INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeeb Road
Ann Arbor, Michigan 48106
GIBLIN, Paul Thomas, 1947--
THE DEVELOPMENT OF RECURSIVE THINKING AND
ALTRUISM IN BOYS GRADES ONE, THREE AND FIVE.

The Ohio State University, Ph.D., 1973
Psychology, general

University Microfilms, A XEROX Company, Ann Arbor, Michigan
THE DEVELOPMENT OF RECURSIVE THINKING AND ALTRUISM
IN BOYS GRADES ONE, THREE AND FIVE

DISSERTATION

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

by

Paul Thomas Giblin, B.A., M.A.

* * * * *

The Ohio State University
1973

Reading Committee:
George Thompson
Charles Wenar
Phillip Clark

Approved by
Advisor
Department of Psychology
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II.</td>
<td>RELATED RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Role-Taking Accuracy</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Revision and Reassessment</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Role-Taking Activity</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Altruism</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Definition of Altruism</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Research in Altruism</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Developmental Studies of Altruism</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Role-Taking Ability and the Development of Altruism</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Role-Taking Activity as an Affective Response and the Incidence of Altruism</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Role-Taking Activity as an Underlying Cognitive Process and the Incidence of Altruism</td>
<td>35</td>
</tr>
<tr>
<td>III.</td>
<td>METHODOLOGY</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Introduction</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Experiment No. 1. The Development of Recursive Thinking and Altruism in Boys Grades 1, 3 and 5</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Population and Sample</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Design 1 for Experiment No. 1. Assessment of Levels of Recursive Thinking</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Procedure 1 for Experiment No. 1.</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Design 2 for Experiment No. 1. Assessment of Degrees of Altruism</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Procedure 2 for Experiment No. 1.</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Predictions</td>
<td>51</td>
</tr>
</tbody>
</table>
Chapter

Experiment No. 2. The Existence of a Significant Developmental Trend in Altruism in Boys Grades 1, 3 and 5 as a Function of Methodology 52
Population and Sample 52
Design for Experiment No. 2.
Assessment of Degrees of Altruism 52
Procedures for Experiment No. 2. 53
Predictions 54

IV. RESULTS ......................................................... 55
Introduction 55

Experiment No. 1. The Development of Recursive Thinking and Altruism in Boys Grades 1, 3 and 5 55
Procedure for the Treatment of Data 55
Recursive Thinking 55
Altruism 57
Covertness 57
Data Analysis 58
Success of Predictions in Experiment No. 1 66

Experiment No. 2. The Existence of a Significant Developmental Trend in Altruism in Boys Grades 1, 3 and 5, as a Function of Methodology 68
Procedure for the Treatment of Data 68
Data Analysis 68
Success of Predictions 69

V. DISCUSSION ..................................................... 75
Introduction 75

Recursive Thinking and Altruism 75
Covertness and Altruism 80
Altruism¹ - Altruism² 82
Research Proposals 85

VI. SUMMARY ....................................................... 90

APPENDIX A: PICTORIAL DEPICTIONS OF RECURSIVE THINKING 92

APPENDIX B: 24 NONSENSE PLANOMETRIC FIGURES 96

APPENDIX C: SAMPLE SHEET USED IN ASSESSMENT OF ALTRUISM - EXPERIMENT NO. 1 98
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX D: SAMPLE SCORE SHEET AND SCORING USED IN THE ASSESSMENT OF ALTRUISM AND COVERTNESS IN EXPERIMENT NO. 1.</td>
<td>100</td>
</tr>
<tr>
<td>APPENDIX E: STATISTICAL PROCEDURES EMPLOYED FOR GENERATION OF CORRELATIONAL MATRIXES</td>
<td>103</td>
</tr>
<tr>
<td>APPENDIX F: THE REACTIONS OF ROLE-TAKING ACTIVITY IN CHILDREN OF AGES 6, 7 AND 8 TO CONDITIONS OF MILD FRUSTRATION</td>
<td>106</td>
</tr>
<tr>
<td>APPENDIX G: OPPORTUNITIES FOR Ss' ADOPTION OF COVERT TEST-TAKING STRATEGIES AS A FACTOR IN THE ASSESSMENT OF ALTRUISM</td>
<td>113</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>117</td>
</tr>
</tbody>
</table>

iv
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A Representative Sampling of Research Reports on Role-Taking Accuracy</td>
<td>7-8</td>
</tr>
<tr>
<td>2.</td>
<td>A Representative Sampling of Research Reports on Role-Taking Activity</td>
<td>14-16</td>
</tr>
<tr>
<td>3.</td>
<td>A Representative Sampling of Recent Research Reports on Altruism (1969-1972)</td>
<td>29</td>
</tr>
<tr>
<td>4.</td>
<td>Altruism at Each Grade Level (Experiment No. 1)</td>
<td>65</td>
</tr>
<tr>
<td>5.</td>
<td>Altruism at Each Grade Level (Experiment No. 2)</td>
<td>74</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Graphic Presentation of the Linear Pearson 'r' Correlations Between</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Recursive Thinking and Grade Level.............................</td>
<td>60</td>
</tr>
<tr>
<td>2.</td>
<td>Altruism and Grade Level (Experiment No. 1)......................</td>
<td>61</td>
</tr>
<tr>
<td>3.</td>
<td>Recursive Thinking and Altruism at Each Grade Level (Experiment No. 1)</td>
<td>62</td>
</tr>
<tr>
<td>4.</td>
<td>Covertness and Altruism at Each Grade Level (Experiment No. 1)</td>
<td>63</td>
</tr>
<tr>
<td>5.</td>
<td>Percentages of Perfect Verbal Exposition of Each Level of Recursive Thinking at Each Grade Level</td>
<td>64</td>
</tr>
<tr>
<td>6.</td>
<td>Altruism (Experiment No. 1 — Indices 1 and 2 Only) and Grade Level</td>
<td>71</td>
</tr>
<tr>
<td>7.</td>
<td>Altruism (Experiment No. 2) and Grade Level........................</td>
<td>72</td>
</tr>
<tr>
<td>8.</td>
<td>Altruism (Experiment No. 1) and Altruism (Experiment No. 2) at Each Grade Level</td>
<td>73</td>
</tr>
</tbody>
</table>
According to Piaget (Flavell, 1970; Pinard and Laurendeau, 1969), as new intellectual operations are acquired and become defining characteristics of cognition, they become intimately interconnected (by such operations as reciprocal assimilation) and form new operational structures. In turn, these sets of operational structures are interlinked, thereby creating a network of interrelated structures characteristic of a given developmental period. This conception of distinguishable stages in development, possessing interrelated structures based upon common intellectual operations, is the basis for the positing of concurrent growth between different tasks calling for the same operation, or among measures of different operations. The research methodology typically used to test for such developmental concurrence is correlation.

A second defining characteristic of cognitive development, according to Piaget (Flavell, 1970; Flavell and Wohlwill, 1969), is the sequential patterning in the acquisition of cognitive structures. Sequential patterning is, in turn, an indication of the functional relationships that exist among the relevant acquisitions (is the
acquisition of skills needed for handling task A required before success in dealing with task B can be realized?). The existence of a developmental sequence is confirmed if, for groups of children representative of a rather broad chronological age span in different cultures, the mean age at which test A is passed is lower than the mean age at which test B is passed.

The research of this dissertation is based upon these two major aspects of Piaget's conception of cognitive development. There are two major hypotheses: 1) there is concomitant growth (concurrent acquisition) between the development of recursive thinking (the ability to conceive of another's thinking about a social object, thinking about an action between people, or thinking about thinking itself -- Miller, Kessel and Flavell, 1970) -- and the development of altruism (a helpful action which incurs some cost to the individual with the expectation of little or no gain relative to the magnitude of the investment -- Midlarsky, 1968) -- in children of grades 1, 3 and 5, and 2) there exist functional relationships of implicative mediation among cognitive acquisitions -- Flavell and Wohlwill, 1969) -- in the acquisitions of both recursive thinking and altruism.

The specific hypotheses tested by this research are:

H1. ...there is a significant correlation between recursive thinking and altruism at each grade level tested
H2. ...individually, both recursive thinking and altruism correlate significantly with grade level.

H3. ...correlations between recursive thinking and altruism increase in magnitude with progression in grade level.

