ASSAWAMATIYANONT, Suree, 1944-
THE RELATIONSHIP BETWEEN PSYCHOLOGICAL DIFFERENTIATION AND EGOCENTRISM.

The Ohio State University, Ph.D., 1971
Psychology, general

University Microfilms, A XEROX Company, Ann Arbor, Michigan

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED
THE RELATIONSHIP BETWEEN PSYCHOLOGICAL
DIFFERENTIATION AND EGOCENTRISM

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Suree Assawamatiyanont, B.A., M.A.

*****

The Ohio State University
1971

Approved by

[Signature]
Adviser
Department of Psychology
ACKNOWLEDGMENTS

The author wishes to express her gratitude to her professors and fellow graduate students who have advised her, consulted with her, and provided her stimulation and encouragement from the time this study was conceived until it was completed.

She would like to express her gratitude to Mr. Dwight Cool, Dr. Joseph Perito, Mrs. Dunn, teachers, parents, and students of the Jefferson County Public school system who have given their full cooperation in this study.

The author would like to express her appreciation to Dr. Charles Wenar and Dr. M. M. Helper for their thoughtful suggestions and criticisms in the planning of the research.

And, the author wishes to thank her adviser, Dr. John Horrocks, for the support and encouragement he tended the author throughout the study. She would like to especially express her appreciation for the fine example he set of a scholar and a person.
VITA

November 14, 1944 . . . Born - Bangkok, Thailand

1963 . . . . . . . High school diploma, Auckland House School, Simla, India

1966 . . . . . . . B.A., Sacramento State College, Sacramento, California

1969 . . . . . . . M.A., The Ohio State University, Columbus, Ohio

FIELD OF STUDY

Major Field: Developmental Psychology

Professor John E. Horrocks
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Acknowledgments</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VITA</td>
<td>iii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>vi</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xi</td>
</tr>
</tbody>
</table>

**Chapter**

1. **Introduction** ........................................ 1
   - The Concept of Differentiation ....................... 1
   - The Concept of Egocentrism ........................... 4
   - Field Approach ........................................ 7
   - Role-Playing and Communicative Skills .............. 8
   - The Problems to be Researched ....................... 9
   - The Experimental Design ............................. 14
   - Hypotheses ........................................... 14

2. **Review of Theoretical and Empirical Literature**  . 16
   - The Theoretical Background on Heinz Werner .......... 16
   - A Theoretical Overview of Jean Piaget .............. 30
   - Cognitive Style of Field Dependence-Independence  .. 48
   - Role-Playing Ability .................................. 70
   - Summary ............................................ 84
# TABLE OF CONTENTS (Continued)

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>III. METHODOLOGICAL DESIGN</td>
<td>89</td>
</tr>
<tr>
<td>Description of the Subjects</td>
<td>89</td>
</tr>
<tr>
<td>Instruments</td>
<td>93</td>
</tr>
<tr>
<td>Procedure</td>
<td>97</td>
</tr>
<tr>
<td>The Rating of Subjects</td>
<td>103</td>
</tr>
<tr>
<td>The Statistical Analysis</td>
<td>104</td>
</tr>
<tr>
<td>IV. RESULTS</td>
<td>106</td>
</tr>
<tr>
<td>The Developmental Aspects of the Subject's Performance</td>
<td>106</td>
</tr>
<tr>
<td>The Relationship Between Tasks</td>
<td>118</td>
</tr>
<tr>
<td>The Interjudge Reliabilities</td>
<td>130</td>
</tr>
<tr>
<td>Summary</td>
<td>131</td>
</tr>
<tr>
<td>V. DISCUSSION</td>
<td>133</td>
</tr>
<tr>
<td>The Hypotheses</td>
<td>133</td>
</tr>
<tr>
<td>Interpretation of the Results</td>
<td>139</td>
</tr>
<tr>
<td>Conclusion</td>
<td>144</td>
</tr>
<tr>
<td>Implications of the Present Study</td>
<td>146</td>
</tr>
<tr>
<td>VI. SUMMARY</td>
<td>148</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>155</td>
</tr>
<tr>
<td>APPENDIXES</td>
<td>168</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>The First, Third, Fifth, and Seventh Graders' Means and Standard Deviations on the Human-Figure-Drawing-Task</td>
<td>107</td>
</tr>
<tr>
<td>II.</td>
<td>The First, Third, Fifth, and Seventh Graders' Means and Standard Deviations on the Two-Story Task</td>
<td>109</td>
</tr>
<tr>
<td>III.</td>
<td>The First, Third, Fifth, and Seventh Graders' Performance Scores on the Selling-A-Necktie Task</td>
<td>111</td>
</tr>
<tr>
<td>IV.</td>
<td>The First, Third, Fifth, and Seventh Graders' Means and Standard Deviations on the Buying-A-Television Task</td>
<td>112</td>
</tr>
<tr>
<td>V.</td>
<td>The First, Third, Fifth, and Seventh Graders' Means and Standard Deviations on the Mountains-and-the-Doll Task</td>
<td>114</td>
</tr>
<tr>
<td>VI.</td>
<td>The First, Third, Fifth, and Seventh Graders' Means and Standard Deviations on the Children's-Embedded-Figures Test</td>
<td>115</td>
</tr>
<tr>
<td>VII.</td>
<td>Comparison and Performance on HFDT, TST, SANT, BATT, MDT, and CEFT Across the First, Third, Fifth, and Seventh Grades</td>
<td>117</td>
</tr>
<tr>
<td>VIII.</td>
<td>The Relationships of HFDT, TST, SANT, BATT, MDT, and CEFT with Chronological Age</td>
<td>118</td>
</tr>
<tr>
<td>IX.</td>
<td>The Intercorrelations of TST, SANT, BATT, and MDT in the First Grade</td>
<td>119</td>
</tr>
<tr>
<td>X.</td>
<td>The Intercorrelations of TST, SANT, BATT, and MDT in the Third Grade</td>
<td>120</td>
</tr>
<tr>
<td>XI.</td>
<td>The Intercorrelations of TST, SANT, BATT, and MDT in the Fifth Grade</td>
<td>120</td>
</tr>
</tbody>
</table>
# LIST OF TABLES (Continued)

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XII.</td>
<td>The Intercorrelations of TST, SANT, BATT, and MDT in the Seventh Grade</td>
<td>121</td>
</tr>
<tr>
<td>XIII.</td>
<td>The Intercorrelations of the Four Role-Playing Tasks—TST, SANT, BATT, and MDT—with All Four Grades Combined</td>
<td>123</td>
</tr>
<tr>
<td>XIV.</td>
<td>The Relationships Between HFDT and TST, SANT, BATT, and MDT in the First, Third, Fifth, and Seventh Grades</td>
<td>124</td>
</tr>
<tr>
<td>XV.</td>
<td>The Relationships Between CEFT and TST, SANT, BATT, and MDT in the First, Third, Fifth, and Seventh Grades</td>
<td>126</td>
</tr>
<tr>
<td>XVI.</td>
<td>The Relationships Between Cognitive-Style Tasks, HFDT and CEFT, and Role-Playing Tasks, TST, SANT, BATT, and MDT, with Four Grades Combined</td>
<td>128</td>
</tr>
<tr>
<td>XVII.</td>
<td>The Relationship Between HFDT and CEFT in the First, Third, Fifth, and Seventh Grades</td>
<td>129</td>
</tr>
<tr>
<td>XVIII.</td>
<td>The Relationship Between the Two Cognitive-Style Tasks, HFDT and CEFT, with all Grades Combined</td>
<td>130</td>
</tr>
<tr>
<td>XIX.</td>
<td>The Interjudge Reliabilities in HFDT, TST, SANT, and BATT Across Grades</td>
<td>131</td>
</tr>
<tr>
<td>XX.</td>
<td>Comparisons of Subjects from Main Study Group and the Experimental Group on the Performance of HFDT</td>
<td>232</td>
</tr>
<tr>
<td>XXI.</td>
<td>Comparisons of Control Subjects on the TST—Means and Standard Deviations</td>
<td>232</td>
</tr>
<tr>
<td>XXII.</td>
<td>Comparisons of Control Group Subjects on TST—T-Test</td>
<td>233</td>
</tr>
<tr>
<td>XXIII.</td>
<td>The Relationships of HFDT, TST, SANT, BATT, MDT, and CEFT with Chronological Age and Mental Age Across Grades</td>
<td>233</td>
</tr>
</tbody>
</table>
LIST OF TABLES (Continued)

<table>
<thead>
<tr>
<th>Table</th>
<th>The Comparisons of Performance Scores Between Grades in the Human-Figure-Drawing Task</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXIV.</td>
<td></td>
<td>234</td>
</tr>
<tr>
<td>XXV.</td>
<td></td>
<td>234</td>
</tr>
<tr>
<td>XXVI.</td>
<td>The Comparisons of Performance Scores Between Grades in the Selling-A-Necktie Task</td>
<td>235</td>
</tr>
<tr>
<td>XXVII.</td>
<td>The Comparisons of Performance Scores Between Grades in the Buying-A-Television Task</td>
<td>235</td>
</tr>
<tr>
<td>XXVIII.</td>
<td>The Comparisons of Performance Scores Between Grades in the Mountains-and-the Doll Task</td>
<td>236</td>
</tr>
<tr>
<td>XXIX.</td>
<td>The Comparisons of Performance Scores Between Grades in the Children's-Embedded-Figures Test</td>
<td>236</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Schema of Egocentric Communication</td>
<td>72</td>
</tr>
<tr>
<td>2.</td>
<td>Schema of Non-Egocentric or Intelligent Communication</td>
<td>74</td>
</tr>
<tr>
<td>3.</td>
<td>Performance Scores of First, Third, Fifth, and Seventh Grades on the Human-Figure-Drawing Task</td>
<td>108</td>
</tr>
<tr>
<td>4.</td>
<td>Performance Scores of First, Third, Fifth, and Seventh Grades on the Two-Story Task</td>
<td>109</td>
</tr>
<tr>
<td>5.</td>
<td>Performance Scores of First, Third, Fifth, and Seventh Grades on the Selling-a-Necktie Task</td>
<td>111</td>
</tr>
<tr>
<td>6.</td>
<td>Performance Scores of First, Third, Fifth, and Seventh Grades on the Buying-a-Television Task</td>
<td>113</td>
</tr>
<tr>
<td>7.</td>
<td>Performance Scores of First, Third, Fifth, and Seventh Grades on the Mountains-and-the-Doll Task</td>
<td>114</td>
</tr>
<tr>
<td>8.</td>
<td>Performance Scores of First, Third, Fifth, and Seventh Grades on the Children's-Embedded-Figures Test</td>
<td>116</td>
</tr>
<tr>
<td>9.</td>
<td>The Relationship of SANT-BATT, BATT-MDT, SANT-MDT, TST-SANT, TST-MDT, and TST-BATT Across Grades</td>
<td>122</td>
</tr>
<tr>
<td>10.</td>
<td>The Relationships of HFDT-TST-HFDT-BATT, HFDT-MDT, and HFDT-SANT Across grades</td>
<td>125</td>
</tr>
<tr>
<td>11.</td>
<td>The Relationship of CEFT-MDT, CEFT-TST, CEFT-BATT, CEFT-HFDT, and CEFT-SANT Across Grades</td>
<td>127</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

The major problem of the present investigation is closely related to two different bodies of empirical works— that of Herman Witkin (see Witkin, et al., 1962) and that of John Flavell (see Flavell, et al., 1968). Witkin's work is strongly influenced by the organismic developmental theory of Heinz Werner (Werner, 1948). Flavell's work is deeply rooted in the developmental theory of the Swiss psychologist, Jean Piaget (Piaget, 1955; Piaget and Inhelder, 1956 and 1969; and in Flavell, 1963).

The two main concepts that are investigated in the present study are "differentiation" and "egocentrism." Differentiation is the core concept in Werner's theory of development and egocentrism is an important concept in Piaget's theory of development.

The Concept of Differentiation

Differentiation is a borrowed concept from embryology. Perhaps it is best to examine the meaning of "differentiation" in its original usage. The earliest stage of the
embryo is the single cell, the fertilized egg. The first change that takes place is the division of this cell into two, then four, then eight, than sixteen, and on in a geometrical progression. Instead of a single cell, there is now an organism divided into sixteen similar parts.* These different divisions of the single cell, later, become different types of cells (Coghill, 1929). At first, the cells are more or less independent of each other in terms of functioning. They are homogeneous and function in the same way without any kind of coordination. Gradually, their functioning becomes articulated, that is, each cell has a specific function. With this development of specialization of functionings in the cells, the organism cannot survive without the coordination of functions among these cells.

There are two different kinds of articulation, that is, two levels of articulation, occurring at the same time—articulation in a single cell, and articulation of a particular group of cells displaying the same function. In the articulation of a group of cells displaying the same function, the organizational pattern of this particular group of cells changes—resulting in the domination and subordination of functioning. With organization or coordination of functions, some cells become more dominant in

*Let's limit the division of the cell to only sixteen for the purpose of simplicity.
relation to some other cells. The dominant cell controls or coordinates the functioning of the subordinating cells. For example, a nerve cell transmits an impulse to the muscle cell which then contracts (the functions of these two cells are interdependent and articulated).

In the development of the single cell, the cell divides itself into different kinds of cells with different functions. Some cells develop control over others, resulting in the dominance of some functions over some others. During the process of differentiation, the cell progresses from the state of unarticulated, independent, and homogeneous functioning to a state of articulation, integration, and hierarchic organization.

Werner (1948) believes that the principle of development is an orthogenetic one in which, whenever development occurs, it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration. This process of development is a gradual one. The concept of differentiation can be used to describe a broad spectrum of behavior, e.g., cognitive development, and affective development, or a specific behavior, such as the development of the auditory or visual perception.

According to this principle, a state involving a relative lack of differentiation between "subject" and
"object" is developmentally prior to the one in which there is polarity of "subject" and "object." This increasing subject-object differentiation involves the corollary that the organism, as it develops, becomes increasingly less dominated by the immediate perceptual field. The individual is less dominated by the immediate concrete situation. The individual is less stimulus-bound and less impelled by his own affective states. This freedom from the domination of the immediate stimulus situation also permits a person to have a more accurate assessment of the others.*

The second important concept to be discussed is egocentrism. The concept of egocentrism is related to Piaget's cognitive development.

The Concept of Egocentrism

Egocentrism, which is defined by Piaget, does not carry all the excessive social implications which are common in the every day usage of the term. Essentially, egocentrism is the inability to see another person's point of view. It is also related to the inability to play a role, to search out the role attributes of others, compare these attributes with one's own, and make effective use of the comparison in any of a variety of adaptions.

*A more complete coverage of Werner's theory will be given in the next chapter.
There are two fundamentally different modes of thinking. They are the directed or intelligent thought, and undirected or autistic thought. The directed thought is conscious, that is, it pursues an aim which is present to the mind of the thinker; it is intelligent, which means that it is adapted to reality and tries to influence it; it admits of being true and false (empirically or logically); and it can be communicated by language. Autistic thought is subconscious, which means that the aims it pursues and the problems it tries to solve are not present in consciousness; it is not adapted to reality, but creates a dream world of imagination for itself; it does not bend to the established truths, but only to satisfy its desires; and it remains strictly individual and incommunicable by means of language.

According to Piaget (1955), there are many classes of thoughts, with various degrees of communicability, between the two different modes of thinking—directed and autistic. The chief of these intermediate classes is the egocentric thought. This class of thinking exemplifies the type of thought which seeks to adapt itself to reality, but does not communicate itself as such.

The egocentric type of thinking is a more pervasive phenomenon in younger children than in older children or adults. Egocentrism does not stop with the realm of
thought. It taints the child's efforts in virtually all spheres of activity, e.g., his primitive conceptions about the physical world, i.e., autistic beliefs; his attitudes about moral-ethical phenomena; his social world of interpersonal activities; and, his verbal communication.

The child supposes that everyone necessarily thinks like himself. He does not spontaneously seek to convince others, or to prove or test his opinions. In the young child's world, there is no distinction between "self" and the "external world," "body" and "mind," and "thought" and "thing."

The progression from egocentric mode of thought to the directed or intelligent mode of thought is a gradual process. After the age of 7-8, the child gradually adopts the role-playing technique to make his communication adaptive. This decline of egocentrism is believed to result from negative reinforcement from the social environment, namely, the child's parents and peers.*

The two main empirical orientations which emerge from the theoretical backgrounds of Werner and Piaget respectively are those of Witkin and Flavell. From Werner's theory of differentiation, Witkin and his associates establish a relationship between an individual's psychological differentiation and his field approach.

---

*Piaget's theory of development will be discussed in greater detail in the next chapter.
Field Approach

The two modes of perception which are apparent in Witkin's studies* (1962) are field-independency (active or analytic field approach) and field-dependency (passive field approach). A person with a field-independent way of perceiving tends to experience his surroundings analytically, with objects experienced as discrete from their background. Such a person also has an articulated and sophisticated body concept. A person who has a field-dependent mode of perception tends to experience his surroundings in a relatively global fashion, passively conforming to the influence of the prevailing field or content, and has an unarticulated and unsophisticated body concept.

A person's particular mode of perception tends to be generally consistent and characteristic of his style of dealing with various tasks (e.g., the Embedded Figures Test, Rod and Frame Test, Rorschach Test, Draw-a-Person Test, etc.). If a subject deals with one test analytically, he will also deal with the other tests in the same manner.

Witkin's data may be neatly categorized according to Werner's scheme of differentiation. The two modes of perception can be arranged along the continuum of differentiation.

*Witkin's studies were done with both male and female subjects ranging in age from eight years through adulthood.
with field-dependency at the undifferentiated pole and the field-independency at the differentiated pole. Relatively speaking, a field-independent person or a person who has an analytic mode of perception is more differentiated than a person who perceives the stimuli in a field-dependent manner.

While Witkin talks about perceptual development, Flavell deals with role-playing or communicative development. Flavell's central theory involves the concept of egocentrism.

**Role-Playing and Communicative Skills**

The evidence from Flavell's study* (1968) indicates that profound and widespread changes in role-playing ability and communication skills take place during middle childhood and adolescence. The changes that are identifiable go beyond a mere awareness that role attributes vary with people and situations.

The development of "existence" is at least partly accomplished by the beginning years of school. As the child develops, he becomes increasingly aware of the necessity of paying careful attention to the characteristics of his audience when communicating. With age, there

*Flavell's studies were done with subjects of both sexes ranging in age from three years to seventeen years.
is an increasing tendency to take careful note of differences in listener role attributes and try to tailor the message accordingly.

Flavell's data demonstrate that egocentrism in communication and role performance declines with age. With increasing age, the child progresses along the continuum of autistic or undirected thought to the pole of intelligent or directed thought. Flavell's results follow closely Piaget's theory of development.

The Problems to be Researched

The two major concepts of differentiation and egocentrism are the primary focus of the present investigation. The questions that are raised concerning these two phenomena evolve from the works of Werner, Piaget, Witkin, and Flavell.

The focus of the present study may be briefly divided into four parts.

The first problem that the present writer is concerned with involves the development of the two phenomena, differentiation and egocentrism, in children, as they develop. How do the phenomena of differentiation and egocentrism develop across age?

From Werner's theory and the empirical data of Witkin, differentiation is expected to increase with age,
that is, with increasing age the child begins to deal with his environment differentially and analytically. Piaget's theory and the results of Flavell's studies indicate that egocentrism tends to decline with increasing age, i.e., the intelligent mode of thought becomes more prominent with increasing age, while the egocentric mode of thought tends to recede from the foreground.*

Thus, differentiation is expected to increase with age, while egocentrism is expected to decrease, i.e., intelligent mode of thought becomes more dominant with increasing age.

The second problem to be investigated centers around the relationship between the phenomenon of differentiation and the phenomenon of egocentrism. What is the relationship between differentiation and egocentrism?

The bridge that links the phenomena of differentiation and egocentrism is yet to be built. Whatever light that is shed on this subject comes mainly from the theoretical realms—those of Werner's and Piaget's. The essential attributes of a relatively differentiated person are: the establishment of polarity between subject" and

*It must be kept in mind that the transition from undifferentiation to differentiation, field-dependency to field-independency, and egocentric mode of thought to intelligent mode of thought is a gradual one. The concepts—egocentricity, differentiation, etc.—are used here only relative to age and not in an absolute sense.
"object"; less domination by the immediate perceptual field and affective states which permit the individual a more accurate assessment of others. A relatively undifferentiated person possesses none of the mentioned attributes but rather the opposite of those qualifications. The qualities of a directed or intelligent thought are the following: belonging to consciousness; adapting to reality and exerting influence upon it; being able to be communicated. An egocentric thought admits none of the above characteristics but rather the opposite of what an intelligent thought is. Egocentrism does not accept the existence of another perspective besides the one that self is aware of. Thus, there is no polarity between "subject" and "object" in such a state of awareness.

An intelligent or directed mode of thought seems to belong to a differentiated person, and vice versa. The egocentric mode of thought seems to be the property of the relatively undifferentiated person, and vice versa.

The hypothetical relationship between differentiation and egocentrism is a negative one, that is, when an individual is highly differentiated, he does not operate from the egocentric mode of thought. The relationship between differentiation and intelligent or directed mode of thought is a positive one, that is, when an individual is highly differentiated, he operates from the intelligent
mode of thought. Although in theory an individual functions on the same level on most or all tasks, in reality his performances on most or all tasks are not necessarily consistent. For example, a child theoretically should perform consistently on all the subtests of the Wechsler Intelligence Scale, but, in reality, he performs well in some subtests and poorly in other subtests.

An individual who operates from an intelligent mode of thought does not function only on that level of operation. Piaget has stated that the residual of the previous stage remains with the individual. The progression to the more advanced stage means that the new mode of operation becomes more prominent while the old or less satisfactory mode of operation becomes weakened. But, the less satisfactory function does not disappear completely.

Therefore, egocentrism implies a relative lack of differentiation and the inability to role-play or take another person's point of view.

The third problem concerns the relationship among body concept, differentiation, and egocentrism. Witkin (1954, 1962) demonstrates that there is a significant relationship between sophistication of body concept and the phenomenon of differentiation. The relationship between body concept and the phenomenon of egocentrism has not yet been established. If egocentrism is related to lack of
differentiation, it is highly likely that egocentrism implies primitive or unsophisticated body concept.

The fourth problem to be investigated revolves around the relationship among the various role-playing tasks. Is role-playing ability a task specific phenomenon or is it a phenomenon across all role-playing tasks?

