the foundations for the logical mathematical structures. Piaget suggested that they are not operations but they are the beginning of what will later become known as operations

Piaget suggested that his second argument concerns children whose thinking is logical but who do not have language available to them. He gave as an example deaf and dumb children. Piaget suggested that language is certainly not an exclusive means of representation. Language is described as only one of the very general functions. Actions can be represented in a number of different ways, of which language is only one. Actions may be represented by gesturing, deaf and dumb language--systematized, drawing, painting, modeling and deferred imitation.

Piaget has disagreed strongly with Chomsky. Piaget suggested that he supported the idea that the structures that are available to a child at the age of fourteen or sixteen months are the intellectual basis upon which language can develop but does not believe these structures are innate. Chomsky according to Piaget developed the hypothesis that

the core of reason on which the grammar of language is developed is innate. Piaget stated that Chomsky's hypothesis was unnecessary.

Piaget addressed himself to the work of Madame Hermine Sinclair, who studied the relationships between operational level and linguistic level in children between five and eight years of age. Madame Sinclair performed an experiment with two groups of children. One group was described as conservers. The other group was described as nonconservers. Madame Sinclair proceeded to study the language of each of these groups of children by giving them very simple objects to describe. The objects were generally presented in pairs. She discovered noticeable differences in the language related to the child being a conserver or a nonconserver.

The experiment seemed to show a relationship between operational level and linguistic level. Piaget suggested that we still do not know in what order the influence is exercised. Does the linguistic level influence the operational level, or does the operational level influence the linguistic level? Madame Sinclair went on to another aspect of the experiment. She provided linguistic training to the nonconserving group. She taught the children to describe the objects using the same language the conservers used. She examined again the children who had been nonconservers but who had been exposed to linguistic forms to see whether their operational level had been affected by the

linguistic training. In every case she found that there was only minimal progress after the linguistic training. Piaget suggested that the change was so minimal that he wondered whether these children were not already at an intermediate phase and right on the doorstep of the next substage. Madame Sinclair's conclusion based on the experiments was that the intellectual operations appeared to elevate linguistic progress and not vice versa.[1]

Lev Semenovich Vygotsky

Vygotsky (1962) viewed language processes in cognitive development as playing a stronger role. Vygotsky easily admitted that thought and speech arise independent of each other in the nervous system but strongly suggested that when individualized speech develops, the two systems of thought and language merge or fuse. Stronger still, Vygotsky suggested that complex logical thinking is dependent upon interiorized speech. Vygotsky believed that language was interiorized speech. Vygotsky believed that speech was interiorized psychologically before it was interiorized physically.

His investigations showed that speech development followed the same course and obeyed the same laws as the development of all other mental operations involving the

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[1]Jean Piaget, Genetic Epistemology (New York: Columbia University Press, 1970), pp. 41-51.

use of symbols. Vygotsky stated that these operations generally developed in four stages. The first stage was described as the primitive or natural stage, corresponding to the pre-intellectual speech and preverbal thought, when these operations appear in their original form, as they were initiated at the primitive level of behavior.

The second stage was "naive psychology"--this involves the child's experience with the physical properties of his body and of objects in the world around him and the applicability of this experience to the use of tools. Vygotsky referred to this stage as the first budding of practical intelligence. It is marked very clearly in the speech development of the child. Vygotsky proposed that the child used grammatical forms and structures before the child had understood the logical operations for which they stood. He has insisted that the child may utilize subordinate clauses, with words like because, if, when, and but long before he really grasps causal, conditional or temporal relations. The child mastered syntax of speech before syntax of thought.

The third stage was described by external signs and operations that are used as aids in the solution of internal problems. It is in this stage that Vygotsky maintained that egocentric speech was recognized.

The fourth stage was described as the "ingrowth" stage. External operation turned inward and a profound change is processed. "Logical memory" is described as the

ability to operate with inherent relationships and inner signs. Speech development is characterized as an inner, soundless speech. Vygotsky supported the idea that there is a constant interaction between outer and inner operations, one form without effort and frequently changing into the other and back again. External and internal behavior influence each other; external and internal speech influence each other.[1]

Benjamin Whorf

Whorf (1964) referred to grammatical patterns as interpretations of experience. He suggested that a category such as number (singular vs. plural) was an attempted interpretation of a whole large order of experience, virtually of the world or of nature; it attempts to say how experience is to be segmented, what experience is to be called "one" and what is to be called "several." Whorf suggested difficulty as related to standing aside from our own language and scrutinizing it objectively. Whorf through his studies proposed some interesting questions: Are our own concepts of "time," "space," and "matter" given in substantially the same form by experience to all men, or are they in part conditioned by the structure of a particular language or languages? Are there traceable characteristics

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[1]Lev Semenovich Vygotsky, Thought and Language (Massachusetts and New York: The M.I.T. Press and John Wiley and Sons, Inc., 1962), pp. 43-47.

between cultural and behavioral norms and large scale linguistic patterns?

Whorf suggested that the effortlessness of speech and the subconscious way we picked up the act of speech in early childhood led us to regard talking and thinking as totally straightforward and transparent. He further suggested that it was a natural feeling that we think we embody self-evident laws of thought. There is a tendency for us to know all the answers but when examined, the discovery is that they are fuzzy, hazy answers. Whorf stated that the "why" of understanding may remain undiscovered for a long time but the present logic of understanding, its background of laws or regularities is discoverable.

Whorf emphasized that he does not propose that language can be taken to men, that nothing is back of the nature of what has been called "mind." His own studies showed that language however in some sense is a superficial topping upon deeper processes of consciousness, which was necessary before any communication, signaling or symbolism could occur. The statement that "thinking" is a matter of language is viewed as an incorrect generalization. The more nearly correct idea is that "thinking is a matter of different tongues."[1]

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[1]Benjamin Lee Whorf, Language, Thought, Reality (Cambridge: M.I.T. Press, 1965), pp. 137-139, 236-241.

Language

Edward Sapir

> Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the "real world" is to a large extent unconsciously built up on the language habits of the group . . . We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation.*
>
> --Edward Sapir

Lois Bloom

Bloom (1970) stated that the grammatical categories in early child language are selectional rather than inflectional. They can only be marked by patterns of order and selection so that membership categories cannot be reliably determined until lexicon items occur in syntactic construction.

In the early stage, before a child uses notions of syntax to produce construction, his lexicon usually contains a high proportion of words that can be classified as nouns. Further, the new or different forms--adjectives, verbs,

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*Reprinted from pp. 75-93, Language, Culture and Personality, essays in memory of Edward Sapir, edited by Leslie Spier (Menasha, Wisconsin: Sapit Memorial Publication Fund, 1941). The article was written in the summer of 1939.

prepositions and other nouns that children add to their lexicons are generally just those forms that could be selected to combine with noun forms already acquired. Emerging notions of syntax might appear with experience or combinations.[1]

Celia Stendler Lavatelli

Lavatelli (1970) suggested that the model for language training should incorporate certain features: (1) Language training should be provided in small group sessions, so as to maximize opportunity for two-way conversations between teacher and child. (2) The teacher should serve as a model, presenting to the children a variety of well-formed sentences. (3) The teacher should model certain syntactical structures for children and elicit from the children those structures she modeled. (4) The modeling and eliciting should be carried on in as natural a conversational manner as possible. (5) Language training should be carried on in a warm, friendly, supportive environment with the teacher relying strongly on modeling rather than correction so that the child's associations with languages are pleasant ones and the child will more likely be motivated to use language well.[2]

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[1]Lois Bloom, Language Development Form and Function in Emerging Grammars (Cambridge: M.I.T. Press, 1970), pp. 29-30.

[2]Lavatelli, Piaget's Theory Applied, p. 78.

James Moffett

Moffett (1968) suggested that the pre-school child and even the child in the early school years showed no great evidence of possessing a gift for discourse. When the child speaks, his conversations are likely to show the following:

1. Difficulty in relying exclusively on language. The child wants to point. Bruner referred to this as use of the ostensive mode.

2. Egocentrism--The child is likely to use terms and draw upon experiences that his peers do not share. The child finds no discrepancy between his own information and that of the other person.

3. Failure on the part of the child to analyze the given information according to the problem.

4. The child does not order information so that the listener knows what he needs to know.

5. The child does not maintain a consistent point of view--subject to change when he wants to.[1]

Jean Piaget and
Barbel Inhelder

Piaget and Inhelder (1969) stated that articulate language makes its appearance, after a phase of spontaneous vocalization (common to children of all cultures between six and ten to eleven months) and a phase of differentiation of phonemes by imitation (from eleven or twelve months), at the end of the sensorimotor period, with what have been

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[1]James Moffett, Teaching the Universe of Discourse (Boston: Houghton Mifflin Company, 1968), pp. v, vi.

called "one word sentences." These single words may express desires, emotions, or observations. The verbal scheme becomes an instrument of assimilation and generalization based on the sensorimotor schemes.

From approximately the end of the second year, two-word sentences appear, then short complete sentences without conjugation or declension and next a gradual acquisition of grammatical structures. The syntax of children from two to four according to Brown, Berko and others at Harvard and Ervin and Miller at Berkeley, has shown that the acquisition of the syntactical rules cannot be reduced to passive imitation. It involves not only an important element of generalizing assimilating but also certain original constructions.[1]

Case Studies

Lois Bloom

Bloom (1970) studied the form and function of three children's speech--ages nineteen months to twenty-one months. The data for the study were obtained from observations conducted every six weeks in the homes of the children. The utterances of the three children were electrically recorded and transcribed. The data were analyzed according to an attempt to reach the meaning of children's sentences by focusing on the correlating of linguistic and contextual features

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[1]Jean Piaget and Barbel Inhelder, The Psychology of the Child (New York: Basic Books, Inc., 1969), pp. 86-87.

and on what the child said in relation to what he was talking about and the situation and behavior that occurred with what was said.[1]

Jean Piaget

Jean Piaget (1959) studied the functions of language in two children of six; two children between the ages of four and eleven; two children between the ages of six and eight; and twenty children between the ages of nine and eleven.

Piaget's procedure for the two children of six was as follows: Piaget and a companion observed the two children for about a month recording in detail and context all responses on the two children while in the classroom. When the data were collected on the two children, Piaget and his companion numbered all the subjects' sentences. A procedure was used for classifying the responses into elementary functional categories. Piaget described the results of the responses as egocentered speech and socialized speech which have been defined in a previous review under Ginsburg and Opper (1969).

Piaget's observations showed that to a large extent the greater part of the pre-school child's talk is egocentric. Even if socialized speech is utilized by the six and seven year old, it is not entirely free of egocentrism.

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[1]Bloom, Language Development, p. 16.

Piaget suggested as a result of this study that the child has a great many ideas he does not express in precise terms because they are egocentric and uncommunicable.[1]

Madame Hermine Sinclair

This case study was mentioned under Jean Piaget's Genetic Epistemology where Madame Sinclair conducted an experiment with language as related to conservers and nonconservers. Madame Sinclair in the second part of the experiment trained the nonconservers in language. Results of the study showed that the nonconservers showed a minimal difference related to language as a result of the training.

Theodore R. Sarbin, Ronald Taft, Daniel E. Bailey

Sarbin, Taft, and Bailey (1960) provided procedures regarding the logic of clinical inference as related to persons, intuition, and cognitive organization.[2]

Conclusion

Lois Bloom

Bloom (1970) has suggested that,

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[1]Jean Piaget, The Language and Thought of the Child (New York: The Humanities Press, Inc., 1959), pp. 5-21.

[2]Thomas R. Sarbin, Ronald Taft, and Daniel E. Bailey, Clinical Inference and Cognitive Theory (New York: Holt, Rinehart and Winston, Inc., 1960), pp. 44-84.

> . . . the intuition of the native speaker is inaccessible in an investigation of children's language and to the problem of testing an adequate theory of children's language. Any attempt should be viewed as a tentative proposal for accounting for the child's use of language.

CHAPTER III

CASE I--RON

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Ron Birthday: October (Month) 31 (Day) 1965 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: Dunbar Elementary

Pupil's address: confidential

What is the pupil's race? Check one: White ___ Negro x
Indian ___ Mexican ___ Other ___

Father's name: confidential

What kind of work does the pupil's father, or guardian, do? welfare (disabled Vet.) (If father, or guardian, works in a factory, or store, or office, tell what kind of jobs he does there.)

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here:

What other kind of work has the father ever done? construction

How often is the father paid? Check one: Every week ___
Once every two weeks ___ Once a month x By the day ___
In business for himself ___

What kind of work does the pupil's mother do? housewife
What other kind of work has she ever done? none

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	(2)	3	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	(8)	1	2	3	4	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house x Duplex ___ Single-family dwelling ___[1]
How many rooms are there in the family dwelling? four

Pre-Tests

The Piagetian Conservation Tasks

Ron's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Ron as a non-conserver in the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length. The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length also identified Ron as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Ron performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length, Ron utilized the Ostensive Mode of pointing to objects in response to the questions. The tester

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[1]Robert L. Curry, "The Effect of Intelligence on the Scholastic Achievements of Sixth Grade Children of Comparable Socio-Economic Status" (Unpublished Ph.D. dissertation, University of Oklahoma, 1960), p. 55.

supplied Ron with words "yes," "no," "the same," "not the same," for responses. When the tester asked the "why" questions, Ron's language pattern was characterized by "no responses." Ron sat in a crouched position and appeared very threatened by the testing situation.

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of seventy-nine which according to the manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of low potential for success related to language development and general mental development.[1] Ron appeared reluctant to engage in the Stanford-Binet Intelligence Scale Form L-M tasks. Ron appeared to be almost unfamiliar with the words and phrases to which he was expected to respond. He often did not respond, but would sit and sometimes repeat the question. On occasions, he appeared to search the tester's face for help or guidance before attempting to answer.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying, yielded a pre-test letter rating of E which is

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[1]Lewis M. Terman and Maud A. Merrill, Stanford-Binet Intelligence Scale Form L-M (3rd rev. ed.; Boston: Houghton Mifflin Company, 1962).

interpreted as low. According to the Metropolitan Readiness Tests Forms A and B Manual, the letter rating E is interpreted as, "high chances of difficulty under ordinary instructional conditions. Further readiness work, assignment to slow sections, or individualized work is recommended as essential in the manual."[1]

Analysis of Ron's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Ron's performances on the Piagetian Conservation Tasks. Ron's marking patterns on the sub-tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Ron appeared to look at some pictures and sometimes appeared not to look at the pictures. He appeared to mark the pictures with which he seemed to be familiar.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for each of the sixteen rows of pictures.

Ron's pattern of marking varied from marking pictures at the beginning of the rows to marking pictures at the end of the rows. Ron marked very few pictures in the middle position. Ron appeared to remember what he heard first or last but not much in the middle. The pre-operational characteristic of states versus transformation would appear to be present in Ron's marking pattern. Centering on the first pictures or centering on the last pictures appeared to be present in Ron's marking pattern. The pre-operational characteristic of centering would also appear to be present in Ron's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place a finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line. The tester then asked the subject to mark one of the three words or figures with an "x" that matched the stem model. The procedure was followed for each of the fourteen rows of pictures.

Ron marked the stem models before the heavy green line by tracing over them. Sometimes Ron's marking pattern varied to tracing the pictures at the end of the rows. The pre-operational characteristics of states versus transformation and centering would appear to be present in Ron's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of the sixteen rows.

Ron's marking pattern varied from tracing the letters at the beginning or end of the rows. The pre-operational characteristics of centering would appear to be present in Ron's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Ron traced the pictures at the end of the row or varied his pattern of marking to tracing all the pictures in

the series. The pre-operational characteristic of states versus transformation and centering would appear to be present in Ron's marking pattern.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Ron copied or reproduced one letter where there were two; two letters where there were three and did not reproduce numerals and most figures. If the attempt was made to reproduce any figure, it was only a partial reproduction. The pre-operational characteristics of centering and transductive reasoning, which is reasoning from particular to particular, would appear to be present in Ron's marking pattern.

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Ron drew the picture and appeared quite absorbed in his drawing, paying little attention to other subjects drawing. His drawing included head, eyes, nose, mouth, trunk, arms, fingers, feet and

head in proportion to body. Ron's drawing of the man was interpreted as belonging to Category C which according to the manual of the Metropolitan Readiness Tests Forms A and B is an average rating. The average rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, brown, purple, yellow, blue, white, pink, red, and orange. The procedure was followed for each of nine colors. Ron identified the following colors: black, brown, purple, yellow, blue, white and orange. Ron did not identify the pink yarn. Ron identified the color "red" as orange.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The

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[1] Ibid., p. 36.

[2] Celia Stendler Lavatelli, Piaget's Theory Applied to an Early Childhood Curriculum (Boston: American Science and Engineering Company, 1970), p. 83.

subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing, with the teacher syntactically structuring the language and eliciting the responses from the subject.

Ron attempted seventy-nine responses with fourteen no responses during the six Lavatelli Classification ECC Lessons. Approximately 40 percent of the attempts were in the labeling mode and 60 percent in the sentential mode.[1] Approximately 80 percent of the language units included the element of property or properties while approximately 25 percent of the language units included the element of action or actions and approximately 8 percent of the language units included the element of complementary classes. Ron made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two omission lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and

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[1]Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units or cases.

remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Ron attempted five responses with thirteen no responses during the two Omission Classification Lessons. Approximately 60 percent of the attempts were in the labeling mode and 40 percent in the sentential mode. Approximately 80 percent of the language units included the element of property or properties while approximately 40 percent of the language units included the element of action or actions and no language units included complementary classes. Again Ron made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one

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[1]Lavatelli, Piaget's Theory Applied, p. 83.

pile then two piles. The subject was asked to make decisions related to abstracting the common property related to the two piles.[1] The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing, with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Ron attempted eight responses with eight no responses during the one Piagetian Changing of Criteria Task. Approximately 75 percent of the attempts were in the labeling mode and 25 percent in the sentential mode. Approximately 50 percent of the language units included the element of property or properties while approximately 33 percent of the language units included the element of action and no language units included complementary classes. Again Ron made no attempts in the language unit of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. The

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[1] Ibid., p. 156.

intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Ron attempted twenty-eight responses with thirteen no responses during the eight Number, Measurement, Space ECC Lessons. Approximately 68 percent of the attempts were in the labeling mode and 32 percent in the sentential mode. Approximately 68 percent of the language units included the element of property or properties while approximately 42 percent included the element of action or actions, and for the first time approximately 10 percent of the language units included the element of complementary classes. Again Ron made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons were adapted to create the two Omission Lessons. In

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[1]Ibid., p. 83.

the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Ron attempted twelve responses with thirteen no responses and three restricted responses during the two Number, Measurement, Space Lessons. Fifty percent of the attempts were in the labeling mode and 50 percent in the sentenial mode. Approximately 34 percent of the language units included the element of property or properties while 33 percent included the element of action or actions and approximately 66 percent of the language units included the element of complementary classes. Again Ron made no attempt in the language unit of abstractions.

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[1] Ibid.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Ron attempted four responses with twenty-two no responses and one restricted response during the six Piagetian Conservation Task Lessons. Fifty percent of the attempts were in the labeling mode and 50 percent in the sentential mode. None of the language units included the element of property or properties, none of the language units included the element of action or actions and approximately 50 percent of the language units included the element of complementary classes. Again Ron made no attempts in the language unit of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the

subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Ron attempted twenty responses with three no responses during the three Lavatelli Seriation ECC Lessons. Approximately 15 percent of the attempts were in the labeling mode and 85 percent in the sentential mode. Approximately 90 percent of the language units included the element of property or properties while approximately 50 percent of the language units included the element of action or actions and approximately 65 percent of the language units included the element of complementary classes. Again Ron made no attempts in the language unit of abstractions.

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[1] Ibid.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons were adapted to create the two Omission Lessons. In the two Omission Seriation Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information involved in mental operations related to one property, two properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Ron attempted three responses with seven no responses and one restricted response during the two Omission Seriation Lessons. None of the attempts were in the labeling mode and 100 percent were in the sentential mode. Approximately 66 percent of the language units included the element of property or properties while 66 percent of the language units included the element of action or actions and approximately 32 percent of the language units included the element of complementary

[1]Ibid.

classes. Again Ron made no attempts in the language unit of abstractions.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Ron attempted 127 responses with thirty no responses during the seventeen Lavatelli Classification, Number,

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[1] *Ibid.*

Measurement, Space and Seriation ECC Lessons. Approximately 34 percent of the attempts were in the labeling mode and approximately 66 percent were in the sentential mode. Approximately 78 percent of the language units included the element of property or properties while approximately 32 percent of the language units included the element of action or actions and approximately 17 percent of the language units included the element of complementary classes. Ron made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement, Space and Seriation Lessons were adapted to create the six Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The

[1] Ibid.

subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing, with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Ron attempted twenty responses with thirty-three no responses and three restricted responses during the six Omission Classification, Number, Measurement, Space and Seriation Lessons. Approximately 45 percent of the attempts were in the labeling mode and approximately 55 percent were in the sentential mode. Approximately 50 percent of the language units included the element of property or properties while approximately 40 percent of the language units included the element of action or actions and approximately 45 percent of the language units included the element of complementary classes. Ron made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions related to abstracting the common property for two piles. The subject was asked "why" questions after performing the activity.