H4. ...recursive thinking and altruism relate more strongly to each other than either relates to grade level.
Related Research

The development of recursive thinking (the ability to conceive of others' thinking about a social object, thinking about an action between people, or thinking about thinking itself (Miller, Kessel and Flavell, 1970) has been conceived of as the essential element of change in the development of social cognition in children of ages six through twelve (Miller, Kessel and Flavell, 1970; Flavell, et al., 1968; Flapan, 1968; De Vries, 1970).

The ontogeny of social cognition (the growing knowledge concerning specifically human objects and events in one's environment (Miller, Kessel and Flavell, 1970) is seen in two aspects by Flavell, 1968: 1) the disposition to "take the role" of another person in a cognitive sense — to assess another's response capacities and tendencies; and 2) the ability to use this resulting understanding as a tool in behaving socially appropriately towards particular others. This first aspect of social cognition (role-taking ability) involves the ontogeny of empathy and role-taking ability. The second aspect of social cognition (behaving appropriately towards others) relates to one of the more important dimensions of role-taking ability, namely, the development of altruism.
Role-Taking Accuracy

Early research in role-taking ability is characterized by a concern for empathic accuracy and a lack of clear differentiation between the cognitive and affective aspects of empathy. Empathic accuracy was considered to be the accurate perception of social phenomena (Gates, 1923); the accurate perception of others' emotional states. Empathy (a term now mainly used to connote emotional experiencing of another's emotional state, but which once was conceived of as synonymous with role-taking ability (Cottrell, 1942) was defined as "the imaginative transposing of oneself into the thinking, feeling and actions of another and so structuring the world as he does" (Dymond, 1949, p. 127). Empathy was conceived of as the basic process on which our understandings of others were built (Cottrell, 1942).

From 1923 through 1952 the assessment of 'role-taking' accuracy was approached in three major ways: 1) as the accurate perception of a social phenomenon (Gates, 1923; Dashiell, 1927; Gates, 1927; Kellogg and Eagleson, 1931; Walton, 1926), 2) as a possible determining factor or correlate of insight and other aspects of personality (Dymond, 1949; Dymond, Hughes and Raabe, 1952 -- test 2), and 3) as the accurate perception of a social situation assessed by sociometric methods (Dymond, 1949; Dymond,
Hughes and Raabe, 1952 -- test 2; Ausubel, Schieff and Gasser, 1952). (See Table 1 for summaries of these and other articles concerned with 'role-taking' accuracy.)

The studies by Dimitrovsky (1964) and Rothenberg (1970), both of which are approximate replications of Gates (1927), may be considered to be anachronistic, since they were published after the critiques of Cronbach (1958) and others on tests which attempt to assess 'role-taking' accuracy.

In the early 1950's studies of role-taking accuracy were severely criticized for methodological reasons. Hastorf and Bender (1952) demonstrated that the highest correlations achieved in sociometric assessment of 'role-taking' accuracy were between one's own self-rating and one's rating of others, rather than between one's rating of others and others' self-ratings. Therefore they felt that projection was the most common, and most intense, determinant of 'role-taking' accuracy rather than one's ability to perceive social phenomena accurately.

Further critiques by Taft, 1955; Gage and Cronbach, 1955; Cronbach, 1958; and Strazer, 1960, not only criticized studies of 'role-taking' accuracy because of the effects of projection, but also because of: 1) the confounding effects of cultural stereotyping of emotions presented and the responses given, 2) the lack of consensus on the meaning of terms and the quantitative standards to be used in assessing the responses, and 3) the accidental
### Table 1

A Representative Sampling of Research Reports on Role-Taking Accuracy

<table>
<thead>
<tr>
<th>Studies</th>
<th>no. S</th>
<th>ages</th>
<th>sex</th>
<th>Trend</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gates 1923</td>
<td>458</td>
<td>3-14</td>
<td>M&amp;F</td>
<td>+</td>
<td>verbal interpretation of facial expressions</td>
</tr>
<tr>
<td>Dashiell 1927</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>selection of appropriate emotionally expressive picture to characterize the emotion reaction to a story</td>
</tr>
<tr>
<td>Gates 1927</td>
<td>627</td>
<td>3-8</td>
<td>M&amp;F</td>
<td>+</td>
<td>verbal interpretations of vocal expressions</td>
</tr>
<tr>
<td>Kellogg &amp; Eagleson 1931</td>
<td>332</td>
<td>3-14</td>
<td>M&amp;F</td>
<td>+</td>
<td>verbal interpretations of facial expressions</td>
</tr>
<tr>
<td>Walton 1937</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>interpretations of words by drawing emotionally expressive lines; verbal interpretations of lines, colors and facial expressions</td>
</tr>
<tr>
<td>Dymond 1949</td>
<td>54</td>
<td>college age</td>
<td>M&amp;F</td>
<td>o</td>
<td>sociometric rating of oneself, how he believes others would rate themselves, how he believes others would rate him</td>
</tr>
<tr>
<td>Dymond, et al. 1952, test 2</td>
<td>40</td>
<td>7,11</td>
<td>M&amp;F</td>
<td>+</td>
<td>awareness of one's own sociometric status in a group</td>
</tr>
<tr>
<td>Ausubel, et al. 1952</td>
<td>grades</td>
<td>3,5,7</td>
<td>M&amp;F</td>
<td>J.H., H.S.</td>
<td>+</td>
</tr>
<tr>
<td>Dimitrovsky 1934</td>
<td>224</td>
<td>5-12</td>
<td>M&amp;F</td>
<td>+</td>
<td>verbal interpretation of vocal expression within a prescribed range</td>
</tr>
</tbody>
</table>
Table 1 (cont'd)

A Representative Sampling of Research Reports on Role-Taking Accuracy

<table>
<thead>
<tr>
<th>Studies</th>
<th>no. S</th>
<th>ages</th>
<th>sex</th>
<th>Trend</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rothenberg</td>
<td>108</td>
<td>3,5</td>
<td>M&amp;F</td>
<td>+</td>
<td>verbal interpretation of vocal expressions of two adults together</td>
</tr>
</tbody>
</table>

\(^a(+)\) represents the finding of a positive relationship between age and increasing ability in role-taking accuracy.

\(^b(o)\) existence of a developmental trend not examined.
similarity of the subjects being evaluated, and the criterion group which would inflate the 'role-taking' accuracy score if projection was the main determinant of the subjects' responses. With these criticisms the assessment of role-taking ability required a major revision in its procedures and in its underlying conceptions which had guided previous research.

Revision and Reassessment

A pessimistic revision of Cronbach's (1958) conception of the series of stages through which methodological developments in all field progress would read according to the following cycle: 1) A new procedure, often introduced as an operational definition of a speculative concept, appears. 2) Small improvements are introduced; the concern is for refinement of technique rather than questioning of underlying conceptions. 3) Criticisms of underlying conceptions. 4) And again a new procedure, often introduced as an operational definition of a speculative concept, appears.

After the criticism of attempts to assess 'role-taking' accuracy by Hastorf and Bender (1952), Taft (1955), Gage and Cronbach (1955), Cronbach (1958), and Strazer (1960) a reassessment of the underlying conceptions which had guided research in role-taking occurred.

The first aspect of this reassessment was the revival
of Piaget's conception of cognitive development as a source for a new set of underlying conceptions. The attempt was made to perform a theoretical extension of Piaget's primary concern with the analysis of impersonal cognitive organization to an analysis of interpersonal behavior (Feffer, 1970). There are two basic principles in Piaget's conception of cognitive organization which are most important in its extension to an analysis of interpersonal behavior (Feffer, 1970): 1) One knows or constructs his world in accordance with certain principles of organization. 2) An individual's construction of reality is expressive of particular equilibrium relationships between himself and his phenomenological world. Moreover, the function of developmental change that determines, to some extent, this equilibrium relationship is the individual's ability to decentralize (the ability to shift one's focus from one viewpoint to another) and to integrate these impressions (a simultaneous decentralizing by which part-whole organization is accomplished) (Feffer, 1970; Piaget, 1970).