Although Flavell's studies have shown that with increasing age the children display more ability in the role-playing and communicative skills, his studies have shown no indication along the dimension of interrelationship among the various role-playing tasks. In Piaget's theory of development, the egocentric mode of thought or the intelligent mode of thought is not a task specific phenomenon, but rather a phenomenon appearing across many tasks and functionings.

The present writer is aware that the particular characteristic of a task would influence the manner in which the subject would perform. Therefore, the unique nature of a specific task would determine to a certain degree the subject's performance. But, it would not be parsimonious to assume that a subject who is able to perform well in one role-playing task would perform poorly in another role-playing task.

Thus, it is hypothesized that there is an interrelationship among the different role-playing tasks. The size
of the correlation between any two role-playing tasks would depend partially on the nature of the particular role-playing tasks involved.

The Experimental Design

The experimental design of the present study is a cross-sectional one. There are four groups of children involved in the study. These children were chosen on the basis of four particular age ranges, with a number of other variables controlled across groups in order to restrict the variances of the measurements. Age was an independent variable. The variables to be investigated were chosen on the basis of the theories of Werner and Piaget, and the empirical research of Witkin and Flavell.

Hypotheses

It is hypothesized:

1. That role-playing ability will be significantly correlated with the ability to overcome visual embedding context.

2. That role-playing ability will be significantly correlated with the sophistication of body concept.

3. That role-playing ability in one task setting will be significantly related to the role-playing ability in another task setting, i.e., role-
playing ability is not a task specific but an ability which underlies most, if not all, tasks which require role-playing ability.

4. That role-playing ability will increase significantly with age.

5. That the ability to overcome visual embedding context will increase significantly with age.

6. That body concept will become more sophisticated with age.

7. That the ability to overcome visual embedding context is significantly related to the sophistication of body concept.*

---

*The relationship between particular tasks, which measure the above concepts, will be discussed at the end of the next chapter. The detail description of a particular task will be presented in Chapter III.
CHAPTER II

REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE

The material to be presented in this chapter covers the theoretical and empirical background of the study. The theoretical background should be dealt with first to lay the groundwork for the related empirical data which have formed the basis for the subject matter of the present investigation.

The Theoretical Background on Heinz Werner

Heinz Werner (1948) belongs to the tradition of organismic psychology. After Descartes, in the seventeenth century, there was a trend in psychology to look at the organism in two separate, yet, interacting entities—body and mind. Wundt, in the nineteenth century, subscribing to the tradition of British associationism, atomized the mind further by reducing it to the elementary particles of sensations, feelings, and images. Since then, there have been recurrent attempts to put the mind and the body back together and to treat the organism as a unified, organized whole. Jan Smuts (1926), a South African statesman and
soldier, is recognized as the leading philosophical proponent of organismic theory and his book *Holism and Evolution* (1926) has been very influential in the development of organismic theory. The word Smuts used, holism, comes from the Greek root *holos*, meaning complete, whole, entire.

In psychology, organismic theory has been expounded by Kantor (1924, 1933), Goldstein (1939), Wheeler (1940), Murphy (1947), Rogers (1947), and Werner (1948).

The basic tenets of the organismic theory pertaining to the functioning of a person may be briefly summarized in the following. The organismic theory emphasizes the unity, integration, consistency, and coherence of the normal personality. Organization is the natural state of the organism and disorganization implies pathology. Organismic theory starts with the organism as an organized system and proceeds to analyze it by differentiating the whole into its constituent components. The theory assumes that the individual is motivated by one sovereign drive rather than by a plurality of drives, e.g., Goldstein (1939) believes that the drive to self-actualize is the most powerful force in guiding an individual's activities. Although the organismic theory frequently makes use of the principles of Gestalt psychology, it feels that the preoccupations of the Gestaltists with isolated functions of the organism such as
perception and learning provide too narrow a scope for understanding the organism. It broadens the base by including within its scope everything that the organism is and does.

The Part-Whole Relationship

An important aspect of Werner's theory of development is related to the analysis of behavioral events in terms of the interrelationship and integration of parts to the whole, rather than a treatment of parts in isolation. An example of this is the sensori-tonic field theory (Werner and Wapner, 1949, 1952; Wapner, 1964, in Scheerer). The focus of the sensori-tonic field theory is on the interrelationship among modalities.

The basic assumption of sensori-tonic field theory is that perception is a reflection of the relation between proximal stimulation and the ongoing organismic states. Proximal stimulation is defined as stimulation of sensory surfaces which issues from a physical object; organismic state represents the total ongoing state of the organism as it is affected by past history, present internal stimulation, and stimulation from sources other than those of the object attended.

Questions have been raised concerning the interaction between two distinct modalities, e.g., "how it is possible that intrinsically different elements, such as
motor and sensory activities, can affect one another?"

Werner and Wapner (1949) resolve this paradox by postulating the priority of a whole with respect to such factors as sensory and motor. That is, there is a dynamic process to which both the sensory and motor factors contribute.

The analysis of perceptual behavior from the sensori-tonic view is made with reference to the relationship between proximal stimuli (sensory input from an object) and the emotional status of the organism. This analysis of perceptual processes does not follow the lines of projection theory which regards perception as the "mirror of personality," but rather that perceptual processes are analyzed in terms of a field comprised of two parts—the "organism" and the "object" (Werner and Wapner, 1956). Therefore, perception is a reflection of a part of "proximal stimulation" in relation to the context of "organismic state."

Any changes in perception can occur as a function of changes on either side of the equation involving both the organism and the object, that is, the organismic context: the proximal stimulus. For example in the perception of verticality, all forms of seemingly extraneous stimulation employed—head tilt, body tilt, direct stimulation of the neck muscle, auditory stimulation, rotary acceleration around the vertical axis of the body—exerts an influence
on the organismic state and, thus, upon the individual's perception of verticality (Werner and Wapner, 1949; Werner, Wapner, and Bruell, 1953).

When Stimuli impinge on the organism various relationships are possible between the proximal stimuli and the existing state of the organism. One possible relationship is that of stability. Perhaps, with some proximal stimulus, there may be no tendency for pertinent aspects of the organismic state to change. The alternative relationship is that of instability. This state occurs when certain stimuli issuing from an object are in disequilibrium with the organismic state. The resulting tendency is for the organismic state to change so that an "organism-object" equilibrium could be established. Therefore, given a particular proximal stimulus which results in a change in the organismic state, there necessitates a change in perception.

Werner and Wapner assume that there is a biological tendency which operates toward maintaining stable relations between proximal stimulus and state of the organism.

Werner's emphasis on part-whole relationship does not apply only to the "organism-object" relations, but, also covers the relations among the different functionings within the organism as well. That is, Werner uses part-whole relationship in his analysis of the interaction
between the "organism" and the "external world," and, also in his analysis of the interaction among the various functions within the organism itself.

The Orthogenetic Principle of Development

Werner believes that wherever there is life there is growth and development, that is, there is formation in terms of systematic and orderly sequence. The regulative of development is called the orthogenetic principle. The essence of this principle is that "whenever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration" (Werner, 1957, pp. 126, in Harris).

According to the above principle, a state involving a relative lack of differentiation between subject and object is developmentally prior to one in which there is polarity of subject and object. The child's placement of his dreams as something external to himself and belonging to something "out there" demonstrates the lack of differentiation between subject and object in the child. To a young child, the distinction between "self" and "non-self" is relatively unclear. The child, also, experiences names both as things in themselves and as fused in the objects they denote. The distinction between what one sees and
what one dreams is clearer in an adult than in the child. On Werner's scale of development, the child would be placed near the undifferentiated state while the adult would be near the differentiated pole.

Werner infers that with increasing "subject-object" differentiation, the organism becomes increasingly less dominated by the immediate concrete situation (i.e., perceptual field), and is less stimulus-bound and less impelled by his own affective states. The consequence of this freedom is a clearer understanding of goals, the possibility of employing substitutive means and alternative ends, and a greater capacity for delay and planned action. With greater differentiation, the person is able to manipulate his environment to meet his goals rather than to respond passively to the environment. The freedom from the domination of the immediate situation allows the individual a more accurate assessment of others. Therefore, at a developmentally higher level, there is less tendency for the world to be interpreted solely in terms of one's own needs.

**Differentiation and Hierarchical Organization**

The orthogenetic principle of increasing differentiation and hierarchic organization underlies the total development of an organism. Five pairs of concepts need to
be defined so that the phenomena of differentiation and hierarchical organization could be clarified.

The first pair of concepts is *syncretic and discrete*. "Syncretis" means the fusion of qualities. If several mental functions or phenomena, which would appear as distinct from each other in a mature state of consciousness, are merged without distinction among one another into one activity or one phenomenon, this process can be referred to as "syncretic." But, if the mental contents, acts, and meanings are relatively specific, singular, and unambiguous, this state of affair may be defined as "discrete." The syncretic functioning can be seen in the global excitement of the young infant. This globality develops into joy and distress later on (Bridges, 1932). This distinction of the two emotional states may be described as discrete functioning.

The second pair of concepts is *diffuseness and articulation*. "Diffuseness" refers to the structure that is relatively uniform and homogeneous, i.e., parts of the structure are relatively indistinct from one another. "Articulation" denotes the formal structure with distinguishable parts constituting the whole, that is, it implies separateness, yet, coordination between parts of the organization. When an infant is accidentally poked with a pin, he will wave his arms and legs in excitement, unable to
communicate the pain to his care-taker. The infant's reaction may be described as diffuse. If the same event happens to an older child, he will probably cry, tell his care-taker, or find out "what is hurting him" himself, and remove the pin (the source of pain) if he could. The older child's reaction may be described as articulated.

The third pair is hierarchization and subordination. This pair of concepts are reciprocal to one another. Thus, it is simplest to define them together. Increasing hierarchic integration implies an increasing centralization in the formal structure. Through centralization, certain parts become salient and dominant with respect to some others. As a result, the less dominant parts become subordinated to the more central and dominant parts. The example to illustrate this pair of concepts can be seen in the development of children's drawings. The development starts with "chain-like" characteristics (without relation between parts) and progresses to a drawing which is centralized according to one comprehensive theme.

The fourth and fifth pairs of concepts—rigid and flexible and labile and stable, respectively—refer to the dynamism of the structure. In general, the more differentiated and hierarchically organized the mental structure of the organism, the more flexible (plastic) and stable its behavior will be, since the organism can vary its activity,
within a considerable range to comply with the demands of the varying situations. Flexibility and stability characterize the functioning of a differentiated and articulated organism. Rigidity of a response is adaptive only under a stable environment in which nothing new occurs but it is usually maladaptive in a changing environment. Generally, the less differentiated and hierarchically organized a mental structure is, the more rigid and labile (unstable) its behavior will be.

The organism travels along the continuum of development from the state of undifferentiated, syncretic, diffuse, rigid, unstable, and unorganized system to the state of being a differentiated, articulated, flexible, stable, and hierarchically organized system. Differentiation implies a system that is articulated, flexible, stable and hierarchically organized. Differentiation permits the organism to meet the demands of a heterogeneous, variegated environment.

The transition from an undifferentiated to a differentiated state is a gradual one, and a relative one, i.e., not an absolute one. For example, in syncretic and discrete functionings, the transition from syncretic to discrete is never complete, so that some syncretism remains a part of the adult's experience. Adults have available to them the option of experiencing in a more syncretic or discrete
manner, while young children do not have such an alternative, since they have not developed beyond the syncretic end of the development.

The development of concept formation may be used to illustrate the progression of differentiation in children (Werner and Kaplan, 1952, 1963). The characteristic of a child's mentality is diffuse as well as concrete, i.e., he always refers to a concrete situation in which a concept is firmly, if not clearly, embedded. The diffuse-concrete mode of thought leads to a lack of consistency and a consequent lability in the concept formation. This diffuse-concrete mode of thought may be placed at the lower level of development. With increasing age, the child becomes more able to deal with a concept in an abstract or general manner. The ability to abstract or generalize allows the child to perform better in the concept formation task. This developmental increase in achievement, first, signifies an increasing capacity for hierarchization with age, and, second, it reflects changes in the underlying patterns of operation. Conceptual synthesis is not achieved by a unitary pattern of operations. There are various sorts of processes of synthesis which differ from each other developmentally. The lower forms are found to emerge, increase, and then decrease during intellectual development, replaced by the more advanced form of generalization (Werner, 1952).
With the development of concept formation, one observes a specialization of functions. Werner states that general ability is minimized in favor of special abilities as the child grows older. Functions such as verbal ability, number, spatial abilities and general memory, seem to be more closely related to one another in children than in adults. Garrett, Bryan, and Pearl (1935) report that the correlations on a ten-test battery drop with increasing age, particularly in the areas of verbal, number, spatial abilities and general memory.

The rates of growth of different functions are quite different. This suggests that functions that were most significant at the earlier periods may be replaced by other more dominant functions in subsequent periods. This shift of significance seems to be caused by the emerging or strengthening of functions that possess a higher degree of subordinating power (that is, there is an increase in hierarchic integration). The functions which are able to gain such strength must have at least one of the following two characteristics. First, they must be able to coordinate other independent functions. This occurrence can be observed in neurophysiological development where the emergence of higher brain centers govern over the lower ones. Second, they must have the capacity to change in relation to the total personality pattern of the growing
organism—depending on the need or motivational system of
the personality.

The development of different processes progresses and
pauses at different levels. At what level the process comes
to a halt depends upon several conditions, e.g., complexity
of stimuli, experience, normal or pathological status of the
individual in question. For example, in the case of percep-
tion, normal and psychopathological persons do not differ
significantly in their perception of the Rorschach, under
the condition of shortest exposure, (Phillips and Framo,
1954). With increase of exposure time, however, the psycho-
pathological subjects lagged behind in the development of
perceptually mature responses. Unlike the normal subjects,
these subjects did not utilize the greater allowance of
time to obtain perceptual adequacy and integration.

Summary

In conclusion, Werner's theory of development may be
summarized into the following points. First, the descrip-
tion of an organism moving along the continuum of develop-
ment is essentially to obtain an "equilibria" between the
"organismic state" and the "proximal stimuli." The sensor-
"tonic field theory explains the changes in the organism.
The change occurs so that an equilibrium between the
impinging environment and the organism can be obtained.
Perhaps, another description of this process is "adaptation."
In order to survive, the organism has to adapt or accommodate to the environment. Second, the development of the organism is regulated by the orthogenetic principle which states that wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration. Therefore, the state of globality and homogeneity is prior to the state of differentiation and hierarchic integration. Third, differentiation of the organism implies discrete, flexible, and articulated structures within the system. This results in a system that is stable, i.e., possessing the capacity to adapt to heterogeneous environments. Fourth, with differentiation also comes hierarchical integration of the structures within the system. As the various structures of the system become differentiated, some structures become more prominent and central in relation to others. The prominent structures gain control over the less prominent ones, i.e., they stay on the higher level of the hierarchic organization. And, fifth, hierarchic organization results in different rates of growth of the structures since the previously more significant structures are gradually supplanted by the structures that possess more subordinating power and meet the needs of the organism more satisfactorily.

The next pertinent piece of theoretical work to be discussed is that of Jean Piaget's. Both Werner and Piaget
seem to subscribe to a similar development of differentiation in the organism.

**A Theoretical Overview of Jean Piaget**

Jean Piaget comes from the diverse backgrounds of biology, philosophy, mathematics, and physics. These four disciplines influence his particular conception of human development. He believes strongly in universal order, i.e., unity of all things—biological, social, psychological, and ideational (Piaget, 1954, in Abramson). To him, all sciences are interrelated. He seems parallelism in human development based on the isomorphism of psychological and biological processes.

Most of Piaget's work could be classified under the heading of "intellectual or cognitive" research. Although his research is done in this realm, he does not believe in the separate functioning of different human faculties, e.g., mind-body. He emphasizes the conviction that intellectual operations never exist in isolation from a governing totality. For example, adaptive behavior, whether in early infancy or in adulthood, can be meaningfully interpreted only in terms of its organization as a total system. In this way, he is very similar to Werner.

This holistic outlook on the different processes of human development also colors the interaction between the
outer "reality" and the inner intellectual organization of the individual. The quality of the relationship or interaction between the environment and the organism is never explicitly stated. But, looking at Piaget's works, one may infer that the environment exerts some influence on the intellect at the same time that the intellect is able to assert a force on the environment. Although the environment is "something" out there, the organization and interrelationship of objects, space, causality, and time presume an a priori existence of definite patterns of intellectual development. The intellect organizes its own structure by virtue of its experience with objects, space, causality, time, and the interrelationship of these environmental "realities." The environment and the intellect do not exist as independent entities; the coordination between them can be observed in the pattern and structure of the intellect.

**Schemata**

For Piaget, the behavioral parallel of structure in biology is the scheme (Piaget, 1968). The schema is the behavioral structure that changes and adapts. A schema may be simple and unitary or it may be a whole system. Piaget does not give one clear and complete definition of the term but the comprehensive meaning is spread out in various
fragments, appearing in his numerous volumes of studies (e.g., Piaget, 1951, 1952, 1954).

A schema is a cognitive structure which has reference to a class of similar action sequences; these sequences are necessarily bounded totalities in which the constituent behavioral elements are tightly interrelated. In its simplest form, a schema can be nothing more than a reliable response to a stimulus, but in practice, however, it is usually more complicated than it sounds. For example, the "sucking reflex" (Piaget, 1952) is one of the earliest schemas. It consists of a sucking response to the stimulation of the inside of the mouth. But this "sucking schema" is more complex than that. This sucking response also involves the turning of the head, opening of the mouth, and swallowing (of the liquid, if present). A few weeks after birth, it expands to include the searching for the breast when the infant snuggles comfortably in the mother's arms. From this earliest schema, we can see that schemas generally include a variety of acts in many different circumstances, not just a response to a specific stimulus.

Schema is mobile and its mobility increases with age. Mobility, here, means that it can be applied to a variety of objects or situations, even the ones never encountered before. For example, grasping is a schema. This grasping
schema may be applied by the infant to various objects, e.g., bottle, blocks, beads, dolls, and hands. The mobility of a schema also implies the ability to apply the action as an instrument or means to obtain some goal, instead of applying the action as an end in itself. The child who already has available the grasping schema grasps a cookie on the table and eats it because he is hungry.

Piaget believes that cognitive schemas derive from sensorimotor schemas by a process of internalization. For example, visual image represents an internalized form of looking. Although the terms schema and concept are not completely interchangeable, Piaget recognizes a certain similarity between them.

The schema, as it appeared to us, constitutes a sort of sensorimotor concept, or more broadly, the motor equivalent of a system of relations and classes. The history and development of a schema therefore consists primarily in its generalization, through application to increasingly varied circumstances (Piaget, 1952, pp. 384).

According to Piaget, conceptual thinking, actually, involves such mental acts as adding, drawing implications, or judging distances. When these internal actions become integrated into a coherent logical system, they are considered logical operations. Therefore, schema is a complex concept encompassing both the overt motor behavior patterns and the internalized thought processes.
In short, schemas are cognitive structures. They are both created and modified by intellectual functioning. Schema is more or less a plastic organization to which actions and objects are assimilated during cognitive functioning. Piaget considers schemas to be the "mobile frames" successively applied to various contents (Piaget, 1952). Schemas also accommodate to things, that is, they adapt and change their structure to fit reality.

Assimilation and Assommodation--the Mechanisms of Equilibrium

Equilibrium, as is used by Piaget, is an internal and constitutional property of organic and mental development. The mechanisms of equilibrium are the special regulatory organs which function at all levels of development (from sensorimotor operations up to formal operations).

Models of equilibrium are found in mechanics, thermodynamics, physics, chemistry, biology, and economics. The term "equilibrium" seems to imply a stagnant or immobile state, e.g., in the field of force, equilibrium is defined as an exact balance of forces whose sum of vector forces equal zero.

The model of equilibrium that Piaget has in mind is not a model of balanced forces. The model that is more appropriate for the higher cognitive functions needs to take into account the necessity of compensation between external intrusion and the activities of the organism.
Equilibrium thus corresponds to the saddle point of the matrix of imputation and by no means expresses a state of rest but a play of compensations involving a maximum amount of activity on the part of the subject (Piaget, 1967, pp. 109).

Thus, the cognitive equilibrium is "mobile." Note that any state of equilibrium is entirely theoretical and, at best, only momentarily attainable. Achieving a near equilibrium in a constantly changing situation is the goal of all human functions. Piaget recognizes two pulls in opposite directions. The individual seeks a balance by striving toward a new, more advanced equilibrium. Life is a progressive series of attempts to balance forms.

Assimilation and accommodation are the two main mechanisms of equilibrium. Broadly speaking, assimilation describes the capacity of the organism to handle new situations and new problems with its present stock of schemas. Accommodation describes the process of change through which the organism becomes able to manage situations that are at first too difficult for it. These two mechanisms are interlocked with each other. Because of the differences in their orientations of functionings, they often act like conflicting forces between opposite poles. Yet, assimilation is always balanced by the force from accommodation and accommodation is possible only with the function of assimilation. For example, an "external object" is never experienced by an individual, unless it
has a personal, assimilative impact on him.

The model of equilibrium is not static since its two mechanisms are in constant opposing pulls. On the one hand, assimilation involves the individual's adaptation of the environment to himself and represents the individual's use of his environment as he would conceive it. On the other hand, accommodation represents the impact of the actual environment and involves the individual conceiving and incorporating the environmental experience as it really is. Thus, assimilation implies that the organism has adapted and can handle the situation presented to it; accommodation implies that the organism must change in order to adapt. To attain "equilibrium," interaction and coordination between these two mechanisms are inevitable.

In conclusion, assimilation and accommodation, at first antagonistic to the extent that the first remains egocentric and the second is simply imposed by the external environment, compete each other to the extent they are differentiated, the coordination of the schemata of assimilation favoring the progress of accommodation and vice versa. So it is that, from the sensorimotor plane on, intelligence presupposes an increasingly close union of which the exactitude and the fecundity of reason will one day be the dual product (Piaget, 1952, pp. 418-9).

Egocentrism

The essential transformation in the relationship between assimilation and accommodation during the early years of life is the progression from the initial state of egocentrism (in which assimilation and accommodation are
undifferentiated from each other and yet mutually antagonistic in their functioning) to a state of objectivity and relative equilibrium (in which the two functions are relatively distinct and separate, on the one hand, and coordinated and complementary, on the other hand) (Piaget, 1954).

Egocentrism is a cognitive state in which the cognizer sees the world only from his point of view, without the knowledge of the existence of others' viewpoints or perspectives. The fact, that the cognizer is unaware that other people have different perspectives from his, results also in his ignorance of his own perspective. That is, he believes that whatever perspective he has is absolute and is "out there."