In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task[1] the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Ron attempted twelve responses with thirty no responses and one restricted response during the seven Piagetian Conservation Tasks. Approximately 66 percent of the attempts were in the labeling mode and 33 percent in the sentential mode. Approximately 33 percent of the language units included the element of property or properties while approximately 17 percent of the language units included the element of action or actions and approximately 17 percent of the language units included the element of complementary classes. Ron made no attempts in the language unit of abstractions.

Post-Tests

The Piagetian Conservation Tasks

Ron's performances during the post administration of

[1]The Conservation of Area Task was administered twice.

CASE I Ron

		LANGUAGE UNITS			PROPERT				
					NONE		ONE		TW
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Sent.	Lab.
CLASSIFICATION									
Structured ECC Lessons	(6)	31	48	79	5	11	23	34	3
Unstructured Omission Lessons	(2)	3	2	5		1	3	1	
Unstructured Task Lesson	(1)	6	2	8	4		2	2	
NUMBER, MEASUREMENT and SPACE									
Structured ECC Lessons	(8)	9	19	28	1	8	8	11	
Unstructured Omission Lessons	(2)	6	6	12	3	5	3	1	
Unstructured Task Lessons	(6)	2	2	4	2	2			
SERIATION									
Structured ECC Lessons	(3)	3	17	20		2	3	11	
Unstructured Omission Lessons	(2)		3	3		1		1	
LESSONS ALL TYPES									
Structured ECC Lessons	(17)	43	84	127	6	21	34	56	3
Unstructured Omission Lessons	(6)	9	11	20	3	7	6	3	
Unstructured Task Lessons	(7)	8	4	12	6	2	2	2	
Total, All Types	(30)	60	99	159	15	30	42	61	3

LANGUAGE UNITS REFLECTING:

ROPERTY					ACTION								COMPLEMENTARY CLASSES							
NE		TWO		THREE	NONE		ONE		TWO		THREE +		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCLUS and EXCLUS	
Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	S
34	3	3			31	29		19					31	42		6				
1					3			2					3	2						
2					6			2					6	2						
11					9	7		12					9	16		1		2		
1					6	2		4					3	1	2	2	1	3		
					2	2							1	1	1	1				
11		4			3	7		8		2			3	4		2		9		
1		1				1		2						2				1		
56	3	7			43	43		39		2			43	62		9		11		
3		1			9	3		8					6	5	2	2	1	4		
2					8	2		2					7	3	1	1				
61	3	8			60	48		49		2			56	70	3	12	1	15		

:TING:										RESTRICTED RESPONSES	NO RESPONSES
)MPLEMENTARY CLASSES						ABSTRACTIONS					
INCLUSION		EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		
	6					31	48				14
						3	2				13
						6	2				8
	1		2			9	19				13
2	2	1	3			6	6			3	13
1	1					2	2			1	22
	2		9		2	3	17				3
			1				3			1	7
	9		11		2	43	84				30
2	2	1	4			9	11			3	33
1	1					8	4			1	30
3	12	1	15		2	60	99			4	93

the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Ron as a nonconserver in all five Tasks of Number, Liquid Amount, Solid Amount, Area and Length. Ron was identified as a nonconserver in the Piagetian Tasks at pre-test time.

Ron's performances on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length at Time II supported the identification of Ron as pre-operational. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning would appear to be supported as Ron performed other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length, Ron did not utilize the Ostensive Mode of pointing to objects in response to the questions. Ron utilized the labeling mode for the responses to questions concerning objects that he was manipulating. It was not necessary for the tester to supply Ron with words "yes," "no," "the same," for responses. When the tester, however, asked the "why" questions, Ron's language pattern was characterized by "no response." Ron appeared comfortable in the testing situation at Time II.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying

yielded a Time II letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B manual, the letter rating of D is interpreted as, "likely to have difficulty in first-grade work. Careful study should be made of the specific strengths and weaknesses of pupils in this group and plan their instruction accordingly."[1]

Analysis of Ron's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Ron's performances on the Piagetian Conservation Tasks. Ron's marking patterns on the Sub-Tests yielded significant information related to preoperational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Ron appeared to look and mark pictures in a casual manner with some tendency to center upon the middle picture position. He did not seem concerned with the selection of or marking a picture with thich he was familiar.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at

[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

the first row of pictures with the tester pointing to the first row. The tester described something about one of three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of one of the three pictures increased in length and complexity. The procedure was followed for each of the sixteen rows of pictures.

Ron's pattern of marking varied from marking pictures at the beginning of the rows to marking pictures at the end of the rows. Ron marked few pictures in the middle position.

Ron's pattern of marking appeared to reinforce that Ron remembered what he heard first or last. The pre-operational characteristics of states versus transformation and centering on the first or last picture would appear to be present in Ron's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first row of pictures with the tester pointing to the first row of pictures. The subject was asked to look at the stem model appearing before the heavy green line. The tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Ron's pattern of marking was to consistently mark the middle picture position. The consistency of his marking the

middle picture position suggested that the pre-operational characteristic of centering may be present.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Ron's pattern of marking in each of the sixteen rows of four letters was to mark the first letter. The consistency of his marking the first letter of four letters suggested that the pre-operational characteristic of centering may be present.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Ron's pattern of marking may be described by Ron usually having marked all of the series of pictures in a row. The marking pattern was so extravagant or massive that no appropriate interpretation could be made as related to the pre-operational characteristics.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Ron copied or reproduced one letter where there were two; two letters where there were three. Ron attempted reproducing numerals although his numerals were not completely formed. Ron reproduced some figures completely while other figures were reproduced in part. The pre-operational characteristic of centering and reasoning from particular to particular, transductive reasoning, would appear to be present in Ron's marking pattern at Time II.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man.

Ron drew the picture and appeared quite absorbed in his drawing, paying little attention to other subjects drawing. His drawing of the man included head, eyes, mouth, ears, hair, trunk, arms, legs, waist and head in proportion to the body. Ron's drawing of the man was interpreted as belonging

to Category D, a Below Average rating according to the manual of the Metropolitan Readiness Tests Form A and B.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, red, pink and orange. Ron identified black, green, purple, yellow, blue, white and red. Ron identified orange as red and did not identify the color pink.

[1] Ibid., p. 36.

CHAPTER IV

CASE II--CAROLYN

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Carolyn Birthday: January (Month) 1 (Day) 1966 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: none

Pupil's address: confidential

What is the pupil's race? Check one: White ___ Negro ___
Indian x Mexican ___ Other ___

Father's name: confidential

What kind of work does the pupil's father, or guardian, do? Automotive School (If father, or guardian, works in a factory, or store, or office, tell what kind of jobs he does there.) student

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here: ___

What other kind of work has the father ever done? carpentry

How often is the father paid? Check one: Every week x
Once every two weeks ___ Once a month ___ By the day ___
In business for himself ___

What kind of work does the pupil's mother do? laundress
What other kind of work has she ever done? none

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	2	(3)	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	2	(3)	4	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house x Duplex ___ Single-family dwelling ___
How many rooms are there in the family dwelling? three

Pre-Tests

The Piagetian Conservation Tasks

Carolyn's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length identified Carolyn as a non-conserver in the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length. The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length identified Carolyn as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Carolyn performs other activities.

The Piagetian Conservation Task of Area was abandoned according to the directions for administering of the Tasks because Carolyn refused to respond. Directions for administering of the Task may be found in Chapter I.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length Carolyn responded with the word "same."

When the tester asked the "why" questions, Carolyn gave no response in the Piagetian Conservation Task of Number. In the Piagetian Conservation Task of Liquid Amount, Carolyn responded with "I don't know." In the Piagetian Conservation Task of Solid Amount, Carolyn gave no response. In the Piagetian Conservation Task of Area, Carolyn gave no response. Carolyn appeared to be very passive. During the administering of the Piagetian Conservation Tasks, Carolyn did not appear to have any interest in the objects nor activities she was asked to perform.

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of eighty-one which according to the manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of low average potential for success related to language development and general mental development.[1] Carolyn only responded to the Stanford-Binet Intelligence Tasks after much encouragement. Most of Carolyn's responses may be described as "single word" responses.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers,

[1]Terman and Merril, Stanford-Binet Form L-M, p. 18.

Copying yielded a pre-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B Manual, the letter rating D is interpreted as, "likely to have difficulty in first-grade work. Should be assigned to slow section and given more individualized help."[1]

Analysis of Carolyn's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Carolyn's performance on the Piagetian Conservation Tasks. Carolyn's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of the eighteen rows of pictures.

Carolyn did not appear to look at each of the three pictures in the sixteen rows. Carolyn marked most often the pictures at the end of each row. The pre-operational

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

characteristics of centering and states versus transformation would appear to be present in Carolyn's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for the sixteen rows of pictures.

Carolyn most often marked the pictures at the beginning or the pictures in the middle position in each of the sixteen rows. The pre-operational characteristics of centering would appear to be present in Carolyn's marking pattern.

When given the Matching Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line and then the tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for fourteen rows of pictures.

Carolyn most often marked the first word or figure appearing immediately after the heavy green line. The pre-operational characteristic of centering would appear to be present in Carolyn's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters in the box with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Carolyn marked the second letter or last letter in a series of four letters. The pre-operational characteristic of centering would appear to be present in Carolyn's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Carolyn appeared to mark the pictures with which she was familiar related to numerals. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find the first row of boxes at the top of the page. The tester pointed

to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every picture on the pages. The fourteen pictures consisted of letters, numerals, and figures. This procedure was followed for each of the fourteen boxes.

Carolyn reproduced one letter where there were two and one letter where there were three. Each letter that Carolyn reproduced was distinguishable. Carolyn attempted to reproduce or copy models in all fourteen boxes. Carolyn appeared to encounter difficulty in reversing directions of lines. The pre-operational characteristics of centering and transductive reasoning would appear to be present in Carolyn's marking pattern.

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. As Carolyn drew her picture she appeared to watch other subjects drawing closely. Her drawing included a head, eyes, nose, mouth, ears, trunk, one foot with toes. Carolyn's man was interpreted as belonging to Category E which according to the Metropolitan Readiness Tests Form A, 1-6 manual is an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

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[1]Hildreth, Griffiths and McGauvran, Manual of Directions, p. 36.

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, red, pink, orange. The procedure was followed for each of nine colors. Carolyn identified black, green, purple, yellow, white and red. Carolyn identified blue as black, orange as red and did not identify the color pink.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

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[1]Lavatelli, Piaget's Theory Applied, p. 83.

Carolyn attempted 127 responses with one no response during the six Lavatelli Classification ECC Lessons. Approximately 32 percent of the attempts were in the labeling mode and 68 percent in the sentential mode.[1] Approximately 64 percent of the language units included the element of property or properties while approximately 30 percent of the language units included the element of action or actions and approximately 16 percent of the language units included the element of complementary classes. Approximately one percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two omission lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials

[1]Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units or cases.

[2]Lavatelli, Piaget's Theory Applied, p. 83.

with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Carolyn attempted sixteen responses during the two Omission Classification Lessons. Approximately 31 percent of the attempts were in the labeling mode and 69 percent in the sentential mode. Approximately 81 percent of the language units included the element of property or properties while approximately 50 percent of the language units included the element of action or actions and no language units included the element of complementary classes. Carolyn attempted no responses in the language unit of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile then two piles. The subject was asked to make decisions related to abstracting the common property related to the two piles. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.[1]

[1] Ibid., p. 156.

Carolyn attempted twelve responses during the one Piagetian Changing of Criteria Task with eleven no responses. Approximately 67 percent of the attempts were in the labeling mode and 33 percent in the sentential mode. Approximately 66 percent of the language units included the element of property or properties while approximately 16 percent of the language units included the element of action or actions and approximately 16 percent of the language units included the element of complementary classes. Carolyn made no attempts in the language unit of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked

[1] Ibid., p. 83.

to state what she was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Carolyn attempted thirty-six responses with five no responses during the eight Lavatelli ECC Lessons. Approximately 30 percent of the attempts were in the labeling mode and 70 percent in the sentential mode. Approximately 44 percent of the language units included the element of property or properties while approximately 25 percent of the language units included the element of action or actions and approximately 50 percent of the language units included the element of complementary classes. Carolyn attempted no responses in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons were adapted to create the two Omission Lessons. In the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete

[1] Ibid.

objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Carolyn attempted eleven responses with three no responses and one restricted response during the two Number, Measurement and Space Lessons. Approximately 63 percent of the attempts were in the labeling mode and 37 percent in the sentential mode. Approximately 54 percent of the language units included the element of property or properties while approximately 9 percent of the language units included the element of action or actions and approximately 36 percent of the language units included the element of complementary classes. Again Carolyn made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of of Liquid Amount the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation

of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Carolyn attempted seventeen responses with nine no responses and one restricted response during the six Piagetian Conservation Tasks. Approximately 35 percent of the attempts were in the labeling mode and 65 percent in the sentential mode. Approximately 52 percent of the language units included the element of property or properties while approximately 11 percent of the language units included the element of action or actions and approximately 29 percent of the language units included the element of complementary classes. Approximately 5 percent of the language units included the element of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of

[1] Ibid.

concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Carolyn attempted seventeen responses with two no responses during the three Lavatelli Seriation Lessons. Approximately 23 percent of the attempts were in the labeling mode and 77 percent in the sentential mode. Approximately 47 percent of the language units included the element of property or properties while approximately 41 percent of the language units included the element of action or actions and approximately 64 percent of the language units included the element of complementary classes. Again Carolyn made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons were adapted to create the two Omission Lessons. In the two Omission Seriation Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information involved in mental operations related to one property, two properties; one action, two actions, three actions or more; complementary

classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Carolyn attempted nineteen responses with three no responses during the two Omission Seriation Lessons. Approximately 42 percent of the attempts were in the labeling mode and 58 percent in the sentential mode. Approximately 63 percent of the language units included the element of property or properties while approximately 47 percent of the language units included the element of action or actions and approximately 31 percent of the language units included the element of complementary classes. Again Carolyn made no attempts in the language unit of abstractions.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in Classification, Number,

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[1] Ibid.

Measurement, Space and Seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Carolyn attempted 180 responses with eight no responses during the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons. Approximately 31 percent of the attempts were in the labeling mode and 69 percent in the sentential mode. Approximately 58 percent of the language units included the element of property or properties while approximately 30 percent of the language units included the element of action or actions and approximately 27 percent of the language units included the element of complementary classes. Approximately one percent of the language units included the element of abstractions.

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[1] Ibid.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement, Space and Seriation adapted to create the Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Carolyn attempted forty-six responses with six no responses and one restricted response during the six Omission Classification, Number, Measurement, Space and Seriation ECC Lessons. Approximately 43 percent of the attempts were

[1] Ibid.

in the labeling mode and 57 percent in the sentential mode. Approximately 67 percent of the language units included the element of property or properties while approximately 39 percent of the language units included the element of action or actions and approximately 28 percent of the language units included the element of complementary classes. Carolyn made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and square, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions related to abstracting the common property for two piles. The subject was asked "why" questions after performing the activity.[1]

In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

[1]Ibid., p. 156.

Carolyn attempted twenty-nine responses with twenty no responses and one restricted response during the seven Piagetian Conservation Tasks. Approximately 48 percent of the attempts were in the labeling mode and 52 percent in the sentential mode. Approximately 58 percent of the language units included the element of property or properties while approximately 13 percent of the language units included the element of action or actions and approximately 17 percent of the language units included the element of complementary classes. Approximately 3 percent of the language units included the element of abstractions.

Post-Tests

The Piagetian Conservation Tasks

Carolyn's performance during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Carolyn as a non-conserver in all five Tasks of Number, Liquid Amount, Solid Amount, Area and Length and also identified Carolyn as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Carolyn performs other activities. Carolyn was identified as a non-conserver in the Piagetian Tasks at pre-test time.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid

CASE II Carolyn

		LANGUAGE UNITS			PROPE			
					NONE		ONE	
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Sent.
CLASSIFICATION								
Structured ECC Lessons	(6)	41	86	127	11	34	24	45
Unstructured Omission Lessons	(2)	5	11	16	1	2	3	8
Unstructured Task Lesson	(1)	8	4	12		4	8	
NUMBER, MEASUREMENT and SPACE								
Structured ECC Lessons	(8)	11	25	36	4	16	7	9
Unstructured Omission Lessons	(2)	7	4	11	2	3	5	1
Unstructured Task Lessons	(6)	6	11	17	1	7	4	4
SERIATION								
Structured ECC Lessons	(3)	4	13	17	2	7	1	3
Unstructured Omission Lessons	(2)	8	11	19	2	5	6	4
LESSONS ALL TYPES								
Structured ECC Lessons	(17)	56	124	180	17	57	32	57
Unstructured Omission Lessons	(6)	20	26	46	5	10	14	13
Unstructured Task Lessons	(7)	14	15	29	1	11	12	4
Total, All Types	(30)	90	165	255	23	78	58	74

LANGUAGE UNITS REFLECTING:

ROPERTY					ACTION								COMPLEMENTARY CLASSES						
ONE		TWO		THREE		NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCLU or EXCLU
	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.
8	45	4	6	2	1	41	47		34		5			40	66		14	1	6	
3	8	1			1	5	3		8					5	11					
						8	2		2					8	2		2			
	9					11	16		8		1			8	10		5	3	9	
	1					7	3		1					5	2	1	1			1
	4	1				6	9		2					4	8		1	2	2	
	3	1	3			4	6		6		1			2	4	2			9	
	4		2			8	2		9					8	5		1		5	
	57	5	9	2	1	56	69		48		7			50	80	2	19	4	24	
	13	1	2		1	20	8		18					18	18	1	2		5	1
	4	1				14	11		4					12	10		3	2	2	
	74	7	11	2	2	90	88		70		7			80	108	3	24	6	31	1

TING:										RESTRICTED RESPONSES	NO RESPONSES
MPLEMENTARY CLASSES						ABSTRACTIONS					
CLUSION		EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
ab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		
	14	1	6			41	84		2		1
						5	11				
	2					8	4				11
	5	3	9		1	11	25				5
1	1			1	1	7	4			1	3
	1	2	2			5	11	1		1	9
2			9			4	13				2
	1		5			8	11				3
2	19	4	24		1	56	122		2		8
1	2		5	1	1	20	26			1	6
	3	2	2			13	15	1		1	20
3	24	6	31	1	2	89	163	1	2	2	34

Amount, Area and Length, Carolyn responded with "yea same." When the tester asked the "why" questions in all five Piagetian Tasks of Number, Liquid Amount, Solid Amount, Area and Length Carolyn did not respond. Carolyn appeared passive and appeared to demonstrate little interest in the Tasks.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying yielded a post-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Forms A and B Manual, the letter rating D is interpreted as, "likely to have difficulty in first-grade work. Should be assigned to slow section and given individualized help."[1]

Analysis of Carolyn's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Carolyn's performances on the Piagetian Conservation Tasks. Carolyn's marking pattern on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester.

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of sixteen rows of pictures.

Carolyn marked pictures at the beginning, in the middle position and at the end. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for each of the sixteen rows of pictures.

Carolyn marked pictures at the beginning and end of each of sixteen rows. The pre-operational characteristic of centering would appear to be present in Carolyn's pattern of marking.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row of pictures. The subject was asked to

look at the stem model appearing before the heavy green line. The tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Carolyn marked the word or figure at the end of each of the fourteen rows of pictures. The pre-operational characteristic of centering would appear to be present in Carolyn's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of the four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Carolyn marked the first letter of the series of four letters in each of the sixteen rows. The pre-operational characteristic of centering would appear to be present in Carolyn's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Carolyn appeared to mark the pictures which represented number concepts with which she was familiar. Carolyn marked pictures in the series at the beginning, middle position, end and all of the pictures where appropriate. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Carolyn reproduced one letter where there were two; one letter where there were three or one numeral where there were two. The reproduced letter and numerals were distinguishable. Carolyn attempted to reproduce all the models in each of fourteen boxes. Carolyn appeared not to have difficulty in reversing directions of lines. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations were not easily identifiable.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked

to draw a picture of a man. As Carolyn drew her picture she appeared to look at other subjects drawing. Her drawing included a head eyes, nose, mouth, ears, trunk. Carolyn's man was interpreted as belonging to Category D which according to the Metropolitan Readiness Tests Forms A and B Manual is a below average rating. The below average rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, pink, red and orange. The procedure was followed for each of nine colors. Carolyn identified black, green, purple, yellow, white, red and orange. Carolyn identified blue as black and did not identify the color pink.