Within this framework, research on role-taking accuracy shifted to research on role-taking activity -- the concern here was for the exposition of the development of cognitive organization as reflected in the ontogeny of role-taking ability. As a guideline for further discussion of research on role-taking activity, a brief exposition of Piaget's conception of cognitive development (Piaget,

In the beginning, the fundamental and pervasive quality of a child's thought is egocentrism -- a general incognizance of the notion of "points of view", and therefore a lack of awareness of how his own point of view may differ from that of other people. Egocentrism taints a child's efforts in virtually all spheres of activity -- interpersonal relations, physical world conceptions, and attitudes towards ethical phenomena.

Due to the desire to engage in social interaction with other children, and the developing capacity to organize experience conceptually, the child becomes increasingly sensitive to the existence of covert perceptual, cognitive and motivational processes in other people. In the preoperational phase of cognitive development (ages approximately four to seven) understanding between two children exists only if two nearly identical mental schemas exist in the two children. As the child moves into the concrete phase of cognitive development (approximately ages seven to eleven) the child's progressive ability to decenter allows him to gradually rid himself of egocentric illusions (distortions in his perceptions of reality due to his inability to take a point of view other than his own), and begins to actively engage in role-taking activity which...
gives rise to inferential thinking.

The period of formal operations (commencing approximately at age twelve) is attained by a progressive decen-
tration which allows the child to cognitively represent
not only possible actions, but also to represent representa-
tions of possible actions. [This transition from con-
crete operations to formal operations is discussed in re-
lation to the ontogeny of role-taking activity in the dis-
cussion of Miller, Kessel and Flavell (1970).]

The second aspect of the present reassessment is to
redefine empathy ('role taking') by differentiating it
into two major components: cognitive and affective (Mil-
gram, 1960; Feshbach and Roe, 1968). The cognitive aspect
of empathy (now generally referred to as role taking) was
seen to involve two components (Feshbach and Roe, 1968;
Selman, 1971): 1) social insight: which requires one to
have the ability to infer another's expectations, attri-
butes, feelings and potential actions, and 2) social per-
spective: which requires one to be able to differentiate
others' views from one's own, and to be able to shift, ba-
lance and evaluate both perceptual and cognitive processes.

The affective aspect of empathy (now generally re-
ferred to as empathic ability) was assessed by physiologi-
cal measures such as GSR, heart rate, palm sweating, etc.,
and generally avoided any speculation beyond what could be
operationally defined and measured. Research on empathy
was typically non-developmental in orientation and generally involved visual viewing of differentially arousing situations and physiological assessment of vicarious experiencing (Hanes and Whitney, 1960; Lazarus, et al., 1962; Berger, 1962; Stotland and Dunn, 1963; Stotland and Walsh, 1963; Bandura and Rosenthal, 1966). These studies are not directly relevant to the present discussion of the ontogeny of role taking ability, but provide important foundation for later studies which might be designed to relate empathic experiencing and altruism.

Role-Taking Activity

The major concern in the assessment of the ontogeny of role-taking ability in terms of role-taking activity is the nature of the underlying cognitive activity which determines the nature of the role-taking activity. A representative sampling of recent research on the ontogeny of role-taking activity (see Table 2) reveals three major trends of analysis in terms of underlying cognitive activities: 1) richness of description (Dymond, 1948, 1950; Dymond, Hughes and Raabe, 1952; Yarrow and Campbell, 1963; Feshbach and Roe, 1968); 2) concrete-abstract descriptions (Milgram and Goodglass, 1961; Wolfe, 1963; Gilden, 1969; Scarlett, Press and Crockett, 1971); and 3) inferences (Gollin, 1958; Feffer, 1959; Feffer and Gourevitch, 1960; Flavell, et al., 1968; Flapan, 1968; Rockway, 1969; Rappa-
<table>
<thead>
<tr>
<th>Studies</th>
<th>no. S</th>
<th>ages</th>
<th>sex</th>
<th>Trend</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dymond 1948</td>
<td>20</td>
<td>college age</td>
<td>M&amp;F</td>
<td>o</td>
<td>TAT responses</td>
</tr>
<tr>
<td>Dymond 1950</td>
<td>80</td>
<td>college age</td>
<td>M&amp;F</td>
<td>o</td>
<td>TAT responses, Wechsler and Rorschach responses</td>
</tr>
<tr>
<td>Dymond, et al. 1952, task 1</td>
<td>40</td>
<td>7-11</td>
<td>M&amp;F</td>
<td>+a</td>
<td>TAT responses</td>
</tr>
<tr>
<td>Gollin pilot 1958</td>
<td>97</td>
<td>8-18</td>
<td>M</td>
<td>+</td>
<td>written interpretations of visual scenes</td>
</tr>
<tr>
<td>Gollin 1958</td>
<td>712</td>
<td>10-17</td>
<td>M&amp;F</td>
<td>+</td>
<td>written interpretations of visual scenes</td>
</tr>
<tr>
<td>Feffer 1959</td>
<td>college age</td>
<td>M</td>
<td>o</td>
<td>Feffer (RTT) - verbal descriptions of stories evolving from a picture -- from one's own point of view and from each character's (in the picture) point of view</td>
<td></td>
</tr>
<tr>
<td>Feffer &amp; Gourevitch 1960</td>
<td>68</td>
<td>6-13</td>
<td>M</td>
<td>+</td>
<td>Feffer (RTT) and Piagetian cognitive tasks</td>
</tr>
<tr>
<td>Milgram &amp; Goodglass 1961</td>
<td>300</td>
<td>grades 2-8</td>
<td>M&amp;F</td>
<td>+</td>
<td>characterizations of a child's vs. an adult's responses</td>
</tr>
<tr>
<td>Yarrow &amp; Campbell 1963</td>
<td>267</td>
<td>6-13</td>
<td>M&amp;F</td>
<td>+</td>
<td>verbal characterizations of peers</td>
</tr>
<tr>
<td>Studies</td>
<td>no. S</td>
<td>ages</td>
<td>sex</td>
<td>Dev'1</td>
<td>Task</td>
</tr>
<tr>
<td>----------------</td>
<td>-------</td>
<td>----------</td>
<td>-----</td>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wolfe 1963</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+ Peffer (RTT) and Harvey, Hunt and Shroder's (1961) evaluation of concrete-abstract dimension</td>
</tr>
<tr>
<td>Flavell, et al. 1968</td>
<td>160 grades M&amp;F</td>
<td>1-8,11</td>
<td></td>
<td></td>
<td>+ Flavell (RTT) - verbal prediction of another's behavior</td>
</tr>
<tr>
<td>Flapan 1968</td>
<td>60</td>
<td>6.9, F</td>
<td>12</td>
<td></td>
<td>+ verbal descriptions of films</td>
</tr>
<tr>
<td>Feshbach &amp; Roe 1968</td>
<td>6.7 M&amp;F</td>
<td></td>
<td></td>
<td></td>
<td>+ verbal descriptions of films</td>
</tr>
<tr>
<td>Gilden 1969</td>
<td>202</td>
<td>2,4,6,8,10</td>
<td>M&amp;F</td>
<td></td>
<td>+ verbal descriptions of specified internal affective experiences</td>
</tr>
<tr>
<td>Rockway 1969</td>
<td>96</td>
<td>early, M middle &amp; late adolescence</td>
<td></td>
<td></td>
<td>+ verbal prediction of future behavior of an object person in programmed case history</td>
</tr>
<tr>
<td>Rappaport &amp; Fritzler 1969</td>
<td>grades M&amp;F</td>
<td>1,4,6</td>
<td></td>
<td></td>
<td>+ verbal descriptions of cartoons</td>
</tr>
<tr>
<td>Gilbert 1969</td>
<td>102</td>
<td>4-6 M&amp;F</td>
<td></td>
<td></td>
<td>+ verbal and performance responses to an affect awareness test</td>
</tr>
<tr>
<td>Baldwin, not K- et al. re-col. 1969</td>
<td>M&amp;F</td>
<td></td>
<td></td>
<td></td>
<td>+ choice of alternatives in a social interaction situation</td>
</tr>
<tr>
<td>Baldwin &amp; Baldwin 1970</td>
<td>696 K-college</td>
<td>M&amp;F</td>
<td></td>
<td></td>
<td>+ verbal judgements of stories dealing with kindness</td>
</tr>
</tbody>
</table>
Table 2 (cont'd)
A Representative Sampling of Research Reports on Role-Taking Activity