Through an apparently paradoxical mechanism whose parallel we have described a propos of the egocentrism of thought of the older child, it is precisely when the subject is most self-centered that he knows himself the least, and it is to the extent that he discovers himself that he places himself in the universe and constructs it by virtue of that fact. In other words, egocentrism signifies the absence of both self-perception and objectivity, whereas acquiring the possession of the object as such is on a par with the acquisition of self-perception (Piaget, 1954, p. xii).

The child's egocentrism results from a simple lack of differentiation between the ego, i.e., self, and the alter, i.e., external world. He assimilates his environmental events without realizing that he has not yet distinguished his viewpoint from that of others, that is, he falls to
coordinate points of view. His egocentrism in both the physical and social areas results from his ignorance of his own subjectivity.*

The child's egocentricity leads him to believe that everyone necessarily thinks like himself. He will not spontaneously seek to convince others, nor to accept common truths, nor to prove or test his opinions. Therefore, he thinks or speaks without troubling to make himself understood nor to place himself at other people's point of view. An example of absolute egocentrism can be seen in the case of a child who believes that there is a dynamic participation between his own movement and the movement of the moon. It is because he lacks the capacity to differentiate "self" from the "external world," i.e., everything participates in the nature of and can influence everything else. This level of development results in the special kind of perception, logic, speech, thought, and morality in the child (Piaget, 1955, 1965, 1967, 1968; Piaget and Inhelder, 1956, 1969; and Piaget, 1952, in Newcomb).

*Note that egocentrism, as is used by Piaget, does not carry the excessive social connotations which the term usually implies. Although egocentrism is more prevalent in young children than in adults, it is not an all-or-none process, but a matter of relative amounts. Residuals of egocentrism in an adult is not inconceivable, particularly, when he is put into an unfamiliar situation, e.g., an instructor, who has no experience in teaching, tries to lecture to a group of students from various backgrounds.
In early childhood, assimilation and accommodation are undifferentiated to the extent that an object and the activity in which the object is assimilated constitute for the child an indivisible experience. Thus, the act of assimilating an object to a schema is totally confused with an undifferentiated from the accommodatory adjustment which is intrinsic to the act. Essentially, there is no distinction between his own act and the external event. With gradual separation of "self" and "world," accommodation is increasingly distinguished from assimilation and comes to be recognized as pursuit of the "unknown." This development, in turn, enriches the assimilatory schema by allowing it to encompass and interpret a wider horizon of "reality." The product of this progress is that the self comes to be seen as an object among objects. And, cognition begins at the boundary between self and object where a gradual change is seen from an initial and profound egocentrism (in which subject and object are indissociable) to an articulation and objectification of the self and a parallel articulation and objectification of the outside reality.

Definition of Intelligence

Piaget defines intelligence to be the state of equilibrium towards which tend all the successive adaptations of a sensori-motor and cognitive nature, as well as all assimilatory and accommodatory interactions between the organism and the environment (Piaget, 1968, p. 11).
Intelligence is defined by the direction towards which its development progresses, without the insistence on the question of boundaries. It is the stages or successive forms of equilibrium. Intelligence starts where the boundary between self and object is formed and develops as the pathways between self and object become progressively more complex.*

Egocentrism is the obstacle to cognition. The lack of differentiation between self and object does not allow the subject the pleasure of "perspective" including his own. The subject believes that his viewpoint is the ultimate universal one. Thus, he distorts and mislocates perceptions, opinions, and moral judgments (Piaget, 1955, 1965, 1967, 1968).

One can therefore believe that intellectual activity, departing from a relation of interdependence between organism and environment, or lack of differentiation between subject and object, progresses simultaneously in the conquest of things and reflecting on itself (Piaget, 1952, p. 19).

The development of awareness between subject and object—i.e., the progress from egocentricity—opens the gateway for interaction between assimilation and accommodation. Cognition represents the relative balance between assimilation and accommodation, while egocentrism illustrates

*Intelligence is not a structure or an object. It is a process of equilibration where assimilation and accommodation are constantly challenged into action.
the imbalance of power and hence is unstable. Changes in the assimilation-accommodation relationship occur both within and between stages of development, and these changes are crucial to the nature of cognition.

Another avenue of looking at intelligence is adaptation. Intelligence is adaptation. If the equilibrium between assimilation and accommodation is upset through the accentuation of either the assimilatory process or accommodatory process, this accentuation is sooner or later checked by the intervention of the opposite process. This occurrence is possible because assimilation and accommodation function complementarily rather than antagonistically. Therefore, intelligence is stable and adaptive because although assimilation and accommodation function from opposite poles of orientations, they cooperate with each other, while egocentrism is unstable and non-adaptive since the lack of differentiation between assimilation and accommodation does not allow these two processes to cooperate and regulate each other's functioning.

Intelligence and Perception

For Piaget (1969) perception covers a narrower, more restricted range of behavior than it does for most theorists. Intelligence and perception need to be distinguished as types of adaptation, with perception being the prior developing form of adaptation. According to
Piaget, perception is only a fair approximation of the world we conceive. Intelligence, being a higher form of adaptation, is capable of yielding certain absolute knowledge. For example, in abstract conception, if it is given that $A = B$ and $B = C$, it necessarily follows that $A = C$. But in perception, this knowledge is always a product of probability and approximation. Because of the constant changes in the field conditions, given that perceptual judgment of $A = B$ and $B = C$, under some conditions the outcome of $A \neq C$ may exist perceptually. The fundamental ambiguity of the sensory information is well illustrated in the demonstrations devised by Ames (1951) or in Piaget's own conservation experiments (Piaget and Inhelder, 1956).

Perception is the knowledge we have of objects or of their movements by direct and immediate contact, while intelligence is a form of knowledge obtaining when detours are involved and when spatio-temporal distances between subject and objects increase (Piaget, 1968, p. 53).

Piaget does not believe that intelligence is simply a derivative of perception through the processes of abstraction and generalization. In addition to perceptual data, abstract concepts incorporate specific constructions of a more or less complex nature. For example, logico-mathematical concepts presuppose a set of operations that are abstracted not from the perception of the objects but from the actions performed on these objects. "Even if every action can give rise to exteroceptive and proprioceptive
perceptions, the schemas of these actions are no longer perceptible" (Piaget and Inhelder, 1969, p. 49). Thus, once these perceptions are transformed into concept (i.e., logico-mathematical structure), it goes beyond the original perceptions themselves.

The point is "what is the relationship between intelligence and perception?" Piaget's observation that intelligence is more encompassing and reversible than perception is an important scientific finding. But his implication that intelligence does not derive from perception remains to be challenged. This topic deserves to be dealt with in depth but this is beyond the scope of this dissertation.

Two conclusions may be drawn from Piaget's studies. First, the pattern of development is similar in both intelligence and perception. And second, intelligence differs from perception in being more reversible and having more generalizing or abstracting power. The question is to what extent they are separate entities without any influence on each other. At what point is cognition a "pure" intellectual activity and has no relationship to perception?

An Illustration of Development--
Conception of Space

Piaget and Inhelder (1956), in examining the successive stages in children's development, draw a fundamental
distinction between spatial perception and the earliest spatial imagery. Spatial perception takes place in the presence of the object whereas the image arises only in its absence. Perceptual space develops more rapidly than conceptual space. There is an interval of several years between perceptual and conceptual construction, despite the fact that they pursue a similar path of development.*

Perceptual space appears to be a complex product, resulting both from direct perception and from sensorimotor activity applied to the control and direction of the various movements determining perceptual centration. Sensorimotor activity at first embraces the whole of the child's behavior. Then, with the appearance of imagery it becomes confined to the strictly motor and perceptual areas which continue to provide the foundation for spatial concepts throughout life. From motor activity stems the spatial relationships. As soon as this process of development begins, spatial relationships are indicated by "signifiers" (these consist precisely of sensory signs).

*Although children may have available to them the abstract conception of space, it does not imply that they necessarily understand or are able to write up all the logical operations constituting the concept. The subtle difference between being able to use a concept, e.g., Euclidean concept, in one's everyday life and understanding about Euclidean space conceptually, is like having a digestive system and understanding all the operations of the system.
Consequently, when a shape is seen in depth or in perspective, a whole series of relationships will be brought into play. These go beyond the data recorded by the sensory receptors and are virtually the product of sensori-motor activity. However, sensori-motor activity alone and unaided cannot extend beyond the field of direct perception. Imagination (i.e., imagery) extends space beyond the confines of the perceptual field. Sensori-motor activity is reinforced by imagination at the point where the symbolic function just appears, i.e., when the "signifiers" in the form of symbols (images) begin to be differentiated from what they "signify" in the form of conceptual relationships. At this point, conceptual space is said to have begun its development.

The development of spatial concept starts with the topological relationship, then goes on to projective, and then to Euclidean relationships. Essentially, in the development of spatial concept, there is a growing number of increasingly complex coordinations between different actions of the subject.

A topological relationship is the attainment of constancy of size and shape. It includes proximity, separation, relation of order, enclosure, and continuity. Proximity corresponds to the simplest type of perceptual structurization. It is the "nearby-ness" of elements
belonging to the same perceptual field. Separation involves the segregation of units or the analysis of elements making up a global whole. The relation of order establishes the relationship between two separate, neighboring elements. Enclosure gives the dimension of "insideness" or "surrounding," e.g., object in a closed box or a nose framed by the rest of the face. Continuity essentially increases the fineness of the thresholds of sensitivity and the relationship of proximity and separation. It gives the information concerning what in the whole of perceptual field constitutes a continuous spatial field.

The relations of proximity, separation, order, enclosure, and continuity are built up empirically between the various parts of figures or patterns which they organize. They are independent of any contraction or expansion of these figures and are, therefore, unable to conserve features such as distances, straight lines, angles, etc., during the changes of shape. Topological space is purely internal to the particular figure whose intrinsic properties it expresses. That is, it only furnishes the basis for the type of analysis which operates from the standpoint of each figure in isolation, rather than that of a comprehensive system where coordination of all figures within a whole is possible.

Projective and Euclidean structures are more complex in organization and are evolved at a later stage in the
child's development. Both structures derive from topological space.

Projective space begins at the point when the object or pattern is no longer viewed in isolation, but begins to be considered in relation to a "point of view." ("Point of view" used here refers to both the subject's own point of view and other people's point of view.) Projective relationship conserves neither parallels, angles, nor distances.

Euclidean space deals not with objects relative to some point of view or changes in point of view, but with the various features of the object relative to its "placements" or "displacements." Euclidean relationship involves the conservation of size and distance, with the coordination of the actual locations relative to which the objects are moved. This conservation of size and distance allows the development of an overall frame of reference.

Summary

In conclusion, Piaget's theory of development may be briefly summarized in the following way. Schema is the basic behavioral structure or mold into which reality is poured. Schema both assimilates and accommodates to external reality. The processes of assimilation and accommodation allow the organism to attain equilibrium or adaptation. The balance of forces, between assimilation and accommodation, within the organism is accomplished only
with the progression from egocentrism, i.e., the lack of differentiation between subject and object. Cognition starts where the boundary of subject and object is. And, cognition is the process of equilibrium, i.e., equilibration, between assimilation and accommodation. The ultimate goal of the equilibrating process is adaptation.

In the following sections, the empirical researches that have evolved from both Werner's and Piaget's theories will be discussed in depth. The first large body of research to be presented will be that of Witkin and his associates.

**Cognitive Style of Field**

**Dependence-Independence**

Witkin and his associates (Witkin, 1949, 1950, 1959, 1965 and 1964, in Scheeerer; Witkin, et al., 1954, 1962, 1966) have conducted numerous studies in establishing relationship between perception and personality. They find a broad relationship between personality pattern and perception pattern. "Cognitive style," as defined by Witkin, refers to the "...self consistent modes of functioning found pervasively throughout an individual's cognitive, that is, perceptual and intellectual activity" (Witkin, 1967, p. 234). Under a given test condition each person performs in a very consistent way, and this particular person also tends to show consistency in
performance under different test conditions.

According to Witkin and his associates (1954, 1962), an individual's concept of himself as a person may affect his confidence in his body, and his image of it. Peculiarities of body structure, or fantasies about body peculiarities, may influence a person's psychological development in important ways. This two-way relation between body and personality organization makes it very likely that the way in which a person perceives the position of his body and the readiness with which he experiences sensations from it as revealed in the orientation tests, are related to aspects of his personality.

People are self-consistent in their perception under different test conditions, but the degree to which they are self-consistent varies with the extent of structural similarity of the tests involved. Some individuals tend to be more variable than others from series to series—suggesting that a given degree of variability in performance under different test conditions might in itself be an important and stable feature of a person's perception. This individual's characteristic modes of orientation tend to remain stable over long periods of time.

Rudin (1968) prefers to talk about the perceptual phenomenon that Witkin and his associates have isolated as an operational measure of "ego autonomy." Although Rudin
and Witkin may disagree on the terminology of the concept measured, they both seem to accept the hypothesis that field independence should be considered a "style" and not an "ability."

Concept of Differentiation

Witkin's work evolves from the theory of differentiation (Werner, 1948). Differentiation, as is conceived by Witkin (1954, 1962) refers to the formal (as contrasted to the content) aspects of a system. Development toward greater differentiation involves progress from an initial relatively unstructured state, which has only limited segregation from the environment, to a more structured state, which has relatively definite boundaries and is capable of greater specificity of function.

Differentiation is one of the ways to describe a system. The other characteristic that also defines a system is integration. Though the development of differentiation and the development of integration proceed together in a closely interwoven way, the achievement of a high level of differentiation does not necessarily imply the effectiveness of integration, adequacy of adjustment, or degree of maturity. Developed differentiation may be found in effectively functioning people or in people with marked pathology (Witkin, et al., 1954; Sanguiliano, 1951; Franks, 1956; Gruen, 1955; Zukmann, 1957).
According to Witkin, indications of advanced differentiation are reflected in an articulated way of experiencing the world, a differentiated self as reflected in a clearly defined body concept, a developed sense of separate identity, and specialized, structured controls and defenses. People who are relatively more differentiated tend to perceive their environment in a field-dependent way. That is, they tend to experience their surroundings analytically, with objects experienced as discrete from their backgrounds. People who are relatively undifferentiated tend to perceive their environment in a field-dependent way. They tend to experience their surroundings in a global fashion, passively conforming to the influence of the prevailing field or content. The tendency toward an analytic or global way of experiencing the world characterizes a person's problem-solving behavior as well as his perceptions.

The Tasks Employed by Witkin and his Associates

The tests, used by Witkin and his associates, were chosen on the basis of their simplicity and effectiveness from a larger group of tests in the area of perception. The exact descriptions of the tests are best described by Witkin himself.

First, the Rod-and-Frame-Test (RFT) is used to evaluate the individual's perception of the position in
relation to the upright of an item within a limited visual field. Witkin describes the RFT in the following way:

The apparatus used consists of a luminous square frame, pivoted at its center so that it may be tilted to left or right. Pivoted at the same center, but moving independently of the frame, is a luminous rod. Since the test is conducted in a completely darkened room, all the subject can see are the frame and rod. These are presented in tilted positions. With the frame remaining tilted, the subject is required, by his instructions, from the examiner, to adjust the rod to a position he perceives as upright. For successful performance of this task the subject must "extract" the rod from the tilted frame through reference to body position (Witkin, et al., 1962, p. 36).

The average extent to which people are influenced by the prevailing visual field, or resist the influence of the visual field through effective reference to postural experiences, is determined by a variety of factors: the structure of the visual field and the prominence of postural experiences, the nature of the item featured in the perceptual task, and the extent of separability of an item within a visual field.

The second task used by Witkin is the Tilted-Room-Tilted-Chair Test (TRTC). This evaluates a subject's perception of the position of his body and of the whole surrounding field in relation to the upright. The apparatus of the test consists of

...a boxlike room 70 by 71 by 69 inches, suspended on ball-bearing pivots so that it can be tilted by an amount to left or right. Inside the room is a chair for the subject which also can be tilted to
left or right independently of the room (Witkin, et al., 1962, p. 37).

The subject establishes the position of his body by bringing his body to a position that he perceives as upright from the various degrees of tilt he is subjected to. If he brings himself close to the true upright, he is resisting the influence of the field and showing awareness of his bodily sensations.

The third task used by Witkin is the Embedded-Figure Test (EFT). This task requires the subject to separate a two-dimensional item from its surrounding two-dimensional field. The items in this test were selected from those developed by Gottschaldt (1926). Unlike the two tests mentioned previously, this test does not involve the orientation toward the upright nor body position. The subject is asked to find a particular simple figure within a larger complex figure. The simple figure is "hidden" by being incorporated into the pattern of the larger figure.

Basic Research Findings Using the RFT, TRTC* and EFT

The correlations among scores from the RFT, BAT, and EFT are for the most part significant, implying substantial consistency in individual functioning in these different test situations (Witkin, et al., 1962). It seems that the

*TRTC consists of two subtests—BAT (body adjustment test) and RAT (room adjustment test).
ability to overcome an embedding context is central to the field-dependence dimension. A number of studies done by other people also seem to confirm these findings (Gardner, et al., 1959; Gruen, 1955; Epstein, 1957; and Linton, H. B., 1955).

There is a significant correlation between the Wechsler Intelligence Scale for Children and Witkin's perceptual tests. People who tend to do well in Witkin's tests are the ones who tend to score high on the Wechsler Intelligence Scale. The relationship between perceptual scores and the intelligence scale scores is mostly accounted for by the Wechsler performance subtests, e.g., Block Design and Object Assembly. This indicates that the aspects of intelligence which involve the analytical ability may be contributing heavily to the over-all relation found between the full-scale intelligence tests and perception.

Factor analytic studies (Goodenough and Karp, 1961; Karp, 1963; Witkin, et al., 1962) that were conducted using various intellectual measures established a relationship between field perception tests and the Wechsler subtests. Three factors were extracted: (1) verbal-comprehension, (2) attention-concentration, and (3) analytic-field approach. Perceptual tests of field approach was found to load on the "analytic-field approach" factor.
This factor loaded most heavily on the following subtests:

A number of cognitive dimensions, identified by different investigators, may tap the same core of individual functioning. Field dependence, Thurstone's flexibility of closure, Guilford's adaptive flexibility, Phillips' spatial decontentualization, Dunker's functional fixedness, and "perceptual organization" on the Wechsler scale all appear to involve the ability to overcome an embedding context. In a period of extensive research on cognitive styles it is not surprising that there should be overlap or even identity among the cognitive styles established by different investigators (Witkin, et al., 1962, p. 80).

The relationship between Witkin's perceptual tests and the personality tests may be illustrated in the correlations between perceptual tests and the Rorschach ink blot tests, the TAT, and the Draw-a-Man Test.

Thetford, et al. (1951), and Hemmendinger (1953) found an increasing "organizing" ability in the children's responses to the Rorschach cards with increasing age. In more recent studies, the Rorschach was found to be correlated with a composite of measure of spatial decontentualization, a component in the EFT scores (Phillips, 1957; Witkin, et al., 1962). To the extent that the spatial-decontentualization and field-approach dimensions are similar, the ability to impose organization on an unstructured field is related to mode of field approach.

A non-significant correlation between the perceptual tests and TAT is found (Witkin, et al., 1962). Witkin interprets this result to be that the ability to overcome
an embedding context in a verbal medium is unrelated to such ability in the medium of stimulus configurations. Although the organizational level of the responses on TAT does not relate significantly to the perceptual, intellectual, or cognitive index scores, it is significantly related to the verbal index scores. It should be noted that this is referring to the three "intellectual" factors isolated by Goodenough and Karp (1961).

The articulation of body concept, as measured by the Draw-a-Man Test, is found to be highly related to Witkin's perceptual tests (Witkin, et al., 1954, 1962). Children and adults who, in their drawings, project an articulated or sophisticated conception of the body also tend to show an analytical field approach. Those who reflect a relatively unarticulated or primitive body concept are likely to show a global field approach. Silverman, et al. (1961), investigated body boundaries by measuring the manner in which the subjects respond to the stimuli on the surface of their bodies. The subjects who are analytic in their approach to RFT are also better able to experience separate stimuli on the surface of their bodies as discrete, and to apprehend the relation among these stimuli.

The evidence seems to point to the fact that Witkin's perceptual tests are not restricted to the realm of "perception" as such, but that perceptual activity is a
pervasive way of dealing with the environment and self. If the "outside," the environment, is experienced as articulated, the "inside," the self, tends to be experienced in the same manner. Cognitive style pervades the perceptual realms of human functionings.

Field Independency as Contrasted with Field Dependency

In Witkin's perceptual test--RFT, TRTC, and EFT--the subjects differed from one another, under all test conditions, in the extent to which their perception conformed to the structure of the presented visual field or in the extent to which they were able to avoid being influenced by this structure through the effective use of their bodily sensations. Their performances ranged from approximate identification of the upright with the "vertical" of the field (in TRTC task), based on complete acceptance of the prevailing visual framework, to location of the upright completely with reference to sensations of body position. Some subjects decided on a location of upright quickly and confidently, while others were troubled and agitated about their decisions. Tendency to rely mainly on the visual framework, or to remain independent of it through awareness of bodily experiences, represents a fairly pervasive characteristic of an individual's orientation.

Field independency represents one manner in which an individual perceives and deals with his environment. Field
independent subjects perform differently from the field dependent individuals. They are able to use cues from their bodily sensations more accurately than the field dependent subjects in the RFT and TRTC. Field independent individuals are not as much influenced by the prevailing field and are capable of dealing with it in an active analytical fashion; they produce drawings expressing a high degree of narcissistic investment in the body; they have sophisticated defenses against anxiety (e.g., intellectualization in contrast to global, free, floating anxiety); possess self-assurance; identify with the "desirable characteristics" of both sexes; and, show manipulative tendencies in controlling their drives. Generally speaking, the field independent men and women have an active attitude toward the environment. By this is meant that they indicate a possession of a concept of an independent self who can act to initiate events in the environment (Witkin, et al., 1954, 1962).

Field dependent subjects show an almost opposite tendency to that of the field independent subjects. Field dependent individuals exhibit the lack of ability to use their bodily sensations accurately in obtaining the upright position in the TRTC. They perform relatively poorly compared to the field independent subjects in the EFT. In general, the people who are field dependent in their
perceptions produce figure drawings reflecting a low evaluation of their bodies; possess infantile defenses against anxiety (e.g., unlocalized, free, floating form of anxiety); show lack of self-assurance; are passive; and, have difficulty in accepting an "adult role" (Witkin, et al., 1954, 1962). Field dependent people also tend to recall more photographed faces correctly (Messick and Damarin, 1964), are more affected by anxiety on recall tasks (Uhlmann, 1962), are more extroverted (Evers, 1967), are less creative (Spotts and Maklin, 1967), are more cognitively rigid (Goodman, 1955), are more conforming (Crutchfield, 1955), and are less intellectualizing (Schimek, 1968). Individuals with high ego-strength (as measured by Barron ego-strength scale) were more field independent than those individuals with low ego-strength (Vaught, 1964).