[1] Ibid., p. 36.

CHAPTER V

CASE III--SUSAN

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Susan Birthday: September (Month) 25 (Day) 1966 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: none

Pupil's address: confidential

What is the pupil's race? Check one: White ___ Negro x
Indian ___ Mexican ___ Other ___

Father's name: confidential (deceased)

What kind of work does the pupil's father, or guardian, do? Steel Factory (If father, or guardian, works in a factory, or store, or office, tell what kinds of jobs he does there.)

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here: deceased

What other kind of work has the father ever done? deceased

How often is the father paid? Check one: Every week deceased
Once every two weeks ___ Once a month ___ By the day ___
In business for himself ___

What kind of work does the pupil's mother do? deceased
What other kind of work has she ever done? deceased

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	(3)	4	5	6	7	8	1	2	3	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	(7)	8	1	2	3	4	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house ____ Duplex ____ Single-family dwelling x
How many rooms are there in the family dwelling? five

Pre-Tests

The Piagetian Conservation Tasks

Susan's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Susan as a non-conserver in the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length. The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Susan as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Susan performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length, Susan utilized the word "same." When the tester asked the "why" questions, Susan responded

in the Piagetian Conservation of Number Task, "I don't know." In the Piagetian Conservation of Liquid Amount Task, Susan responded "I just know." In the Piagetian Conservation of Solid Amount Task, Susan responded "just because I think so." In the Piagetian Conservation of Area Task, Susan responded "I guessed." In the Piagetian Conservation of Length Task, Susan responded "cause I know everything."

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of ninety-four which according to the manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of average potential for success related to language development and general mental development.[1] Susan appeared quiet, reserved and very cautious at the beginning of the testing situation. Susan was very cooperative and appeared to want very much to attend to the Stanford-Binet Intelligence Tasks. When an item appeared difficult for Susan or she appeared confused, she openly replied "I don't know." Susan appeared to search the tester's face for the answer.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers,

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[1]Terman and Merril, Stanford-Binet Form L-M, p. 18.

and Copying yielded a pre-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B Manual, the letter rating D is interpreted as, "likely to have difficulty in first-grade work. Should be assigned to slow section and given more individualized help."[1]

Analysis of Susan's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Susan's performance on the Piagetian Conservation Tasks. Susan's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for eighteen rows of pictures.

Susan appeared to look at the three pictures in each row. Susan appeared to mark the pictures with which she was familiar. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

transformation and transductive reasoning were not easily identifiable through observation of Susan's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for sixteen rows of pictures.

Susan appeared to look at the three pictures in each row. Susan appeared to tire as descriptive sentences about the pictures increased in length and complexity. Susan appeared to mark the pictures with which she was familiar. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable through observation of Susan's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line and then the tester asked the subject to mark one of the three pictures

with an "x" that matched the stem model. The procedure was followed for fourteen rows of pictures.

Susan marked the last word or figure in most of the rows. Susan's marking of the last word or figure was accompanied by marking a particular letter, sometimes the second, third or last letter in the words. The pre-operational characteristic of centering would appear to be present in Susan's marking pattern. Susan centered on the 1st words or particular letters in the words.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Susan marked the second letters in a series of four letters varying the marking pattern to marking of first and second letters. Susan's marking pattern appeared to be characterized by Susan's apparently thinking she was familiar with some letters. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not identifiable.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the

row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Susan appeared to mark the pictures in the series of each row with which she was familiar. The pictures marked in the series in the other rows appeared to represent a "guessing" type behavior. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Susan reproduced or copied one letter where there were two, two letters where there were three. She attempted to reproduce figures in rows five through nine with some detail. Susan refused to reproduce in rows ten through fourteen by responding "I can't do it."

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Susan drew a head, two eyes, two stick legs and glanced at other subjects while drawing. The drawing was barely distinguishable as a human. Susan's drawing was interpreted as belonging to Category E which according to the Metropolitan Readiness Tests Forms A and B Manual was an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, brown, purple, yellow, blue, white, red, pink, orange. The procedure was followed for each of nine colors. Susan identified all nine colors described.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The subject

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[1] Ibid., p. 36.

[2] Lavatelli, Piaget's Theory Applied, p. 83.

was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Susan attempted 137 responses with six restricted responses during the six Lavatelli Classification ECC Lessons. Approximately 25 percent of the attempts were in the labeling mode and approximately 75 percent were in the sentential mode.[1] Approximately 63 percent of the language units included the element of property or properties while approximately 27 percent of the language units included the element of action or actions and approximately 20 percent of the language units included the element of complementary classes. Approximately 2 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two omission lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and remaking

[1]Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units or cases.

of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Susan attempted 27 responses with one no response. During the two Omission Classification Lessons approximately 19 percent of the attempts were in the labeling mode and 81 percent in the sentential mode. Approximately 30 percent of the language units included the element of property or properties which approximately 60 percent of the language units included the element of action or actions and approximately 55 percent of the language units included the element of complementary classes. Approximately 7 percent of the language units included the element of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--

[1]Lavatelli, Piaget's Theory Applied, p. 83.

circles and squares, red and blue, large and small--into one pile then two piles. The subject was asked to make decisions related to abstracting the common property related to the two piles. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.[1]

Susan attempted sixteen responses with one no response during the one Piagetian Changing of Criteria Task. Approximately 44 percent of the attempts were in the labeling mode and 56 percent in the sentential mode. Approximately 35 percent of the language units included the element of property or properties while 31 percent of the language units included the element of action or actions and 18 percent of the language units included the element of complementary classes. For the first time Susan made no attempts in the language unit of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement, and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to

[1] Ibid., p. 156.

take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Susan attempted forty-five responses with three restricted responses during the eight Lavatelli Number, Measurement, Space Lessons. Approximately 20 percent of the attempts were in the labeling mode and approximately 80 percent in the sentential mode. Approximately 24 percent of the language units included the element of property or properties while approximately 26 percent of the language units included the element of action or actions and approximately 66 percent of the language units included the element of complementary classes. Approximately 2 percent of the language units included the element of abstractions.

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[1] Ibid., p. 83.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons adapted to create the two Omission Lessons. In the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Susan attempted thirty responses with one restricted response during the two Omission Number, Measurement and Space Lessons. Approximately 47 percent of the attempts were in the labeling mode and 53 percent in the sentential mode. Approximately 56 percent of the language units included the element of property of properties while approximately 37 percent of the language units included the element of action or

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[1] Ibid.

actions and approximately 46 percent of the language units included the element of complementary classes. Susan made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Susan attempted thirty-five responses with one no response and two restricted responses during the six Piagetian Conservation Tasks. Approximately 9 percent of the attempts were in the labeling mode and 91 percent in the sentential mode. Approximately 23 percent of the language units included the element of property or properties while approximately 11 percent of the language units included the element of action or actions and approximately 63 percent of the language units included the element of complementary classes. Approximately 8 percent of the language units included the element of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Susan attempted twenty-eight responses with one restricted response during the three Lavatelli Seriation ECC Lessons. Approximately 22 percent of the attempts were in the labeling mode and approximately 78 percent in the sentential mode. Approximately 54 percent of the language units included the element of property or properties while

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[1] Ibid.

approximately 36 percent of the language units included the element of action or actions and approximately 42 percent of the language units included the element of complementary classes. Approximately 4 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons adapted to create the two Omission Lessons. In the two Omission Seriation Lessons the subject was asked to perform mental operations related to one property, two properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Susan attempted thirty-six responses with five restricted responses during the two Omission Seriation Lessons. Approximately 20 percent of the attempts were in the labeling mode and approximately 80 percent in the sentential mode. Approximately 72 percent of the language units included the

[1] Ibid.

element of property or properties while approximately 25 percent of the language units included the element of action or actions and approximately 55 percent of the language units included the element of complementary classes. Approximately 3 percent of the language units included the element of abstractions.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space, and Seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

[1] Ibid.

Susan attempted 210 responses with ten restricted responses during the twelve of the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons. Approximately 23 percent of the attempts were in the labeling mode and approximately 77 percent in the sentential mode. Approximately 57 percent of the language units included the element of property or properties while approximately 59 percent of the language units included the element of action or actions and approximately 32 percent of the language units included the element of complementary classes. Approximately 2 percent of the language units included the language unit of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement, Space and Seriation Lessons adapted to create the six Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided

[1] Ibid.

with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Susan attempted ninety-three responses with one no response and six restricted responses during the six Omission Classification, Number, Measurement, Space and Seriation Lessons. Approximately 28 percent of the attempts were in the labeling mode and 72 percent in the sentential mode. Approximately 56 percent of the language units included the element of property or properties while approximately 38 percent of the language units included the element of action or actions and approximately 53 percent of the language units included the element of complementary classes. Approximately 3 percent of the language units included the element of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions related to abstracting the common property for two piles.

The subject was asked "why" questions after performing the activity.[1]

In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Susan attempted fifty-one responses with two no responses and two restricted responses during the seven Piagetian Tasks. Approximately 20 percent of the attempts were in the labeling mode and 80 percent in the sentential mode. Approximately 24 percent of the language units included the element of property or properties while approximately 17 percent of the language units included the element of action or actions and approximately 49 percent of the language units included the element of complementary classes. Approximately 5 percent of the language units included the element of abstractions.

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[1]Ibid., p. 156.

CASE III Susan

		LANGUAGE UNITS			PROPER				
					NONE		ONE		
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Sent.	L
CLASSIFICATION									
Structured ECC Lessons	(6)	33	104	137	5	47	24	46	
Unstructured Omission Lessons	(2)	5	22	27	1	17	2	5	
Unstructured Task Lesson	(1)	7	9	16	6	6	1	3	
NUMBER, MEASUREMENT and SPACE									
Structured ECC Lessons	(8)	9	36	45	3	31	6	3	
Unstructured Omission Lessons	(2)	14	16	30	5	8	9	8	
Unstructured Task Lessons	(6)	3	32	35	2	25	1	7	
SERIATION									
Structured ECC Lessons	(3)	6	22	28		7	6	14	
Unstructured Omission Lessons	(2)	7	29	36		10	7	11	
LESSONS ALL TYPES									
Structured ECC Lessons	(17)	48	162	210	8	85	36	63	
Unstructured Omission Lessons	(6)	26	67	93	6	35	18	24	
Unstructured Task Lessons	(7)	10	41	51	8	31	2	10	
Total, All Types	(30)	84	270	354	22	151	56	97	

LANGUAGE UNITS REFLECTING:

ROPERTY					ACTION								COMPLEMENTARY CLASSES							
NE		TWO		THREE	NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCLU ar EXCL	
Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	
46	3	10	1	1	32	68	1	30		6			33	78		13		12		
5	2				5	6		15		1			5	7		7		8		
3					7	4		2		3			7	6				3		
3		2			9	24		10		2			4	11		10	5	15		
8					14	5		11					10	6	2	7	1	3	1	
7					3	28		4					1	12	1	18	1	1		
14		1			6	12		10					6	10		2		10		
11		8			7	20		9					7	9		9		11		
63	3	13	1	1	47	104	1	50		8			43	99		25	5	37		
24	2	8			26	31		35		1			22	22	2	23	1	22	1	
10					10	32		6		3			8	18	1	18	1	4		
97	5	21	1	1	83	167	1	91		12			73	139	3	66	7	63	1	

'ING:									RESTRICTED RESPONSES	NO RESPONSES
IPLEMENTARY CLASSES						ABSTRACTIONS				
LUSION		EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.		
).	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	
	13		12		1	33	101		3	6	
	7		8			5	20		2		1
			3			7	9				1
	10	5	15			9	35		1	3	
?	7	1	3	1		14	16			1	
	18	1	1		1	3	29		3	2	1
	2		10			6	21		1	1	
	9		11			7	28		1	5	
	25	5	37		1	48	157		5	10	
	23	1	22	1		26	64		3	6	1
	18	1	4		1	10	38		3	2	2
	66	7	63	1	2	84	259		11	18	3

Post-Tests

The Piagetian Conservation Tasks

Susan's performance during the post administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Susan as a non-conserver in the four Tasks of Liquid Amount, Solid Amount, Area and Length. Susan's performance on the Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length also identified Susan as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Susan performs other activities.

Susan's performance on the Piagetian Conservation of Number Task identified Susan as concrete-operational which would appear to suggest that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may not appear as Susan performs other number activities. Susan was identified as a non-conserver of number at pre-test time.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length, Susan responded with the word "same."

When asked the "why" questions during the Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length, Susan responded with "I just thought it up," "I thought I would just say it was," "cause," "cause."

When asked the "why" question during the administering of the Piagetian Conservation of Number Task Susan responded with "one red checker on top of a black checker." Susan appeared to have established one-to-one correspondence. In the four Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length Susan's language pattern appeared to include the pre-operational characteristics of egocentrism and use of restricted language.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying yielded a pre-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B manual, the letter rating D is interpreted as, "likely to have difficulty in first-grade work. Should be assigned to slow section and given more individualized help."[1]

Analysis of Susan's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

significant information in relation to Susan's performance on the Piagetian Conservation Tasks. Susan's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Susan marked the first or last picture in each row with few markings in the middle position. The pre-operational characteristics of centering and states versus transformations would appear to be present in Susan's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Susan marked pictures correctly in eleven of the sixteen rows. The pre-operational characteristics of centering,

irreversibility, egocentricism, concreteness, states versus transformations and transductive reasoning would not appear to be present in Susan's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row of pictures. The subject was asked to look at the stem model appearing before the heavy green line. The tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Susan marked the stem model before the heavy green line varying the marking pattern to first pictures appearing after the heavy green line. The pre-operational characteristic of centering would appear to be present in Susan's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Susan marked mostly the first letters in a series of four letters in each row. The pre-operational characteristic of centering would appear to be present in Susan's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Susan appeared to mark the pictures with which she was familiar in the series according to each row. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning would not appear to be present in Susan's marking pattern.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of four-teen boxes.

Susan reproduced or copied one letter where there were two and two where there were three. Susan attempted to reproduce all figures. Susan appeared not to be able to re-verse direction of the figures involving reversals. The

pre-operational characteristics of centering, transductive reasoning and irreversibility appeared to be present in Susan's marking pattern.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Susan drew the picture and glanced around at other subjects drawing. Susan's drawing included a head, mouth, two ears on the right side, trunk, and two stick legs. Susan's man was interpreted as belonging to Category E which according to the Metropolitan Readiness Tests Form A and B Manual is an immature rating. The immature rating is related to an estimate of general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, pink, red and orange. The procedure was followed for each of the nine colors. Susan identified all nine colors.

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[1]Ibid., p. 36.

CHAPTER VI

CASE IV--JERRY

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Jerry Birthday: October (Month) 23 (Day) 1966 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: none

Pupil's address: confidential

What is the pupil's race? Check one: White x Negro ___
Indian ___ Mexican ___ Other ___

Father's name: confidential

What kind of work does the pupil's father, or guardian, do? potato factory (If father, or guardian, works in a factory, or store, or office, tell what kinds of jobs he does there.) cuts potatoes

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here: ___

What other kind of work has the father ever done? none

How often is the father paid? Check one: Every week x
Once every two weeks ___ Once a month ___ By the day ___
In business for himself ___

What kind of work does the pupil's mother do? housewife
What other kind of work has she ever done? none

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	(8)	1	2	3	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	(1)	2	3	4	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house ____ Duplex ____ Single-family dwelling x
How many rooms are there in the family dwelling? three

Pre-Tests

The Piagetian Conservation Tasks

Jerry's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, and Length identified Jerry as a non-conserver. The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length identified Jerry as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Jerry performs other activities.

The Piagetian Conservation Task of Area identified Jerry as concrete operational which would appear to suggest that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may not appear as Jerry performs other activities related to area.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, and Length Jerry responded with the words "more," "same." When the tester asked the "why" questions, Jerry centered on the stars on the checkers in the Piagetian Conservation of Number Task; centered on the water in the other containers in the Piagetian Conservation of Liquid Amount Task; centered on the distorted clay ball in the Piagetian Conservation of Solid Amount Task; centered on the outside and inside road on the Piagetian Conservation of Length Task.

When asked questions during the administering of the Piagetian Conservation Task of Area Jerry responded with the word "same." When tester asked the "why" questions, Jerry's language pattern was characterized by establishing one-to-one correspondence. This identified Jerry as a conserver.

Jerry appeared very hyper-active during the testing situation. Jerry appeared very excited with the objects he was manipulating and seemed comfortable in the situation.

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of eighty-nine which according to the manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of low average potential for success related to language development and general mental development.[1]

[1]Terman and Merrill, Stanford-Binet Form L-M, p. 18.

Jerry's attention was difficult to maintain for the duration of the Stanford-Binet Intelligence Scale Form L-M tasks. Jerry insisted upon having a pencil and paper on which to draw and write. Jerry's behavior was characterized by seeming to tire, sighing, wiggling, squirming and appeared to find it very difficult to remain in the chair.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying yielded a pre-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B Manual, the letter rating D is interpreted as "likely to have difficulty in first grade work. Should be assigned to a slow section and given more individualized help."[1]

Analysis of Jerry's performances on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Jerry's performances on the Piagetian Conservation Tasks. Jerry's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Jerry appeared to look at and mark the pictures at the beginning of each row. Jerry marked only one picture in the middle position. The pre-operational characteristic of centering would appear to be present in Jerry's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Jerry's pattern of marking appeared to be characterized by marking pictures in the middle position. Jerry marked very few pictures at the beginning of each row. The pre-operational characteristics of states versus transformation and centering would appear to be present in Jerry's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the

stem model appearing before the heavy green line and then the tester asked the subject to mark one of the three words or figures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Jerry marked the words or figures at the beginning of the rows. Jerry's pattern of marking appeared to be characterized by tracing one letter at the beginning of the row. At times Jerry traced the letter in initial position or the letter in final position. Jerry traced one letter in the middle position. Jerry traced figures at the beginning of rows. The pre-operational characteristic of centering would appear to be present in Jerry's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Jerry's marking pattern varied from marking letters at the beginning of a series of four letters to marking the fourth letter. Jerry refused to mark any letter in many instances. The pre-operational characteristic of centering would appear to be present in Jerry's marking pattern. Interpretation of Jerry's refusal to mark any of the rows appeared to be related to attention span.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Jerry marked the pictures at the beginning of the rows. Jerry's pattern of marking varied from marking at the beginning of the rows to marking all the pictures in the series in some rows. Jerry refused to mark in ten of the rows. The pre-operational characteristics of centering would appear to be present in Jerry's marking pattern. Interpretation of Jerry's refusal to mark the last ten rows appeared to be related to attention span.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

There was no reading on the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6. Jerry refused to

attend to this activity. The tester presented the Sub-Test three times in a two week period. Jerry refused. Jerry responded by saying "I won't," "I won't."

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Jerry drew the picture, glancing around the room while drawing, paying little attention to other subjects drawing. Jerry's drawing was barely recognizable as a human being. His picture included a very large head with eyes, nose, lines for a mouth, two ears extending from the left side of the head, a long neck, another head at the bottom of the neck with two eyes.

Jerry's man was interpreted as belonging to Category E which according to the Metropolitan Readiness Tests Form A and B Manual is an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, brown, purple, yellow, blue, white, red, pink and orange. The procedure was followed for each of nine colors. Jerry identified brown, purple, yellow, white, black and red. Jerry identified blue as black; orange as red; and pink as red.

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 36.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Jerry attempted sixty-nine responses with one restricted response during the six Lavatelli Classification ECC Lessons. Approximately 34 percent of the attempts were in the labeling mode and 66 percent in the sentential mode.[2] Approximately 75 percent of the language units

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[1] Lavatelli, Piaget's Theory Applied, p. 83.

[2] Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units or cases.

included the element of property or properties while approximately 21 percent of the language units included the element of complementary classes. Approximately 4 percent of the language units included abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two Omission Lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Jerry attempted four responses with one no response during the two Omission Classification Lessons. Approximately

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[1]Lavatelli, Piaget's Theory Applied, p. 83.