<table>
<thead>
<tr>
<th>Studies</th>
<th>no. S</th>
<th>ages</th>
<th>sex</th>
<th>Dev’l Trend</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miller, Kessel &amp; Flavell 1970</td>
<td>72 grades</td>
<td>M&amp;F</td>
<td>1-6</td>
<td>+</td>
<td>verbal descriptions of pictures</td>
</tr>
<tr>
<td>De Vries 1970</td>
<td>143</td>
<td>5-7</td>
<td>M&amp;F</td>
<td>+</td>
<td>performance on a social guessing game</td>
</tr>
<tr>
<td>(study II)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grove 1970</td>
<td>34</td>
<td>6-12</td>
<td>M</td>
<td>+</td>
<td>Feffer’s (RTT) and Turner’s scale for altruism</td>
</tr>
<tr>
<td>Selman 1971a</td>
<td>60</td>
<td>8-10</td>
<td>M&amp;F</td>
<td>+</td>
<td>Flavell’s (RTT 1&amp;2) and Kohlberg’s moral stories</td>
</tr>
<tr>
<td>Scarlett, et al. 1971</td>
<td>90 grades</td>
<td>M</td>
<td>1,3,5</td>
<td>+</td>
<td>verbal descriptions of peers</td>
</tr>
<tr>
<td>Staub 1971</td>
<td>75</td>
<td>K</td>
<td>M&amp;F</td>
<td>0</td>
<td>role playing experience and resulting helping and sharing</td>
</tr>
<tr>
<td>Selman 1971b</td>
<td>60</td>
<td>4,5,6</td>
<td>M&amp;F</td>
<td>+</td>
<td>Flavell (RTT)</td>
</tr>
</tbody>
</table>

\(^{a}(+)\) represents the finding of a positive relationship between age and increasing ability in role-taking accuracy.

\(^{b}(o)\) existence of a developmental trend not examined.

Analysis of role-taking activity in terms of richness of description and concrete-abstract descriptions requires few inferences and little evaluation. Richness of description, using Dymond (1948) as an example, was assessed in the following manner: high empathy -- when the thoughts and feelings of the characters were richly described; medium empathy -- when the descriptions of the thoughts and feelings of a character concentrated on his gross physical attributes; and low empathy -- when the thoughts and feelings of a character were named but not described. Concreteness or abstractness of descriptions was assessed by use of a frequency count of concrete or abstract terms used in descriptions, or the acquisition of consensual labels of varying degrees of abstractness used to describe emotions.

Analysis of role-taking activity in terms of the increasing use of inferences is a somewhat more complex and inferential task than analysis of role-taking activity in terms of richness of description or the use of concrete-abstract terminology. According to Feffer (1969), the increasing use of inferences in role-taking activity is a result of the increasing ability for cognitive decentera-
tion -- the increasing ability to consider and compare, simultaneously, different points of view. Research in role-taking activity in terms of the increasing use of inference may be differentiated into four major areas: 1) studies similar in procedure to those which assessed role-taking activity by analysis of the richness of descriptions utilized (increase in use of inferential concepts with increasing age -- Rappaport and Fritzler, 1967; Gilbert, 1969; increase in use of hypothetical-deductive concepts with increasing age -- Rockway, 1969); 2) studies concerned with the increasing ability to evaluate another's behavior by higher-order guidelines (benevolence, kindness, etc.) rather than by concrete alternatives and consequences (Baldwin, et al., 1969; Baldwin and Baldwin, 1970); 3) studies which demonstrate increasing attempts of older Ss to utilize inferential concepts to achieve descriptions of consistency in the behaviors observed in the same actors (Gollin, 1958; Feffer, 1959; Feffer and Gourevitch, 1960; Grove, 1970); 4) studies which trace the establishment of the ability to maintain an independent point of view¹, and the later development of more abstract levels of recursive thinking (Flavell, et al., 1968; Flapan

¹An independent point of view refers to the development of the cognitive skill of decenteration which enables the child to maintain his own unique perspective while, simultaneously, being aware of others' unique and independent perspectives.

For the present research, the fourth major area listed above is of most importance. To establish an adequate frame of reference for the methodology used in this study (Miller, Kessel and Flavell, 1970, on the development of recursive thinking) three criteria are met: 1) an adequate view of the development of role-taking activity up to and including the establishment of an independent point of view and recognition of the independence of others' points of view (the basis of all recursive thinking) is presented, 2) a description of the ontogeny of role-taking activity in terms of recursive thinking is also presented (this can be seen to mark a form of transition from concrete to formal operations), and 3) research which adds credibility to the existence of these developmental levels of recursive thinking are discussed.

The first requirement for a conceptualization of the development of role-taking activity up to and including the establishment of an independent point of view, and recognition of the independence of others' points of view, is fulfilled by Selman (1971b). Using Flavell's Role Taking Task, in which a subject must make predictions about a peer's response to a situation in which the subject has more information than his peer, Selman has suggested a four-level conceptualization of the development of role-
taking activity (which significantly correlates with age) between the ages of four and six. The chronologically sequential stages are: 1) a sense of others, yet lacking the ability to distinguish between the thoughts and perspectives of the others and of self, 2) the self and others are distinguished, yet no commonality of thought is perceived between the self and others, 3) attribution of one's own ideas to others, and failure to account for a particular other's different perspective, and 4) awareness of other's perspectives that may or may not be similar to one's own. At this point the child has acquired the ability, in various degrees of concrete ways, to take into account, simultaneously, both the other's viewpoint and the other's taking of his own perspective ("reciprocal role taking" -- Selman, 1971b).

With the establishment of one's own independent point of view and the recognition of the independence of the other's point of view, the next major development in role-taking activity is a function of the development of recursive thinking. Recursive thinking is the ability to accurately represent others' objects of thought. Miller, Kessel and Flavell (1970), using a procedure of eliciting verbal descriptions of cartoons representing various levels of recursive thinking and scoring the response for correctness of interpretation of the recursive nature of these cartoons, demonstrated a four-stage conception of the ontogeny
of recursive thinking, from grades one through six, that was positively correlated with grade level. These stages are: 1) the perception of others' thinking about contiguous people (social objects), 2) the perception of other's thinking about action involving two or more people (e.g., talking), 3) the perception of other's thinking about their own or another's thinking (one-loop recursion), 4) the perception of other's thinking about their own or another's thinking about still another's thinking (two-loop recursion). The relevance of this dimension of cognitive ability to the transition between the concrete and formal operation's conception of cognitive development, as described by Piaget, can be seen in a concise statement of the nature of this transition by Piaget (1968, p. 63): "Concrete thinking is the representation of a possible action, and formal thinking is the representation of a representation of the possible action."

Support for Miller, Kessel and Flavell's (1970) conception of the developmental levels of recursive thinking comes from four sources, three of which derive support from two varieties of social guessing games (Flavell, et al., 1968; De Vries, 1970; Selman, 1971a), and the other from verbal descriptions of films and the characters in them (Flapan, 1968). Flapan (1968) notes, in an analysis of verbal description used to assess role-taking ability, that inferences about one actor's thoughts, intentions and
feelings appear earlier than inferences about one actor's perception of another actor's psychological state (i.e., contiguous recursive thinking precedes one-loop recursive thinking). Flavell (1968), De Vries (1970) and Selman (1971a), using two forms of social guessing games, indicate that the development of contiguous recursive thinking occurs prior to the development of one-loop recursive thinking. De Vries (1970) notes the existence of a transitional phase in the strategy of a social guessing game in which the child is able to take into account the other's perspective (as evidenced by a shifting strategy of hiding a penny behind one's back in order to fool a competitor who is guessing in which hand the penny is being held) before he is able to take into account the other's-taking-account-of his own perspective (as evidenced by the absence of a shifting strategy in guessing in which hand a competitor is hiding the penny). Eventually, both shifting strategies in hiding and guessing behavior are achieved.