Other Studies on Cognitive Style

Lee, Kagan, and Rabson (1963) report that knowledge and conceptualization of the environment initially derive from the kind of processing of the stimuli. What conceptualizations develop, they contended, are related to the stimulus components selected by the child for processing. Some of their male subjects processed stimuli by searching for areas of similarity requiring careful attention to the specific properties of the stimuli, while other boys responded in terms of total stimulus. The former way of
processing the information from the stimuli is labeled as "analytic" by Kagan and his associates. They also conclude that children and adults have a preference hierarchy with respect to the stimulus characteristics they will initially attend to in situations where the individual has several degrees of freedom.

Two cognitive dispositions that are related to producing conceptualization are (1) the tendency to reflect over alternative solutions available, and (2) the tendency to analyse a visual stimulus into its component parts (Kagan, 1964).

Analytic conceptualization tends to increase with age (Kagan, Moss, and Siegel, 1963). Field dependent people are generally more impulsive than the field independent subjects (Rosman, 1962). Nadean (1968), using Kagan's framework, found the antecedent of reflectivity—impulsivity (i.e., analytic-nonanalytic styles) dimension in pre-school children.

Using the Hidden-Figures-Test (a test similar to the EFT), Rosman (1962) found consistent individual differences in the tendency to analyze stimulus material. Like Kagan, et al. (1963), Rosman reports a tendency toward analytic conceptualization to increase with age. The significant contribution from Rosman's work is that the Hidden-Figures-Test is similar to and correlates with Witkin's EFT. This
seems to point to the similarity between Kagan's analytic conceptualization and Witkin's perceptual analytic factor.

Doyle (1965), however, reports a contradictory evidence. There was no relationship found between Kagan's Conceptual-Style Test and Witkin's EFT. The present writer agrees with Moskowitz (1970) that the apparent relationships (as seen in Rosman's study, 1962), between Kagan's concept and Witkin's concept is so strong that the denial of relationship at this time is considered premature.

**Stability in Cognitive Style**

The male college students that were originally studied by Witkin and his associates (the study was published in 1954) were reassessed by Bauman (1951) three years later for perceptual and personality testing. The figure drawings of these men showed striking stability in the articulation of body concept.* The test-retest correlation of these ratings was .86 (p<.01, N=24).

Another group of subjects were tested, when they were 17 years of age, with a battery of perceptual and personality tests. They were restudied three years later by Fliegel (1955) with the perceptual battery, the figure-drawing test, the Rorschach and an interview. The test-retest correlations for perceptual measures are extremely

*Note that Bauman was the examiner for the human figure drawings during the initial testing and the retesting three years later.
high, suggesting a striking stability in the mode of field approach over the period of three years.*

Special training of the subjects (mainly with adults) has been carried out to test if performance of the subjects could be altered. But, the perception of these subjects seems to be unalterable and little transfer of training occurs between tests. Witkin (1948) attempted to bring about a change in perception by means of special training procedures, including discussions of the problems of orientation and practical demonstrations. These training methods improved the scores in the test in which the training was given, TRTC, but not the RFT. The results seem to suggest that no fundamental change in mode of field approach (that is, in the sense of altering the subject's characteristic way of perceiving) occurred in consequence of training.

*See Witkin, et al., 1962, p. 370, Table 23-1, for the correlation coefficients reflecting the stability.
Witkin, Goodenough, and Karp (1967) report stability of "cognitive style" over the ages of eight to twenty-four years.

Kagan and Moss (1962), with a totally different approach to the study of development, seem to report results which are similar to those of Witkin and his associates. That is, there is consistency in human characteristics. Many behaviors that were inhibited by the child during the period of six to ten years of age were moderately good predictors of theoretically related behaviors during early adulthood. For example, passive withdrawal from stressful situations, dependency on family, ease-of-anger arousal, involvement in intellectual mastery, social interaction anxiety, sex-role identification, and pattern of sexual behavior in adulthood were each related to the reasonably analogous behavior dispositions during the early school years.

These findings suggest that relatively more developed or less developed differentiation in many areas of functioning may be a stable characteristic of the growing child, even though the manner in which differentiation expresses itself varies from one age to another. Thus, differentiation is defined relative to age.
The Effect of Early Life Experience

The child's manner of experiencing himself is similar to his manner of experiencing the world around him. The child who could not readily perceive his body as separate from "non-body" had difficulty identifying a simple figure embedded in a complex design. The child who has a clear sense of the relations among important people around him also had a definite sense of his own role in the family and in various social groups.

The process of segregation of "self" from the "environment" is a continuing one during development. Early in life, the formation of body boundaries is an essential aspect of the emerging sense of separation of the body from the environment. The development of awareness of the "separateness" of the body has its roots in the active exploration of the body and the experiences of being handled, with the attendant kinesthetic, tactual, and visual sensations. It also depends on the exploration of other objects besides one's own body. The exploration of other objects provides sensations quite different from those generated by handling one's own body. This helps "...sharpen the difference between the 'me' and 'not-me.'" (Witkin, et al., 1962, p. 116)

Hess and Shipman (1965) speculate that children's cognitive styles (this refers to Kagan's two cognitive
styles of assertive, initiatory mode and passive, compliant mode of behaviors) are related to the dimensions of maternal linguistic codes and types of family control systems. The results indicate that the teaching styles of the mothers induce and shape the learning styles and information processing strategies in the children. A cognitive environment in which behavior is controlled by status rules (e.g., mother imposing power without reasonable explanation) rather than by attention to the individual characteristics of a specific situation produces a child who relates to authority rather than to a rationale. This particular child is compliant but not reflective in his behavior, and the consequences of an act are considered in terms of the immediate punishment or reward rather than in terms of long-range goals.

Witkin and his associates (1962) correlated the mothers' perceptual performances with those of their children. The results are the following

Mothers' figure-drawing scores correlated .48 (p<.05) with their children's perceptual index scores, .41 (not significant) with children's intellectual index scores, and .49 (p<.05) with children's cognitive index scores. Mothers' EPT scores correlated .37 (not significant) with their children's perceptual scores, .15 (not significant) with intellectual scores, and .29 (not significant) with cognitive index scores (Witkin, et al., 1962, p.319).

On the whole, the relation between the extent of differentiation of the mother and child tends to be in the expected direction, though no significant except when the
mothers' figure-drawing score is used as the index to reflect differentiation.

The Effect of Socio-Economic Background on Cognitive Style

Witkin and his associates have not dealt with the effect of "socio-economic status" on articulation in depth. They only mentioned briefly that the factor of socio-economic class does not seem to relate to the performance on the articulation measures (Witkin, et al., 1968).

Karp and Silberman (1966) report results which support Witkin's speculation. They used lower and middle-class boys as their subjects and found that socio-economic class differences are not reflected in a subject's field approach.

However, two studies that were carried out with Negro subjects found the effect of socio-economic status on the children's cognitive style.

Hess and Shipman (1965) found that middle and lower class mothers handled their children differently. The mothers of the middle and lower classes differed relatively little, on the average, in the affective elements of their interaction with their children. The gross differences appeared in the verbal and cognitive environments they provided for their children. There were marked social-class differences in the ability of the children to learn from
their mothers. The children from the middle-class homes scored well above children from the working-class homes in the performance of these tasks.

Using lower and middle class Negro children as his subjects, Robbins (1962) found that socio-economic status was related to field approach.

The effect of socio-economic status on field approach is not entirely clear. Perhaps, the effect is complicated by other factors (e.g., race, since both Hess and Shipman and Robbins' studies were done on Negro Subjects). But at this point, Witkin's interpretation, that the factor of socio-economic status does not relate to articulation of field approach, is thought to be premature.

Sex Differences and Cognitive Style

Sex differences have been found in both child and adult samples (Frank, 1956; Gross, 1959; Hess, 1930, Witkin, et al., 1954, 1962). The effect of biological sex has been demonstrated for children as young as eight years of age. At the younger ages, the problem cannot be investigated easily due to the difficulty in measurement. However, the results obtained from the children in the age range of five to eight years with similar kinds of perceptual tests seemed to indicate that there may be no significant sex differences in the articulation of field approach
at these younger ages (Crutden, 1941; Goodenough and Eagle, 1963; Karp and Kanstadt, 1963). Although sex differences were not significant, until the age of seventeen years or so, it is consistent in that direction. There is also evidence that suggests an absence of sex differences in the geriatric group (Schwartz and Karp, 1967).

Women as a group tend toward a global field approach in their perceptual and intellectual functioning, men toward an analytic approach. The differences between the sexes, though clear-cut and consistent, tend to be small compared to the range of individual differences within each sex. And, sex differences in performance on similar problems, but that do not require the ability to overcome embedding contexts, are generally not significant.

Piebert (1967) reports that women are generally more field dependent than men. When the female subjects' scores on the masculine-feminine scale are correlated with their performance on the perceptual tasks, however, the measures of masculinity-femininity are found to be related to the cognitive style. The more masculine women were more field independent than the feminine women. The field independent women also tend to choose the more masculine roles (Greenwald, 1968).

Lynn (1962) hypothesizes that the females learn their identities from their mothers, who, at the beginning of life,
are almost always present. The males learn their identities less with the mothers but more with the less present and more "abstract" fathers. From the above hypothesis, one may assume that females would be more cue dependent than males. Sherman and Smith (1967) add another dimension to Lynn's hypothesis. They found orphaned females to be less cue dependent than normal home-reared females and the orphaned males to be more cue dependent than the normal home-reared males. Therefore, the sex differences hypothesized by Lynn may not be only the function of "who" the child identifies with, but also the function of "what" socialization environment the child is under.

Summary

In conclusion, Witkin's research may be briefly summarized in the following way. First, articulation of perception, as an index of differentiation, is a pervasive characteristic of an individual's functioning under different situations and across a variety of tasks. Second, the two styles of field perception--field dependent and field independent--are related to personality variables. For example, the individual with an analytic or field-independent approach tends to have a greater interest in activity, assertiveness and striving. Third, the mode of field approach or perceptual articulation does not imply adjustment. Psychopathology has been reflected in
Individuals with either mode of perception. Therefore, differentiation, from Witkin's framework, may not imply adjustment or maturity. Fourth, the relationship between the cognitive style that Witkin defined and that of other investigators, e.g., Kagan's, has not been fully established. Fifth, stability of perceptual articulation has been demonstrated in subjects from the age range of 8- to 24-years. Sixth, evidence indicates that the mother figure is a significant factor in contributing to the child's mode of field approach. Seventh, the relationship between socio-economic status and mode of field perception is as yet unclear. Eighth, women are more field dependent than men. The origin of sexual identification remains complicated and unaccounted for by any single theory or hypothesis.

While Witkin and his associates are concerned with the phenomenon of psychological differentiation, Flavell and his associates are concerned with the development of communicative skills or the decline of communicative egocentrism.

The work of Flavell and his associates will be the topic of the next discussion.

Role-Playing Ability

Piaget (1955) was the first to investigate the child's verbal communicative behavior from the point of view reflecting his level of role-playing skill. Generally,
children of the younger ages tend not to be able to communicate effectively because they fail to take account of the listener's point of view.

Role-playing activity* is defined by Flavell and his associates (1968, 1967 in Hartup) as "...the attempted discrimination of another person's role attributes, 'discrimination' and 'role attributes' taken in a very inclusive sense" (Flavel, et al., 1968, p. 207). In most situations in which an individual engages in role-playing activity, this activity serves as a means to some end. For example, it serves an instrumental function (i.e., means) to communicate.

Role-playing activity, as defined by Flavell, undoubtedly exhibits a range of subtlety and complexity, just as other kinds of cognition do. Some knowledge about another person's attributes ought to require intellectual maturity to detect and to reason about. One would expect younger children to discern only the more superficial, simple, or obvious characteristics about another individual, whereas older children ought to be more capable of finding the more complex, profound, and subtle ones.

*"Role-playing activity," used in this study, is the same as what Flavell calls "role-taking activity" in his study.
Egocentric vs. Non-Egocentric, Intelligent, Communication

Communication may be roughly divided into two broad categories—egocentric and non-egocentric (or intelligent).

Egocentric communication may be defined in the following way:

(1) S (speaker) cognizes X (data) and covertly codes them so that they are meaningful and "communicable" to himself. (This meaning is ideosyncratic and not consensually understood.)*

(2) S sends L (listener) a message about X. The message is, in all important respects, unrecoded, that is, it is essentially a simple externalization without modification of his private coding and is hence an egocentric communication (Flavell, et al., 1968, pp. 8-9).

An illustration of this egocentric communication is shown in Figure 1.

*Author's note
(Dotted lines around "data X for S" illustrates interchange between "S" and "data." The arrows represent direction of communication.)

Non-egocentric or intelligent communication necessarily involves modification of "data X for S" to suit the characteristics of L, so that the message is intelligible. The non-egocentric communication may be conceptualized as the following:

(1) S cognizes X and covertly codes it for himself....
(2) Prior to and/or during his communication to L (step 3 below) S attempts to discriminate those role attributes of L which appear to be pertinent to L's ability to decode communicative input regarding X.
(3) S recodes X and externalizes it as a message to L about X. This recoding-and-externalization process occurs under the aegis of two concurrent (and related) articulations: (a) S uses the information gained in Step 2 to shape and fashion the message in such a way as to maximize the likelihood that it will meet L's communicative needs; (b) S's activity suppresses the insistent and recurring tendency to allow his message to drift or "regress" toward the initial coding of Step 1 (the egocentric error), a tendency which exists by virtue of the fact that this initial coding is both continuously and intensively present in S's consciousness and by definition, is communicatively adequate for him. That is, communicatively satisfying from his point of view (Flavell, et al., 1968, p. 9).

Figure 2 illustrates the pattern of non-egocentric communication.
The Five Components of Role-Playing Activity

According to Flavell and his associates (1968), there are five components of communication or role-playing activity. These five components are necessary in order to achieve any role-playing-mediated end, that is, they are needed to make the communicated message comprehensible to another individual. A description of each of the five components follows.

Existence. The subject has to realize that there is such a thing as "perspective." What one perceives, thinks, or feels in any given situation need not coincide with what another individual may perceive, think, or feel. It is simply the awareness that the "self" and "other" may apprehend the same object or situation differently.
Need. The realization that an analysis of the other's perspective is inevitable in order to communicate effectively. The subject needs to be aware that his analysis would be a useful means to effective communication. In certain situations, it is necessary for one to utilize one's role-playing capabilities.

Prediction. The subject must be able to discriminate with accuracy whatever the relevant role attributes of another person are. An analysis of another person's role attributes must be carried out and the message tailored according to only those relevant attributes.

Maintenance. This involves the subject's ability to hold on to his own viewpoint and prevent it from influencing his message to the other individual. One's own viewpoint is continuously active and impinging on the recoded message to another person. Thus, in order to recode a message effectively the subject needs to neutralize his own viewpoint.

Application. The subject needs to know how to reassemble his "original message," according to what he knows about the listener's personal attributes, into an effective message. The listener's particular characteristics may serve as an effective monitor on the original message so that the recoded message may become comprehensible to the listener.
The five components are essential to the effectiveness of communication. By the time a child enters school, he is at least partly aware of the existence of perspective. With increasing age, the child normally accomplishes the other components of role-playing which eventually lead him from egocentric to intelligent or non-egocentric communication.

Role-Playing Activity

The basic and essential ingredient of communicative skill or role-playing activity appears to be the process in which the individual cognizes, apprehends, or grasps certain personal attributes of another individual. He must understand the individual attributes that would make the communication possible or the role-playing activity effective.

Sarbin (1954, in Lindzey) makes a distinction between role enactment and role-playing. Role enactment means that the subject actually takes on the role attributes of another person and behaves overtly in accordance with them. Role-playing refers more to the covert, more exclusively cognitive process of adopting the perspective or attitude of another individual. Maccoby (1959) proposes that a child acquires a repertoire of actions by practicing covertly the actions characteristic of the adult with whom he interacts most frequently and who control the resources that he needs.
These covert practices are the preparations for later, overt enactment. She even goes so far as to suggest that covert role-playing is a means of learning not only about adult-like social actions directed toward others, but also about the reactions toward the self.

In order that communication can be effective, an individual necessarily needs to role-play or to take into consideration the personal attributes of another individual involved. He must try to get "under the skin" of the listener. The attributes that are referred to here are primarily inferential rather than directly perceptible. When Tagiuri and Petrullo (1958) talk about "person perception," they do not mean the actual visual perception of the person, but rather the knowledge or observation one makes about another person concerning his intentions, attitudes, emotions, ideas, abilities, purposes—essentially the "personal" characteristics of the person in question.

A fundamental human acquisition is the capacity to utilize the significant symbols (Mead, 1952, in Newcomb and Hartley). The paradigm of communicative interaction between two persons involves person A making a gesture to person B. This gesture from A is a significant symbol if it brings out in B the same response that A would give. This occurrence is likely only if A and B have very similar experiences or share the same kind of cognition (i.e.,
similar way of thinking). If A and B do differ in their cognition, A would need to role-play B's cognition to make his gesture meaningful to B.

According to Vygotsky (1962), during early childhood, speech represents both private and social communication at the same time, that is, the child has not differentiated the private coding from the coding for others. With age, speech evolves into two main patterns—social and private. Social speech becomes more elaborated and complex with age, while private speech becomes progressively covert to the point where it is totally unfit for communication (i.e., non-meaningful).

In communication, if a subject is aware that the information he is coding is to be communicated later to a third person, he will tend to code it in a particular way (different from that if he is coding merely for himself) so that it is easier for recoding when the time comes for him to construct his message for another person (Zajorc, 1960).

Another hypothesis concerning role-playing activity implies that role-playing skills serve a variety of adaptive ends. Psychopathology perhaps stems from deficiency in role-playing skills (Cameron, 1954; Cameron and Margaret, 1951; Gough, 1948; Sarbin, 1954; Sullivan, 1954).
Studies on the Development of Role-Playing Activity

If we may consider the ability to identify another individual's emotional expressions as being one of the components of role-playing activity, then the early studies of Gates (1923) and Walton (1936) should be mentioned. The children were asked to identify the intended emotional expressions from a series of posed pictures. The results tend to suggest that the ability to identify the correct (i.e., according to reliable judges' ratings) emotional expressions increases with age.

The children of the younger ages usually do not make inferences concerning the true motives or thoughts of other people. To them, such a dimension almost does not exist. When second graders responded to TAT-like pictures, they were less likely than the sixth graders to make inferences concerning the covert attributes of the characters, e.g., thoughts, feelings (Dymond, et al., 1952).

This inability to take into consideration another person's motivation, thought, or feeling seems to complicate the child's ability to construct his message effectively. In a study by Moore (1958) the children were divided into teams to compete with one another. One of the essential abilities which would help a team to win was the ability to construct a private verbal code which would be
comprehensible only to one's own team-mates and not to the members of the opposite team. It is clear that the children could not perform well unless they took active account of what the others in the situation were planning to do, and regulated their own behavior accordingly. Each team would have to see its own action in dual perspectives, that is, from its own viewpoint as well as from that of its opponent. The general results were that the 12- to 14-year old children were better able than the 9-to 11-year olds in constructing the effective private verbal code of communication.

The role-playing ability seems to increase across middle childhood. Feffer (1959) devised a Role-Taking-Task (RTT) consisting of background scenes, e.g., a living room, plus a variety of cardboard men, women and children which are placed in various positions against the backgrounds. The subject's task is to tell a story about each scene. Following this, he is asked to retell each story from the point of view of each character in the scene. The results on Feffer's Role-Taking-Task seem to indicate that, across middle childhood, there is first an increase in the ability to take on a succession of different roles in a given depicted social situation. Second, the ability to keep each characterization in the particular scene consistent with all the others tends to increase with age (Feffer and Gourevitch, 1960).
Another role-taking task devised by Gollins (1958) also measures the subject's ability to maintain consistency in the face of change. This particular task seems to demand more subtle and searching inferences about other's characteristics than that of Feffer. Only middle adolescent subjects were found to perform well on it.

Wolfe (1963) did a study using both Feffer's and Gollin's measures of role-taking tasks. His results seemed to confirm both Feffer's and Gollin's original findings.

Using a less complex version of Piaget and Inhelder's (1956) mountain problem, Lovell (1959) replicated Piaget's study. The preschoolers had considerable difficulty in making predictions concerning another person's perspective. Their own egocentricity did not permit them to consider a perspective which differed from their own. The child's egocentrism also influences his conceptualizations of "left" and "right" (Elkind, 1961). He also found that around the age of 10-11, a child's concept of "brother" and "sister" generally becomes wholly symmetrical and abstract (Elkind, 1962).

Generally, with increasing age, the child's performance on the role-playing tasks improves. His ability to do well on a role-playing task also influences his skills in communication. If a child obtains a high score on a role-playing task, he usually performs well on a
The Effects of Sex, Social Class, Psychopathology, and Training on Role-Playing Ability

Gollin's studies (1954, 1958) seem to be the only ones to imply that biological sex is a factor that influences the role-playing ability. Girls are found to perform better than boys in role-playing tasks. However, this interpretation remains unconfirmed. On the contrary, Flavell and his associates (1968) report an opposite set of results. Boys are found to perform better than girls in some role-playing tasks, but the results do not reach a significant level of difference.

Gollin (1954, 1958) also reports that the factor of social class influences the role-playing ability. In interviewing the survivors of a tornado and recording their accounts of the experience, Schatzman and Strauss (1955) come to the conclusion that communicative behavior is related to differences in social status. The inference one can draw from Schatzman and Strauss' study is that the lower-class people tend to be relatively more egocentric in their communication.

Cameron (1954) and Sullivan (1954) speculate that psychopathology reflects role-playing deficiency. Twenty children from a public school and twenty emotionally
disturbed children from an institution were administered one of Piaget's (1956) tasks. The results indicate that the institutionalized children are significantly more egocentric than the "normal" children (Neale, 1966).

Attempts have been made to improve role-playing ability by giving training to subjects. Up to now the efforts in such an enterprise have not yielded positive results (Fry, 1961, 1966).

The interactional effect between biological sex, social class, psychopathology, and training on role-playing ability remains unclear. No definite statement or interpretation can be made yet concerning the influence of one on the other.