75 percent of the attempts were in the labeling mode and 25 percent in the sentential mode. Approximately 50 percent of the language units included the element of property or properties while approximately 25 percent of the language units included the element of action or actions. No language units included the element of complementary classes. Jerry made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile then two piles. The subject was asked to make decisions related to abstracting the common property related to the two piles. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.[1]

Jerry attempted fifteen responses during the one Piagetian Changing of Criteria Task. Approximately 94 percent of the attempts were in the labeling mode and 6 percent in the sentential mode. Approximately 33 percent of the language units included the element of property or properties

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[1] Ibid., p. 156.

while no language units included the elements of actions and complementary classes. Again Jerry made no attempts in the language unit of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Jerry attempted ninety responses with two no responses and one restricted response during the eight Number, Measurement and Space ECC Lessons. Approximately 22 percent of the

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[1] Ibid, p. 83.

attempts were in the labeling mode and 78 percent in the sentential mode. Approximately 27 percent of the language units included the element of property or properties while approximately 24 percent of the language units included the element of action or actions and 46 percent of the language units included the element of complementary classes. Approximately one percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons adapted to create the two Omission Lessons. In the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to

[1] Ibid.

state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Jerry attempted fourteen responses with one no response and one restricted response during the two number, measurement, and space lessons. Approximately 57 percent of the attempts were in the labeling mode and 42 percent in the sentential mode. Approximately 64 percent of the language units included the element of property or properties while approximately 35 percent of the language units included the element of action or actions and approximately 35 percent of the language units included the element of complementary classes. Jerry made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Jerry attempted twenty-two responses with three restricted responses during the six Piagetian Conservation Tasks. Approximately 19 percent of the attempts were in the

labeling mode and 81 percent in the sentential mode. Approximately 22 percent of the language units included the element of property of properties while approximately 13 percent of the language units included the element of action or actions and approximately 68 percent of the language units included the element of complementary classes. Approximately 4 percent of the language units included the element of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

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[1] Ibid.

state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Jerry attempted fourteen responses with one no response and one restricted response during the two number, measurement, and space lessons. Approximately 57 percent of the attempts were in the labeling mode and 42 percent in the sentential mode. Approximately 64 percent of the language units included the element of property or properties while approximately 35 percent of the language units included the element of action or actions and approximately 35 percent of the language units included the element of complementary classes. Jerry made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Jerry attempted twenty-two responses with three restricted responses during the six Piagetian Conservation Tasks. Approximately 19 percent of the attempts were in the

labeling mode and 81 percent in the sentential mode. Approximately 22 percent of the language units included the element of property of properties while approximately 13 percent of the language units included the element of action or actions and approximately 68 percent of the language units included the element of complementary classes. Approximately 4 percent of the language units included the element of abstractions.

Seriation

Structured ECC L[redacted]

In t[redacted]eriation ECC Lessons the subject was a[redacted]perations in seriation. The subje[redacted]nformation and remake the informatic[redacted]ing of information involved mental ope[redacted]roperty, two properties, three propert[redacted]o actions, three actions or more; complementar[redacted] of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

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[1] Ibid.

Jerry attempted six responses with three no responses during the three Lavatelli Seriation ECC Lessons. Approximately 10 percent of the attempts were in the labeling mode and 90 percent in the sentential mode. Approximately 90 percent of the language units included the element of property or properties while 50 percent of the language units included the element of action or actions and approximately 90 percent of the language units included the element of complementary classes. Jerry made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons adapted to create the two Omission Lessons. In the two Omission Seriation Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information involved in mental operations related to one property, two properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the

[1] Ibid.

teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Jerry was absent during the two Omission Seriation Lessons.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Jerry attempted 165 responses with five no responses and six restricted responses during the fifteen Lavatelli

[1] *Ibid.*

Classification, Number, Measurement, Space and Seriation ECC Lessons. Approximately 27 percent of the attempts were in the labeling mode and 73 percent in the sentential mode. Approximately 49 percent of the language units included the element of property or properties while approximately 23 percent of the language units included the element of action or actions and approximately 35 percent of the language elements included the element of complementary classes. Approximately 2 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement, Space and Seriation Lessons adapted to create the six Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or

[1] Ibid.

interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Jerry attempted eighteen responses with two no responses and one restricted response during the six Omission Classification, Number, Measurement, Space and Seriation Lessons. Approximately 62 percent of the attempts were in the labeling mode and approximately 38 percent in the sentential mode. Approximately 62 percent of the language units included the element of property or properties while approximately 33 percent of the language units included the element of action or actions and approximately 27 percent of the language units included the element of complementary classes. Jerry made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions related to abstracting the common property for two piles. The subject was asked "why" questions after performing the activity.

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[1]Ibid., p. 156.

In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Jerry attempted thirty-seven responses with three restricted responses during the seven Piagetian Conservation Tasks. Approximately 49 percent of the attempts were in the labeling mode and 51 percent in the sentential mode. Approximately 26 percent of the language units included the element of property or properties while approximately 8 percent of the language units included the element of action or actions and approximately 40 percent of the language units included the element of complementary classes. Approximately 2 percent of the language units included the element of abstractions.

Post-Tests

The Piagetian Conservation Tasks

Jerry's performance during the post administering of the Piagetian Conservation Tasks of Liquid Amount, Length and

CASE IV Jerry

		LANGUAGE UNITS			PROPERTY					
					NONE		ONE		TWO	
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Sent.	Lab.	S
CLASSIFICATION										
Structured ECC Lessons	(6)	23	46	69	5	12	15	26	2	
Unstructured Omission Lessons	(2)	3	1	4	1	1	2			
Unstructured Task Lesson	(1)	14	1	15	9	1	5			
NUMBER, MEASUREMENT and SPACE										
Structured ECC Lessons	(8)	19	71	90	5	60	14	11		
Unstructured Omission Lessons	(2)	8	6	14	1	4	7	1		
Unstructured Task Lessons	(6)	4	18	22	3	14	1	4		
SERIATION										
Structured ECC Lessons	(3)	1	5	6		1		4	1	
Unstructured Omission Lessons	(2)									
LESSONS ALL TYPES										
Structured ECC Lessons	(17)	43	122	165	10	73	29	41	3	
Unstructured Omission Lessons	(6)	11	7	18	2	5	9	1		
Unstructured Task Lessons	(7)	18	19	37	12	15	6	4		
Total, All Types	(30)	72	148	220	24	93	44	46	3	

LANGUAGE UNITS REFLECTING:

PERTY					ACTION								COMPLEMENTARY CLASSES							
	TWO		THREE		NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCLUSION and EXCLUSION	
t.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent
6	2	7	1	1	23	31		15					22	36	1	8		2		
					3			1					3	1						
					14	1							14	1						
1					18	50	1	21					15	33	1	15	3	23		
1		1			8	1		5					6	3		2	2	1		
1					4	15		3					1	6	1	9	2	3		
	1				1	2		3					1			3		2		
	3	7	1	1	42	83	1	39					38	69	2	26	3	27		
		1			11	1		6					9	4		2	2	1		
					18	16		3					15	7	1	9	2	3		
	3	8	1	1	71	100	1	48					62	80	3	37	7	31		

NG:									RESTRICTED RESPONSES	NO RESPONSES
PLEMENTARY CLASSES					ABSTRACTIONS					
JSION	EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		
8		2			23	44		2	1	
					3	1				1
					14	1				
15	3	23			19	70		1	5	2
2	2	1			8	6			1	1
9	2	3			4	17		1	3	
3		2			1	5				3
26	3	27			43	119		3	6	5
2	2	1			11	7			1	2
9	2	3			18	18		1	3	
37	7	31			72	144		4	10	7

Area identified Jerry as a non-conserver in three of the five Piagetian Tasks of Liquid Amount, Length, and Area. Jerry's performance on the Piagetian Conservation Tasks of Liquid Amount, Length and Area identified Jerry as pre-operational which suggests that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Jerry performs other activities.

Jerry's performance on the Piagetian Conservation Tasks of Number and Solid Amount identified Jerry as concrete operational which would appear to suggest that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may not appear as Jerry performs other activities related to number and solid amount. Jerry's performance on the Piagetian Conservation Task of Area changed from pre-test time to post-test time.

When asked questions during the administering of the Piagetian Conservation Tasks of Liquid Amount, Length, and Area Jerry responded with the words "same," "more." When the tester asked the "why" questions Jerry responded in the Piagetian Conservation of Liquid Amount Task with "you give them the shots." In the Piagetian Conservation Task of Length Jerry responded with "cause we each got a car," "cause they each got a man in it." In the Piagetian Conservation of Area Task Jerry responded with "cause I got more grass."

When asked questions during the administering of the Piagetian Conservation Tasks of Number and Solid Amount Jerry responded with the words "same," "both of them the same." When the tester asked the "why" questions Jerry responded in the Conservation of Number Task with "the red checker is on top of the black checker," "cause one is on top of the other." In the Conservation of Solid Amount Task Jerry responded "that one is a ball" and "that one is a ball," "that stretched out ball is the same."

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, and Copying yielded a post-test letter rating of D which is interpreted as low. According to the Metropolitan Readiness Tests Form A manual, the letter rating D is interpreted as, "likely to have difficulty in first grade work. Should be assigned to slow section and given more individualized help."[1]

Analysis of Jerry's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Jerry's performance on the Piagetian Conservation Tasks.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Jerry appeared to look at each of the three pictures in the sixteen rows. Jerry's marking pattern was characterized for the most part by marking the pictures in the middle position. The pre-operational characteristics of states versus transformation and centering would appear to be present in Jerry's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Jerry again appeared to look at each of the three pictures in ten rows. Jerry's marking pattern in the first row was characterized by marking the first picture, in the second row was characterized by marking the second picture, and in the third row was characterized by marking the third or last picture. Jerry's marking pattern varied from

marking the first picture to the last picture alternately in the next seven rows. Jerry's marking pattern was characterized by marking the first picture in the last six rows. Jerry appeared not to look at all three pictures in the last six rows. Jerry's markings in the first three rows would appear to suggest a slight departure from centering. The pre-operational characteristics of centering and states versus transformation would appear to be present in Jerry's marking pattern in the next thirteen rows.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line and then the tester asked the subject to mark one of the three words or figures with an "x" that matched the stem model. The procedure was followed for fourteen rows of pictures.

Jerry marked the first pictures appearing immediately after the heavy green line in each row. The pre-operational characteristic of centering would appear to be present in Jerry's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first box where a picture and letters were displayed. The tester pointed to the first box. The tester

then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Jerry consistently marked the first letter in each of sixteen rows. The pre-operational characteristic of centering would appear to be present in Jerry's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Jerry marked two pictures in the series in a very few rows; marked two numerals where there were four and then marked all pictures in the other series in other rows. The pre-operational characteristics of states versus transformation and centering would appear to be present in Jerry's marking pattern.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model

in each box. The procedure was followed for each of fourteen boxes.

Jerry copied or reproduced one letter where there were two; one letter where there were three; one number where there were two. Copies or reproductions of other designs varied from limited detail in the figure to some degree of accuracy in detail. The pre-operational characteristics of centering and transductive reasoning appeared to be present in Jerry's marking pattern. Centering and transductive reasoning however do not appear pronounced.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Jerry drew the picture and appeared to be attending to his own drawing, paying little attention to other subjects drawing. Jerry's drawing was barely recognizable as a human being. His drawing included head, two huge ears, many eyes, nose, mouth, trunk, no legs and no arms. Jerry's man was interpreted as belinging to Category E which according to the Metropolitan Readiness Tests Form A and B Manual is immature.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, pink, red and orange. The procedure was

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[1]Ibid., p. 36.

followed for each of nine colors. Jerry identified brown, purple, yellow, white, black, and red. Jerry identified blue as black; orange as red; and pink as light red.

CHAPTER VII

CASE V--RENEE

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Renee Birthday: April (Month) 16 (Day) 1966 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: none

Pupil's address: confidential

What is the pupil's race? Check one: White x Negro ____
Indian ___ Mexican ___ Other ___

Father's name: confidential

What kind of work does the pupil's father, or guardian, do? trucking firm (If father, or guardian, works in a factory, or store, or office, tell what kinds of jobs he does there.) truck driver

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here: foreman

What other kind of work has the father ever done? canning plant

How often is the father paid? Check one: Every week ____
Once every two weeks ____ Once a month x By the day ____
In business for himself ____

What kind of work does the pupil's mother do? housewife
What other kind of work has she ever done? nurses' aide

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	3	4	5	(6)	7	8	1	2	3	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	2	(3)	4	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house ____ Duplex ____ Single-family dwelling x
How many rooms are there in the family dwelling? three

Pre-Tests

The Piagetian Conservation Tasks

Renee's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Area identified Renee as a non-conserver in the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Area. The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Area identified Renee as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Renee performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Area Renee responded with the word "same." When the tester asked the "why" questions the subject

responded in the Piagetian Conservation of Number Task with "cause we had some before." In the Piagetian Conservation of Liquid Amount Task, Renee responded with "cause I know." In the Piagetian Conservation of Solid Amount Task Renee responded with "I don't know." In the Piagetian Conservation of Area Task Renee responded with "I don't know." The Piagetian Conservation of Length Task was abandoned according to the directions for administering the Piagetian Conservation Tasks.[1] Renee appeared very timid and shy during administering of the Tasks. Renee appeared to search the tester's face for the responses.

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of eighty-eight which according to the manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of low average potential for success related to language development and general mental development.[2] Renee appeared very quite and shy. Renee searched the tester's face as she attempted to respond. Renee constantly kept her fingers in her mouth.

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[1]John W. Renner, Robert F. Bibens, and Gene D. Shepherd, Guiding Learning in the Secondary School (New York: Holt, Rinehart and Winston, 1972), p. 95.

[2]Terman and Merrill, Stanford-Binet Form L-M, p. 18.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, and Copying yielded a pre-test letter rating of E which is interpreted as low. According to the Metropolitan Readiness Tests Form A and B Manual, the letter rating E is interpreted as, "high chances of difficulty under ordinary instructional conditions. Further readiness work, assignment to slow sections, or individualized work is essential."[1]

Analysis of Renee's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Renee's performance on the Piagetian Conservation Tasks. Renee's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Renee marked the pictures at the beginning of each row. Renee's marking pattern varied to marking the second pictures

[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

in some rows. The pre-operational characteristic of centering would appear to be present in Renee's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Renee appeared to look at each of the three pictures in each row for duration of the test. Renee appeared to mark the picture with which she was familiar. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place a finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line and then the tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Renee marked the first words in two rows and began to vary her marking pattern to words or figures in the second position after the heavy green line. The pre-operational characteristic of centering would appear to be present in Renee's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Renee did not mark the letters in the first six and a half rows. When Renee began to mark, her pattern of marking was characterized by alternating between marking first and second letters. Renee then varied to marking all first letters. The pre-operational characteristic of centering would appear to be present in Renee's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Renee colored one of a series of pictures in each of the rows in the test. Renee colored all the pictures in the longer series of pictures. The pre-operational characteristic of centering on coloring would appear to be present in Renee's marking pattern.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Renee colored one of two letters; one of three letters. Renee made no attempt to reproduce or copy the model on approximately one-half of the letters and figures in the test. The pre-operational characteristic of centering on coloring would appear to be present in the attempted markings of Renee.

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Renee drew the picture glancing around the room. Her picture included a head, hair, eyes, mouth, arms and trunk. Renee's man was interpreted as belonging to Category E, which according to the

Metropolitan Readiness Tests Form A and B Manual is an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, red, pink and orange. The procedure was followed for each of nine colors. Renee identified black, green, purple, yellow, blue, white, red and orange. Renee did not identify pink.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties, one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the

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[1] Ibid., p. 36.

[2] Lavatelli, Piaget's Theory Applied, p. 83.

responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting responses from the subject.

Renee attempted 129 responses during the Lavetelli Classification ECC Lessons. Approximately 33 percent of the attempts were in the labeling mode and 67 percent were in the sentential mode.[1] Approximately 62 percent of the language units included the element of property or properties while approximately 20 percent of the language units included the element of action or actions and approximately 24 percent of the language units included the element of complementary classes. Approximately 2 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two Omission Lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion

[1]Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units of cases.

and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Renee attempted twenty responses with one no response during the two Omission Classification Lessons. Approximately 30 percent of the attempts were in the labeling mode and approximately 70 percent in the sentential mode. Approximately 60 percent of the language units included the element of property or properties while approximately 55 percent of the language units included the element of action or actions and approximately 5 percent of the language units included the element of complementary classes and approximately 5 percent included the element of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile then two piles. The subject was asked to make decisions related to abstracting the common property related to the

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[1]Lavatelli, Piaget's Theory Applied, p. 83.

two piles. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.[1]

Renee attempted twelve responses during the one Piagetian Changing of Criteria Task. Approximately 67 percent of the attempts were in the labeling mode and approximately 33 percent in the sentential mode. Approximately 41 percent of the language units included the element of property or properties while approximately 25 percent of the language units included the element of action or actions and approximately 33 percent of the language units included the element of complementary classes. No language units included the element of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations

[1] Ibid., p. 156.

related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Renee attempted seventy responses with one no response and five restricted responses during the eight Number, Measurement and Space ECC Lessons. Approximately 38 percent of the language units included the element of property or properties while approximately 22 percent of the language units included the element of action or actions and approximately 50 percent of the language units included the element of complementary classes. Approximately 5 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons adapted to create the two Omission Lessons. In the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number,

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[1]Ibid., p. 83.

measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Renee attempted thirty-two responses with two restricted responses during the two Omission Number, Measurement and Space Lessons. Approximately 32 percent of the attempts were in the labeling mode and approximately 68 percent in the sentential mode. Approximately 53 percent of the language units included the element of property or properties while approximately 34 percent of the language units included the element of action or actions and approximately 50 percent of the language units included the element of complementary classes. Renee made no attempts in the language unit of abstractions.

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[1] Ibid.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Renee attempted twenty-three responses with eight no responses and three restricted responses during the six Piagetian Conservation Tasks. Approximately 21 percent of the attempts were in the labeling mode and approximately 79 percent in the sentential mode. Approximately 26 percent of the language units included the element of property or properties while approximately 8 percent of the language units included the element of action or actions and approximately 82 percent of the language units included the element of complementary classes. Approximately 17 percent of the language units included the element of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties; three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Renee attempted twenty-five responses during the three Lavatelli Seriation ECC Lessons. Approximately 12 percent of the attempts were in the labeling mode and approximately 88 percent were in the sentential mode. Approximately 76 percent of the language units included the element of property or properties while approximately 56 percent of the

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[1] Ibid.

language units included the element of action or actions and approximately 60 percent of the language units included the element of complementary classes. Renee made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons adapted to create the two Omission Lessons. In the two Omission Seriation Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information involved in mental operations related to one property, two properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Renee attempted thirty responses during the two Omission Seriation Lessons. Approximately 26 percent of the attempts were in the labeling mode and approximately 74 percent in the sentential mode. One hundred percent of the

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[1] Ibid.

language units included the element of property or properties while approximately 56 percent of the language units included the element of action or actions and approximately 26 percent of the language units included the element of complementary classes. Renee made no attempts in the language unit of abstractions.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring

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[1] Ibid.

the language and eliciting the responses from the subject.

Renee attempted 224 responses with two no responses and five restricted responses during the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation Lessons. Approxiamtely 26 percent of the attempts were in the labeling mode and approximately 74 percent in the sentential mode. Approximately 56 percent of the language units included the element of property or properties while approximately 25 percent of the language units included the element of action or actions and approximately 36 percent of the language units included the element of complementary classes. Approximately 3 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement, Space and Seriation Lessons adapted to create the six Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion

and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Renee attempted eighty-two responses with one no response and two restricted responses during the six Classification, Number, Measurement, Space and Seriation Lessons. Approximately 29 percent of the attempts were in the labeling mode and approximately 71 percent in the sentential mode. Approximately 71 percent of the language units included the element of property or properties while approximately 42 percent of the language units included the element of action or actions and approximately 30 percent of the language units included the element of complementary classes. Approximately one percent of the language units included the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions

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[1] Ibid.

related to abstracting the common property for two piles. The subject was asked "why" questions after performing the activity.[1] In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Renee attempted thirty-five responses with eight no responses and three restricted responses during the seven Piagetian Conservation Tasks. Approximately 37 percent of the attempts were in the labeling mode and approximately 63 percent of the responses were in the sentential mode. Approximately 31 percent of the language units included the element of property or properties while approximately 14 percent of the language units included the element of action or actions and approximately 65 percent of the language units included the element of complementary classes. Approximately 11 percent of the language units included the element of abstractions.