This review of research on the ontogeny of role-taking activities ends with a summary of two major modes of change in the development of inferential activity and five essential aspects of mature role-taking activity (Flavell, 1968, 1970). The two major modes of change in the development of inferential activity are: 1) as one matures, the construction of an increasingly rich interpretation of others' covert processes and the attribution of increasingly complex
internal psychological events in others, and 2) that which is attributed to another becomes more accurate and objective (less biased by an egocentric perspective). The five essential aspects of mature role-taking activity are: 1) **existence** of "perspective" -- the recognition of the independence of one's own point of view and of another's point of view, 2) **relevance** -- the realization that the analysis of another's perspective would facilitate social interactions, 3) **ability** -- the ability to analyze accurately another's relevant role attributes and to predict his behavior, 4) **maintenance** -- the ability to maintain the awareness of another's cognition while engaged in a goal directed behavior, and 5) **application** -- the ability to apply these cognitions to a desired end.
Altruism

Besides presenting the conceptual framework within which this research approached the study of altruism (i.e., the definition of altruism), and reviewing research which tends to relate the existence of altruism with empathy and role-taking activity (which is discussed in a separate section of this paper), and extensive review of the literature on altruism (as has been attempted on the ontogeny of role-taking ability) is not warranted. There are two major reasons for this conclusion: 1) Unlike the literature on role-taking ability (see dated review for Taft, 1955; Strunk, 1957, and an incomplete review by Flavell, 1968), the research and theoretical literature on altruism has been extensively reviewed in recent years (Mildarsky, 1968; Bryan and London, 1970; Krebs, 1970a), and the major outlines of Krebs' conceptualization of altruism research are described in some detail in this review. 2) Unlike research in role-taking ability, in which a great amount of concern has been given to developmental conceptualization, there has been little effort to investigate the ontogeny of altruism. Those studies which do investigate the ontogeny of altruism are briefly described following the description of the major areas of research in altruism as considered by Krebs (1970a).
Definition of Altruism

Midlarsky (1968) has defined altruism as a helpful action which incurs some cost to the individual with the expectation of little or no gain relative to the magnitude of the investment. In addition, Midlarsky (1968) has proposed four criteria for an assessment of the degree of altruism involved in a given act [in proposing these criteria Midlarsky owes an obvious debt to Leeds' (1963) three criteria of the norm of giving]: 1) the degree of gain to the individual performing an 'altruistic' act -- there must be little or no personal gain beyond affective reinforcement, 2) the actual cost to the individual of his altruistic actions -- in terms of time, effort, etc., 3) the degree to which an 'altruistic' act is prescribed, and 4) the availability of alternative actions -- how compelling is the need to act?

Krebs (1970b) has accurately assessed the difficulties involved in a conception of altruism when he states that there exists no absolute form of altruism; rather there exists a continuum of less altruistic to more altruistic actions. Less altruistic actions are dependent upon expectations of material rewards, more altruistic actions are dependent upon social approval, while the most convincing altruistic actions are based upon internal rewards (such as vicariously conditioned affective reinforcement).
Research in Altruism

Krebs (1970a) has classified the independent variables employed in research on altruism within the framework of a two-by-four matrix. The two aspects which comprise the X-axis are the characteristics of the benefactor and the characteristics of the recipient. The four aspects which comprise the Y-axis are situational state variables, personality trait variables, social roles and demographic attributes and social norms. The independent variables which have attracted research attention and presently comprise these eight categories are: 1) Situational state variables -- benefactors: the creation of positive affective states through experience which involves success and the perception of competence, the creation of negative affective states through the experiencing of failure, unintentional harm to another and acts of transgression, and the inducement of cognitive states by the observation of models. 2) Situational state variables -- recipient: the perception of dependency in the recipient, and the interpersonal attractiveness of the recipient (e.g., perceive similarity). 3) Personality trait variables -- benefactor: an assessment of altruism as defined by the rating of others, scores on pencil-and-paper tests, and some behavioral measures. 4) Personality traits -- recipients: perception of dependency, etc. 5) Social roles and demographic attributes --
benefactor: sex differences, age, ordinal position, social class and group affiliation and nationality. 6) Social roles and demographic attributes -- recipient: friendship status, ingroup affiliation, social class, and nationality. 7) Social norms -- benefactors: norm of social responsibility and norm of giving. 8) Social norms -- recipient: norms of reciprocity, generalized reciprocity.

Research still tends to stress the importance of the effects on altruistic behavior of temporary states of the benefactor, and also an experimental orientation towards the benefactor rather than the recipient. Recently, the concern for the effects on altruistic behavior of temporary states of the benefactor (as induced by modelling -- modelling as an imitative behavior facilitated by the model who draws attention to particular courses of action of salience of social norm, who helps define the situation and creates a normative standard, and who supplies information on the consequences of actions rather than modelling which may result in the acquisition of congruent behavioral dispositions, e.g., empathy -- Krebs, 1970a) has emphasized not only the actions of the model but also the preachings\(^2\)

\(^2\)preaching refers to the declarations of proper modes of behavior -- it is a term drawn directly from the cited references.
of the model (Bryan and Walbek, 1970a, 1970b; Presbie and Colteux, 1971; Bryan, Redfield and Mader, 1971; Grusec, 1972). Results on the interaction effects of preaching and practicing generosity have indicated that an optimal modelling effect occurs when the model both preaches and practices generosity; that when a model preaches generosity and does not practice it the occurrence of altruistic behavior may be insignificantly depressed, and that the preaching of the model is most effective in determining the model's attractiveness. Grusec (1972) has questioned many of these interaction effects in terms of the specific task one is to model, and that the determining factor of the subject's behavior may not be due to modelling but rather the demand characteristics of the experimental situation. (See Table 3.)

Developmental Studies of Altruism

Studies by Wright (1942), Ugurel-Semin (1952), Durkin (1962), Midlarsky and Bryan (1967), L. Harris (1967), Shure (1968), M. Harris (1970), Handlon and Gross (1968), Staub (1968), Staub and Feagans (1969) and Grove (1970) have all found the incidence of altruism to be positively correlated with age. These studies may be grouped into three categories: 1) those which involved the giving of some tangible object (tokens, money, food) — Wright (1942), Ugurel-Semin (1952), Midlarsky and Bryan (1967), Handlon and Gross
### Table 3

A Representative Sampling of Recent Research Reports on Altruism (1969-1972)

<table>
<thead>
<tr>
<th>I Situational State Variables</th>
<th>Benefactor</th>
<th>Recipient</th>
</tr>
</thead>
<tbody>
<tr>
<td>III Social Roles and Demographic Variables</td>
<td>Grove (1970)</td>
<td>(none)</td>
</tr>
<tr>
<td>IV Social Norms</td>
<td>Harris (1970)</td>
<td>(none)</td>
</tr>
<tr>
<td></td>
<td>Presbie and Kanor-eff (1970)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schwartz (1970)</td>
<td></td>
</tr>
</tbody>
</table>
(1968), M. Harris (1970) and Staub (1968); 2) those which examined helping behavior (physical assistance) -- Staub and Feagans (1969); and 3) those which evaluated altruism by verbal expression -- Durkin (1961), L. Harris (1967), Shure (1968), and Grove (1970). The most ambitious of those studies of giving was that performed by Uğurel-Şemin (1952) which included 291 males and females of ages four to sixteen. From this study, there resulted three major classifications of the children: selfish (those who kept more than they shared), generous (those who gave more than they kept), and equalitarian (those who shared equally). Selfishness decreased with age (from 66% of four through six-year-olds characterized as selfish to the complete disappearance of selfishness after age twelve); generosity increased with age from the ages six to its zenith at the ages of seven and eight years (63% characterized as generous -- after age eight the percentage tended to fluctuate and remain lower than equalitarian); and equalitarianism increased with age to its apogee at ages eleven and twelve (68%).

Uğurel-Şemin's (1952) results which indicated a transition from selfish to generous between the ages of five and eight have been confirmed by Handlon and Gross (1959) and Midlarsky and Bryan (1967). However, Handlon and Gross (1959) and Midlarsky and Bryan (1967) did not find the development of altruism to be curvilinear with respect
to age (selfish-generous-equalitarian) but rather to exist in a direct relationship with age (selfish→generous→more generous).

Role-Taking Ability and the Development of Altruism

In the classic study by Murphy (1937), feelings of sympathy were related to altruistic and helping responses: "The sympathetic responses and the patterns of sharing that may develop during the same period...may well be preparatory stages which lead to true altruism" (Murphy, 1937, p. 12). (True altruism was viewed as behavior which incurs some cost to the individual, while sympathetic behavior was considered as not threatening to the individual's own interests.)