Flavell's Study on the Development of Role-Playing Ability

The significant contribution of Flavell's research is the demonstration that role-playing ability is an age dependent factor. The ability to role-play increases with age. This does not merely refer to the awareness that there are different "perspectives" concerning the same situation, but also the improvement in the quality and subtlety of role-playing.

The various tasks that Flavell and his associates (1968) invented are a rich source of research instruments. They keep the subjects interested and they make the tasks
correspond as much as possible to real life situations.

What Flavell and his associates have done is relatively new. The present writer does not mean to imply that there were no studies on role-playing activity before Flavell. There was a large number of studies on role and role-playing but there were relatively meager attempts to conceptualize role-playing ability or communication in the framework of cognition. Being influenced by Piaget and his work, Flavell sets out to study role-playing and communication in reference to cognition.

**Summary**

In this chapter, the present writer has attempted to bring out all the pertinent background materials that have led up to the present research.

Werner's theory of differentiation provides the backdrop for the research of Witkin and his associates. The empirical results from Witkin's research may be roughly summarized in the following way. There are two modes of perception, field dependency and field independency. Field dependency represents a passive approach that an individual uses in dealing with his environment. Field independency refers to an individual's assertive approach to his environment. These two modes of field approach are pervasive characteristics of the individual's personality.
Piaget's theory of egocentrism influenced Flavell and his associates in conceptualizing role-playing activity and communicative skills within the framework of cognitive development. Egocentrism, essentially, refers to the lack of awareness or the inability of a subject to perceive another individual's perspective of the same situation. Flavell's research in the role-playing and communicative skills illuminates the fact that role-playing ability is an age dependent factor. The ability to role play and thus communicate effectively increases with age.

The explanation of the contributory factors to the decline of egocentrism remains doubtful and questionable. One of the possible ways to conduct research on this problem is to look into all the probable variables and interactions in this phenomenon. It is the effort of the present research to investigate the relationship between the phenomena of differentiation and egocentrism. Basing this research on the theoretical works of Werner and Piaget and the empirical data of Witkin and Flavell, the present writer seeks to establish the relationship between the concepts of differentiation and egocentrism.

Differentiation describes the process of polarization between "self" and "object." The polarization between self and the environment effects the way an individual approaches the world. The differentiated individual
is able to deal with his environment analytically or field-independently. A lack of differentiation implies a lack of polarization between the "self" and "other." This leads to a particular approach of handling the environment. The individual who is relatively undifferentiated approaches his environment passively or field dependently.

Werner's definition of the state of undifferentiation is similar to Piaget's definition of the state of egocentrism. It makes one wonder if the lack of differentiation is similar to, if not the exact same phenomenon as, the state of egocentrism. On the theoretical level, one would expect a positive relationship between the phenomenon of lack of differentiation and the phenomenon of egocentrism, and vice versa.

The descriptions of the instruments used in this study will be given in detail in the following chapter. Briefly, the relationships between tasks will be discussed in the next paragraph.

The tasks in this study may be broadly divided into two main groups. First, there is the type of task that is designed to tap the psychological differentiation of the subjects. These tasks come from Werner and Witkin's framework. Secondly, there is the other type of task that is designed to tap the decline of egocentrism or the development of intelligent thought. These tasks come to
us from the work of Piaget and Flavell. If there was an established, standardized task that could measure one of the phenomena that the present writer is interested in, that particular task was used, e.g., CEFT. If there was no standardized test available, the present writer constructed the task herself, based on the empirical works of other researchers.

The tasks that have been found to measure an individual's psychological differentiation are: (1) the Human Figure Drawing Test (Witkin, et al., 1962) and (2) the Children's Embedded Figures Test (CEFT, by Karp and Konstadt, 1963).

The tasks that have been suggested by other researchers to measure the decline of the phenomenon, egocentrism, or the development of intelligent thought are: (1) the Mountains and the Doll Task (Piaget and Inhelder, 1956), (2) the Two-Story Task (Flavell, et al., 1968), (3) the Selling a Necktie Task (Flavell, et al., 1968), and (4) the Buying a Television Task (Flavell, et al., 1968).

According to the hypotheses at the end of Chapter I, the hypothesized relationships between the tasks mentioned above are the following: First, that a child's performance on the CEFT and the Human Figure Drawing Test should improve with age; second, that a child's performance on the
CEPT should relate to his performance on the Human Figure Drawing; third, that a child's performances on the Mountains and the Doll Task, the Two-Story Task, the Selling a Necktie Task, and the Buying a Television Task ought to improve with age; fourth, that all the tasks measuring the decline of egocentrism or the development of intelligent thought are related to all the tasks measuring the development of psychological differentiation; and fifth, that there is a relationship among all the tasks measuring the decline of egocentrism.

The detailed descriptions of the subjects in this study, the tasks used as the measurements, the procedures of testing, the ratings of subjects' performances, and the statistical analysis performed on the data will be discussed in the following chapter.
CHAPTER III

METHODOLOGICAL DESIGN

Description of the Subjects

The subjects in this study were 98 students from two suburban schools in the same county on the outskirts of Denver, Colorado. These students were selected on the basis of the following factors. To be selected the subjects had to be: male; Caucasian; in the first, third, fifth, and seventh grades; within the intelligence range of dull normal to bright normal; have parents who belong to the middle socio-economic class; and be non-skippers or repeaters of any grade. These factors were taken into consideration to restrict the variance due to population characteristics. The rationale for the control of specific variables follows. **Sex**—As was discussed in the previous chapter the factor of biological sex may influence the performance of an individual in perceptual and role-playing tasks. The effect of sex on the perceptual tasks has been clearly shown, while its effect on role-playing tasks remains questionable. Although the biological sex of the individual effects of his performance on a particular task, it does not necessarily imply the "superiority" or
"inferiority" of the particular sex involved (Maccoby, 1966). It simply means that there are different patterns of development for males and females in the area of perception. It may also be important in role-playing activity or communication skills. Since a study by Witkin and his associates illustrates a clearer pattern of development in the males than in the females, the males were selected for the subjects of the present study.

Race—There is no clear evidence to indicate a relationship between the racial factor and the topic of the present research. Karp and Silberman (1966) report that the effect of socio-economic status does not reflect on an individual's field approach, while Hess and Shipman (1965) and Robbins (1962) report the reverse. The subjects that were studied by Robbins and Hess and Shipman were Negroes. It is difficult to make any interpretation concerning this significant issue. It is premature to draw any kind of conclusion.

The present researcher would like to take the precaution of restricting subject variance due to demographic variables. Thus only Caucasian males were selected as the subjects.

Age--The subjects in this study were in the age range of six years to thirteen years. During this study they were in the first, third, fifth, or seventh grades.
Their specific age ranges are the following:

First graders - 6-7 years of age
Third graders - 8-9 years of age
Fifth graders - 10-11 years of age
Seventh graders - 12-13 years of age

This particular age range was based on the instruments to be used in this study (to be described in the latter part of this chapter) and the theories and the empirical data already mentioned in the previous chapter.

**Intelligence**—Intellectual ability tends to interact with a subject's perceptual performance (Witkin, et al., 1954, 1962). In one of Flavell's role-playing tasks (Flavell, et al., 1968) an interaction between intelligence and role-playing ability was reported to reach a level of significance.

The subjects in this study are in the intelligence range of dull normal to bright normal. They were selected on the basis of their performance on the Lorge-Thorndike Intelligence Scale. Since not all the subjects have taken the Lorge-Thorndike test, all the subjects were screened again with the Goodenough Intelligence Test (Goodenough, 1926).

**Socio-Economic Status**—Robbins (1962) suggests that socio-economic status effects the field approach of an individual. Gollin (1954, 1958) and Schatzman and Strauss
(1955) also report an interaction between socio-economic class and the role-playing ability or communicative skills.

To narrow the range of variances in the measurement, subjects from only one socio-economic class were selected, that of the middle class.

Non-skippers and Non-repeaters—The subjects in this study were non-skippers and non-repeaters of any grade. The length of time a subject spends in the institution, i.e., school, may interact or contribute to the variances of the measurement. For example, if a subject is a repeater of a grade and another subject in the same grade is not, then the former subject would have spent one year in the school longer than the latter. It would be difficult to account for the possible interactions between the length of time in the institution of schooling and the factors measured in the present study. For the present researcher, the skippers or the repeaters of a grade are a special topic of study by themselves. Thus, to control this effect, only the non-skippers and non-repeaters of each grade were studied. (Note that the first three groups of subjects—first, third, and fifth grades attended the same school, while the last group of subjects, the seventh graders, belonged to another school in the same county. Since the seventh grade is a part of the junior high school and not the elementary school, there is very little that the
present researcher could do to control this factor.)

Instruments

The instruments or tasks in the present study were based on Flavell's, Piaget's, Witkin's and Karp's previous research.

The Human Figure Drawing

In this task, the subject was simply asked to first draw a "male" figure and then a "female" figure.

The Two-Story Task*

The material of this task consisted of seven paste-board cards, with an average surface area of about twenty to twenty-five square inches. On each card was painted in color a scene in which a boy is the central figure. The descriptions of each card follows:

Card #1 - The boy is walking along the sidewalk, whistling and waving a stick.

Card #2 - The boy looks frightened and drops his stick as he sees a rather ugly looking dog running towards him.

Card #3 - The boys runs, looking anxiously over his shoulder at the dog, who is in hot pursuit.

*This task is taken from Flavell and his associates (1968), TASK ID, page 71.
**Card #4** - The boy is shown running with arms outstretched toward an apple tree laden with fruit. The dog is not shown in the picture and the boy's face (showing fear in the two previous pictures is hidden by a branch of the tree).

**Card #5** - The boy scrambles up the tree, with the dog nipping at his heels.

**Card #6** - The boy is shown standing up in the tree. The dog can be seen across the street, trotting away (he looks smaller in this picture, and with no visible evidence of ferocity). Although the boy's head is partly turned in the dog's direction, he shows no particular emotional expression.

**Card #7** - The boy is seated in the tree, munching on an apple, with the dog no where in sight.

**The Mountain and the Doll**

This task is a modification of Piaget's mountains problem (Piaget and Inhelder, 1956, pp. 210-1).

Three mountains, ranging in height from five inches to twelve inches, were built out of celler-clay on a piece of pasteboard, the surface of which was four hundred and thirty-two inch square (18"x24"). The three mountains varied from one another in size, shape, color, height, and
the objects on the mountain tops. The shortest mountain was green in color, it was about five inches tall, and it had a house on the top of it. The tallest mountain was grey in color, about twelve inches tall, and had a white snow cap on its top. The brown mountain was in between the green and the grey ones in height, and it had a cross on the top of it.

The doll that was used in the task was a regular "Raggady-Andy" doll that could be purchased in a child's toy department.

The Children Embedded Figures Test

The Children Embedded Figures Test (CEPT) was devised by Stephen A. Karp and Normal L. Konstadt, copyright 1963 by Cognitive Tests, P.O. Box 4, Vanderveer Station, Brooklyn 10, New York.

This test grew out of the theoretical background and empirical research of Witkin and his associates (1962) on the broad dimension of individual functioning called psychological differentiation. One of the tests that Witkin used as a measurement of differentiation was the Embedded Figures Test (EFT). This instrument, though, proved to be unsuitable for young children.

In response to this limitation, Goodenough and Eagle (1963) developed a children's version of Witkin's EFT,
called CHEF. Although there is considerable evidence for the validity and reliability of this test, its format presented problems which limited the usefulness of this particular test. The test lacked portability and was relatively complex to administer due to the size and weight of the figures.

Karp and Konstadt, with assistance from Goodenough and Witkin, undertook to revise Goodenough and Eagle's CHEF. The final version of this revised test is called the Children's Embedded Figures Test (CEFT).

The CEFT consists of twenty-five test figures with a few demonstration and example figures. The maximum score on the CEFT is twenty-five. The test is designed to be used with children in the age range of five to twelve years.

The internal consistency-reliability of CEFT ranges from .83 to .90. The CEFT correlates with EFT in the magnitude of .83 to .86, suggesting that almost all of the reliable variance of the CEFT may be accounted for by common variance with EFT.

A Tape Recorder

A portable tape recorder was used as a means of storing the material, i.e., the verbal performance of subjects on some tasks.
Procedure

The subjects were given all the tasks to be described in the following section. Each subject was tested individually. The length of time for administering all the tasks ranged from 45 to 80 minutes per child.

The Human Figure Drawing

The subject was given a piece of blank paper and a pencil. He was then asked to write his name on top of the paper and, after that, to draw a "male" figure. He was told to draw the best he could and use all the time he wanted to. After he was finished drawing the "male" figure, he was given another piece of blank paper and asked to draw a "female" figure.

The Mountain and the Doll Task

(The graphical features of the mountains are present in Appendix A). The child was asked to be seated at position A. From this initial position (A), the child sees a green mountain occupying the foreground a little to his right. The summit of this mountain is topped by a little house. To his left he sees a brown mountain, higher than the green one and slightly to its rear. This mountain is distinguished not only by its color, but also by having a red cross at the summit. In the background stands the highest of the three mountains, a grey pyramid whose peak is covered with snow.
The child remained in his initial position during the whole task. The child was asked to study the "view" in front of him carefully and note all the different features of the mountains. He, then, was given a collection of eight pictures, measuring 9x12 inches. These represent the mountains seen from different viewpoints and are painted in the same colors as the model in front of the child. They are clearly distinguishable and are large enough for particular features such as the cross, the house and the snow-capped peak to be easily visible.

The child was asked to select the picture, representing the view he was looking at from position A, out of the collection of pictures given to him.

After he had identified the picture representing his view, the collection of pictures was taken from him. Then the child was given three pieces of cut-out cardboard, shaped and colored the same as each of the mountains in the model. He was, again, asked to arrange the three pieces of cardboard to represent the mountains as seen in his given perspective from position A.

After he had arranged the pieces of cardboard to represent his perspective from position A, "Raggady-Andy" was introduced into the picture. The child was told that he was supposed to play a game with "Raggady-Andy." The examiner placed Raggady-Andy at position C (across from the
child, i.e., across from A) and asked the child to predict what "view" Raggady-Andy could be looking at from position C. The child was given the collection of pictures, and asked to identify Raggady-Andy's view from position C. After the child had done this, he was given the three pieces of cardboard and asked to arrange Raggady-Andy's view of C.

After position C, Raggady-Andy travelled to positions D (left of the child), then to B (right of the child). At each position, D and B, the same procedure, as when Raggady-Andy was at position C, was carried out.

The Children's Embedded Figures Test

The detailed instruction to this task is given in the Manual of CEFT. Briefly, the procedure will be described here.

The child was first taught the concept of "embedding" by going through the discrimination procedure. The examiner was permitted to help the child to find the embedded figure in this section if he had difficulty. As the child proceeded, he was told that the "figure" would become more and more hidden. The child was supposed to learn from the discrimination procedure that the "figure" that he was looking for, need not be of one color, it might be intersected by one or more lines and could be different colors when it was hidden in the "complex figure."
After the discrimination procedure, the child would go through the training procedure, which is similar to the testing procedure but not the same.

Finally, he would go through the testing procedure with no help from the examiner.

The Two-Story Task

"Raggady-Andy" was introduced to the child in the beginning of this task. The child was to suppose that Raggady-Andy was a "person." And, the examiner and the child were going to play a game with Raggady-Andy.

The child was told that in the next few minutes the child and the examiner were going to do "something" that they did not want Raggady-Andy to know. Therefore, Raggady-Andy was taken out of the testing room and put on the chair outside with the door of the testing room closed.

After Raggady-Andy had left the room, the following instructions were given to the child: *

"Raggady-Andy has left the room and he would not be

*To test out this particular instruction, a control group of subjects who were not in the original subject pool, was chosen. Three control subjects were chosen from each of the following grades: 1, 3, 5, and 7. In this control situation, Raggady-Andy was not introduced at all. The control subjects were simply asked to tell a story, based on the seven cards in front of them. Then cards 2, 3, and 5, were taken away, leaving cards #1, #4, #6, and #7. The subjects were then asked to tell another story, basing it on the remaining four cards.
able to see or hear what we are going to do would he? Here is a series of seven pictures which tell a story, just like the comics in the newspaper."

The cards were then placed in proper sequence on the table in front of the child (see Appendix Bl).

"You tell me what's going on. Begin here at the beginning." The examiner pointed at Card #1.

(A tape-recorder was used to help the examiner store all the information given by the child.)

After the child had finished telling the story, based on the seven cards, the examiner said, "That's fine. Now Raggady-Andy has not seen any of these pictures. I'm going to go and bring him back into the room and show him just these four pictures (cards #2, #3, and #5 were taken away, leaving only cards #1, #4, #6, and #7, see Appendix B2). I want you to pretend you are he and tell me the story that you think he would tell."

The examiner, then, went out and brought Raggady-Andy back into the testing room.

The examiner then asked the child, "What story would these pictures tell Raggady-Andy?"

After the child had finished telling Raggady-Andy's version of the story, if he failed to clarify the following matters spontaneously in the course of his story, he was asked: "Why does Raggady-Andy think the boy climbed the
tree?" Or: "What does Raggady-Andy think about the dog there (Card #6), what does Raggady-Andy think the dog is there for?"

**Selling a Necktie Task**

The child was given the following instructions:

"Suppose you were on one of those TV programs where they give away prizes for doing funny things. Suppose the thing you had to try to do is to sell a necktie to a man. If you sell him this particular tie, you'll get a prize of five dollars on the TV program. But, of course, this man doesn't know that and you can't tell him. But since you want the money you would try just as hard as you could to talk him into buying the tie, you would say *everything* you can think of to talk him into buying it. So here's the man just coming into the room. Go ahead and sell it to him the very best you can."

(A tape recorder was used to help the examiner store the child's verbal performance.)

When the child appeared to have finished, the examiner said: "Is there anything else you can think of to say which might help to make him buy it?"

**Buying a Television Task**

The child was given the following instructions:

"Now suppose you wanted a TV set for your own room
real bad, and you are trying to get your father to buy one for you. Once again, you'll try to use every argument you can think of which might talk him into buying it for you. Go ahead and try to talk him into it."

(A tape recorder was used to help the examiner store the child's verbal performance.)

When the child appeared to have finished, the examiner said: "Is there anything else you can think of to say which might help to make him buy it?"

**The Rating of Subjects**

The researcher in this study administered all the tasks, previously mentioned, to the subjects herself. Since she had interacted with the subjects personally and knew to which groups they belonged, it was more objective for other people to take the role of judges in rating these children's performances. These people who served as judges in the present study did not know any specific details of the research design or hypotheses concerning the study.

**The Judges**

There were four judges in the present study. There was one Ph.D. psychologist, a second year medical student, a senior in college, and a sophomore in college. The judges did not know any of the subjects in the study. All they knew was the children's performance protocols and
nothing concerning the age, grade, and sex of a particular subject. They knew nothing about what protocols belonged to what child. (The tape was transcribed verbatim, and typed on index cards for the judges. A numerical identification number was placed randomly on each index card by the researcher for scoring purposes.)

The Rating of Protocols

The judges were given only one group of protocols from one task at a time. And, there was no particular order of judging one task before another. The instructions to the judges are given in the following appendixes:

- The Human-Figure Drawing Test - in Appendix C
- The Two-Story Task - in Appendix D
- The Selling a Necktie Task - in Appendix E
- The Buying a Television Task - in Appendix F

The criteria for judging HFDT were taken from Witkin, et al., 1962, and the criteria for judging TST, SANT, and BATT from Flavell, et al., 1968.

The Statistical Analysis

Correlation analyses were done on scores of all tasks within each grade, and across grades. A Student t-test was done on the performance scores for each of the various tasks to test the significance of differences within a task across grades.
The Kendall coefficient of concordance was computed to discern the inter-judge reliability of the four judges, both within each task and as a total across tasks.
CHAPTER IV

RESULTS

In this chapter, the materials to be presented are mainly the subjects' performances on the different tasks and the statistical analysis done on those results. The chapter is divided into the following sections: developmental aspects of the subjects' performances, relationship between different tasks, and the interjudge reliability.

The Developmental Aspects of the Subject's Performance

The subjects' performance on each task will be described and illustrated by figures to show how a particular age-range of subjects perform in relation to subjects in another age-range. The description of the subjects' performances will be carried out, one task at a time.

The Human-Figure-Drawing Task

In the Human-Figure Drawing Task (HFDT), the maximum points that a subject can earn is five and the lowest point possible is one. A subject's final score is the average of how the four judges independently rated his HFDT performance.
The quality of a subject's male and female figure drawings are similar across all four age groups. If a subject drew his male figure in a particular manner, he would also tend to draw his female figure in the same fashion (see Appendix G for illustration). There are no significant differences between the subject's male and female figure drawings across grades ($t = 0.941$, $p = n.s.$).

The performances of the first, third, fifth, and seventh grades are given in Table I and illustrated in Figure 3.

TABLE I

THE FIRST, THIRD, FIFTH, AND SEVENTH GRADERS' MEANS AND STANDARD DEVIATIONS ON THE HUMAN-Figure-DRAWING-TASK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Means of Performance</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1.266</td>
<td>0.324</td>
</tr>
<tr>
<td>Third</td>
<td>1.672</td>
<td>0.489</td>
</tr>
<tr>
<td>Fifth</td>
<td>3.078</td>
<td>0.992</td>
</tr>
<tr>
<td>Seventh</td>
<td>2.729</td>
<td>0.957</td>
</tr>
</tbody>
</table>

The Two-Story Task

The Two-Story Task (TST) consists of the maximum score of four and the minimum of one. A particular subject's final score is the average of the four judges' independent ratings of his TST performance.
FIGURE 3

Performance scores of first, third, fifth, and seventh grades on the Human-Figure-Drawing Task.

The performance scores of the subjects, across grades, are presented in Table II. The graphic illustration of these performances is given in Figure 4.

For the TST, four groups of control subjects—three first graders, three third graders, three fifth graders, and three seventh graders—were administered this task without introducing Raggady-Andy into the picture at any one time. The subjects were simply given the seven cards and asked to tell a story. Three cards were taken away and
TABLE XI

THE FIRST, THIRD, FIFTH, AND SEVENTH GRADERS' MEANS AND STANDARD DEVIATIONS ON THE TWO-STORY TASK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Means of Performance</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>2.490</td>
<td>1.017</td>
</tr>
<tr>
<td>Third</td>
<td>3.156</td>
<td>0.980</td>
</tr>
<tr>
<td>Fifth</td>
<td>3.573</td>
<td>0.724</td>
</tr>
<tr>
<td>Seventh</td>
<td>3.667</td>
<td>0.597</td>
</tr>
</tbody>
</table>

FIGURE 4

Performance scores of first, third, fifth, and seventh grades on the Two-Story Task.
they were asked to tell another story on the remaining four cards.