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[1] Ibid., p. 156.

CASE V Renee

		LANGUAGE UNITS			PROPE				
					NONE		ONE		
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Sent.	
CLASSIFICATION									
Structured ECC Lessons	(6)	42	87	129	14	35	23	43	
Unstructured Omission Lessons	(2)	6	14	20	1	7	5	6	
Unstructured Task Lesson	(1)	8	4	12	4	3	4	1	
NUMBER, MEASUREMENT and SPACE									
Structured ECC Lessons	(8)	15	55	70	4	39	11	16	
Unstructured Omission Lessons	(2)	10	22	32		15	10	7	
Unstructured Task Lessons	(6)	5	18	23	4	13	1	5	
SERIATION									
Structured ECC Lessons	(3)	3	22	25	1	5	2	13	
Unstructured Omission Lessons	(2)	8	22	30			6	17	
LESSONS ALL TYPES									
Structured ECC Lessons	(17)	60	164	224	19	79	36	72	
Unstructured Omission Lessons	(6)	24	58	82	1	22	21	30	
Unstructured Task Lessons	(7)	13	22	35	8	16	5	6	
Total, All Types	(30)	97	244	341	28	117	62	108	

LANGUAGE UNITS REFLECTING:

PERTY					ACTION								COMPLEMENTARY CLASSES							
	TWO		THREE		NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCLUSIO and EXCLUSI	
nt.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Se
.3	4	9	1		41	62	1	22		3			40	58	2	23		6		
6		1			6	3		11					6	13		1				
1					8	1		3					8			4				
6					15	39		16					11	24	1	18	3	12		
7					10	11		11					10	6		11		4		
5					5	16		2						4	4	6	1	8		
3		4			3	8		10		4			2	8		3	1	9		
7	2	5			8	5		17					8	14				8		
'2	4	13	1		59	109	1	48		7			53	90	3	44	4	27		
0	2	6			24	19		39					24	33		12		12		
6					13	17		5					8	4	4	10	1	8		
8	6	19	1		96	145	1	92		7			85	127	7	66	5	47		

NG:									RESTRICTED RESPONSES	NO RESPONSES
LEMENTARY LASSES					ABSTRACTIONS					
ION	EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
ent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		
23		6			42	84		3		1
1					6	13		1		1
4					8	4				
18	3	12		1	15	51		4	5	1
11		4		1	10	22			2	
6	1	8			4	15	1	3	3	8
3	1	9		2	3	22				
		8			8	22				
4	4	27		3	60	157		7	5	2
12		12		1	24	57		1	2	1
10	1	8			12	19	1	3	3	8
66	5	47		4	96	233	1	11	10	11

Post-Tests

The Piagetian Conservation Tasks

Renee's performance during the post administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length identified Renee as a non-conserver in all five Tasks of Number, Liquid Amount, Solid Amount, Area and Length. Renee's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length also identified Renee as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may continue to appear as Renee performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Area and Length Renee responded with the words "same," "more." When the tester asked the "why" questions during the Piagetian Conservation of Number Task, Renee responded with "more checkers in the black checkers." In the Piagetian Conservation of Liquid Amount Task, Renee responded with "there ain't enough water in the little container." In the Piagetian Conservation of Solid Amount Task, Renee responded with "one's bigger than the other." In the Piagetian Conservation of Area Task, Renee responded with "cause they wouldn't let the car go fast then the other car." In the Piagetian Conservation

of Area Task Renee responded with "ain't any grass on to your or mine." Renee appeared still shy and timid during the testing situation.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying yielded a post-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B Manual, the letter rating D is interpreted as, "likely to have difficulty in first grade work. Should be assigned to slow section and given more individualized help."[1]

Analysis of Renee's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant data in relationship to Renee's performance on the Piagetian Conservation Tasks. Renee's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester who then asked the subject to mark one of the pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

[1]Hildreth, Griffiths, McGauvran, Manual of Directions, p. 11.

Renee did not appear to look at all three pictures in each row. Renee marked some pictures at the beginning, some in the middle and some at the end. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of one of the three pictures increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Renee marked pictures for the most part at the end of the row with a few pictures marked at the beginning or in the middle position. The pre-operational characteristic of centering would appear to be present in Renee's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row of pictures. The subject was asked to look at the stem model appearing before the heavy green line. The tester asked the subject to mark one of the three pictures

with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Renee marked the words or figures at the beginning after the heavy green line. Renee varied her pattern of marking words or figures at the beginning to marking at the end of the row. The pre-operational characteristic of centering would appear to be present in Renee's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Renee marked the first letter in a series of four letters in each of sixteen rows. The pre-operational characteristic of centering would appear to be present in Renee's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Renee marked pictures that were second in a series of pictures. Renee varied the pattern to marking all pictures in the longer series. Renee marked one numeral in the series of numerals. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Renee reproduced two letters for two letters and three letters for three letters. Letters were reproduced letter for letter in a distinguishable form. Renee's reproductions of models were accomplished in detail so that they were quite distinguishable. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was

asked to draw a picture of a man. Renee drew her man paying little attention to other subjects drawing. Her drawing included a head, eyes, nose, mouth, hair, ears, trunk, arms, fingers, three legs and three feet. Renee's man was interpreted as belonging to Category C which according to the Metropolitan Readiness Tests Forms A and B Manual is an average rating.[1] The average rating is related to an estimate of language and general mental development. The Metropolitan Readiness Tests Form A and B Manual makes no provision for drawing three legs and feet. An interpretation by writer could be faulty.

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, pink, red and orange. The procedure was followed for each of nine colors. Renee identified black, green, purple, yellow, blue, white, red and orange. The color pink was not identified.

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[1] Ibid., p. 36.

CHAPTER VIII

CASE VI--LON

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Lon Birthday: August (Month) 29 (Day) 1966 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: none

Pupil's address: confidential

What is the pupil's race? Check one: White x Negro ____
Indian ____ Mexican ____ Other ____

Father's name: confidential

What kind of work does the pupil's father, or guardian, do? trucking firm (If father, or guardian, works in a factory, or store, or office, tell what kinds of jobs he does there) truck driver

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here: _____

What other kind of work has the father ever done? service station attendant

How often is the father paid? Check one: Every week ____
Once every two weeks ____ Once a month x By the day ____
In business for himself ____

What kind of work does the pupil's mother do? welfare
What other kind of work has she ever done? waitress

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	(2)	3	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	2	3	(4)	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house x Duplex ____ Single-family dwelling ___
How many rooms are there in the family dwelling? three

Pre-Tests

The Piagetian Conservation Tasks

Lon's performance on the Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length identified Lon as a non-conserver in the Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length. The Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length identified Lon as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Lon performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Liquid Amount, Solid Amount, Area and Length, Lon responded with the word "same." When the tester asked the "why" questions during the Piagetian

Conservation of Liquid Amount Task, Lon responded "cause it did," "water went off to that." In the Piagetian Conservation of Solid Amount Task, Lon responded "it stretched out." In the Piagetian Conservation of Area Task, Lon responded "barns on one are together." In the Piagetian Conservation of Length Task, Lon responded "cause my car go faster."

The Piagetian Conservation of Number Task identified Lon as concrete-operational which suggests that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may not appear as Lon performs other number activities. When asked questions during the administering of the Piagetian Conservation of Number Task, Lon responded with the word "same." When the tester asked the "why" questions, Lon responded with "one red checker to cover a black checker," "black one to red one." Lon appeared comfortable during the testing situation.

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of 100 which according to the Manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of average potential for success related to language development or general mental development.[1] Lon appeared

[1]Terman and Merril, Stanford-Binet Form L-M, p. 36.

alert, cooperative and interested throughout the testing situation and required a minimum of encouragement to continue his participation in the testing situation.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, and Copying yielded a pre-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B Manual the letter rating D is interpreted as, "likely to have difficulty in first-grade work. Should be assigned to slow section and given more individualized help."[1]

Analysis of Lon's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant data in relationship to Lon's performance on the Piagetian Conservation Tasks. Lon's marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

pictures in each row with an "x." This procedure was followed for eighteen rows of pictures.

Lon appeared to look at the three pictures in each row and mark the pictures with which he was familiar. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for sixteen rows of pictures.

Lon marked pictures at the beginning, in the middle position and at the end in each of sixteen rows. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line and

then the tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for fourteen rows of pictures.

Lon traced the last letter in many of the words or traced a portion of the figure at the end of most rows after the heavy green line. Lon traced several times the stem model that appeared before the heavy green line. The pre-operational characteristic of centering would appear to be present in Lon's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Lon traced the first letter of a series of four letters most often. In a few instances, Lon varied the marking pattern to the second letter and last letter at the end of the row. The pre-operational characteristic of centering would appear to be present in Lon's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the

particular picture to be marked. This procedure was followed for each of twenty-six rows.

Lon appeared to mark pictures related to numerals with which he seemed to be familiar. Lon marked pictures at the beginning, all the pictures where necessary, and some pictures at the end of the rows. The pre-operational characteristics of centering, irreversibility, egocentrims, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Test Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Lon's reproductions or copies of the model were barely distinguishable. Lon reproduced only portions of the model. The pre-operational characteristic of transductive reasoning would appear to be present in Lon's marking pattern.

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Lon drew the picture and appeared absorbed in his own drawing. His drawing included a very large head, eyes, nose, mouth, ears, fingers, legs, feet. Lon's man

was interpreted as belonging to Category E which according to the Metropolitan Readiness Tests Forms A and B Manual is an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, red and orange. The procedure was followed for each of the nine colors. Lon identified black, green, purple, yellow, blue, white and red. Lon identified orange as red also and did not identify pink.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher

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[1] Ibid., p. 36.

[2] Lavatelli, Piaget's Theory Applied, p. 83.

syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Lon attempted 150 responses with six no responses during the six Lavatelli Classification ECC Lessons. Approximately 26 percent of the attempts were in the labeling mode and approximately 74 percent were in the sentential mode.[1] Approximately 66 percent of the language units included the element of property or properties while approximately 23 percent of the language units included the element of action or actions and approximately 26 percent of the language units included the element of complementary classes. Approximately 6 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two Omission Lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action,

[1]Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units or cases.

two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Lon attempted seventeen responses with three restricted responses during the two Omission Classification Lessons. Approximately 29 percent of the attempts were in the labeling mode and approximately 71 percent were in the sentential mode. Approximately 76 percent of the language units included the element of property or properties while approximately 35 percent of the language units included the element of action or actions and approximately 21 percent of the language units included the element of complementary classes. Lon made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile then two piles. The subject was asked to make decisions

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[1]Lavatelli, Piaget's Theory Applied, p. 83.

related to abstracting the common property related to the two piles. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.[1]

Lon attempted thirteen responses during the one Piagetian Changing of Criteria Task. Approximately 30 percent of the attempts were in the labeling mode and approximately 70 percent in the sentential mode. Approximately 76 percent of the language units included the element of property or properties while approximately 15 percent of the language units included the element of action or actions and approximately 23 percent of the language units included the element of complementary classes. Again Lon made no attempts in the language unit of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations

[1] Ibid., p. 156.

related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Lon attempted seventy-nine responses with three restricted responses during the eight Lavatelli Number, Measurement and Space Lessons. Approximately 17 percent of the attempts were in the labeling mode and 83 percent in the sentential mode. Approximately 45 percent of the language units included the element of property or properties while approximately 22 percent of the language units included the element of actions or actions and approximately 48 percent of the language units included the element of complementary classes. Lon made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons adapted to create the two Omission Lessons.

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[1]Ibid., p. 83.

In the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Lon attempted twenty-nine responses during the two Omission Number, Measurement and Space Lessons. Approximately 37 percent of the attempts were in the labeling mode and 63 percent in the sentential mode. Approximately 65 percent of the language units included the element of property or properties while approximately 37 percent of the language units included the element of action or actions and approximately 62 percent of the language units included the element of complementary classes. Again Lon made no attempts in the language unit of abstractions.

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[1] Ibid.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Lon attempted twenty-four responses with four restricted responses during the six Piagetian Conservation Tasks. Approximately 12 percent of the attempts were in the labeling mode and 88 percent in the sentential mode. Approximately 20 percent of the language units included the element of property or properties while approximately 4 percent of the language units included the element of action or actions and approximately 83 percent of the language units included the element of complementary classes. Approximately 4 percent of the language units included the element of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the

subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Lon attempted nineteen responses during the three Lavatelli Seriation ECC Lessons. Approximately 15 percent of the attempts were in the labeling mode and 85 percent in the sentential mode. Approximately 68 percent of the language units included the element of property or properties while approximately 63 percent of the language units included the element of action or actions and approximately 47 percent of the language units included the element of complementary classes. Approximately 10 percent of the language units included the element of abstractions.

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[1] Ibid.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons adapted to create the two Omission Lessons. In the two Omission Seriation Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information involved in mental operations related to one property, two properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Lon attempted twenty-three responses with three restricted responses during the two Omission Seriation Lessons. Approximately 26 percent of the attempts were in the labeling mode and 74 percent in the sentential mode. Approximately 65 percent of the language units included the element of property or properties while approximately 34 percent of the language units included the element of action or actions and approximately 69 percent of the language units included the

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[1] Ibid.

element of complementary classes. Approximately 4 percent of the language units included the element of abstractions.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in Classification, Number, Measurement, Space and Seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Lon attempted 248 responses with nine restricted responses during the seventeen Lavatelli Classification, Number,

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[1] Ibid.

Measurement, Space and Seriation Lessons. Approximately 23 percent of the attempts were in the labeling mode and approximately 77 percent in the sentential mode. Approximately 60 percent of the language units included the element of property or properties while approximately 26 percent of the language units included the element of action or actions and approximately 31 percent of the language units included the element of complementary classes. Approximately 6 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement and Seriation Lessons adapted to create the six Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in classification, number, measurement, space and seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials

[1] Ibid.

upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Lon attempted sixty-nine responses with one no response and three restricted responses during the six Omission Classification, Number, Measurement, Space and Seriation Lessons. Approximately 31 percent of the attempts were in the labeling mode and approximately 69 percent in the sentential mode. Approximately 69 percent of the language units included the element of property or properties while approximately 36 percent of the language units included the element of action or actions and approximately 55 percent of the language units included the element of complementary classes. Approximately one percent of the language units included the element of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions related to abstracting the common property for two piles. The subject was asked "why" questions after performing the activity.[1]

[1]Ibid., p. 156.

In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Lon attempted thirty-seven responses with four restricted responses during the seven Piagetian Tasks. Approximately 18 percent of the attempts were in the labeling mode and 82 percent in the sentential mode. Approximately 40 percent of the language units included the element of property or properties while approximately 8 percent of the language units included the element of action or actions and approximately 62 percent of the language units included the element of complementary classes. Approximately 2 percent of the language units included the element of abstractions.

Post-Tests

The Piagetian Conservation Tasks

Lon's performance during the post administering of the Piagetian Conservation Tasks of Liquid Amount and Length

CASE VI Lon

		LANGUAGE UNITS			PROPER				
					NONE		ONE		
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Sent.	La
CLASSIFICATION									
Structured ECC Lessons	(6)	40	110	150	13	37	24	60	
Unstructured Omission Lessons	(2)	5	12	17	1	3	4	9	
Unstructured Task Lesson	(1)	4	9	13		3	4	6	
NUMBER, MEASUREMENT and SPACE									
Structured ECC Lessons	(8)	14	65	79	1	42	13	23	
Unstructured Omission Lessons	(2)	11	18	29	3	7	6	11	
Unstructured Task Lessons	(6)	3	21	24	3	16		5	
SERIATION									
Structured ECC Lessons	(3)	3	16	19		6	3	7	
Unstructured Omission Lessons	(2)	6	17	23	1	7	5	8	
LESSONS ALL TYPES									
Structured ECC Lessons	(17)	57	191	248	14	85	40	90	
Unstructured Omission Lessons	(6)	22	47	69	5	17	15	28	
Unstructured Task Lessons	(7)	7	30	37	3	19	4	11	
Total, All Types	(30)	86	268	354	22	121	59	129	

LANGUAGE UNITS REFLECTING:

ROPERTY					ACTION								COMPLEMENTARY CLASSES						
NE	TWO		THREE		NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCL EXCL
Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab
60	2	13	1		40	75		29		6			38	72	1	27	1	10	
9					5	6		5		1			5	8		1		3	
6					4	7		2					4	6		3			
23					14	47		16		2			12	29	1	17	1	12	
11	1		1		11	7		11					6	5	2	8	2	4	1
5					3	20		1						4	3	11		4	
7		3			3	4		8		4			3	7		3		5	
8		2			6	9		8					6	1		11		4	
90	2	16	1		57	126		53		12			53	108	2	47	2	27	
28	1	2	1		22	22		24		1			17	14	2	20	2	11	1
11					7	27		3					4	10	3	14		4	
129	3	18	2		86	175		80		13			74	132	7	81	4	42	1

NG:									RESTRICTED RESPONSES	NO RESPONSES
PLEMENTARY CLASSES					ABSTRACTIONS					
USION	EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		
27	1	10		1	40	100		10	6	
1		3			5	12				1
3					4	9				
17	1	12		7	14	61		4	3	
8	2	4	1	1	11	18				
11		4		2	3	20		1	4	
3		5		1	3	14		2		
11		4		1	6	16		1	3	
47	2	27		9	57	175		16	9	
20	2	11	1	2	22	46		1	3	1
14		4		2	7	29		1	4	
81	4	42	1	13	86	250		18	16	1

identified Lon as a non-conserver in the two Tasks of Liquid Amount and Length. Lon's performance on the Piagetian Conservation Tasks of Liquid Amount and Length identified Lon as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Lon performs other activities related to liquid amounts and length.

Lon's performance on the Piagetian Conservation Tasks of Number, Solid Amount and Area identified Lon as concrete-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may not appear as Lon performs other activities related to number, solid amount and area. Lon's performance on the Piagetian Conservation Tasks of Number, Solid Amount and Area changed at post-test time.

When asked questions during the administering of the Piagetian Conservation Tasks of Liquid Amount and Length, Lon responded with the word "same." When the tester asked the "why" questions in the Piagetian Conservation of Liquid Amount Task, Lon responded with "I don't know," "that one full and that one full." In the Piagetian Conservation of Length Task, Lon responded with "I'll get there first," "cause you move mine up here."

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Solid Amount and Area Lon responded with the word "same." When the tester asked the "why" questions in the Piagetian Conservation of Number Task, Lon responded with "red one fits on the black one," "one fits on one." In the Piagetian Conservation of Solid Amount Task, Lon responded with "this one is the same amount as this one while ago." Lon was referring to the distorted ball of clay being the same. In the Piagetian Conservation of Area Task, Lon responded with "there's one on each of 'em," "there's three on each of 'em." At the conclusion of each Piagetian Conservation Task, Lon identified what the next activity would involve as "pouring water," "play dough," "fields of grass," and "racing cars."

Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, Copying yielded a post test letter rating of C which is interpreted as average. According to the Metropolitan Readiness Tests Forms A and B Manual, the letter rating C is interpreted as, "likely to succeed in first-grade work. Careful study should be made of the specific strengths and weaknesses of pupils in this group and their instruction planned accordingly."[1]

[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

Analysis of Lon's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Lon's performance on the Piagetian Conservation Tasks. Lon' marking patterns on the Sub-Tests yielded significant information related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Lon appeared to mark the pictures with which he was familiar. Lon marked pictures at the beginning, in the middle position and at the end of each of sixteen rows. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows

of pictures increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Lon appeared to mark pictures at the beginning, in the middle position and at the end of each of sixteen rows with which he was familiar. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first row of pictures with the tester pointing to the first row of pictures. The subject was asked to look at the stem model appearing before the heavy green line. The tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Lon appeared to mark the reproductions or copies of stem models that seemed visually correct to him in the first ten rows. Lon marked the first word or figure appearing after the heavy green line in the last four rows. In the first ten rows, the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable. In the last four rows, the pre-operational characteristic of centering appeared to be present in Lon's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place his finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Lon marked mostly the first letter in a series of four letters. The pre-operational characteristic of centering would appear to be present in Lon's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Lon appeared to mark the pictures in the series with which he was familiar. Lon's marking pattern appeared to demonstrate the ability to conserve number. The pre-operational characteristics of centering, irreversibility, concreteness, states versus transformation and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with

the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Lon reproduced two letters where there were two and two letters where there were three. Lon's reproductions were distinguishable. Lon attempted to reproduce all numerals and figures, but appeared to encounter difficulty in reversals related to formation of numerals. The pre-operational characteristic of irreversibility would appear to be present in Lon's marking pattern.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Lon drew his picture and appeared absorbed in his own drawing. His picture included a head, eyes, hair, trunk, legs, and feet. Lon's man was interpreted as belonging to Category D which according to the Metropolitan Readiness Tests Forms A and B Manual is a below average rating. The below average rating is related to language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked

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[1]Ibid., p. 36.

to identify nine colors of yarn: black, green, purple, yellow, blue, white, pink, red and orange. The procedure was followed for each of nine colors. Lon identified black, green, purple, yellow, blue, white and red. Lon identified orange as red and did not identify pink.