In turn, the roots of sympathy were conceptualized by both Mead (1934) and Murphy (1937) as lying in role-taking ability: "The attitude that we characterize as that of sympathy springs from this same capacity to take the role of the other with whom one is socially implicated" (Mead, 1934, p. 366); "In the case of sympathy, probably general thresholds for being affectionate, for seeing similarities between other's situations and our own, and for empathic responsiveness underlie sympathetic habits" (Murphy, 1937, p. 286).

Until recently the nature of this relationship between role-taking ability and altruism has received little con-
sideration. This lack of interest may have been caused by an uncertainty as to an appropriate research methodology to be used in assessing role-taking ability (role-taking accuracy vs. role-taking activity), and by the global conception of role-taking ability. With recent research interest in role-taking activity, and the conception of role-taking ability as involving both affective and cognitive components, interest in the nature of the relationship between role-taking ability and altruism has been renewed.

Role-Taking Activity as an Affective Response and the Incidence of Altruism

Research has already been cited (p. 12) that demonstrates vicarious experiencing is sometimes an antecedent correlate of affective responses. The general paradigm for such vicarious influence has been described by Berger (1962) in experimental conditioning terms: a performer's emotional response is inferred by an observer by the stimulus the performer is thought to experience and by the performer's overt responses; in turn, the performer's emotional responses elicits from the observer an emotional response.

 Adopting this conception of vicarious experience and referring to it as empathy\(^3\), Aronfreed (1968, 1970) has

\(^3\) empathy is defined as an individual's affective experiencing when it is elicited by social cues which trans-
proposed that altruism is acquired through behavior contingent upon, or observational learning engaging, both positive and negative affective control. According to Aronfreed (1968) it is a necessary, but not sufficient, prerequisite that a child's empathic and vicarious experiences be established before the acquisition of altruism. In summary, the general paradigm for the acquisition of altruistic components of behavior has two prerequisites: 1) "the attachment of potentially reinforcing empathic or vicarious changes of affectivity to social cues which transmit information about the experience of others" (Aronfreed, 1968, p. 149), 2) "the establishment of the instrumental value of overt acts for which such social cues are contingent outcomes -- initially through their external occurrences as visible indicators of the experience of others, and subsequently through their cognitive representation by the child" (Aronfreed, 1968, p. 149).

Support for this conception of the relationship between empathy (conceived of as the affective component of role-taking activity) and the incidence of altruistic behavior can be found in the findings of four recent studies (Aronfreed and Paskal, reported in Aronfreed, 1968; Mid-mit information about the corresponding affective experience of another person -- either by expressive cues which are direct indices of another's affective state or by the kinds of cues which convey the affective impact of external events upon another.
larsky and Bryan, 1967; Aderman and Berkowitz, 1969; and Krebs, 1970b). Aronfreed and Paskal (reported in Aronfreed, 1968) and Midlarsky and Bryan (1967) found that seven and eight-year-old females were more likely to make self-sacrificial responses when these responses were rewarded by an adult female's expressive signs of joy (smiling) and affection (hugs), than when these responses were rewarded by either an adult female's expressive cues of joy or an adult female's signs of affection.

Aderman and Berkowitz (1969) demonstrated that the likelihood of college students helping an experimenter score data was related to their prior listening to tape recordings of interactions between two other students. In these situations one student asked another to help him compile a bibliography. The other student either volunteered to help and was thanked for giving his aid, did not volunteer to help, or volunteered to help but was not thanked for giving his aid. They found that college students are most likely to help the experimenter after hearing the first tape, less likely to help the experimenter after hearing the second tape, and least likely to help after hearing the last tape.

Krebs (1970b) has also reported research which involved the performance of overt behavior which had been made contingent upon social cues designed to elicit empathic controls. Moreover, he employed the measurement of
some physiological reactions of the observer to demonstrate the observer's empathy with the performer. Both overt behaviors and physiological reactions were demonstrated to be contingent upon the social cues of others.

These four studies can reasonably be interpreted as indicating that empathic affective experience plays a critical role in eliciting helping acts.

Role-Taking Activity as an Underlying Cognitive Process and the Incidence of Altruism

According to Aronfreed (1968) it is a necessary, but not sufficient, prerequisite for the acquisition of altruism that a child is capable of empathic and vicarious experiencing. Supporters of this position (p. 33) have concentrated their attention on the affective component of role-taking activity, with little consideration of cognitive development and the possible determining roles of cognitive structures. However, Feshbach and Roe (1968) have noted that empathy, as a vicarious affective response, may be contingent on the interpretation (or level of comprehension) of a social event. It is from this sequence of necessary prerequisite acquisitions (the level of cognitive development as a determinant factor in the nature of role-taking activity, the nature of role-taking activity as a determinant factor in empathic and vicarious experiencing, and acquisition of altruistic behavior through behavior
contingent on observational learning based upon the child's empathic and vicarious experiencing), and from Piaget's conception of concurrent growth among different tasks calling for the same operation or among the processes of different operations that this paper's primary hypothesis of concomitant growth between role-taking activity (as indicated by the development of recursive thinking) and the development of altruism is derived.

Suggestive support for this hypothesis of concomitant growth may be found in five recent studies. Baldwin, et al. (1969) and Baldwin and Baldwin (1970) have traced the increasing ability to evaluate another's prosocial behavior by higher-order guidelines based upon the cognitive aspects of developing role-taking ability from kindergarten through college; Selman (1971a) has demonstrated the existence of a positive relationship between the cognitive aspects of the development of role-taking ability and moral judgement in children of ages eight to ten; Staub (1971) has demonstrated the effectiveness of role playing in the willingness of kindergarten children to share candy and to attempt to aid a distressed peer (as a tape recording of cries from another room); and Grove (1970) has investigated

4higher order guidelines refers to a child's developing ability to be simultaneously aware of factors of benevolence, self interest and equality of outcome and behavior in a situation, rather than being limited to the awareness of only one alternative in a situation at any one time.
the implications of cognitive functioning (role-taking activity) in the development of altruistic patterns of behavior.

The study by Grove (1970) found a positive relationship of concomitant growth between role-taking activity (as assessed by Feffer's RTT, 1959, and Dymond, Hughes and Raabe's, 1952, picture interpretation task) and the development of altruistic patterns of behavior (as assessed by Turner's Altruism Scale, 1948). This study should be conceived of as only a pilot study with suggestive implications for two reasons: 1) only thirty-four boys were used to assess the development of role-taking ability and altruism between the ages of six and twelve. 2) Turner's Altruism Scale assesses a child's altruism by secondhand, subjective reportage (teachers' ratings), involves no direct observations of altruistic behavior in the child, and the content of the scale appears to emphasize ethical goodness more than altruism.
Methodology

According to Piaget (Flavell, 1970; Flavell and Wohlwill, 1965; Pinard and Laurendeau, 1969), there are two major defining characteristics of cognitive development: 1) concurrent growth among different adaptive skills calling for the same operation, or among simultaneous use of different operations, and 2) sequential patterning in the acquisition of cognitive structures. The two primary hypotheses of this research are derived from these two aspects of Piaget's conception of cognitive development: 1) That there exists a relationship of concomitant growth between the development of recursive thinking and the development of altruism in boys of grades 1, 3 and 5. 2) That there exist invariant developmental sequences in the acquisition of both recursive thinking and altruism. The statistical methodology typically used to analyze data for the existence of concurrence between, and sequentiality among cognitive acquisition is correlation.

The methodology of this study is discussed in two separate sections. The first section is designed to test the hypotheses of concomitant growth and of sequential acquisition. The second section describes the testing of
an hypothesis generated from one of the findings of the first experiment.

Experiment No. 1. The Development of Recursive Thinking and Altruism in Boys Grades 1, 3 and 5

Recursive thinking has been defined by Miller, Kessel and Flavell (1970) as the ability to conceive of other's thinking about a social object, thinking about an action between people, or thinking about thinking itself. In an earlier section of this dissertation (Related Literature -- Role-Taking Activity), a frame of reference for the development of recursive thinking was discussed in three parts: 1) a view of the development of role-taking activity up to and including the establishment of an independent point of view was presented, 2) a description of the ontogeny of role-taking activity in terms of recursive thinking was presented, and 3) research findings which add some credibility to the existence of the developmental levels of recursive thinking were briefly discussed.