The control subjects were chosen on the basis of their similarities to the subjects in the main study, e.g., intelligence, socio-economic background, biological sex, the grades they are in, similar performance on the HFDT, etc. The performance scores of these four groups of subjects are not discriminating. That is, the performances of the groups are fairly homogeneous (see Tables XXI and XXII in Appendix H).

The Selling-a-Necktie Task

In Selling-a-Necktie Task (SANT), the subject's performance was judged in three different ways—the number of arguments he presented, the persuasiveness of his sales pitch, and how his message came across to the judges on the rating scale of hard vs. soft sell. A particular subject's score is the total of the three different kinds of ratings mentioned above. His final score is the average of how the four judges independently rated his SANT performance. A subjects maximum or minimum score in SANT depends on the number of arguments he presented, his persuasiveness in his message, and his ability in using a soft or hard sell approach.

The performances of the first, third, fifth, and seventh grades' subjects are presented in Table III, and
FIGURE 6

Performance scores of first, third, fifth, and seventh grades on the Buying-a-Television Task.

The Mountains-and-the-Doll Task

In the Mountains-and-the-Doll Task (MDT), the maximum score that a subject can earn is eight and the minimum score is zero.

Performance scores of the subjects in the first, third, fifth, and seventh grades are presented in Table V
illustrated in Figure 5.

TABLE III
THE FIRST, THIRD, FIFTH, AND SEVENTH GRADE'S PERFORMANCE SCORES ON THE SELLING-A-NECKTIE TASK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Means of Performance</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>3.146</td>
<td>1.073</td>
</tr>
<tr>
<td>Third</td>
<td>5.552</td>
<td>2.958</td>
</tr>
<tr>
<td>Fifth</td>
<td>9.364</td>
<td>2.884</td>
</tr>
<tr>
<td>Seventh</td>
<td>9.885</td>
<td>2.742</td>
</tr>
</tbody>
</table>

FIGURE 5
Performance scores of first, third, fifth, and seventh grades on the Selling-a-Necktie Task.
The Buying-a-Television Task

The Buying-a-Television Task (BATT) is similar to the SANT. The subject's performance on BATT was rated in three different ways—the number of arguments he presented, his persuasiveness in delivering his sales pitch, and his method of using hard vs. soft sell in his message. A subject's score consists of the total on the three different kinds of ratings mentioned. His final score is the average of the four judges' independent ratings of his BATT performance.

Table IV presents the first third, fifth, and seventh graders' performances on BATT. Figure 6 illustrates how a particular grade performs in relation to other grades.

TABLE IV

THE FIRST, THIRD, FIFTH, AND SEVENTH GRADERS' MEANS AND STANDARD DEVIATIONS ON THE BUYING-A-TELEVISION TASK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Means of Performance</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>2.677</td>
<td>0.988</td>
</tr>
<tr>
<td>Third</td>
<td>5.125</td>
<td>2.737</td>
</tr>
<tr>
<td>Fifth</td>
<td>8.073</td>
<td>2.358</td>
</tr>
<tr>
<td>Seventh</td>
<td>9.333</td>
<td>1.867</td>
</tr>
</tbody>
</table>
and each grade's performance in relation to the other grades is illustrated in Figure 7.

TABLE V

THE FIRST, THIRD, FIFTH, AND SEVENTH GRADERS' MEANS AND STANDARD DEVIATIONS ON THE MOUNTAINS-AND-THE-DOLL TASK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Means of Performance</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1.958</td>
<td>1.042</td>
</tr>
<tr>
<td>Third</td>
<td>4.625</td>
<td>1.715</td>
</tr>
<tr>
<td>Fifth</td>
<td>6.208</td>
<td>0.977</td>
</tr>
<tr>
<td>Seventh</td>
<td>6.375</td>
<td>1.377</td>
</tr>
</tbody>
</table>

FIGURE 7

Performance scores of first, third, fifth, and seventh grades on the Mountains-and-the-Doll Task.
For the Children's-Embedded-Figures Test (CEFT), the maximum score that a subject can earn is twenty-five points. The possible minimum score is zero.

The performance scores of the first, third, fifth, and seventh graders' are given in Table VI, and the performance of a particular grade in relation to the other grades is illustrated in Figure 8.

### TABLE VI

<table>
<thead>
<tr>
<th>Grade</th>
<th>Means of Performance</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>11.708</td>
<td>4.667</td>
</tr>
<tr>
<td>Third</td>
<td>16.292</td>
<td>1.715</td>
</tr>
<tr>
<td>Fifth</td>
<td>20.458</td>
<td>3.439</td>
</tr>
<tr>
<td>Seventh</td>
<td>20.875</td>
<td>2.894</td>
</tr>
</tbody>
</table>

The subjects' performance scores tended to increase with age across all tasks. Generally, the differences in performance between the first and third grades, and between the third and fifth grades are significant beyond the level of .01 of confidence across all tasks. But the differences in performance between the fifth and the seventh grades are usually insignificant (see Table VII).
Performance scores of first, third, fifth, and seventh grades on the Children's-Embedded-Figures Test.
### TABLE VII

COMPARISONS AND PERFORMANCE ON HFDT, TST, SANT, BATT, MDT, AND CEFT ACROSS THE FIRST, THIRD, FIFTH, AND SEVENTH GRADES

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>Task</th>
<th>N</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>HFDT</td>
<td>48</td>
<td>3.394</td>
<td>.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>HFDT</td>
<td>49</td>
<td>6.259</td>
<td>.001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>HFDT</td>
<td>50</td>
<td>-1.238</td>
<td>n.s.</td>
</tr>
<tr>
<td>First and Third</td>
<td>TST</td>
<td>48</td>
<td>2.312</td>
<td>.05</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>TST</td>
<td>49</td>
<td>1.776</td>
<td>n.s.</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>TST</td>
<td>50</td>
<td>0.104</td>
<td>n.s.</td>
</tr>
<tr>
<td>First and Third</td>
<td>SANT</td>
<td>48</td>
<td>3.746</td>
<td>.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>SANT</td>
<td>49</td>
<td>4.673</td>
<td>.001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>SANT</td>
<td>50</td>
<td>0.723</td>
<td>n.s.</td>
</tr>
<tr>
<td>First and Third</td>
<td>BATT</td>
<td>48</td>
<td>4.122</td>
<td>.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>BATT</td>
<td>49</td>
<td>4.078</td>
<td>.001</td>
</tr>
<tr>
<td>First and Third</td>
<td>MDT</td>
<td>48</td>
<td>6.511</td>
<td>.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>MDT</td>
<td>49</td>
<td>4.080</td>
<td>.001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>MDT</td>
<td>50</td>
<td>0.591</td>
<td>n.s.</td>
</tr>
<tr>
<td>First and Third</td>
<td>CEFT</td>
<td>48</td>
<td>3.292</td>
<td>.01</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>CEFT</td>
<td>49</td>
<td>3.395</td>
<td>.01</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>CEFT</td>
<td>50</td>
<td>0.544</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

*n.s. stands for not significant

Table VIII presents the correlations between age and the six tasks. The evidence indicates that there is a significant increase in the performance of HFDT, TST, SANT, BATT, MDT, and CEFT with age.
### TABLE VIII
THE RELATIONSHIPS OF HFDT, TST, SANT, BATT, MDT, AND CEFT WITH CHRONOLOGICAL AGE

<table>
<thead>
<tr>
<th>Task</th>
<th>Correlations</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFDT</td>
<td>0.61009</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>TST</td>
<td>0.43019</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SANT</td>
<td>0.73277</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>BATT</td>
<td>0.78263</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>MDT</td>
<td>0.76005</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CEFT</td>
<td>0.63479</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

N=98

In the following section, the relationship between tasks will be presented.

**The Relationship Between Tasks**

In this section, the statistical relationships between tasks will be dealt with. Since there are four different groups of subjects—first, third, fifth, and seventh grades—the statistical analysis concerning the relationships between tasks will be presented one grade at a time.
The Relationships Between TST, SANT, BATT, and MDT

The First Grade—The relationships between TST, SANT, BATT, and MDT are presented in Table IX. There are no significant relationships between the role-playing tasks.

### Table IX

THE INTERCORRELATIONS OF TST, SANT, BATT, AND MDT IN THE FIRST GRADE

<table>
<thead>
<tr>
<th>Tasks</th>
<th>TST</th>
<th>SANT</th>
<th>BATT</th>
<th>MDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST</td>
<td>1.00000</td>
<td>-0.03837</td>
<td>0.11279</td>
<td>0.07136</td>
</tr>
<tr>
<td>SANT</td>
<td>1.00000</td>
<td>0.28992</td>
<td></td>
<td>0.20985</td>
</tr>
<tr>
<td>BATT</td>
<td></td>
<td>1.00000</td>
<td>0.29274</td>
<td></td>
</tr>
<tr>
<td>MDT</td>
<td></td>
<td></td>
<td>1.00000</td>
<td></td>
</tr>
</tbody>
</table>

N=24

The Third Grade—There are significant relationships between TST and MDT, and between BATT and SANT (p < .05 and p < .01, respectively). The information on the correlations between tasks is given in Table X.

The Fifth Grade—There is significant relationship between BATT and SANT in the fifth grades (p < .05). Table XI gives the complete information on the correlations between tasks in this grade.
TABLE X
THE INTERCORRELATIONS OF TST, SANT, BATT, AND MDT IN THE THIRD GRADE

<table>
<thead>
<tr>
<th>Tasks</th>
<th>TST</th>
<th>SANT</th>
<th>BATT</th>
<th>MDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST</td>
<td>1.00000</td>
<td>0.17981</td>
<td>0.05723</td>
<td>0.41790*</td>
</tr>
<tr>
<td>SANT</td>
<td>1.00000</td>
<td>0.50370**</td>
<td>0.15831</td>
<td></td>
</tr>
<tr>
<td>BATT</td>
<td></td>
<td></td>
<td>-0.12393</td>
<td></td>
</tr>
<tr>
<td>MDT</td>
<td></td>
<td></td>
<td></td>
<td>1.00000</td>
</tr>
</tbody>
</table>

*p < .05; N=24

**p < .01.

TABLE XI
THE INTERCORRELATIONS OF TST, SANT, BATT, AND MDT IN THE FIFTH GRADE

<table>
<thead>
<tr>
<th>Tasks</th>
<th>TST</th>
<th>SANT</th>
<th>BATT</th>
<th>MDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST</td>
<td>1.00000</td>
<td>0.15415</td>
<td>0.33408</td>
<td>-0.07765</td>
</tr>
<tr>
<td>SANT</td>
<td>1.00000</td>
<td></td>
<td>0.42001*</td>
<td>0.00348</td>
</tr>
<tr>
<td>BATT</td>
<td></td>
<td>1.00000</td>
<td></td>
<td>0.08990</td>
</tr>
<tr>
<td>MDT</td>
<td></td>
<td></td>
<td></td>
<td>1.00000</td>
</tr>
</tbody>
</table>

*p < .05; N=25

The Seventh Grade—The relationships between TST, SANT, BATT, and MDT in the seventh grade do not reach a significant level. The highest correlations are between BATT and SANT, MDT and SANT, and BATT and MDT. But, they
do not reach the level of significance (see Table XII).

**TABLE XII**

THE INTERCORRELATIONS OF TST, SANT, BATT, AND MDT IN THE SEVENTH GRADE

<table>
<thead>
<tr>
<th>Tasks</th>
<th>TST</th>
<th>SANT</th>
<th>BATT</th>
<th>MDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST</td>
<td>1.00000</td>
<td>0.18238</td>
<td>0.01811</td>
<td>0.08276</td>
</tr>
<tr>
<td>SANT</td>
<td>1.00000</td>
<td>0.25247</td>
<td>0.24569</td>
<td></td>
</tr>
<tr>
<td>BATT</td>
<td>1.00000</td>
<td>0.24009</td>
<td>0.24009</td>
<td></td>
</tr>
<tr>
<td>MDT</td>
<td>1.00000</td>
<td>0.08276</td>
<td>0.24009</td>
<td>1.00000</td>
</tr>
</tbody>
</table>

N=25

Figure 9 illustrates the relationships between the four role-playing tasks across grades. Table XIII reports the relationships between the four role-playing tasks with four grades combined, and with chronological age and metal age partialled out.

**The Relationships Between the Differentiation (Cognitive Style) Tasks and the Role-Playing Tasks**

The HFDT and the CEFT are the two tasks that are based on the theory of differentiation, while TST, SANT, BATT, and MDT measure egocentrism. The relationships between the two sets of tasks will be presented in two sub-sections, across grades.
The relationship of SANT-BATT, BATT-MDT, SANT-MDT, TST-SANT, TST-MDT, and TST-BATT across grades.
TABLE XIII

THE INTERCORRELATIONS OF THE FOUR ROLE-PLAYING TASKS—TST, SANT, BATT, AND MDT—WITH ALL FOUR GRADES COMBINED

<table>
<thead>
<tr>
<th>Task</th>
<th>Correlations</th>
<th>p-value</th>
<th>Correlations with age partialed out</th>
<th>p-value</th>
<th>Correlations with M.A. partialed out</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST &amp; SANT</td>
<td>0.42319</td>
<td>&lt; .001</td>
<td>0.17714</td>
<td>n.s.</td>
<td>0.17547</td>
<td>n.s.</td>
</tr>
<tr>
<td>TST &amp; BATT</td>
<td>0.42814</td>
<td>&lt; .001</td>
<td>0.16419</td>
<td>n.s.</td>
<td>0.16254</td>
<td>n.s.</td>
</tr>
<tr>
<td>TST &amp; MDT</td>
<td>0.47735</td>
<td>&lt; .001</td>
<td>0.25660</td>
<td>&lt; .02</td>
<td>0.23112</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>SANT &amp; BATT</td>
<td>0.75079</td>
<td>&lt; .001</td>
<td>0.42420</td>
<td>&lt; .001</td>
<td>0.54960</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SANT &amp; MDT</td>
<td>0.64917</td>
<td>&lt; .001</td>
<td>0.21240</td>
<td>&lt; .05</td>
<td>0.35070</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>BATT &amp; MDT</td>
<td>0.63896</td>
<td>&lt; .001</td>
<td>0.16330</td>
<td>n.s.</td>
<td>0.29245</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>

N=98
The Relationships Between HFDT and the Role-Playing Tasks—There is significant relationship between HFDT and MDT in the first grade (p<.05). There is no significant correlation between the HFDT and any of the role-playing tasks in the third and seventh grades. In the fifth grade, there are significant correlations between HFDT-SANT, and HFDT-BATT (p<.05; p<.01, respectively). But, there are significant relationships between HFDT-TST, HFDT-SANT, HFDT-BATT, and HFDT-MDT in the four grades combined (see Table XIV and Figure 10).

<table>
<thead>
<tr>
<th>Grade</th>
<th>N</th>
<th>HFDT TST</th>
<th>HFDT SANT</th>
<th>HFDT BATT</th>
<th>HFDT MDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>24</td>
<td>-0.20962</td>
<td>0.12988</td>
<td>0.29679</td>
<td>0.40444*</td>
</tr>
<tr>
<td>Third</td>
<td>24</td>
<td>0.14569</td>
<td>0.20875</td>
<td>0.04825</td>
<td>0.02837</td>
</tr>
<tr>
<td>Fifth</td>
<td>25</td>
<td>0.30240</td>
<td>0.41518*</td>
<td>0.55794**</td>
<td>0.28716</td>
</tr>
<tr>
<td>Seventh</td>
<td>25</td>
<td>0.30635</td>
<td>0.07289</td>
<td>0.13689</td>
<td>0.12475</td>
</tr>
<tr>
<td>Combined</td>
<td>98</td>
<td>0.41350***</td>
<td>0.62168***</td>
<td>0.63981***</td>
<td>0.59424***</td>
</tr>
</tbody>
</table>

*p<.05
**p<.01
***p<.001
The relationships of HFDT-TST, HFDT-BATT, HFDT-MDT, and HFDT-SANT across grades
The Relationships Between CEFT and the Role-Playing Tasks—There is no significant correlation between the CEFT and any of the role-playing tasks in the first, third, and fifth grades. The two significant correlations in the seventh grade are between CEFT and TST and between CEFT and MDT (p<.05, and p<.01, respectively) (Table XV and Figure 11). There are significant correlations between CEFT and the four role-playing tasks when all grades are combined (Table XVI).

**TABLE XV**

THE RELATIONSHIPS BETWEEN CEFT AND TST, SANT, BATT, AND MDT IN THE FIRST, THIRD, FIFTH, AND SEVENTH GRADES

<table>
<thead>
<tr>
<th>Grade</th>
<th>N</th>
<th>CEFT TST</th>
<th>CEFT SANT</th>
<th>CEFT BATT</th>
<th>CEFT MDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>24</td>
<td>-0.28680</td>
<td>0.04359</td>
<td>0.25694</td>
<td>0.11365</td>
</tr>
<tr>
<td>Third</td>
<td>24</td>
<td>-0.12791</td>
<td>-0.12446</td>
<td>-0.17050</td>
<td>0.35495</td>
</tr>
<tr>
<td>Fifth</td>
<td>25</td>
<td>-0.11485</td>
<td>0.04360</td>
<td>0.06167</td>
<td>0.27473</td>
</tr>
<tr>
<td>Seventh</td>
<td>25</td>
<td>0.43747*</td>
<td>-0.02302</td>
<td>0.21725</td>
<td>0.54523**</td>
</tr>
<tr>
<td>Combined</td>
<td>98</td>
<td>0.25835**</td>
<td>0.49066***</td>
<td>0.53672***</td>
<td>0.68422***</td>
</tr>
</tbody>
</table>

*p<.05  
**p<.01  
***p<.001

The relationships between the cognitive-style tasks and the role-playing tasks with the four grades combined are presented in Table XVI, with chronological age and mental age partialed out.
The relationship of CEFT-MDT, CEFT-TST, CEFT-BATT, CEFT-HFDT, and CEFT-SANT across grades.
TABLE XVI

THE RELATIONSHIPS BETWEEN COGNITIVE-STYLE TASKS, HFDT AND CEFT, AND ROLE-PLAYING TASKS, TST, SANT BATT, AND MDT, WITH FOUR GRADES COMBINED

<table>
<thead>
<tr>
<th>Task</th>
<th>Correlations</th>
<th>p-value</th>
<th>Correlations with age partialed out</th>
<th>p-value</th>
<th>Correlations with M.A. partialed out</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFDT &amp; TST</td>
<td>0.41350</td>
<td>&lt; .001</td>
<td>0.21137</td>
<td>&lt; .05</td>
<td>0.06338</td>
<td>n.s.</td>
</tr>
<tr>
<td>HFDT &amp; SANT</td>
<td>0.62168</td>
<td>&lt; .001</td>
<td>0.32571</td>
<td>&lt; .01</td>
<td>0.02135</td>
<td>n.s.</td>
</tr>
<tr>
<td>HFDT &amp; BATT</td>
<td>0.63918</td>
<td>&lt; .001</td>
<td>0.33079</td>
<td>&lt; .001</td>
<td>0.03241</td>
<td>n.s.</td>
</tr>
<tr>
<td>HFDT &amp; MDT</td>
<td>0.59424</td>
<td>&lt; .001</td>
<td>0.25367</td>
<td>&lt; .02</td>
<td>0.01299</td>
<td>n.s.</td>
</tr>
<tr>
<td>CEFT &amp; TST</td>
<td>0.25835</td>
<td>&lt; .01</td>
<td>0.01790</td>
<td>n.s.</td>
<td>0.00315</td>
<td>n.s.</td>
</tr>
<tr>
<td>CEFT &amp; SANT</td>
<td>0.49066</td>
<td>&lt; .001</td>
<td>0.05796</td>
<td>n.s.</td>
<td>0.20983</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>CEFT &amp; BATT</td>
<td>0.53672</td>
<td>&lt; .001</td>
<td>0.09327</td>
<td>n.s.</td>
<td>0.26012</td>
<td>&lt; .02</td>
</tr>
<tr>
<td>CEFT &amp; MDT</td>
<td>0.68422</td>
<td>&lt; .001</td>
<td>0.40706</td>
<td>&lt; .001</td>
<td>0.49940</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

N=98
In the next section the relationship between HFDT and CEFT will be examined.

The Correlation Between HFDT and CEFT

The HFDT and CEFT are significantly correlated with each other only in the first grade ($p<.05$). Although there is a consistent relationship between HFDT and CEFT in the third, fifth, and seventh grades, the size of the correlation does not reach the level of significance (see Table XVII). The relationship between HFDT and CEFT is highly significant in the four grades combined.

**TABLE XVII**

The Relationship Between HFDT and CEFT in the First, Third, Fifth, and Seventh Grades

<table>
<thead>
<tr>
<th>Grade</th>
<th>N</th>
<th>HFDT and CEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>24</td>
<td>0.42712*</td>
</tr>
<tr>
<td>Third</td>
<td>24</td>
<td>0.16628</td>
</tr>
<tr>
<td>Fifth</td>
<td>25</td>
<td>0.32757</td>
</tr>
<tr>
<td>Seventh</td>
<td>25</td>
<td>0.19099</td>
</tr>
<tr>
<td>Combined</td>
<td>98</td>
<td>0.63479***</td>
</tr>
</tbody>
</table>

* $p<.05$; *** $p<.001$
Table XVIII relates the relationship between HFDT and CEFT with chronological age and mental age partialed out.

**TABLE XVIII**

THE RELATIONSHIP BETWEEN THE TWO COGNITIVE-STYLE TASKS, HFDT AND CEFT, WITH ALL GRADES COMBINED

<table>
<thead>
<tr>
<th>Task</th>
<th>Correlation with age partialed out</th>
<th>p-value</th>
<th>Correlation with M.A. partialed out</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFDT &amp; CEFT</td>
<td>0.63479</td>
<td>&lt;.001</td>
<td>0.40710</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

N=98

The interjudge reliability will be presented in the following section.