CHAPTER IX

CASE VII--CIDA

Demographic Data

Questionnaire for Determining
Socio-Economic Status

Pupil's name: Cida Birthday: August (Month) 13 (Day) 1966 (Year)

Pupil's school: Mark Twain Elementary

Previous school attended: pre-school nursery

Pupil's address: confidential

What is the pupil's race? Check one: White ____ Negro ____
Indian ____ Mexican __x__ Other ____

Father's name: confidential

What kind of work does the pupil's father, or guardian, do? meat company (If father, or guardian, works in a factory, or store, or office, tell what kinds of jobs he does there.) butcher

If he has a title, like watchman, foreman, clerk, manager, president, owner, etc., write it here: _____

What other kind of work has the father ever done? none

How often is the father paid? Check one: Every week __x__
Once every two weeks ____ Once a month ____ By the day ____
In business for himself ____

What kind of work does the pupil's mother do? housewife
What other kind of work has she ever done? none

Grade, or year of school completed by the pupil's father.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	1	2	(3)	4	1	2	3	4	5	6	7	8

Grade, or year of school completed by the pupil's mother.
Circle one:

Grade School								High School				College							
1	2	3	4	5	6	7	8	(1)	2	3	4	1	2	3	4	5	6	7	8

Was the father born in the United States? yes
Was the mother? yes

What type of family dwelling? Check one:
Apartment house ___ Duplex ___ Single-family dwelling X
How many rooms are there in the family dwelling? four

Pre-Tests

The Piagetian Conservation Tasks

Cida's performance on the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, and Length identified Cida as a non-conserver in the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length. The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length identified Cida as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Cida performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount and Length, Cida responded with the word "same." When the tester asked the "why" questions in the Piagetian Conservation of Number Task, Cida gave no response. In the Piagetian Conservation of Liquid Amount Task, Cida responded with "cause."

In the Piagetian Conservation of Solid Amount Task, Cida responded with "it's like a snake." In the Piagetian Conservation of Length Task, Cida responded with "cause my doggie thinks so." The pre-operational characteristic of egocentrism would appear to be present in Cida's responses to the "why" questions and some use of restricted language. The Piagetian Conservation of Area Task was abandoned according to the directions for administering the tasks because Cida appeared not to be able to establish that the grass was the same.[1]

The Stanford-Binet Intelligence Scale Form L-M

The Stanford-Binet Intelligence Scale Form L-M yielded an intelligence quotient of ninety-one which according to the Manual of the Stanford-Binet Intelligence Scale Form L-M is a prediction of average potential for success related to language development and general mental development.[2] Cida appeared very cooperative and engaged in the Stanford-Binet Intelligence Tasks easily but preferred to talk about her home and family.

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, and Copying yielded a pre-test letter rating of E which is

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[1]Renner, Bibens, Shepherd, Guiding Learning, p. 95.

[2]Terman and Merril, Stanford-Binet Form L-M, p. 36.

interpreted as low. According to the Metropolitan Readiness Tests Form A and B Manual, the letter rating E is interpreted as "high chances of difficulty under ordinary instructional conditions. Further readiness work, assignment to slow sections, or individualized work is essential."[1]

Analysis of Cida's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant data in relationship to Cida's performance on the Piagetian Conservation Tasks. Cida's marking patterns on the Sub-Tests yielded significant data related to pre-operational characteristics.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for eighteen rows of pictures.

Cida marked the first and last pictures in each row. Cida marked few pictures in the middle position. The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 11.

at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for sixteen rows of pictures.

Cida often marked two pictures in a row. Cida's marking pattern varied from marking two pictures to marking first or last pictures in other rows. The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row. The subject was asked to look at the stem model appearing before the heavy green line and then the tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for fourteen rows of pictures.

Cida marked a letter or part of a figure after the heavy green line in the first three rows. Cida varied to marking figures in the middle position for the next three rows and marking a letter or part of a figure in the last eight rows. The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Cida sometimes colored a picture or letter in the box. The coloring of pictures or letters was characterized by Cida performing this activity with mostly the first letters appearing in the box. The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Cida marked all the series of pictures in each of twelve rows. Cida marked only one picture in the remaining fourteen rows. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each box. The procedure was followed for each of fourteen boxes.

Cida reproduced or copied very few of the letters or figures. The pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning were not easily identifiable.

When given the Draw-A-Man Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. Cida drew the picture and glanced around the room and at other students drawing. Her picture included a triangular shaped head, body and legs. The figure or drawing was not recognizable as a human being. Cida's man was interpreted as belonging to Category E, which according to the Metropolitan Readiness Tests Form A and B Manual is an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

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[1]Ibid., p. 36.

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, red, pink and orange. The procedure was followed for each of nine colors. Cida identified black, green, purple, yellow, blue, white, red and orange. Cida did not identify pink. Cida gave no language responses.

Classification

Structured ECC Lessons

In the six Lavatelli Classification ECC Lessons the subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

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[1]Lavatelli, Piaget's Theory Applied, p. 83.

Cida attempted ninety-two responses with one no response and thirteen restricted responses during the six Lavatelli Classification Lessons. Approximately 34 percent of the attempts were in the labeling mode and 66 percent in the sentential mode.[1] Approximately 43 percent of the language units included the element of property or properties while approximately 40 percent of the language units included the element of action or actions and approximately 10 percent of the language units included the element of complementary classes. Cida made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification ECC Lesson and one additional activity suggested by Lavatelli were adapted to create the two Omission Lessons. In the two Omission Classification Lessons the subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The subject was provided with sets of concrete objects or materials upon which

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[1]Percentages are utilized for descriptive purposes only. The reader is cautioned against manipulating percentage figures between or among the language units or cases.

[2]Lavatelli, Piaget's Theory Applied, p. 83.

to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what he was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Cida attempted seventeen responses with four no responses and one restricted response during the two Omission Classification Lessons. Approximately 41 percent of the attempts were in the labeling mode and 59 percent in the sentential mode. Approximately 18 percent of the language units included the element of property or properties while 41 percent of the language units included the element of action or actions and no language units included the element of complementary classes. Again Cida made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lesson.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile then two piles. The subject was asked to make decisions related to abstracting the common property related to the two piles. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher

withdrawing the support of syntactical structuring of language and eliciting responses.[1]

Cida attempted eleven responses during the one Piagetian Changing of Criteria Task. Approximately 27 percent of the attempts were in the labeling mode and 63 percent in the sentential mode. Approximately 63 percent of the language units included the element of property or properties while approximately 27 percent of the language units included the element of action or actions and no language units included the element of complementary classes. Again Cida made no attempts in the language unit of abstractions.

Number, Measurement, Space

Structured ECC Lessons

In the eight Lavatelli Number, Measurement and Space ECC Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[2] The subject was provided with sets of concrete objects or materials upon which to act or interact.

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[1] Ibid., p. 156.

[2] Ibid., p. 83.

The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the response from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Cida attempted seventy responses and thirteen restricted responses during the eight Lavatelli Number, Measurement, Space ECC Lessons. Approximately 23 percent of the attempts were in the labeling mode and 77 percent in the sentential mode. Approximately 47 percent of the language units included the element of property or properties while approximately 21 percent of the language units included the element of action or actions and approximately 36 percent of the language units included the element of complementary classes. Approximately 6 percent of the language units included the element of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Number, Measurement and Space Lessons adapted to create the two Omission Lessons. In the two Omission Number, Measurement and Space Lessons the subject was asked to perform mental operations in number, measurement and space. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property,

two properties; one action, two actions; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Cida attempted twenty-nine responses with four restricted responses during the two Omission Number, Measurement and Space Lessons. Approximately 38 percent of the attempts were in the labeling mode and 62 percent in the sentential mode. Approximately 58 percent of the language units included the element of property or properties while approximately 34 percent of the language units included the element of action or actions and approximately 38 percent of the language units included the element of complementary classes. Approximately 3 percent of the language units included the element of abstractions for the first time.

Piagetian Conservation Task Lessons.--In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of

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[1] Ibid.

of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Cida attempted twenty-eight responses with fifteen restricted responses during the six Piagetian Conservation Tasks. Approximately 39 percent of the attempts were in the labeling mode and 61 percent in the sentential mode. Approximately 32 percent of the language units included the element of property or properties while approximately 10 percent of the language units included the element of action or actions and approximately 43 percent of the language units included the element of complementary classes. Approximately 14 percent of the language units included the element of abstractions.

Seriation

Structured ECC Lessons

In the three Lavatelli Seriation ECC Lessons the subject was asked to perform mental operations in seriation. The subject was asked to perform mental operations in seriation. The subject was asked to take in information and

remake the information. The intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what she was doing with the teacher syntactically structuring the language and eliciting the response from the subject.

Cida attempted seventeen responses during the three Lavatelli Seriation Lessons. Approximately 12 percent of the attempts were in the labeling mode and 88 percent in the sentential mode. Approximately 65 percent of the language units included the element of property or properties while 70 percent of the language units included the element of action or actions and approximately 82 percent of the language units included the element of complementary classes. Cida made no attempt in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--Two Lavatelli Seriation Lessons adapted to create the two Omission Lessons. In the two Omission

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[1] Ibid.

Seriation Lessons the subject was asked to perform mental operations in seriation. The subject was asked to take in information and remake the information involved in mental operations related to one property, two properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects and materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Cida was absent during the two Omission Seriation Lessons.

Lessons--All Types

Structured ECC Lessons

In the seventeen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons the subject was asked to perform mental operations in classification, number, measurement, space and seriation. The subject was asked to take in information and remake the information. The intake and remaking of information involved mental operations related

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[1] Ibid.

to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher syntactically structuring the language and eliciting the responses from the subject. The subject was asked to state what he was doing with the teacher syntactically structuring the language and eliciting the responses from the subject.

Cida attempted 179 responses with one no response and twenty-six restricted responses during the fifteen Lavatelli Classification, Number, Measurement, Space and Seriation ECC Lessons. Approximately 27 percent of the attempts were in the labeling mode and 73 percent in sentential mode. Approximately 46 percent of the language units included the element of property or properties while approximately 36 percent of the language units included the element of action or actions and approximately 27 percent of the language units included the element of complementary classes. Cida made no attempts in the language unit of abstractions.

Unstructured ECC Lessons

Omission.--One Lavatelli Classification Lesson and five Classification, Number, Measurement, Space and Seriation

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[1] Ibid.

adapted to create the six Omission Lessons. In the six Omission Classification, Number, Measurement, Space and Seriation Lessons the subject was asked to perform mental operations in classification, number, measurement, space and seriation. The subject was asked to take in information and remake the information. This intake and remaking of information involved mental operations related to one property, two properties, three properties; one action, two actions, three actions or more; complementary classes of inclusion and exclusion and inclusion-exclusion.[1] The subject was provided with sets of concrete objects or materials upon which to act or interact. The subject was asked to identify objects or materials with the teacher withdrawing support of syntactical structuring of language and eliciting responses. The subject was asked to state what she was doing with the teacher withdrawing the support of syntactical structuring of language and eliciting responses.

Cida attempted forty-six responses with five no responses and four restricted responses during the six Classification, Number, Measurement, Space and Seriation Lessons. Approximately 48 percent of the attempts were in the labeling mode and 52 percent in the sentential mode. Approximately 43 percent of the language units included the element of property or properties while approximately 37 percent of the

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[1] Ibid.

language units included the element of action or actions and approximately twenty-four percent of the language units included the element of complementary classes. Cida made no attempts in the language unit of abstractions.

Piagetian Conservation Task Lessons.--In the one Piagetian Changing of Criteria Task the subject was asked to abstract the common property by placing geometrical shapes--circles and squares, red and blue, large and small--into one pile and two piles. The subject was asked to make decisions related to abstracting the common property for two piles. The subject was asked "why" questions after performing the activity.[1]

In the Conservation of Number Task the subject was asked if the number of checkers were the same and "why." In the Conservation of Liquid Amount Task the subject was asked if the amount of liquid in the two containers was the same and "why." In the Conservation of Solid Amount Task the subject was asked if the amount of clay was the same and "why." In the Conservation of Area Task the subject was asked if the amount of uncovered grass was the same and "why." In the Conservation of Length Task the subject was asked if the roads were the same and if the cars would reach the end of the road at the same time and "why."

Cida attempted thirty-nine responses with fifteen restricted responses during the seven Piagetian Conservation

[1]Ibid., p. 156.

Tasks. Approximately 39 percent of the attempts were in the labeling mode and 61 percent in the sentential mode. Approximately 41 percent of the language units included the element of property or properties while approximately 21 percent of the language units included the element of action or actions and approximately 33 percent of the language units included the element of complementary classes. Approximately 10 percent of the language units included the element of abstractions.

Post-Tests

The Piagetian Conservation Tasks

Cida's performance during the post administering of the Piagetian Conservation Tasks of Liquid Amount, Solid Amount, and Length identified Cida as a non-conserver in the three Tasks of Liquid Amount, Solid Amount and Length. Cida's performance on the Piagetian Conservation Tasks of Liquid Amount, Solid Amount and Length identified Cida as pre-operational which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states versus transformations and transductive reasoning may appear as Cida performs other activities.

Cida's performance on the Piagetian Conservation Tasks of Number and Area identified Cida as concrete-operational, which suggested that the pre-operational characteristics of centering, irreversibility, egocentrism, concreteness, states

CASE VII Cida

		LANGUAGE UNITS			PRO			
					NONE		ONE	
		Lab.	Sent.	Total	Lab.	Sent.	Lab.	Se
CLASSIFICATION								
Structured ECC Lessons	(6)	31	61	92	17	36	14	2
Unstructured Omission Lessons	(2)	7	10	17	7	7		
Unstructured Task Lesson	(1)	4	7	11	3	1	1	
NUMBER, MEASUREMENT and SPACE								
Structured ECC Lessons	(8)	16	54	70	1	36	15	
Unstructured Omission Lessons	(2)	11	18	29	5	7	5	
Unstructured Task Lessons	(6)	11	17	28	8	11	2	
SERIATION								
Structured ECC Lessons	(3)	2	15	17	1	5	1	
Unstructured Omission Lessons	(2)							
LESSONS ALL TYPES								
Structured ECC Lessons	(17)	49	130	179	19	77	30	4
Unstructured Omission Lessons	(6)	18	28	46	12	14	5	1
Unstructured Task Lessons	(7)	15	24	39	11	12	3	1
Total, All Types	(30)	82	182	264	42	103	38	7

LANGUAGE UNITS REFLECTING:

ROPERTY					ACTION								COMPLEMENTARY CLASSES						
E	TWO		THREE		NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INC EXC
Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab
23		2			31	24		29		8			30	53		3	1	4	
3					7	3		7					7	10					
5		1			4	4		2		1			4	6				1	
17		1			16	39		15					14	31	1	13	1	8	
11	1				11	8		10					8	10	1	3		5	2
5	1	1			11	14		3					6	10	4	7	1		
6		4			2	3		9		3			2	1		3		8	
16		7			49	66		53		11			46	85	1	19	2	20	
4	1				18	11		17					15	20	1	3		5	2
10	1	2			15	18		5		1			10	16	4	7	1	1	
70	2	9			82	95		75		12			71	121	6	29	3	26	2

S:								RESTRICTED RESPONSES	NO RESPONSES
MENTARY SSES				ABSTRACTIONS					
EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		
1	4		1	31	61			13	1
				7	10			1	4
	1			4	7				
1	8		2	16	50		4	13	
	5	2		11	17		1	4	
1				9	15	2	2	15	
	8		3	2	15				
2	20		6	49	126		4	26	1
	5	2		18	27		1	5	4
1	1			13	22	2	2	15	
3	26	2	6	80	175	2	7	46	5

versus transformations and transductive reasoning may not appear as Cida performs other activities.

When asked questions during the administering of the Piagetian Conservation Tasks of Liquid Amount, Solid Amount and Length Cida responded with the word "same," "un huh." When the tester asked the "why" questions during the Piagetian Conservation of Liquid Amount Task, Cida responded "the water that you got was in there--and not in there;" Solid Amount Task, "I got a __?__ got another __?__ didn't you;" Length Task, "We're gonna race." When the tester asked the "why" questions during the Piagetian Conservation of Number Tasks, Cida responded "cause black checker for red checker." When asked the "why" questions during the Piagetian Conservation of Area Task Cida responded "same block right there," "same block right there," "same block right there," "same grass uncovered."

The Metropolitan Readiness Tests Form A, 1-6

The Metropolitan Readiness Tests Form A, 1-6, Sub-Tests: Word Meaning, Listening, Matching, Alphabet, Numbers, and Copying yielded a post-test letter rating of D which is interpreted as low normal. According to the Metropolitan Readiness Tests Form A and B manual, the letter rating D is interpreted as, "likely to have difficulty in first grade work. Should be assigned to slow section and given more individualized help."

Analysis of Cida's performance on the Sub-Tests of the Metropolitan Readiness Tests Form A, 1-6 yielded significant information in relationship to Cida's performance on the Piagetian Conservation Tasks.

When given the Word Meaning Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. All three pictures were identified by the tester. The tester then asked the subject to mark one of the three pictures in each row with an "x." This procedure was followed for each of eighteen rows of pictures.

Cida marked the first or last pictures in most of the rows. Cida marked very few pictures in the middle position. The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Listening Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The tester described something about one of the three pictures in the row. The tester then asked the subject to mark one of the three pictures with an "x" after the description of the picture was given. The descriptions of the rows of pictures increased in length and complexity. The procedure was followed for each of sixteen rows of pictures.

Cida marked the first or last picture in most of the rows. Cida marked very few pictures in the middle position.

The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Matching Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first row of pictures with the tester pointing to the first row of pictures. The subject was asked to look at the stem model appearing before the heavy green line. The tester asked the subject to mark one of the three pictures with an "x" that matched the stem model. The procedure was followed for each of fourteen rows of pictures.

Cida marked all the words or figures immediately following the heavy green line in thirteen of the fourteen rows. The marking in the fourteenth row was in the middle position. The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Alphabet Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to place her finger on the first box where a picture and letters were displayed with the tester pointing to the first box. The tester then asked the subject to mark one of four letters with an "x" that the tester named. The procedure was followed for each of sixteen rows.

Cida marked the second letter in a series of four letters most often. Cida's marking pattern varied somewhat to marking the third letter in a series of four letters.

The pre-operational characteristic of centering would appear to be present in Cida's marking pattern.

When given the Numbers Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to look at the first row of pictures with the tester pointing to the first row. The subject was asked to mark an "x" on one of a series of pictures after the tester identified by number the particular picture to be marked. This procedure was followed for each of twenty-six rows.

Cida marked the second picture in a series of pictures varying the marking pattern to marking all the pictures in a series. Cida drew designs or figures in the boxes where there were only pictures. Pre-operational characteristics were not identifiable in Cida's marking pattern.

When given the Copying Sub-Test of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to find or point to the first row of boxes at the top of the page with the tester pointing to the first row of boxes. The subject was asked to find the box with the circle in it. The subject was asked to reproduce the circle underneath the original circle. The subject was then asked to reproduce every model in each bos. The procedure was followed for each of fourteen boxes.

Cida copied or reproduced one letter where there were two and two letters where there were three. Cida

attempted to reproduce all letters and designs. The pre-operational characteristics of transductive reasoning would appear to be present in Cida's marking pattern.

When given the Draw-A-Man Sub-Test (optional) of the Metropolitan Readiness Tests Form A, 1-6 the subject was asked to draw a picture of a man. While Cida drew the picture, she glanced around the room and at the other subjects drawing. Her drawing included a head, mouth, and trunk. Cida's man was interpreted as belonging to Category E which according to the Metropolitan Readiness Tests Forms A and B Manual is an immature rating. The immature rating is related to an estimate of language and general mental development.[1]

The Yarn Color Test

When given the Yarn Color Test the subject was asked to identify nine colors of yarn: black, green, purple, yellow, blue, white, pink, red and orange. The procedure was followed for each of nine colors. Cida identified black, green, purple, yellow, blue, white, red and orange. Cida did not identify pink.