Altruism has been defined by Midlarsky (1968) as helpful action which incurs some cost to the individual with the expectation of little or no gain relative to the investment. Complementary to this conception of altruism, Krebs (1970b) has stated that there is no absolute form of altruism; rather, there exists a continuum of less altruistic to more altruistic actions dependent upon the expectations of eventual gain for an action helpful to another.
The development of altruism has been shown to be positively related to age, and research findings have been obtained that suggest concomitant growth between role-taking activity and altruism.

Population and Sample

Sixty, male, caucasian children (20 children from each of the grade levels 1, 3 and 5) from intact nuclear families of two to five children comprised the sample. The children had I.Q.'s within the higher part of the normal population range\(^1\) (approximately 100 through 120) and came from one elementary school in a middle-class neighborhood in Columbus, Ohio.

The rationale for one of the above restrictions on the sample is as follows: Sex -- In the ten studies on role-taking accuracy and activity reviewed in this dissertation, which involved both sexes, three found a positive interaction effect for the sex variable (Yarrow and Campbell, 1963; Dimitrovsky, 1964; Staub, 1971), three reported effects of sex differences (Gates, 1923; Dymond, 1949; Feshbach and Roe, 1968) and four found no effect due to sex differences (Gollin, 1958; Gilden, 1969; Roth-

\(^1\)I.Q.'s were taken from school records based on the California Test of Mental Maturity. These records were not available for first graders, therefore selection in this grade was based upon teacher ratings of satisfactory school performance and the absence of any severe behavioral problems.
enberg, 1970; Baldwin and Baldwin, 1970). In the seventeen studies on altruism reviewed by Krebs (1970a), which examined children of both sexes, eleven reported no sex differences, and of those six reporting sex differences, only two reported effects that approached significance (p .01). These results involving the effects of sex in studies dealing with role-taking ability and in studies dealing with altruism, and the effects any possible difference between the sexes might have on findings related to the main thesis of this dissertation, persuaded the male E to select an all male sample of Ss.

Design 1 for Experiment No. 1. Assessment of Levels of Recursive Thinking

Role-taking activity was assessed for children from grades 1, 3 and 5 in terms of recursive thinking. Recursive thinking was assessed by using an adaptation of the procedure developed by Miller, Kessel and Flavell (1970). The present study utilized a procedure of eliciting verbal descriptions of cartoons representing various levels of recursive thinking and scoring the responses for correctness of interpretations of the recursive nature of the cartoons. The cartoons consisted of children, some with scalloped outlined clouds over their heads representing thinking, and some with smooth outlined clouds over their heads representing talking. As implied by the definition of recursive thinking, when the child was represented as
thinking about a representation of object, action or another representation, the scalloped outlined clouds were nested within each other (see pictures, Appendix A).

The study by Miller, et al. (1970), demonstrated a four-stage conception of the ontogeny of recursive thinking; a sequential development from grades one through six that was positively correlated with grade level. These stages are: 1) thinking about contiguous people (social objects), 2) thinking about actions between people (talking), 3) thinking about thinking (one-loop recursion), and 4) thinking about thinking about thinking (two-loop recursion).

Two major changes in methodology of the study by Miller, et al., were made for the present research: 1) the utilization of photographs (instead of cartoon drawings) to represent the various levels of recursive thinking, 2) the elimination of testing for the two-loop recursion level. The need for more realism in the drawings (particularly the action drawings) was noted by Miller, Kessel and Flavell (1970) in the discussion section of their article. The present E made the representations more realistic by utilizing real subjects presented in photographs, actually engaged in recursive actions. To aid in the subjects' understanding of the recursive nature of these pictures the representations of thinking (scalloped outlined clouds) and talking (smooth outlined clouds) were
retained from Miller, Kessel and Flavell's (1970) procedures:

The representation of the two-loop recursion was not included in this study for two major reasons: 1) Unlike the shifts in recursive thought from thinking about contiguous objects, to thinking about action, to thinking about thinking, the shift from thinking about thinking to thinking about thinking about thinking involves what appears to be a tremendously large advance in cognitive representation. Pilot testing yielded findings suggesting that this may alter the dimensions of change through which recursive thinking progresses, and makes the Ss' responses susceptible to an interpretation that what is being measured is not various levels of inferential ability, but rather the child's ability to deal with an unusual type of complexity. 2) There is some question in the present writer's thinking as to the concrete operational existence of a two-loop recursion -- is it merely a representation of a formal operational possibility (such as \(-1\)) rather than a representation based on a concrete operational reality? In a review by N.L. Gage (1968) dealing with IPM questionnaires (an assessment of role-taking activity based upon recursive thinking ability) he states that "the infinitely regressing images of our images may be functionally nonexistent after one or two spirals of this kind" (I think, you think, I think, ...). Also, De Vries (1970), in her analysis of
stages in strategy in a social guessing game, describes shifting behavior representative of only one-loop recursive thought (The boy is thinking that the girl is thinking about the boy hiding the coin.).

Procedure 1 for Experiment No. 1.

All Ss were tested individually\(^2\). E was seated in the same room with S and presented the cartoon representations of recursive thinking to the child while operating a tape machine to record the verbal descriptions of the children for later analysis and classification into recursive levels. E began by familiarizing the child with the representations that would be utilized in the testing (e.g., that facial gestures by the actors indicated thinking, that the scalloped outlined clouds represented thinking and that the smooth outlined clouds represented talking, etc.). The Ss were shown a few typical sequences of a child thinking about a contiguous object (rather than a contiguous person), and asked to describe what he saw (e.g., The boy is thinking about a car...a clock...a butterfly). When E was satisfied that the S understood the instructions he proceeded to the main phase of testing.

\(^2\) Testing was performed in a small arts supply room. Two of the walls had shelves filled with paper, paint, glue and the like. The other two walls were plain. E utilized a small, child-sized desk for Procedure 1 and a larger cafeteria-type (5 feet by 3 feet) table for Procedure 2.
During testing, 14 cartoon representations of recursive thinking were successively presented to S. Each time E presented a new cartoon representation he asked, "What is the boy thinking?" or "What's going on now?" S's verbal descriptions were recorded. In addition, E reminded the S of the distinction between scalloped outlined clouds and smooth outlined clouds, as frequently as he deemed necessary.

There were three orders of presentation of the cartoon representations, each given to one-third of each grade. Each order was a random order of the items, with the exceptions that items 1 and 2 were always the first two items, and also that no items of the same type (contiguity, action, one-loop recursion) appeared more than twice in succession.

The following are accurate verbal descriptions of the items used in this study.

<table>
<thead>
<tr>
<th>Item Group and No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contiguity:</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>The boy is thinking of the girl</td>
</tr>
<tr>
<td>2.</td>
<td>The boy is thinking of himself</td>
</tr>
<tr>
<td>3.</td>
<td>The boy is thinking of the girl and father</td>
</tr>
<tr>
<td>4.</td>
<td>The boy is thinking of himself and the girl</td>
</tr>
<tr>
<td>5.</td>
<td>The boy is thinking of the girl, father, and</td>
</tr>
<tr>
<td></td>
<td>mother</td>
</tr>
<tr>
<td>6.</td>
<td>The boy is thinking of himself, the girl, and</td>
</tr>
<tr>
<td></td>
<td>father</td>
</tr>
<tr>
<td><strong>Action:</strong></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The boy is thinking that the girl is talking to</td>
</tr>
<tr>
<td></td>
<td>father</td>
</tr>
<tr>
<td>8.</td>
<td>The boy is thinking that he is talking to the</td>
</tr>
</tbody>
</table>
9. The boy is thinking that the girl is talking to him.

One-loop recursion:
10. The boy is thinking that the girl is thinking of father.
11. The boy is thinking that he is thinking of the girl.
12. The boy is thinking that the girl is thinking of him.
13. The boy is thinking that the girl is thinking of herself.
14. The boy is thinking that he is thinking of himself.