The Interjudge Reliabilities

The information concerning the reliabilities of the four judges' ratings on the HFDT, TST, SANT, and BATT is given in Table XIX. On the judges' ratings of the subjects' performances on these tasks there is a high degree of interjudge reliability (p<.001).
TABLE XIX
THE INTERJUDGE RELIABILITIES ON HFDT, TST, SANT, AND BATT ACROSS GRADES

<table>
<thead>
<tr>
<th>Grade</th>
<th>No. of Ss</th>
<th>No. of Judges</th>
<th>Reliability</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFDT</td>
<td>98</td>
<td>4</td>
<td>0.810</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>TST</td>
<td>98</td>
<td>4</td>
<td>0.840</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SANT</td>
<td>98</td>
<td>4</td>
<td>0.770</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>BATT</td>
<td>98</td>
<td>4</td>
<td>0.800</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Summary

The performance scores of the subjects increase significantly with age. There are significant differences between the performances of the first and third, third and fifth grades across all tasks. And, generally, the differences in performances between the fifth and the seventh grades are not significant across all tasks, although the seventh graders usually scored higher than the fifth graders.

The relationships of the HFDT and CEFT with the TST, SANT, BATT, and MDT are significant for some grades and not for others. The patterns are irregular. The HFDT and CEFT are significantly correlated with each other only in the first grade. Although all correlations between tasks are significant in the combined group, after the
chronological age and mental age are partialed out the size of correlations is highly reduced.

The interjudge reliabilities are significant across all tasks and across all grades ($p < .001$).

In the next chapter, the writer will discuss and interpret the results presented in this chapter.
CHAPTER V

DISCUSSION

The statistical analysis of the subjects' performance was presented in the previous chapter. The present chapter is concerned with the interpretation of the analysis done on the data. The results of the data analysis will be discussed in relation to the hypotheses made in Chapter I. The hypotheses will be presented one at a time.

The Hypotheses

The order of the hypotheses to be discussed will follow that order in which they were formulated in Chapter I.

Hypothesis (1)

It was hypothesized that role-playing ability will be significantly correlated with the ability to overcome visual embedding context.

The tasks that were used to measure the role-playing ability are the TST, SANT, BATT, and MDT, and the task that was used to measure the ability to overcome visual embedding context is the CEFT. The relationship of the CEFT

133
with the TST, SANT, BATT, and MDT is presented in Tables XV and XVI.

The CEFT is significantly related to the TST and MDT only in the seventh grade, \( r = 0.437 \) and \( r = 0.545 \) (\( p < .05; p < .01 \), respectively). When the first, third, fifth, and seventh grades are combined, the correlations between CEFT-TST, CEFT-SANT, CEFT-BATT, and CEFT-MDT are significant beyond the .01 level of confidence (Table XV). However, when the chronological age and mental age factors are partialed out, only the relationship between CEFT-MDT remains significant (\( p < .001 \)) (see Table XVI).

The evidence indicates that the relationship between role-playing ability and the ability to overcome visual embedding context tends to hold for only MDT-CEFT, and not for TST-CEFT, SANT-CEFT, and BATT-CEFT. The relationships between CEFT-TST, CEFT-SANT, and CEFT-BATT could mostly be explained by either the chronological age or mental age factor. Therefore, hypothesis (1) is partially confirmed (i.e., only in the relationship between MDT-CEFT).

Hypothesis (2)

It was hypothesized that role-playing ability would be significantly correlated with the sophistication of body concept.

The HFDT is used as a measure of the sophistication of body concept (the definition of "sophistication of body
concept" is given in Appendix C), and the TST, SANT, BATT, and MDT are used as the measures of the role-playing ability. The relationship of the HFDT with the TST, SANT, BATT, and MDT is presented in Tables XIV and XVI.

There are significant relationships between HFDT-MDT, \( r=0.404 \), in the first grade \( (p < .05) \), HFDT-SANT and HFDT-BATT, \( r=0.415 \) and \( r=0.557 \) \( (p < .05; \ p < .01, \text{ respectively}) \), in the fifth grade. The correlations between HFDT-TST, HFDT-SANT, HFDT-BATT, and HFDT-MDT in the four grades combined are significant, \( p < .001 \) (see Table XIV). When the chronological age factor is partialed out, the relationships between HFDT and the four role-playing tasks remain significant (Table XVI). But, when the factor of mental age is partialed out, none of the relationships between HFDT and the four role-playing tasks are significant (Table XVI).

The data tend to point to the fact that the relationships between the HFDT and the four role-playing tasks are mostly explained by the mental age factor. The present writer takes this as an evidence for disconfirming hypothesis (2).

Hypothesis (3)

It was hypothesized that role-playing ability in one task setting would be significantly related to the role-playing ability in another task setting, i.e., role-playing
is not task specific but an ability which underlies all tasks which require role-playing ability.

The tasks that are employed to measure the role-playing ability in this study are the TST, SANT, BATT, and MDT. It is observed that there is no uniform relationship between the TST, SANT, BATT, and MDT across the first, third, fifth, and seventh grades (Tables IX, X, XI, XII). The most consistent relationship is found between SANT and BATT, but the correlation is significant only in the third and fifth grades, $r=0.503$ and $r=0.420$ ($p < .01$; $p < .05$, respectively) (Tables X, XI). Another significant correlation is noted between TST and MDT, $r=0.417$, in the third grade, $p < .05$ (Table X).

All the intercorrelations between TST, SANT, BATT, and MDT are significant ($p < .001$) when the four grades are combined (Table XIII). However, the correlations between TST-SANT, TST-BATT, and BATT-MDT appear to be the function of either chronological age or mental age (Table XIII). After the chronological age and mental age factors are partialed out, only the relationships between TST-MDT, SANT-BATT, and SANT-MDT remain significant (Table XIII).

There appear to be significant relationships between TST-MDT, SANT-BATT, and SANT-MDT, and not between TST-SANT, TST-BATT, and BATT-MDT. Thus, hypothesis (3) is only partly confirmed.
Hypothesis (4)

It was hypothesized that role-playing ability would increase significantly with age.

The performance scores of the first third, fifth, and seventh grades increased with age in all the role-playing tasks (Tables II, III, IV, V). There are generally significant differences in the performance between the first-third, and third-fifth grades, but the differences in performance between the fifth and seventh grades are not significant (Table VII). The curves of performance in TST ($r=0.430$), SANT ($r=0.732$), BATT ($r=0.782$), and MDT ($r=0.760$) are significantly related to age, $p < .001$ (see Table VIII).

The present writer takes this as an evidence indicating that role-playing ability (as measured in TST, SANT, BATT, and MDT) increases significantly with age.

Hypothesis (5)

It was hypothesized that the ability to overcome visual embedding context would increase significantly with age.

The performance scores of the subjects in CEFT increased with age (Table VI). There are significant differences in the performance between the first-third, third-fifth, but not between the fifth-seventh grades (Table VII). However, the curve of performance in CEFT is highly
related to age, $r=0.634$ ($p < .001$). Thus, hypothesis (5) is confirmed.

**Hypothesis (6)**

It was hypothesized that the body concept would become more sophisticated with age.

Table I presents the performance scores of the subjects. The subjects earn higher scores with age, except in the seventh grade. The differences in performance are significant in the first-third, third-fifth, but not in the fifth-seventh grades (Table VII). The HFDT is highly related to age, $r=0.610$, $p < .001$ (Table VIII). Thus, the performance curve of HFDT tend to illustrate that the body concept becomes significantly more sophisticated with age. Hypothesis (6) is confirmed.

**Hypothesis (7)**

It was hypothesized that the ability to overcome visual embedding context is significantly related to the sophistication of body concept.

When the relationship between CEFT and HFDT is examined from grade to grade, their relationship is significant only in the first grade, $r=0.427$, $p < .05$ (Table XVII). However, the correlation between HFDT and CEFT, when the four grades are combined, is significant ($r=0.634$) beyond the .001 level of confidence (Table XVII).
And, when the factors of chronological age and mental age are partialed out, the relationship between HFDT and CEFT remains significant (Table XVIII). The present writer takes this as an evidence supporting hypothesis (7).

In the above section, the results of this study have been discussed in relation to the seven hypotheses. The interpretation of these results will be presented in the following section.

Interpretation of the Results

The results of this study will be discussed and interpreted in relation to the hypotheses and theories already discussed.

The Relationship between the Concepts of Differentiation and Egocentrism

Hypotheses (1) and (2) state, in brief, that there is a positive relationship between the development of differentiation and the development of intelligent thought or the decline of egocentrism, HFDT and CEFT are used as the measurement of the development of psychological differentiation. The decline of egocentrism or the development of role-playing ability is measured by four different tasks—TST, SANT, BATT, and MDT.

Figures 10 and 11 demonstrate the observation that there is no uniform pattern of relationships between the
two cognitive-style (differentiation) tasks and the four role-playing (decline of egocentrism) tasks across the four different age groups. The pattern and size of the correlations between these two categories of tasks vary from grade to grade. Although all the correlations between the cognitive-style tasks and the role-playing tasks, when the four grades are combined, are significant, it is found that the chronological age and mental age are the main contributory factors in most cases. Only the relationship between CEFT-MDT remains significant after chronological age and mental age are partialled out. Therefore, the relationship between the development of psychological differentiation and the decline of egocentrism appears to lie in the relationship between CEFT and MDT.

The evidence tends to indicate that TST, SANT, and BATT do not measure the same "process" as what the HFDT and CEFT have shown to measure. That is, they do not seem to belong to the factor of analytic-field approach. Since the structure of the tasks—TST, SANT, and BATT—is highly verbal in character, at least on the theoretical level, the present writer suspects that these three role-playing tasks would load heavily with the verbal index (this is referring to the three factors extracted from various intelligence tests by Goodenough and Karp, 1961).

The correlation between CEFT and MDT indicates that
there is a relationship between the ability to overcome visual embedding context (one of the measurements of differentiation) and the decline of egocentrism. However, there is no indication in the present study relating the relationship between the sophistication of body concept and the decline of egocentrism.

The CEFT and MDT appear to be measuring a similar "function" in the subjects. The MDT is spatial in structure and, perhaps, similar "processes" may be called for to perform in the MDT as in the CEFT.

The Relationship between the Role-playing Tasks

Hypothesis (3) predicted that there is a relationship between the role-playing tasks. Although a relationship is noted between the role-playing tasks, there is no uniform pattern of relationships across grades. The pattern of relationships between the role-playing tasks tend to be the function of age of the subjects and the particular structure of the tasks involved (Figure 9).

Significant relationships between SANT-BATT and TST-MDT are noted in the third grade, and SANT-BATT in the fifth grade (Tables X, XI). The correlations between the role-playing tasks do not reach the significant level in the first or seventh grades. However, the correlations between these four role-playing tasks are significant, when the
four grades are combined (Table XIII). But, the chronological age and the mental age factors could explain most of these correlations, except in the cases of TST-MDT, SANT-BATT, and the SANT-MDT.

The relationship between SANT and BATT remains significant (p < .001) after the chronological age and mental age are partialled out. The SANT and BATT are highly similar in structure (see Chapter III). Therefore, one would expect a high correlation between them. The TST, MDT, and SANT are not similar in their structures to each other, thus, the significant relationships between TST-MDT and SANT-MDT tend to lend some support to hypothesis (3) that role-playing ability may not be a task-specific ability but a general ability underlying some, if not all, role-playing tasks.

The Increment of Performance with Age

Hypotheses (4), (5), and (6) stated that the performance of the subject would increase significantly with age. The curves of performance in HFDT, TST, SANT, BATT, MDT, and CEFT are highly related to chronological age, with p < .001 (Table VIII). This observation lends support to the hypotheses that the subjects' performance increases significantly with age in the six tasks employed in the present study. The implication is that the performance in
role-playing ability increases with age, the ability to overcome visual embedding context increases with age, and the sophistication of body concept increases with age.

The Relationship between the Two Tasks Measuring Psychological Differentiation

Hypothesis (7) predicted that there is a relationship between CEFT and HFDT. Although CEFT was constructed on the basis of EFT (Witkin, et al., 1962) and the CHEF (Goodenough and Eagle, 1963), its relationship to the variables that EFT and CHEF are related to has not yet been clearly established (e.g., the HFDT and TAT).

The sophistication of body concept was measured by the independent ratings of the subject's drawings by four judges. The criteria of "what" is a primitive or sophisticated body concept is defined in Appendix C (the instructions to the judges for ratings the subject's drawings).

There is no regular or uniform pattern of relationship between these two tasks across grades (Table XVII). When the four grades are combined, however, significant relationship between CEFT and HFDT is observed, even after the factors of chronological age and mental age are partialed out (Table XVIII). The present writer takes this as an evidence supporting the hypothesis that the articulation of body concept is related to the ability to overcome visual embedding context.
Conclusion

The relationship between the development of psychological differentiation, as measured by CEFT and HFDT, and the development of role-playing ability or the decline of egocentrism, as measured by TST, SANT, BATT, and MDT, appears to be substantiated only the case of CEFT-MDT. The correlations between CEFT-TST, CEFT-SANT, CEFT-BATT, HFDT-TST, HFDT-SANT, HFDT-BATT, and HFDT-MDT are explainable mostly by either the factor of chronological age or mental age.

There is a relationship between some role-playing tasks, i.e., TST-MDT, SANT-BATT, and SANT-MDT, in the present study. Although the similarity of the structure of the tasks involved contributes to the size of the correlation between tasks (as seen in the case of SANT-BATT), the relationships between TST-MDT and SANT-MDT tend to bear witness to the assertion that role-playing ability may not be a task-specific ability. But, the root of the relationship between the various role-playing tasks remains complicated and awaits the future research to shed light on it.

The performance of the subjects in tasks studied--HFDT, TST, SANT, BATT, MDT, and CEFT--increases significantly with age. However, the highest age of significant increases in the performance varies with the structure of
the task, i.e., the easiness or difficulty of the task in question. For example, the subjects' performance in TST usually came to the ceiling of performance at an earlier age than in MDT or CEFT.

A significant relationship is observed between the CEFT and HFDT. Yet, if one looks at the relationship between CEFT and HFDT in each grade, no uniform pattern of relationship could be found.

The irregular pattern of relationships found in the intercorrelations between the HFDT, TST, SANT, BATT, MDT, and CEFT from grade to grade might be accounted for by several explanations—the individual differences of the subjects or the function of age or both. By the function of age, the present writer means that these six tasks cluster or change their relationship with each other from grade to grade. The by-product of this event is observed in the irregular pattern of relationship noted. However, this particular interaction is not easy to interpret in the present study since this study is a cross-sectional one in design and not a longitudinal one.

Five main conclusions may be drawn from this study. They follow: First, the relationship between psychological differentiation and role-playing ability appears to be illustrated only in the relationship between CEFT and MDT. There is no relationship between the development of
sophistication of body concept and the development of role-playing ability in the present study. Second, role-playing ability might not be a task-specific ability but a general ability underlying some role-playing tasks. However, the "how" and "why" two role-playing tasks are related to each other remain to be researched. Third, the performance of the subjects in HFDT, TST, SANT, HATT, MDT, and CEFT increases significantly with age. Fourth, there is a significant relationship between the ability to overcome visual embedding context and the sophistication of body concept. And, fifth, when the relationship between any pair of tasks, employed in this study, is examined from grade to grade, no uniform pattern of relationship is noted. This observation might be explained by the interaction between the individual differences of the subject and the tasks employed or the interaction between the chronological age of the subject and the tasks employed or both.*

**Implications of the Present Study**

The implications of the present study are more of a theoretical than a practical one. Although it is premature

*The present writer would like to caution the reader to the fact that the subjects in the present study are all males. Therefore, the conclusions drawn in this study are pertaining mainly to male children.
to draw any absolute confirmation of relationship of the development of psychological differentiation (Werner's theory) and the decline of egocentrism or the development of role-playing ability (Piaget's theory), the data in the present study tend to lend support to the relationship between CEFT and MDT (i.e., between the development of visual embedding context and the development of role-playing ability).

The TST, SANT, and BATT do not relate significantly to the cognitive-style (differentiation) tasks. This observation could be hypothesized that performance in these three role-playing tasks are verbal in character. They, therefore, do not relate significantly to the analytic-field approach, but they could relate more to the verbal index. This hypothesis or intuition, however, remains to be tested in a future research project.

Role-playing ability does not appear to be a task-specific ability, but a general ability underlying some role-playing tasks.

The variability of pattern of relationships observed from grade to grade may indicate that relationship between tasks changes as a function of age. Yet, this remains to be investigated in a future research project with a longitudinal design.
CHAPTER VI

SUMMARY

The present research studied the development of psychological differentiation in relation to the decline of egocentrism or the development of role-playing ability. The two major background theories in the study are Heinz Werner's theory of psychological differentiation and Jean Piaget's theory of the decline of egocentrism or the development of intelligent thought.

The problems that were investigated in this study may be broadly divided into four main parts. The first problem was concerned with the relationship between the development of differentiation and the development of role-playing ability, i.e., the decline of egocentrism. It was hypothesized that there is a significant relationship between the development of psychological differentiation and the development of role-playing ability. The second problem dealt with the relationship between the various role-playing tasks. The present writer predicted that there is a relationship between role-playing tasks. That is, it was thought that role-playing ability is not a task specific ability but an ability that underlies role-playing tasks.
The third problem is concerned with the developmental aspects of psychological differentiation and role-playing ability. It was hypothesized that psychological differentiation and role-playing ability would increase with age.

And, the fourth problem dealt with the relationship between the two measures of psychological differentiation. The writer predicted that there is a significant relationship between the two measures of psychological differentiation, i.e., there is a relationship between the ability to overcome visual embedding context and the sophistication of body concept.

The present study is cross-sectional in design, employing four groups of subjects—children in the first, third, fifth, and seventh grades. All the subjects were boys, Caucasian, middle-class, in the normal intelligence range, non-skippers and non-repeaters of any grade.

The tasks that were used in the present study were based on the theoretical backgrounds of Werner and Piaget, and the empirical research of Herman Witkin and John Flavell. The tasks administered to the subjects may be divided into two main categories. The first group of tasks was intended to measure psychological differentiation. There are two tasks belonging to this first category—the Children's-Embedded-Figures Task (CEFT) by Karp and Konstadt (1963), and the Human-Figure-Drawing task (HFDT) by
The second category of tasks is the role-playing tasks intended to measure role-playing ability. There are four different tasks in this group. The Two-Story Task (TST), Selling-a-Necktie Task (SANT) and the Buying-a-Television Task (BATT) were created by Flavell and his associates (1968) as measures of role-playing ability in their subjects. The fourth task is the Mountain-and-the-Doll Task (MDT) which is a modification of Piaget and Inhelder's (1956) the Mountain-and-the-Doll experiment.

The subjects were tested by the present writer. Their performances were rated by four different judges who did not know the subjects in the study nor had any specific information about the subjects other than that the subjects were a group of children being studied. The criteria for rating the subjects' performance on all tasks were provided for the judges. And, the judges independently rated the subjects' performances. A subject's performance score for a particular task was the average of the four judges' ratings.

The subjects' performance may be discussed in relation to the four broad problems studied. The first problem is concerned with the relationship between the development of psychological differentiation and the development of role-playing ability. The relationship between these two
phenomena is illustrated only in the relationship between CEFT and MDT. The other role-playing tasks—TST, SANT, and BATT—do not appear to relate significantly to the cognitive-style (differentiation) tasks—HFDT and CEFT. No relationship is also observed between the sophistication of body concept and the role-playing ability. It is noted that a particular pattern of relationship between the cognitive-style (differentiation) task and the role-playing task found in a particular grade does not necessarily imply the same pattern of relationship between those two tasks in another grade.

The second problem dealt with the relationships between the role-playing tasks. The performance of the subjects tended to indicate that there is a general ability underlying the performance of some role-playing tasks, i.e., between TST-MDT, SANT-BATT, and SANT-MDT. The size of the correlation between any two role-playing tasks seem to be a function of the similarity of the structure of the tasks in question. Here, it is noted again that there is no uniform relationship across grades studied. The pattern of relationship between the role-playing tasks varied from grade to grade.

The third problem is concerned with the developmental aspects of psychological differentiation and the role-playing ability. The scores of the subjects indicate
that there is a significant increase in performance across age and across all tasks studied.

The fourth problem dealt with the relationship between the two tasks measuring psychological differentiation. The data indicate that there is a significant relationship between CEFT and HFDT, implying that there is a relationship between the ability to overcome visual embedding context and the sophistication of body concept. Again, it is observed that the relationship between these two tasks is not uniform across grades. The pattern of the relationship between them varied from grade to grade.

The conclusions that can be drawn about the results of the data are the following. First, there is a significant relationship between the development of psychological differentiation, as being measured by CEFT, and the development of role-playing ability, as being measured by MDT. The data, also, point to the fact that there appears to be no relationship between the sophistication of body concept and the role-playing ability. The relationship that exists between the sophistication of body concept and the role-playing ability is mostly accounted for by the factors of chronological age or mental age or both. Second, the role-playing ability may not be a task-specific ability but an ability which underlies some role-playing tasks employed in this study (as demonstrated in the
relationships between TST-MDT, SANT-BATT, and SANT-MDT). It must be noted that the similarity of the structure of the tasks would contribute to the size of the correlation between the tasks in question, and there is no uniform pattern of relationships between these role-playing tasks when the relationships are scrutinized in each grade.

Third, there is significant increase with age in the subjects' performance in all tasks employed in this study.

Fourth, a significant relationship between the two measures of psychological differentiation is noted. But, the pattern of relationship is not uniform across grades. The pattern of the correlations varies from grade to grade.

And, fifth, the writer would like to call the reader's attention to the observation that there is no uniform pattern of relationships across grades in the tasks employed in the study. The relationship between the tasks appears to change from grade to grade. Thus, the particular relationship between any two tasks at one age level does not necessarily hold true for another age level.

For the present writer, this study offers mainly theoretical implications. This study indicates that there is a relationship between the development of psychological differentiation and the development of role-playing ability. The results also tend to say that there is a relationship between some role-playing tasks employed. However, there
is no uniform relationship between the development of psychological differentiation and the development of role-playing ability or between the role-playing tasks, when the subjects' performance is examined from grade to grade. The relationship tends to vary from grade to grade. Due to the nature of the design of the present study, i.e., cross-sectional, this observation remains to be investigated and interpreted by a longitudinal study.
BIBLIOGRAPHY


---


---

Fiebert, M. S. "Sex differences in cognitive style," Perceptual and Motor Skills, 1967b, 24 (e, pt. 2), 1277-1278.


---


Franks, C. M. "Differences determinées por le personnalité dans la perception visuelle de la verticalité," Revue de psychologie Appliquée, 1956, 1, 235-246.


Gollins, E. S. "Organizational characteristics of social judgment: a developmental investigation," Journal of Personality, 1958, 26, 139-154.


Goodenough, F. L. and Maurer, K. The Mental Growth of Children from Two to Fourteen Years of Age. Minneapolis: University of Minnesota Press, 1942.


Rudin, S. A. "Figure-ground differentiation under different perceptual sets," Perceptual and Motor Skills, 1968, 27, 71-77.