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[1]Hildreth, Griffiths, and McGauvran, Manual of Directions, p. 36.

CHAPTER X

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Statement of the Problem

The study was made to determine can empirical evidence (examples of children's language) be identified that supports or contradicts the theoretical assumptions of the Lavatelli Early Childhood Curriculum.

Hypotheses

Experience in the Lavatelli Early Childhood Curriculum will result in an observed change in the use of language by children as mental operations are performed. Children's conversations during the Lavatelli Early Childhood Curriculum lessons will provide examples of children's syntactical structuring of language with modeling of syntactical structuring by the teacher eliciting responses, for the purpose of classification, number, measurement, space and seriation.

Children's conversations during the Lavatelli Early Childhood Curriculum lessons will provide examples of children's syntactical structuring of language with omission of modeling of syntactical structuring by the teacher eliciting responses for the purposes of classification, number, measurement, space and seriation. There will be an observed

change in the use of language as mental operations are performed during the unstructured omission lessons.

Children's conversations during the administering of the Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Length, and Area and the one Piagetian Changing of Criteria Task will provide examples of children's syntactical structuring of language with omission of modeling of syntactical structuring of language by the teacher eliciting responses. Examples of children's language will identify the children as conservers and non-conservers.

Children's conversations during the Lavatelli Early Childhood Curriculum lessons will provide examples of children's syntactical structuring of language. The examples will not necessarily be coordinated with the expectations from the results of the Stanford-Binet Intelligence Scale.

Procedure and Methodology

Seven kindergarten subjects, ages five and six were taught a series of structured and unstructured omission lessons five days a week for a period of seven weeks. Each of the series of lessons was approximately ten to twenty minutes in length. The series of structured and unstructured lessons involved activities related to classification, number, measurement, space, seriation and Piagetian Tasks. The structured lessons were taught according to the script from the Lavatelli Manual with modeling of syntactical structuring by the teacher

eliciting responses for the purposes of classification, number, measurement, space and seriation. The unstructured lessons were taught according to the script of the teacher with modeling of syntactical structuring by the teacher without eliciting responses for the purposes of classification, number, measurement, space, seriation and Piagetian Tasks.

The series of structured and unstructured lessons for each subject were electrically recorded and transcribed according to the procedure outlined in Chapter I. The language of each subject from the transcriptions was analyzed according to the criteria established in Chapter I.

Pre-Post Tests and Instruments

Tests.--

The Piagetian Conservation Tasks of Number, Liquid Amount, Solid Amount, Length, and Area

The Stanford-Binet Intelligence Scale Form L-M (not administered as a post-test)

The Metropolitan Readiness Tests Form A, 1-6 and the Draw-A-Man Test (optional)

The Yarn Color Test

Flanders Interaction Analysis (administered to the kindergarten teachers)

Instruments.--

Language Transcription Instrument for Piagetian Conservation Tasks

Language Transcription Instrument for Structured and Unstructured ECC Classification, Number, Measurement, Space, Seriation, Task Lessons

Criteria for the Analysis of Language Units

Case I--Ron

Description.--Ron is a male Negro who was six years and one month of age and whose father and mother had completed eight and ten grades of schooling. The father is a disabled veteran who worked part-time in the construction industry. His mother has not worked, and was a housewife. Ron was of average size for his age but was also the largest and oldest child in the group. His behavior patterns were reserved, quiet, soft of voice, reticent and passive. There was an apparent air of dullness about him that may have been promoted in his lack of expression in either voice tone, volume and facial features, especially the eyes. This dullness in his appearance was sometimes reinforced by his assuming a posture that suggested that he was being threatened and expecting the authority figure to reprimand or even strike him. Near the end of the lessons he became more actively involved in social transmission. The illusion of dullness lessened. At times he smiled and engaged in brief conversations with the other children. His posture became more relaxed and he began to not move away and retreat from the circle of the group.

Pre and Post Test Data.--Ron's performances during the pre and post administering of the Piagetian Conservation Tasks, identified him as a non-conserver, pre-operational child. The only change in his performances was from utilizing the ostensive mode of pointing to the labeling mode for the first questions

of the examiner from the pre to the post test administering of the Conservation Tasks. At both times, he used the "no response" for the "why" questions of the examiner. An interpretation of Piaget's descriptions would suggest that Ron's movement from the ostensive to the labeling mode as a semiotic function for the representation of action was a positive movement towards the development of language patterns to reproduce the logic of manipulation of the object-bound pre-operational child.

His marking patterns on the Metropolitan Readiness Tests during the pre and post periods demonstrated evidences of the pre-operational characteristics of centering, states versus transformation and transductive reasoning. There was an upward movement in his letter rating on the Metropolitan Readiness Tests from the letter rating of E to D. This was accompanied by a downward movement in category rating on the Metropolitan Optional Test (Draw-A-Man) from C to D. These low normal and below average ratings from the Metropolitan seem to have been consistent with Ron's placement on the Stanford-Binet of seventy-nine which suggested low potential for success in language and general mental development. The potential movement and changes in Ron's language or mental operations are not apparent in these instruments as one change may be counterbalanced by the other, i.e.: the persistance of the pre-operational characteristics in his marking patterns, as countered by an upward movement of his letter ratings on the Metropolitan Readiness Tests.

During the Structured Classification ECC Lessons, Ron's behavior was characterized by sitting apart from the group, performing the physical manipulation of the objects and for the most part attempting to imitate the language of the teacher as she insisted on the elicited response. It appeared that when Ron became tired of the modeling and eliciting procedure, he refused to respond. The pre-operational characteristic of centering would appear to be evidenced in the language units reflecting one property, one action and the complementary class of inclusion.

During the Unstructured Classification ECC Omission Lessons, Ron's behavior was characterized by sitting apart from the group and performing the physical manipulation of objects. Without support of language by the teacher, Ron responded in a minimal manner utilizing the labeling mode more than the sentential mode in the language units reflecting property, action and complementary classes. This suggested a minimum of experience in social transmission. Ron's language did not include abstractions and he appeared to give no response when confused as what to say.

During the Unstructured Classification Task Lesson, Ron did not perform the physical manipulation of the objects. Without support of language by the teacher, Ron responded in a minimal manner utilizing the labeling mode more than the sentential mode in the language units reflecting property, action and complementary classes. Ron's language did not

include abstractions and he appeared to give no responses when confused as to what to say.

For the duration of the Classification ECC Lessons, Ron appeared not to be a member of the group, he seldom spoke to other subjects or the teacher unless addressed directly. Even when addressed directly, Ron sometimes refused to respond. This suggested a minimum of experience in social transmission.

During the Structured Number, Measurement, Space ECC Lessons, Ron joined the group by sitting next to someone rather than apart from the group. Ron performed the physical manipulation of the objects during all the lessons. Ron responded more in the sentential mode than labeling mode in the language units reflecting property, action and complementary classes. Ron continued the no response pattern when it appeared that he was confused.

During the Unstructured ECC Number, Measurement, Space Omission Lessons, Ron performed the physical manipulation of the objects. Ron responded more in the labeling mode than the sentential mode in the language units reflecting property, action, complementary classes and for the first time restricted language appeared.

During the Unstructured Task Lessons, Ron performed the physical manipulation of the objects. Ron responded one half of the time in the labeling mode and the other half of the time in the sentential mode in the language units reflecting property, action and complementary classes. There was a minimal number of responses.

During the Structured Seriation ECC Lessons, Ron performed the physical manipulation of the objects. Ron responded more in the sentential mode than in the labeling mode in the language units reflecting property, action, complementary classes. His no responses diminished at this point.

During the Unstructured Seriation ECC Omission Lessons, Ron performed the manipulation of the physical objects. Ron responded only in the sentential mode in the language units reflecting property, action and complementary classes. The no responses increased again.

The theme of Ron's performing the requested physical manipulation of the objects but being apparently unable to produce language units as one of the semiotic representations of action appeared over and over again. Piaget would interpret this as an example of logical thought occurring without being accompanied by the skill to reproduce language units parallel to the logical activities. Ron demonstrated that he could consistently perform the manipulation of the physical objects. Often he was among the first to manipulate the objects but alone and without noticing others within the group. This is readiness for the future reproduction of language to parallel his logical activities.

Ron did not utilize any abstractions through Classification, Number, Measurement, Space and Seriation Lessons. Bruner has suggested that this is indicative of Ron's inability to operate at the top of the hierarchy and that it is

suspected that any of the attributes related to language units would be applied to other activities or situations.

The instruments, tasks and tests were not sensitive enough to detect any significant changes in Ron's use of language units but were sensitive to the reflecting of mental operations as a result of experiences with the Lavatelli Early Childhood Curriculum.

Many examples of Ron's syntactical structuring of language were generated during the structured and unstructured lessons. The limited utilization of language units of complementary class and abstractions, the frequency of no responses, the proportionally low number of language attempts, the significant increase of the use of the labeling mode when modeling was withdrawn, all reflect the mental operations of a pre-operational child with no evidence of an observed change towards a transition to concrete operational as a result of his experience with the Lavatelli Early Childhood Curriculum.

Case II--Carolyn

Description.--Carolyn is a female Indian who was five years and ten months of age and whose father and mother had each completed eleven grades of schooling. Her father was a student in an automotive school while her mother was employed as a laundress. Carolyn was the largest girl in the group. Although she usually sat in the circle with the other children, she seemed to be alone and just passively watched the other

children. Except for her tendency to imitate the manipulations and language units of the other children, there was little evidence of social transmission.

Pre and Post Test Data.--Her performance on the Piagetian Conservation Tasks identified her as a non-conserver, pre-operational child at both the pre and post test times. Her language patterns were primarily those of either no response or restricted language. She did not utilize the ostensive mode or the labeling mode during these Tasks. Her marking patterns on the pre and post administering of the Metropolitan Readiness Tests contained the pre-operational characteristics of centering and transductive reasoning. At times her marking patterns on sub-tests was so random that no pre-operational characteristics were identifiable. There were no changes in her letter rating of D--low normal--on the Metropolitan Readiness Tests from the pre to the post test. The Metropolitan Optional Test (Draw-A-Man) did produce a changed category rating, from E to D. The Stanford-Binet Intelligence Scale reported a quotient of eighty-one with a prediction of low average potential for success in language and general mental development.

During the Structured Classification ECC Lessons, Carolyn's behavior was characterized by sitting very passively with the group. Carolyn began performing the physical manipulation of the objects only after looking at other children for a beginning pattern. Carolyn sometimes completed the

manipulation of objects and sometimes she did not. Carolyn attempted imitating of the language by the teacher as she elicited responses but usually through a secondary source. If Carolyn was not addressed initially, she appeared to listen to the modeling of the language by another child and imitated that response well. She appeared to be quite selective in modeling after the child who utilized the sentential mode. It was only when Carolyn was addressed initially that her responses occurred primarily in the labeling mode.

During the Unstructured Classification ECC Omission Lessons, Carolyn again performed the physical manipulation of objects after imitation or searching other children for the pattern to imitation. Without support of language by the teacher, Carolyn responded more in the sentential mode than in the labeling mode. Carolyn had to depend on a secondary source, another child, which she appeared to do in terms of imitating. Once again Carolyn was very selective in terms of imitating a child's model in the sentential mode.

During the Unstructured Classification Task Lesson, Carolyn did not perform the physical manipulation of the objects. Without support of language by the teacher or support from a secondary source, that of another child, Carolyn responded more in the labeling mode than the sentential mode. Carolyn's frequency of no responses increased from one no response to eleven no responses.

During the Structured Number, Measurement, Space ECC Lessons, again Carolyn performed the physical manipulation of the objects as in the other lessons but did not always complete the manipulation. Carolyn responded more in the sentential mode than in the labeling mode. Once again Carolyn imitated the child who preceded her in terms of modeling. Carolyn gave five no responses.

During the Unstructured Number, Measurement, Space ECC Omission Lessons, Carolyn performed the physical manipulation of objects as described in the other lessons but did not always complete the manipulation. Carolyn responded more often in the labeling mode than the sentential mode with three no responses. Carolyn for the first time used an abstraction. In the Omission Lessons, Carolyn appeared not to respond to imitation of other children's language which would appear to be a change of some kind in her behavior.

During the Unstructured Tasks Lessons, Carolyn again performed the physical manipulation of the objects as described in the other lessons but did not always complete the manipulation. For the first time, without the support of the language from the teacher or other children, Carolyn responded more in the sentential mode than labeling mode during unstructured task lessons. Carolyn used one abstraction and gave nine no responses.

During the Structured Seriation ECC Lessons, Carolyn performed the physical manipulation of the objects but almost

completely abandoned the task after the ordering of objects three times. Carolyn responded more in the sentential mode than in the labeling mode with two no responses.

During the Unstructured Seriation ECC Omission Lessons, Carolyn almost abandoned the manipulation of the objects completely. Without support of language by the teacher but with support of language from the children, Carolyn responded more in the labeling mode than in the sentential mode with three no responses.

A degree of speculation is involved, yet Carolyn did begin to release her dependency upon other children for language imitation purposes during the Number, Measurement, Space and Seriation Omission Lessons. You could speculate that she became bored with the whole procedure or that the manipulating of objects and the imitating of the language became too involved for her structures to assimilate and accommodate. If this speculation was accurate, and according to Piaget the pre-operational child refuses to become disequilibrated, Carolyn might have made a choice in terms of imitating the manipulating of objects and ignored the imitation or did not pay as close attention to the imitation of the language.

It is also speculated that Carolyn's use of imitation may account for her tendency to use the sentential mode approximately two-thirds of the time. However during the two lessons where imitation was not available, unstructured and

task lessons in Number, Measurement and Space, her distribution in the utilization of the sentential and labeling mode reversed. After an absence of one week, Carolyn reverted slightly to the labeling mode during seriation lessons.

Carolyn presented a confusing and complicated pattern. She consistently performed as a pre-operational child with a high use of the sentential mode when peer models were available for imitation. Her reluctance to perform the physical manipulations of the objects did not support the high utilization of the sentential mode. The rather low utilization of the sentential mode when peer models for imitation were not available seems more likely to present her true skill in the use of language as the semiotic function to represent mental operations. The results of the Stanford-Binet Intelligence Scale and the Metropolitan Readiness Tests could be used to support an argument for the higher distribution of language patterns in the sentential mode. But still the limited use of abstractions would suggest that Carolyn could not operate at the top of Bruner's hierarchical organization and it would be highly suspect that Carolyn could use any of the attributes and apply them to other situations.

A speculated difference between Ron and Carolyn is that Ron did perform the physical manipulation of the objects but couldn't reproduce or produce the language unit to parallel his logical manipulations, Carolyn appeared to be unable to complete the logical manipulations but did through

imitation reproduce the greater number of language units in the sentential mode. The results of the Stanford-Binet Intelligence Scale and the Metropolitan Draw-A-Man Optional Test suggested that Carolyn should have more success than Ron in language productions. Yet Piaget would probably suggest that because Ron completed the physical manipulations in a logical manner, he will ultimately reproduce more directly the various language units than Carolyn.

Again the instruments, tasks and tests were not sensitive enough to detect any significant changes in Carolyn's use of language units as a reflection of mental operations as a result of her experiences with the Lavatelli Early Childhood Curriculum.

Case III--Susan

Description.--Susan is a female Negro who was five years and two months of age and whose father and mother are deceased. She lives with an aunt, whom she calls mother. Susan's father and mother had completed the third and seventh grade of schooling. She was an average child in size who was well featured and dressed. She was aggressive in a friendly, outgoing manner. She engaged others in communication easily and always appeared to be alert and happy. She was very much a member of the group and would probably be a member of any group. It could possibly be said that "Susan was a very likeable child."

Pre and Post Test Data.--Her performances during the pre and post administering of the Piagetian Conservation Tasks identified her as non-conserver and pre-operational in the Conservation Tasks of Liquid Amount, Solid Amount, Area and Length. Her performance on the Conservation Task of Number changed from non-conserver on the pre-test to conserver on the post-test. Her language units during the pre and post test included many examples of egocentrism.

Her marking patterns during the pre test administering of the Metropolitan Readiness Tests displayed many evidences of the pre-operational characteristics of centering, states versus transformation, transductive reasoning and irreversibility. During the post test sessions, her marking pattern did not display these pre-operational characteristics. Her letter rating on the Metropolitan Readiness Tests did not change (D--low normal) between the pre and post tests.

Apparently, Susan was beginning to change from pre-operational to concrete as evidenced by both her pre and post marking patterns and the ability to conserve number on the post test. Yet the Metropolitan Readiness Tests were not sufficiently sensitive to respond to this change as evidenced by the same letter rating between pre and post test times.

The Stanford-Binet Intelligence Scale yielded a quotient of ninety-four and a prediction of average success in language and general mental development. The Metropolitan Optional Test (Draw-A-Man) yielded a Category E rating of

immature at both the pre and post test times. Again the pre-operational to concrete operational transition suggested by the Conservation Tasks and her marking patterns on the Metropolitan Readiness Tests was not reflected in the Metropolitan Optional Test (Draw-A-Man).

During the Structured Classification ECC Lessons, Susan's behavior was characterized by social transmission. She was a member of the group, interacting with the teacher and the other children as related to language. Susan almost always performed the physical manipulation of objects and to a great extent modeled almost word perfect the responses modeled and then elicited from her by the teacher. Susan appeared to center on the language units reflecting one property and one action. Susan responded with three abstractions and six responses during these lesson.

During the Unstructured Classification Omission ECC Lessons, Susan's behavior was characterized by performing the directed physical manipulations of the objects. Withcut support of language by the teacher, Susan responded more in the sentential mode than the labeling mode. Her responses were limited however under the omission situation. Susan responded with two more abstractions and one no response.

During the Unstructured Classification Task Lessons, Susan performed the physical manipulation of the objects but responded at a minimal level in the sentential mode. Susan's responses were very limited in number with one no response.

During the Unstructured Omission ECC Lessons, Susan usually performed the physical manipulation of the objects. Without support of language Susan almost reverted to the labeling mode and provided one restricted response.

During the Unstructured Task Lessons, Susan performed the directed physical manipulation of the objects. Without support of language, Susan responded more in the sentential mode than in the labeling mode and used language units containing three abstractions.

During the Structured Seriation ECC Lessons, Susan did not perform the physical manipulation of the objects. Susan responded more in the sentential mode than the labeling mode.

During the Unstructured Seriation ECC Lessons, Susan did not perform the physical manipulation of the objects. Susan responded more in the sentential mode than in the labeling mode.

Susan was absent for one week during the Number, Measurement and Space Lessons, It was of considerable interest that Susan had performed almost all of the directed physical manipulation of objects until her absence. It was possible that the time lapse affected Susan as she returned to Seriation and it is also possible that Susan would not have performed the manipulation of physical objects in ordering even if she had not been absent.

Susan utilized a number of abstractions which, according to Bruner, suggested that in some instances she is operating at the top of the hierarchy and that her chances of applying the attributes under another set of conditions are good. The infrequency of her utilization of restricted language and no responses also may be interpreted as a positive sign for future transfer of mental operations into the semiotic representation of action through languages. Also the relatively high utilization of complementary classes of inclusion, inclusion and exclusion strengthens the speculation that there will soon be increases in the transfer of mental operations conducted through her language units. With the exception of the activities of seriation, her physical manipulations would reinforce the present range and distribution of language units as well as the speculation that she will increase this range and distribution.

Of the tests, The Conservation Tasks, the marking pat- on the Metropolitan Readiness Tests and the analysis of her language units appeared to be the most sensitive in reflecting both the present stage of development and the suggested change in her readiness to utilize language in increasingly complex means to reflect mental operations. The intelligence quotient of the Stanford-Binet Intelligence Scale and the letter ratings from the Metropolitan Readiness Tests and the Metropolitan Optional Test (Draw-A-Man) category ratings did not reflect a change. There was some reduction in the

pre-operational characteristics during Susan's experiences with the Lavatelli Early Childhood Curriculum. This may imply that the Lavatelli ECC was a position factor in the reduction.

According to Slobin (1969) it was suggested that the syntactical structuring of language by the teacher eliciting responses when the child imitates almost word perfect that which has been syntactically structured is an indication that much of what was modeled or structured was already within the child's language structure. It is also suggested that in some way the syntactical structuring of language by the teacher eliciting responses would be quite appropriate for Susan because of the low frequency of restricted responses that appeared.[1]

This is the same base for the hypothesis that Susan's experiences in the Lavatelli Early Childhood Curriculum did at least reinforce the use of language units to conduct mental operations and may have been accelerated by it.

Case IV--Jerry

Description.--Jerry is a typical white male, blond hair and blue eyes. He was five years and one month of age with a wiry stature. His father and mother completed eight and nine years of schooling. His father was employed as a potato cutter while his mother was a housewife. Usually Jerry interacted well with others and remained as a participating member of the group. However at times, Jerry was

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[1]Lavatelli, Piaget's Theory Applied, p. 89.

hyperactive and restlessness would cause him to squirm, wiggle, pace and even attack others both physically and verbally. Yet he was basically very cooperative, attempted each activity and completed those that he could before the restlessness took over. Jerry almost always, for example, assisted the teacher in gathering and storing the equipment and objects at the end of a lesson session.

Pre and Post Test Data.--Jerry's performance on the Piagetian Conservation Tasks during the pre test session identified him as a non-conserver, pre-operational child in all Tasks other than the Conservation Task of Area. At post-test administering of the Conservation Tasks, Jerry's performances were those of a conserver, concrete operational child on the Conservation Tasks of Number, and Solid Amount. He performed as a non-conserver, pre-operational child on the Conservation Tasks of Liquid Amount, Area and Length. The behavior of Jerry during the pre and post test of Conservation suggested that during the period of the pre and post test, Jerry was in transition from pre-operational to concrete and that his performances will be inconsistent at times.

His marking pattern on the Metropolitan Readiness Tests presented evidence of the pre-operational characteristics of centering and states versus transformation both in the pre and post test sessions. This reinforced the tentativeness of Jerry's transition to concrete operational. The Metropolitan Readiness Tests yielded a letter rating of D, low normal, at

both pre and post test times. The Metropolitan Optional Test (Draw-A-Man) yielded a category rating of E, immature, at both pre and post test time. The intelligence quotient from the Stanford-Binet Intelligence Scale was eighty-nine predicting an average potential for success in language and general mental development. All of these results were influenced by Jerry's restlessness. He frequently left the pre and post test sessions, especially during the administering of the Metropolitan Readiness Tests.

During the Structured Classification ECC Lessons, Jerry's behavior was characterized by interacting well with group members and also by announcing his departure on several occasions. Jerry responded during these lessons in the sentential mode more than labeling mode and utilized two abstractions and one restricted response. Jerry usually performed the requested manipulation of physical objects.

During the Unstructured Classification ECC Omission Lessons, Jerry typically performed the requested physical manipulation of objects. Jerry responded considerably more in the labeling mode than the sentential mode with one no response.

During the Unstructured Task Lesson, Jerry usually performed the physical manipulation of objects. Jerry's responses were almost all in the labeling mode.

During the Structured, Number, Measurement, Space, ECC Lessons, Jerry performed the physical manipulation of

objects and responded more in the sentential mode than the labeling mode. Jerry utilized one abstraction, five restricted responses and two no responses.

During the Unstructured Number, Measurement, Space ECC Omission Lessons, Jerry performed the requested physical manipulation of the objects. Without language support from the teacher, Jerry responded more in the labeling mode than in the sentential mode with one restricted response and one no response.

During the Unstructured Task Lessons, Jerry performed the requested physical manipulation of the objects. Jerry responded more in the sentential mode than the labeling mode using one abstraction.

Jerry was absent so that he missed all but one of the Seriation Lessons. On that one, a structured lesson, he utilized the sentential mode in five of six attempted language units.

Jerry's use of complementary classes and abstractions were sufficient and yet unstable enough to support the speculation he was in transition between developmental levels. To strengthen the example, Jerry consistently performed the requested manipulation of the objects and equally consistently, when without support of modeling and eliciting from the teacher, was unable to maintain his language units in the sentential mode. It could be inferred that the mental processes were present but the self-initiated capacity to use the sentential

mode for the semiotic representation of action was not yet strong enough.

The tests and instruments which seemed sensitive enough to support the hypothesis concerning Jerry's language and mental operations were the Conservation Tasks and the criteria for the analysis of language units. The other tests showed no movement, transition or change from pre to post test times.

It seems likely and reasonable to infer that the experiences of Jerry during the Lavatelli Early Childhood Curriculum were appropriately reinforcing, supporting and even accelerating the development of language units and patterns to conduct his changing level of mental operations.

Case V--Renee

Description.--Renee is a white female who was five years and five months of age. Her mother and father completed six and eleven years of schooling. Her father was employed as a foreman in a canning factory while her mother was a housewife who had previously worked as a nurse's aide. Renee was a small, quiet, shy, even timid appearing girl. She was always a participating member of the group, usually beginning the requested activities before anyone else. Yet she only interacted with one group member at a time. This inferred that social transmission involving only one member at a time seemed to be limiting factor for Renee.

Pre and Post Test Data.--Renee's performances on the Piagetian Conservation Tasks revealed her to have been a nonconserver, preoperational child at both the pre and post test times. Her language patterns during these testing times were restricted to the labeling mode with characteristics of centering and egocentrism. No movement among developmental levels can be inferred from her performances on these Tasks of Conservation.

Renee's marking patterns on the Metropolitan Readiness Tests during both administerings, showed a stable pattern of centering and that the other preoperational characteristics were not identifiable. Her letter ratings at pre and post testing times for the Metropolitan Readiness Tests changed from a pre-test letter rating of E, low, to a post test letter rating of D, low normal. The category letter ratings on the Metropolitan Optional Test (Draw-A-Man) changed from the pre-test rating of Category E, immature, to at post-test Category C, average. These two measurements seemed to support and parallel each other. The Stanford-Binet Intelligence Scale quotient yielded an eighty-eight which was a prediction of average success for language and general mental development. It supported the post-test ratings from the Metropolitan Optional Test (Draw-A-Man).

During the Structured Classification ECC Lessons, Renee's behavior was characterized by sitting quietly within the group and usually performing the requested physical

manipulations of the objects. Renee responded most often in the sentential mode using three abstractions.

During the Unstructured Classification ECC Lessons, Renee's language units where about evenly distributed between the sentential and labeling modes. She also provided one no response and one language unit containing an abstraction.

During the Unstructured Task Lesson, Renee performed the directed physical manipulations. Renee responded with language units in the labeling mode with very limited use of language units in the sentential mode.

During the Structured Number, Measurement, Space Lessons, Renee performed most of the physical manipulations. Renee responded with more language units in the sentential mode than the labeling mode. Renee often did the exact modeling of the teacher. She presented language units containing abstractions five times.

During the Unstructured Omission ECC Number, Measurement, Space Lessons, Renee performed the physical manipulation of the objects. Without the support of modeling, Renee responded half of the time in the sentential mode and the other half of the time in the labeling mode with two restricted responses.

During the Unstructured Task Lessons, Renee usually performed the requested manipulations on the objects. Renee responded with language units in the sentential mode more than the labeling mode. Renee used four language units containing abstractions and provided eight no responses.

During the Structured Seriation ECC Lessons, Renee typically performed the requested manipulations on the physical objects. Renee responded with more language units in the sentential mode than the labeling mode.

During the Unstructured Seriation Omission ECC Lessons, Renee sometimes performed the requested manipulations. Renee responded with more language units in the sentential mode than the labeling mode.

Renee's use of abstractions suggested that these attributes may be used under other circumstances. This potential was also reflected in her frequent and consistent use of language units reflecting complementary classes. Yet in opposition to this was the factor of minimal use of language units including more than one property or action.

Renee's pattern of movement reflected by the Metropolitan Readiness Tests and the criteria for the analysis of language units demonstrated an upward movement. This upward pattern of movement was also demonstrated on the Metropolitan Optional Test (Draw-A-Man) at pre and post test times. Yet, Renee displayed no movement on the Piagetian Conservation Tasks. In this case, the Metropolitan Readiness Tests were sensitive to a change. Renee's experience with the Lavatelli Early Childhood Curriculum apparently influenced a movement to more nearly align her language units conducting mental operations with the predictions of the Stanford-Binet Intelligence Scale.

Case VI--Lon

Description.--Lon is a white male who was five years and two months of age. His mother had worked as a waitress but was now receiving support from the Oklahoma State Department of Welfare. The father worked for a trucking firm. The father completed ten years of schooling and the mother completed twelve years of schooling. Lon was a blond with brown eyes and of medium stature. He was aggressive but not physically, interacted well with group members and took the initiative to perform physical manipulation of the objects. He often helped other members of the group to get started with their physical manipulations. He often helped the teacher with dismantling of equipment and storing of equipment.

Pre and Post Test Data.--The change Lon exhibited from pre to the post test administering of the Piagetian Conservation Tasks was significant. During the pre test, he performed as a non-conserver on all Tasks other than the Task of Number. During the post test, he performed as a conserver on three of the Conservation Tasks of Number, Solid Amount and Area. Lon was demonstrating an apparent rapid transition from the preoperational developmental level to the concrete operational developmental level. This transition was further evidenced by Lon's performances on the Metropolitan Readiness Tests during both the pre and post test times. During the pre test,

the preoperational characteristic of centering was evident in Lon's marking patterns on some of the sub-tests. On the post-test his marking pattern was such that the pre-operational characteristics were not identifiable. However, there was no change in the pre and post test letter ratings on the Metropolitan Readiness Tests. The letter ratings for pre and post tests were D, low normal. The Metropolitan Optional Test (Draw-A-Man) did change from Category E, immature, at pre-test to Category D, below average, at post test. The Metropolitan Optional Test (Draw-A-Man) seemed more sensitive to his transition from preoperational to concrete operational than the other sub-tests of the Metropolitan Readiness Tests. The Stanford-Binet Intelligence Scale yielded a quotient of 100 with a prediction of average potential for success related to language and general mental development.

During the Structured Classification ECC Lessons, Lon talked freely and openly to other children and the teacher. Lon performed the instructed physical manipulation on the objects. Lon responded very well in the sentential mode and modeled almost word perfect the syntactical structuring of the teacher. Lon utilized ten abstractions with six restricted responses.

During the Unstructured Classification Omission ECC Lessons, Lon performed the requested manipulations of the objects. Without support of language, lon responded in a minimal way in the labeling mode with one no response.

During the Unstructured Task Lesson, Lon performed manipulations on the physical objects. Without support of language, Lon responded in the sentential mode most of the time.

During the Structured Number, Measurement, Space ECC Lessons Lon performed manipulations of the objects. Without the support of language, Lon responded sometimes in the labeling mode and sometimes in the sentential mode with just a few more units in the sentential mode.

During the Unstructured Task Lessons, Lon performed manipulations on physical objects. Without the support of language, Lon responded well in the sentential mode with four restricted responses.

During the Structured Seriation ECC Lessons, Lon did not perform manipulations on physical objects. He responded more in the sentential mode than labeling mode and used two abstractions.

During the Unstructured Omission ECC Lessons, Lon did not perform manipulations on physical objects. He responded mostly in the sentential mode rather than labeling mode and used one abstraction.

Lon was in transition between the preoperational and concrete operational developmental stages. This transition was evidenced by his performances on the Conservation Task, Lon's marking patterns on the Metropolitan Readiness Tests and by the criteria for the analyses of language units.

The strong use of complementary classes and abstractions in the sentential mode to transmit his mental operations was nicely displayed in the matrix for the criteria for the analysis of language units. The letter ratings from the Metropolitan Readiness Tests and the Metropolitan Optional Test (Draw-A-Man) remained insensitive to the evidences of transition. The quotient from the Stanford-Binet Intelligence Scale of 100 seemed to have been the earliest predictor of the transition and of the range and distribution of the language units. Also Lon's high degree of maintenance of language units in the sentential mode when modeling support of language was withdrawn reflects a strength for movement. Lon was ready or became ready to utilize the sentential mode for the semiotic representation of mental operations during the Lavatelli Early Childhood Curriculum. The Lavatelli Early Childhood Curriculum certainly reinforced this and more than likely, because of the timing, encouraged it.

Cida--Case VII

Description.--Cida is a Mexican female who was five years and three months of age. Her parents completed nine and eleven years of schooling. Her father was employed as a butcher and her mother was a housewife. Cida was a tiny, petite girl with a small voice to match her physical stature. She talked often and easily with members of her group and the teacher. She talked mostly about her own interests except when performing the physical manipulation of objects.

Pre and Post Test Data.--The changes exhibited by Cida's performances between the pre and post administering of the Piagetian Conservation Tasks are significant and possibly more striking than that of Lon's. During the pre test, Cida performed as a non-conserver, preoperational child. Her language units contained evidences of egocentrism and restricted language. However, during the post test, her performance identified her as a conserver and concrete operational in two of the Conservation Tasks of Number and Liquid Amount. The pattern of transition from preoperational to concrete is somewhat diffused by the continued existence of the preoperational characteristics of centering, states versus transformation and egocentrism during the pre and post test administering of the Metropolitan Readiness Tests. Also compounding the analysis of her transition, she consistently performed the requested manipulation of objects in a limited, incomplete and unsure manner. She did not evidence the provision of a physical base for the production of language units to reflect her mental operations. Her letter ratings at pre and post test time changed from the letter rating E, low, to letter rating D, low normal, at post testing time. The Metropolitan Optional Test (Draw-A-Man) did not change from the category rating of E, immature, at pre nor post test time.

The intelligence quotient from the Stanford-Binet Intelligence Scale yielded a ninety-one which was a prediction

of average potential for success as related to language and general mental development.

During the Structured Classification ECC Lessons, Cida performed some of the physical manipulations on the objects and sometimes she did not. Cida responded more in the sentential mode than the labeling mode with thirteen restricted responses and one no response.

During the Unstructured Classification Omission ECC Lessons, Cida performed some of the physical manipulations of objects. Without support of language by the teacher, Cida responded only slightly more in the sentential mode than the labeling mode with one restricted response and four no responses.

During the Unstructured Classification Task Lesson, Cida did not perform physical manipulation of the objects. Without support of language, Cida responded slightly more in the sentential mode than the labeling mode.

During the Structured Number, Measurement, Space Lessons, Cida did perform limited physical manipulation of objects. Cida responded more in the sentential mode with the use of four abstractions but thirteen restricted responses.

During the Unstructured Omission ECC Number, Measurement, Space Lessons, Cida performed some of the physical manipulations of the objects. Without support of the language, Cida responded in the sentential mode with one

abstraction and four restricted responses.

During the Unstructured Task Lessons, Cida performed some of the physical manipulations of the objects. Without support of the language Cida responded more in the sentential mode using two abstractions and fifteen restricted responses.

During the Structured Seriation ECC Lessons, Cida performed the physical manipulation of objects almost perfectly. Cida responded almost entirely in the sentential mode. She was absent for the unstructured omission lessons of seriation.

In this case the test and instruments provided confusing and possibly conflicting ratings and information. If it were not for the movement from pre-operational to concrete operational suggested by the Conservation Tasks or the prediction of average potential from the Stanford-Binet Intelligence Scale, the other results might merge.

Cida was able to maintain a good percentage of her language units in the sentential mode when modeling and eliciting of language support was withdrawn. She did move towards concrete operational during the Lavatelli Early Childhood Curriculum. Therefore, her experiences with the Lavatelli Early Childhood Curriculum were apparently a part of her movements in these two important aspects.

Conclusions

The activities and objects of the Lavatelli Early Childhood Curriculum generated many examples of children's syntactical structuring of language. The instrument developed for this study, criteria for the analysis of language units, displayed evidence of the variations in the use of language to transmit mental operations by the different children. During the structured lessons with the teacher modeling and eliciting responses, all children produced more language units in the sentential mode containing two or more properties, actions, complementary classes and abstractions. Yet during the unstructured lessons, without the teacher modeling and eliciting responses, all of the children's language units began to include a greater proportion of language units in the labeling mode rather than the sentential mode. So it was apparent that the structuring of language in the Lavatelli Early Childhood Curriculum increased and/or inflated the use of the sentential mode and the frequency of the language elements of property, action, complementary classes and abstractions utilized by children to conduct their mental operations.

When the structuring of language was withdrawn, the capacity of the child to maintain the same distribution and proportion of language units as during structured lessons changed. The maintenance of the capacity to reproduce and

produce language units in the sentential mode conveying more complex syntax seemed more nearly related to the existence of some transition from the preoperational to the concrete operational developmental stage. Yet it might be argued that the child's experiences in the Lavatelli Early Childhood Curriculum influenced that transition to concrete operational.

The Piagetian Conservation Tasks and Changing of Criteria provided examples of children's syntactical structuring of language consistent with their developmental stage. The preoperational characteristics of centering and states versus transformation were the most obvious of the preoperational characteristics present in the examples of children's syntactical structuring.

The Stanford-Binet Intelligence Scale seemed to be a good predictor of success in language development when supported by evidence of a movement to concrete operational. Without this evidence, the prediction from the Stanford-Binet appeared unstable.

The instrument developed for this study, a criteria for the analysis of language units, seemed to have considerable ability to differentiate among the language units utilized by children to transmit their mental operations. Categories of the instrument--the labeling and sentential modes, properties, actions, complementary classes, abstractions, no responses and restricted responses--adequately accounted for the distribution, production and reproduction of the language units of the children.

Recommendations for Further Study

1. Using the instruments developed for this study, especially the criteria for the analysis of language units, an experimental study with a training design needs to be done to further investigate the impact of the practiced structuring provided in the Lavatelli Early Childhood Curriculum.

2. The results of this study demonstrated that the preoperational characteristics influenced the marking patterns of children on the Metropolitan Readiness Tests. A study should be planned which would utilize objects appropriate to the preoperational learner and paralleling the required activities of the Metropolitan Readiness Tests.

3. Further study is needed to more clearly define the influences of the preoperational characteristics upon children's production and reproduction of language units.

4. This study appeared to support Piaget's suspicion that the ability to perform logical manipulation of objects develops before the ability to produce language units to parallel the logic of the manipulations. Yet in at least one case in this study, the direction of the flow seemed to have been from language units to manipulation. In the other six cases the flow seemed to have been from manipulations to language units.

5. Additional investigations are needed to further explore and explain what influences a child's ability to maintain more complex syntactical structures when modeling is not present.

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APPENDICES

APPENDIX A

INSTRUMENT FOR THE TRANSCRIPTION AND ANALYZATION OF LANGUAGE RESPONSES DURING THE PIAGETIAN TASKS

Case I--Ron

The Piagetian Conservation Tasks

One form for Pre-test
One form for Post-test
One form for Changing of Criteri

Description of Speech Event	Ron's Responses	Analyzation
I. CONSERVATION OF NUMBER		
II. CONSERVATION OF LIQUID AMOUNT		
III. CONSERVATION OF SOLID AMOUNT		
IV. CONSERVATION OF AREA		
V. CONSERVATION OF LENGTH		
VI. CHANGING OF CRITERIA		

APPENDIX B

INSTRUMENT FOR THE TRANSCRIPTION AND ANALYZATION OF LANGUAGE RESPONSES DURING LESSONS--ALL TYPES

Case I--Ron

Classification Time I

Description of Speech Event	Ron's Responses	Analyzation
Red beads, yellow beads, blue beads and string were provided for the Lesson. Subject was asked to hold up a red bead and tell what it was. The same procedure was followed for the yellow and blue beads. Subject was asked to put all the red beads on the string, yellow beads and blue beads. Subject was asked to tell what he was doing. Subject was asked to take the red, yellow and blue beads o off the string. Subject was asked to tell what he was doing.		

APPENDIX C

CRITERIA FOR ANALYSIS OF LANGUAGE UNITS

	LANGUAGE UNITS			PR		
				NONE		ON
	Lab.	Sent.	Total	Lab.	Sent.	Lab.
CLASSIFICATION						
Structured ECC Lessons (6)						
Unstructured Omission Lessons (2)						
Unstructured Task Lesson (1)						
NUMBER, MEASUREMENT and SPACE						
Structured ECC Lessons (8)						
Unstructured Omission Lessons (2)						
Unstructured Task Lessons (6)						
SERIATION						
Structured ECC Lessons (3)						
Unstructured Omission Lessons (2)						
LESSONS ALL TYPES						
Structured ECC Lessons (17)						
Unstructured Omission Lessons (6)						
Unstructured Task Lessons (7)						
Total, All Types (30)						

LANGUAGE UNITS REFLECTING:

ERTY				ACTION								COMPLEMENTARY CLASSES							
TWO		THREE		NONE		ONE		TWO		THREE+		NO INCLUSION or EXCLUSION		INCLUSION		EXCLUSION		INCLUSION and EXCLUSION	
Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent

:								RESTRICTED RESPONSES	NO RESPONSES
IENTARY SES				ABSTRACTIONS					
EXCLUSION		INCLUSION and EXCLUSION		NONE		ABSTRACT.			
Lab.	Sent.	Lab.	Sent.	Lab.	Sent.	Lab.	Sent.		