Sangiuliano, I. A. "An investigation of the relationship between the perception of the upright in space and several factors in personality organization," Ph.D. dissertation, Fordham University, 1951.


_____. "The concept of development from a comparative and organismic point of view," in Harris, D., **The Concept of Development: An issue in the study of human behavior.** Minneapolis: University of Minnesota Press, 1957.


_____. **Symbol Formation.** New York: John Wiley and Sons, 1963.


Witkin, H. A. "Perception of body position as of the position of the visual field," Psychological Monographs, 1949, 63, (Whole No. 302).


APPENDIX A
APPENDIX B_1
Card #1
APPENDIX B_2
THE HUMAN FIGURE DRAWINGS
(A) AND (B)
The purpose of your task is to rate children's drawings according to the level of sophistication on a five point scale. The criteria for these ratings are listed on the following pages. You are to give one score (only) to each drawing based on the following combined three levels: 1. form level, 2. identity and sex differentiation, and 3. detailing.

DIRECTION TO THE JUDGES:

(1) Read the criteria on the following pages.
(2) There are two sets of drawings to be rated. Be sure to finish the ratings of the first set before going on to the second set.
(3) Start the process of rating by arranging the drawings into two groups—primitive and sophisticated.
(4) Rate the primitive pile from 1 to 3, with 1 being the most primitive.
   And, rate the sophisticated pile from 3 to 5, with 5 being the most sophisticated.
   (The sheet for rating is provided.)
CHARACTERISTICS OF DRAWINGS REFLECTING LEVEL OF SOPHISTICATION

A. FORM LEVEL
   1. Primitive features
      a. Circles or ovals for body and limbs
      b. Triangular or rectangular body with limbs stuck on
      c. Other forms lacking attempt at human shape (e.g., absence of waist, shoulders, etc.)
      d. Limbs in form of sticks or ovals, shapeless, ending in pronglike or clawlike fingers; no shaping of hands; pronglike or clawlike toes
      e. Contact point of limbs to trunk involving overlapping or transparent joining; limbs stuck on or detached (as opposed to integrated body parts)
      f. Grossly unequally sized arms, legs, ears, fingers, etc., combined with primitive form, uncontrolled lines
      g. Indiscriminately attached or misplaced body parts (e.g., arms attached at center of trunk)
   2. Sophisticated features
      a. Definite, shaped body outline; head, neck, shoulders well integrated into body outline and lead into trunk and appendages
      b. Attempt at human like shape, proportioning
      c. Adequate profiling (e.g., trunk and legs facing in same direction, etc.)

B. IDENTIFY AND SEX DIFFERENTIATION
   1. Primitive features
      a. Objectively interchangeable male and female figures
      b. Difference between figures only in hair and/or hat treatment
      c. Minimal inadequate trunk differentiation (i.e., triangle trunk for female, oval for male, but otherwise identical; or belt for male and buttons for female as only difference)
   2. Sophisticated features
      Marked and adequate role assignment, expressed in clothing and/or shape (also expressed in hair, features, appropriate accessories, uniforms, etc.)

C. LEVEL OF DETAILING
   1. Primitive features
      a. Body parts omitted (e.g., absence of neck, nose, ears, or eyebrows; fingers attached directly to arms with hand omitted)
      b. No clothing indicated
      c. Facial features expressed by dots or ovals
2. **Sophisticated features**
   a. Consistent, well-rationalized detailing; clothing; facial expression; shoes
   b. Figure cast in role with good attempt at presentation of action
   c. Figure cast in role with presentation of accessories consistent with this role (e.g., cowboy with smoking gun, etc.)
SOPHISTICATION-OF-BODY-CONCEPT SCALE RATINGS

5. Most sophisticated drawings: These manifest high form level (e.g., waistline, hips, shoulders, chest or breast, shaped or clothed limbs, etc.); appendages and details represented in proper relation to body outline, with some sophistication in mode of representation; appropriate, even imaginative, detailing (e.g., successful profiling, as young girl in evening clothes, well-dressed man with cigarette, etc.).

4. Moderately sophisticated drawings: Drawings which show a definite attempt at role assignment (with regard to age, activity, occupation, of outline (i.e., integration of parts) attempted.

3. Drawings intermediate in level of sophistication: Drawings in which identification of sex is evident, attempts at shaping and a fair level of integration of parts are manifested and a minimum of detailing is present.

2. Moderately primitive drawings: Drawings which essentially still lack features of differentiation through form, identity, or detailing; however, these drawings show slightly more complexity in some respect (e.g., presence of one body part that is unusual in most primitive drawings, such as the neck).

1. Most primitive and infantile drawings: These manifest a very low level of form (oval, rectangles, sticks stuck on to each other); no evidence of role or sex identity (same treatment of male and female with, at most, difference in hair treatment, no facial expression, little shaping or clothing).
The human figure drawings - (A)

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 
18. 
19. 
20. 
21. 
22. 
23. 
24. 
25. 
26. 
27. 
28. 
29. 
30. 
31. 
32. 
33. 
34. 
35. 
36. 
37. 
38. 
39. 
40. 
41. 
42. 
43. 
44. 
45. 
46. 
47. 
48.
The human figure drawings - (B)

1. ______________
2. ______________
3. ______________
4. ______________
5. ______________
6. ______________
7. ______________
8. ______________
9. ______________
10. ______________
11. ______________
12. ______________
13. ______________
14. ______________
15. ______________
16. ______________
17. ______________
18. ______________
19. ______________
20. ______________
21. ______________
22. ______________
23. ______________
24. ______________
25. ______________
26. ______________
27. ______________
28. ______________
29. ______________
30. ______________
31. ______________
32. ______________
33. ______________
34. ______________
35. ______________
36. ______________
37. ______________
38. ______________
39. ______________
40. ______________
41. ______________
42. ______________
43. ______________
44. ______________
45. ______________
46. ______________
47. ______________
48. ______________
APPENDIX D
The two stories task (C)
The children were presented with cards and asked to tell stories. Each child was asked to tell two stories. The first story was based on seven cards which would be briefly described in the following:

CARD 1: The boy is walking along the sidewalk, whistling and waving a stick.
CARD 2: The boy looks frightened and drops his stick as he sees a rather ugly looking dog running towards him.
CARD 3: The boy runs, looking anxiously over his shoulder at the dog who is in hot pursuit.
CARD 4: The boy is shown running with arms outstretched toward an apply tree laden with fruit. The dog is not shown in the picture and the boy's face (showing fear in the two previous pictures) is hidden by a branch of the tree.
CARD 5: The boy scrambles up the tree, with the dog nipping at his heels.
CARD 6: The boy is shown standing up in the tree. The dog can be seen across the street, trotting away (he looks smaller in this picture, and with no visible evidence of ferocity). Although the boy's head is partly turned in the dog's direction, it shows no particular emotional expression.
CARD 7: The boy is seated in the tree, munching an apple, with the dog nowhere in evidence.

The above seven cards were intended to elicit story something like the following: a vicious dog chases a terrified boy who finds refuge by climbing a handy tree; once secure there, and with the dog abandoning the chase, he takes the advantage of the kind of tree he happens to be in and eats an apple.

After the first story was told by the child, cards 2, 3, and 5 were taken away, leaving cards 1, 4, 6, and 7 (in that order) in front of the child. And the child was asked to tell a second story, based on these remaining cards, from Andy's (a naive third person who just entered the testing room at this point of time) point of view.

Cards 1, 4, 6, and 7 were intended to elicit a second story which was different from the first one. The second story went something like the following: a boy spies an apple tree laden with apples, climbs up to get one, and sits there eating it; the dog shown in the third picture in the sequence (card 6) is simply part of the background and of no relevance to the story.
The purpose of your task is to rate children's stories on a four point scale. The criteria for these ratings are listed on the following page. You are to give one score (only) to each index-card based on the criteria given.

On each index-card, there are two stories followed by questions on the second story. The first story was told by the child based on the seven cards included here. The cards were arranged for the child by the examiner in the order of the number indicated on the back of the cards. The second story, by the same child, was based on Cards #1, 4, 6, and 7 (cards 2, 3, and 5 which depict a threatening dog were not included). The instructions to the same child, after the first story was told, were: "Now Andy hasn't seen any of these pictures. I'm going to call him back into the room and show him just these four pictures (cards 1, 4, 6, and 7). I want you to pretend you are he and tell me the story that you think he would tell."

DIRECTION TO THE JUDGES:

(1) Read the criteria for ratings on the following page.

(2) Read the stories on each index-card.

(3) Rate the child's second story on a 1 to 4 point scale according to the criteria given on the following page.

NOTE:- A. The questions that were asked of each child after the second story are related to the second story only.

B. Each index-card contains information given by the same child only.

C. The scoring sheet is provided.
THE CRITERIA FOR RATING THE SECOND STORY GIVEN BY THE CHILD

1. Child gives a more or less straightforward presentation of the seven-picture story rather than the four picture one. That is the dog is clearly established as the motive for climbing the tree during the narration proper, prior to inquiry.

2. Although the fear-of-the-dog motive is not explicitly mentioned, it is readily supplied during the inquiry. In most cases so scored, the narration is a bare account of the boy's action, devoid of motivational statements of any kind. But when E. subsequently asks why Andy thinks the boy climbed the tree, the usual response is flatly given, "because the dog chased him."

3. It subsumed stories in which (in narrative or in inquiry) some sort of fear motive is introduced, but the child also says something which bespeaks some recognition by the child that Andy is operating from the four-picture sequence only (that is, something which suggests at least a modicum of sensitivity to the role-taking aspects of the task).

4. When asked to predict the story Andy would tell, the child gives more or less straightforward presentation of the correct four-picture story, that is, the boy is said to climb the tree in response to some nonfear motive (almost always to get an apply) and the dog is said not to be a motive for climbing (is said to be irrelevant to the story, "just walking along," etc.). If these crucial points had not been mentioned spontaneously during the narration proper, they were readily given during the brief inquiry afterwards.

(NOTE: Andy is the naive person who entered the testing room after the cards which involved the threatening dog were excluded, cards 2, 3, and 5, leaving only cards 1, 4, 6, and 7 on the table.)
Selling a tie. (D)
The children were asked to try to convince a man to buy a necktie from them. The instructions given to each child was the following:

"Suppose you were on one of those TV programs where they give away prizes for doing funny things. Suppose the thing you had to try to do is to sell a necktie to a man. If you sell this man this particular tie you'll get a prize of $5 on the program. But of course this man doesn't know that and you can't tell him. But since you want the money you'd try just as hard as you could to talk him into buying the tie, you'd say everything you can think of to talk him into buying it. So here's the man just coming into the room. Go ahead and sell it to him the very best you can."

When the child appeared to have finished, the examiner added: "Is there anything else you can think of to say which might help to make him buy it?"
The purpose of your task is to rate a child's sales-pitch. Each index-card contains the sales-pitch of a child. You are supposed to rate each sales-pitch in three different ways (that is, there are three different scores for each child's sales-pitch). The three different ratings are (1) number of different arguments, (2) persuasive effectiveness, and (3) hard vs. soft sell. The criteria for these ratings are given on the following pages.

DIRECTION TO THE JUDGES:

(1) Read the criteria for ratings on the following pages.

(2) Read the child's sales-pitch on the index-card.

(3) Rate each child's sales-pitch according to the criteria given on the following pages.

NOTE: 1. A scoring sheet is provided.
   2. The "A" on the scoring sheet is where you are to put the score of the number of different arguments.
   The "B" is where you are to put the score of persuasive effectiveness (1 to 7 point scale),
   And the "C" is where you are to put the score of hard vs. soft sell (1 to 7 point scale).
CRITERIA FOR RATINGS:

"A" - Number of different arguments:
One point is given for each different argument contained in the message. Exactly what constitutes an "argument" is up to you to decide. You are simply to derive your own working definition in surveying the protocols and attempt to apply it consistently throughout. Not to be scored, however, are unelaborated appeals to buy, for example, "Please buy me a TV set." That is, there has to be minimal selling point, some content which might induce the listener to buy.

The following are some examples of different arguments:
Personification - The child personalizes the appeal, that is, address this buyer specifically, refers to his particular attributes, etc. For example: "It will look good on you"; "It will go with the suit you have on."

Prestige - The child asserts or implies that the tie is a high-prestige product by alluding to its stylishness, exclusiveness, etc., by suggesting that others will esteem it or its wearer, and the like. For example: "It's the kind of tie well-dressed men are wearing these days"; "People will think you look nice in it."
CRITERIA FOR RATINGS:

"B" - Persuasive effectiveness:

You are to read each child's sales-pitch as though you were the buyer and simply make a global estimate regarding persuasive effectiveness, that is, how much the message would incline you to buy the product.

Then, rate each child's sales-pitch on a 1 to 7 point rating scale. 1 is the least persuasive, and 7 is the most persuasive.
CRITERIA FOR RATINGS:

"C" - Hard vs. soft well:

This is also a global, impressionistic rating. "Hard sell" message is low on the seven-point scale. Hard sell is defined as one in which involves:

(A) "high pressure" tactics, with the seller pushing, imploring, dogging the buyer to buy,

(B) repetitive, unsubtle appeals, with the speaker clearly and undisguisedly in a seller role,

"Soft sell" is high on the seven-point scale. Soft sell is defined as one in which involves:

(A) "low pressure" tactics, with an attempt at gentle and subtle manipulation of the listener,

(B) the use of indirection, understatement, and carefully phrased appeals to reason, the seller to some extent disguising or soft-pedaling the fact that he is seller.

Then, rate each child's sales-pitch on a 1 to 7 point rating scale. 1 is the hardest, and 7 is the softest.
APPENDIX F
Buying a TV. (E)
The children were asked to try to convince their fathers to buy a television for their own bedrooms. The instructions given to each child was the following:

"Now suppose you wanted a TV set for your own room real bad, and you are trying to get your father to buy one for you. Once again you'll try to use every argument you can think of which might talk him into buying it for you. Go ahead and try to talk him into it."

When the child appeared to have finished, the examiner said: "Is there anything else you can think of to say which might help to make him buy it?"
The purpose of your task is to rate a child's sales-pitch. Each index-card contains the sales-pitch of a child. You are supposed to rate each sales-pitch in three different ways (that is, there are three different scores for each child's sales-pitch). The three different ratings are (1) number of different arguments, (2) persuasive effectiveness, and (3) hard vs. soft sell. The criteria for these ratings are given on the following pages.

DIRECTION TO THE JUDGES:

(1) Read the criteria for ratings on the following pages.

(2) Read the child's sales-pitch on the index-card.

(3) Rate each child's sales-pitch according to the criteria given on the following pages.

NOTE: - 1. A scoring sheet is provided,

2. The "A" on the scoring sheet is where you are to put the score of the number of different arguments, The "B" is where you are to put the score of persuasive effectiveness (1 to 7 point scale), And the "C" is where you are to put the score of hard vs. soft sell (1 to 7 point scale).
CRITERIA FOR RATINGS:

"A" - Number of different arguments:
One point is given for each different argument contained in the message. Exactly what constitutes an "argument" is up to you to decide. You are simply to derive your own working definition in surveying the protocols and attempt to apply it consistently throughout. Not to be scored, however, are unelaborated appeals to buy, for example, "Please buy me a T.V. set." That is, there has to be minimal selling point, some content which might induce the listener to buy.

The following are some examples of different arguments:
Advantage to others - The child mentions an advantage or benefit which someone other than himself might derive from the purchase of the TV set. For example: "If I have my own TV set, I won't be bothering you and Mom when you are watching program I don't like."
Economic objections - The child anticipates and attempts to deal with sales resistance relating to the cost of the TV set. For example: "I know they are expensive but......"; "I can pay for part of it myself."
Bandwagon - The child asserts or implies that the family will not be conforming to some social norms if he does not have his own TV set. For example: "All the other kids have their own, why can't I?"
CRITERIA FOR RATINGS:

"B" - Persuasive effectiveness:

You are to read each child's sales-pitch as though you were the father and simply make a global estimate regarding persuasive effectiveness, that is, how much the message would incline you to buy the TV set for the child.

Then, rate each child's sales-pitch on a 1 to 7 point rating scale. 1 is the least persuasive, and 7 is the most persuasive.
CRITERIA FOR RATING:

"C" - Hard vs. soft sell:

This is also a global, impressionistic rating. "Hard sell" message is low on the seven-point scale. Hard sell is defined as one in which involves:

(A) "high pressure" tactics, with the child pushing, imploring, dogging the father to yield,

(B) repetitive, unsubtle appeals, with the speaker clearly and undisguisedly in the benefiter's role.

"Soft sell" is high on the seven-point scale. Soft sell is defined as one in which involves:

(A) "low pressure" tactics, with an attempt at gentle and subtle manipulation of the listener,

(B) the use of indirection, understatement, and carefully phrased appeals to reason, the child to some extent disguising or soft-pedaling the fact that he is the benefiter in this deal.

Then, rate each child's sales-pitch on a 1 to 7 point rating scale. 1 is the hardest, and 7 is the softest.
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE XX

**COMPARISONS OF SUBJECTS FROM MAIN STUDY GROUP AND THE EXPERIMENTAL GROUP ON THE PERFORMANCE OF HFDT**

<table>
<thead>
<tr>
<th>Grades</th>
<th>Means</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>First E and First C</td>
<td>1.125</td>
<td>1.167</td>
<td>0.378</td>
</tr>
<tr>
<td>Third E and Third C</td>
<td>2.042</td>
<td>2.272</td>
<td>0.299</td>
</tr>
<tr>
<td>Fifth E and Fifth C</td>
<td>1.958</td>
<td>1.708</td>
<td>-0.372</td>
</tr>
<tr>
<td>Seventh E and Seventh C</td>
<td>3.208</td>
<td>3.292</td>
<td>0.082</td>
</tr>
</tbody>
</table>

### TABLE XXI

**COMPARISONS OF CONTROL SUBJECTS ON THE TST—MEANS AND STANDARD DEVIATIONS**

<table>
<thead>
<tr>
<th>Grades</th>
<th>Means</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>First and Third</td>
<td>2.333</td>
<td>2.833</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>2.333</td>
<td>2.167</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>2.333</td>
<td>2.833</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>2.833</td>
<td>2.167</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>2.833</td>
<td>2.833</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>2.167</td>
<td>2.833</td>
</tr>
</tbody>
</table>
### TABLE XXII

**COMPARISONS OF CONTROL GROUP SUBJECTS ON TST—T-TEST**

<table>
<thead>
<tr>
<th>Grades</th>
<th>df.</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>4</td>
<td>1.251</td>
<td>n.s.</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>4</td>
<td>-0.485</td>
<td>n.s.</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>4</td>
<td>0.507</td>
<td>n.s.</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>4</td>
<td>-2.825</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>4</td>
<td>0.000</td>
<td>n.s.</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>4</td>
<td>0.716</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

### TABLE XXIII

**THE RELATIONSHIPS OF HFDT, TST, SANT, BATT, MDT, AND CEFT WITH CHRONOLOGICAL AGE AND MENTAL AGE ACROSS GRADES**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Correlations With Age</th>
<th>p-Value</th>
<th>Correlations With M.A.</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFDT</td>
<td>0.61009</td>
<td>&lt;.001</td>
<td>0.81147</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>TST</td>
<td>0.43019</td>
<td>&lt;.001</td>
<td>0.47995</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SANT</td>
<td>0.73277</td>
<td>&lt;.001</td>
<td>0.65440</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>BATT</td>
<td>0.78263</td>
<td>&lt;.001</td>
<td>0.69646</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>MDT</td>
<td>0.76005</td>
<td>&lt;.001</td>
<td>0.71536</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CEFT</td>
<td>0.63479</td>
<td>&lt;.001</td>
<td>0.55234</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
### TABLE XXIV
THE COMPARISONS OF PERFORMANCE SCORES BETWEEN GRADES IN THE HUMAN-Figure-DRAWING TASK

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>N</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>48</td>
<td>3.394</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>49</td>
<td>8.570</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>49</td>
<td>7.225</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>49</td>
<td>6.259</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>49</td>
<td>4.903</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>50</td>
<td>-1.238</td>
<td>n.s.*</td>
</tr>
</tbody>
</table>

n.s. stands for not significant

### TABLE XXV
THE COMPARISONS OF PERFORMANCE SCORES BETWEEN GRADES IN THE TWO-STORY TASK

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>N</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>48</td>
<td>2.312</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>49</td>
<td>4.397</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>49</td>
<td>4.613</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>49</td>
<td>1.776</td>
<td>n.s.</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>49</td>
<td>1.917</td>
<td>n.s.</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>50</td>
<td>0.104</td>
<td>n.s.</td>
</tr>
</tbody>
</table>
### TABLE XXVI
THE COMPARISONS OF PERFORMANCE SCORES BETWEEN GRADES IN THE SELLING-A-NECKTIE TASK

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>N</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>48</td>
<td>3.746</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>49</td>
<td>10.157</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>49</td>
<td>11.442</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>49</td>
<td>4.673</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>49</td>
<td>5.457</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>50</td>
<td>0.723</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

### TABLE XXVII
THE COMPARISONS OF PERFORMANCE SCORES BETWEEN GRADES IN THE BUYING-A-TELEVISION TASK

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>N</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>48</td>
<td>4.122</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>49</td>
<td>10.550</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>49</td>
<td>15.716</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>49</td>
<td>4.078</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>49</td>
<td>6.421</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>50</td>
<td>2.244</td>
<td>&lt; .05</td>
</tr>
</tbody>
</table>
### TABLE XXVIII

THE COMPARISONS OF PERFORMANCE SCORES BETWEEN GRADES IN THE MOUNTAINS-AND-THE-DOLL TASK

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>N</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>48</td>
<td>6.511</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>49</td>
<td>14.901</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>49</td>
<td>12.749</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>49</td>
<td>4.080</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>49</td>
<td>4.082</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>50</td>
<td>0.591</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

### TABLE XXIX

THE COMPARISONS OF PERFORMANCE SCORES BETWEEN GRADES IN THE CHILDREN'S-EMBEDDED-FIGURES TEST

<table>
<thead>
<tr>
<th>The Two Grades Being Compared</th>
<th>N</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and Third</td>
<td>48</td>
<td>3.292</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>First and Fifth</td>
<td>49</td>
<td>7.490</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>First and Seventh</td>
<td>49</td>
<td>8.355</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Third and Fifth</td>
<td>49</td>
<td>3.395</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Third and Seventh</td>
<td>49</td>
<td>3.989</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Fifth and Seventh</td>
<td>50</td>
<td>0.544</td>
<td>n.s.</td>
</tr>
</tbody>
</table>