Design 2 for Experiment No. 1. Assessment of Degrees of Altruism

The degree of altruism was assessed for children from grades 1, 3 and 5 by utilizing an adaptation of a paired comparison and four-choice discrimination tasks described by Witryol and Fisher (1960), and by Witryol, Tyrrell and Lowden (1964, 1965). The findings of these studies were interpreted to suggest "an economical procedure for determining reinforcement strengths in the five-choice discriminative task where each subject serves as his own control" (Witryol, Tyrrell and Lowdon, 1970, p. 233) and a validation of the method of paired comparisons applied to incentives. The important aspect of these findings, as applied to use in this study, is that the ranking of these items by preference in the paired comparison task is significantly reiterated by the ranking of the same items in the four-choice discrimination task.

Remembering the definition of altruism employed by
this study (a helpful action which incurs some cost to the individual with the expectation of little or no gain relative to the magnitude of the investment -- Midlarsky, 1968) and Krebs' (1970) statement that altruism does not exist in an absolute form but rather on a continuum of less to more altruistic actions, the ability to establish cost to the individual of an altruistic action before it occurs is a valuable methodological tool not used in most tests of altruism. The general procedure in this section of the experiment was to establish the value to the children of the objects they would later donate or keep for themselves, in the four-choice discrimination task, and in the paired comparison task. The details of the procedure are discussed in the following section.

There are three final benefits to the utilization of Witryol, et al. (1964, 1965), procedures: 1) the paired comparison and four-choice discrimination tasks have been demonstrated to be a successful means of accurately rating preferences of children of grades 1, 3 and 5, and 2) satisfaction to preferred items was not found to occur in eighty runs of the five-choice discrimination task and therefore a child is not likely to become more 'altruistic' due to the waning desire to accumulate his preferred objects, and 3) stabilization of preference hierarchies among items becomes evident quite rapidly in the four-choice discrimination task.
Procedure 2 for Experiment No. 1.

Procedure 2 directly follows the completion of Procedure 1.

All Ss were tested individually. E began by employing a paired-comparison procedure to establish S's preferences among four items (penny, nickel, dime and quarter). S was directed to point to his most preferred item of the two presented at each time.

E then said to S:

Have you ever been in a hospital? If you have, you know that... (or If you haven't, you still probably know that...) sometimes it can be scary and you can get pretty lonely at times. A lot of children your age are in the hospital because they've broken an arm or a leg, and they have to stay in bed or are on crutches for a while.

I've been told that what these children really would like to have, would be a party. If they could have a party they wouldn't be as scared and they would be a lot less lonely.

In just a moment we're going to play a little game. This game will give you a chance to help the children by throwing a party for them, and it will also give you a chance to earn some money for yourself.

E then put a tray with four cups on it in front of S and said to S:

We're now going to play a little game. Here are four paper cups, each one turned upside-down. On each cup there's a funny little shape. Under each cup you'll find a penny, a nickel, a dime, or a quarter. Your job is to learn under which cup the penny

The 'funny little shapes' are chosen from 30 nonsense planometric figures, and randomized among the children -- see Stimuli, Appendix B.
is hidden, under which cup the nickel is hidden, etc. The funny little shapes will help you learn this.

Here's how we're going to play this game.

Do you remember the children I told you about who are in the hospital now? Well, sometimes they're very lonely and have nothing to do, and they would very much like to have a party. When you play this game you can help these children have that party. I'm going to show you these four cups. You tell me which cup you want me to turn over. Whatever is under that cup, we'll put over on one of these sheets of paper on your left.

When you've filled up a whole sheet of paper with pennies, nickels, dimes or quarters and reached the red square, we'll give a penny, nickel, dime or quarter to help give a party for those children in the hospital. For example, when you've filled every square on this sheet of paper with quarters and there's a quarter in the red square, one quarter will go towards a party for the children. Do you understand?

After we've turned over the first cup, and put the money on one of these sheets on your left, you'll get to choose a second cup and we'll turn that over. Whatever is under that cup we'll put over on one of these sheets on your right.

When you've filled up a whole sheet of paper with pennies, nickels, dimes or quarters and reached

4 The four stimulus patterns and the associated rewards are constant for each child.

5 S had in front of him two sets of four sheets of paper. Each sheet was divided into 8 squares. For the child to obtain for himself, or to donate to others the chosen items, he had to fill up each square on the appropriate sheets -- each sheet had a penny, nickel, dime, or quarter pasted at the top to identify it.

6 When an S reached the eighth square and actually gave a certain amount to himself or the hospital party, all the money on squares 1 through 7 were removed and the S had to start filling the sheet again, beginning with square 1.

7 Whether the child was told to give to the left or to the right was randomized over the total sample.
the red square, we'll give a penny, nickel, dime or quarter to you to keep for yourself. For example, when you've filled every square on this sheet of paper with quarters and there's a quarter in the red square, one quarter will be given to you. Do you understand?\(^8\)

Now, after you've chosen two cups to turn over, I'll replace the money we've taken out from under the cups and then I'll move the cups to a new position. When I've replaced the money, and put the cups in a new position we'll start the game over again.\(^9\)

Now remember, your job is to learn under which cup the penny, nickel, dime or quarter is kept. The sooner you learn this, the sooner you'll be able to give and keep whatever you want.

Do you understand how we're going to play this game?\(^10\)

S was given 24 trials at the four-choice discrimination task. During testing, the money S had given to himself was placed in a little box marked "YOUR MONEY", and the money he donated to the children in the hospital was placed in a little box marked "HOSPITAL FUND". Both boxes were in clear sight of S.

At the end of the testing, E told each S that the principal asked that E keep a record of how much he owed.

\(^8\) See Appendix C for sample sheet upon which money was placed.

\(^9\) E continued to remind S that the money under the first cup turned over would go to the children in the hospital, and the money under the second cup turned over he could keep for himself.

\(^10\) These directions were used by E as a guideline for conversation with each S. There was not a word for word rendering to each S. E attempted to develop an atmosphere of conversation with each S -- a conversation that stressed all relevant points of the situation.
to each S and how much was owed to the hospital, and that this money be given to all the children when E had finished his work in the school.\textsuperscript{11} E then asked each teacher to instruct the child not to open the envelope until he reached home, so he would not lose the money. This procedure was taken to avoid the possible disruption of a classroom by a S returning to his classroom and showing all the other children what he had earned.

Total time for testing both Procedure 1 and Procedure 2 was approximately 35-40 minutes.

Predictions

H1. \ldots there is a significant correlation between recursive thinking and altruism at each grade level tested (grades 1, 3 and 5).

H2. \ldots individually, both recursive thinking and altruism correlate significantly with grade level.

H3. \ldots correlations between recursive thinking and altruism increase in magnitude with progression in grade level.

H4. \ldots recursive thinking and altruism relate more strongly to each other than either relates to grade level.

\textsuperscript{11} E took two weeks to complete the testing of Experiment No. 1.

\textsuperscript{12} The rationale for H3 is that as recursive thinking becomes more firmly established in a child's repertoire of abilities, its effect will become more far reaching and more likely to effect other related aspects of his behavior.
Experiment No. 2. The Existence of a Significant Developmental Trend in Altruism in Boys Grades 1, 3 and 5, as a Function of Methodology

In this paper's result section it is reported that no significant developmental trend was found for altruism in grades 1, 3 and 5 in Experiment No. 1 (using the procedures described on p. 49). An hypothesis to explain this negative finding is described in detail in the discussion section of this paper. Briefly, this hypothesis states that the existence of a significant developmental trend in altruism is, in part, a function of methodology. The following procedure was designed to test the reasonableness of this hypothesis.

Population and Sample

Fifty-seven, male, caucasian children of grades 1, 3 and 5 (18 children from grade 1, 19 children from grade 3, and 20 children from grade 5). These are 57 of the children who participated in Experiment No. 1. Of the original 60 Ss, two were absent and one had changed schools by the time Experiment No. 2 was conducted.

Design for Experiment No. 2. Assessment of Degrees of Altruism

To be altruistic in Experiment No. 1 a child had to forego the retention of money for himself in order to give to others during the time that he was "earning" the money by his own efforts. In all the other studies that have
shown developmental trends in altruism (see p. 28-p. 36) the child first received the money, tokens, etc., and was then given an opportunity to donate or share these concrete items with others. The design of Experiment No. 2 utilized this latter procedure.

**Procedures for Experiment No. 2.**

All Ss were tested individually.\(^{13}\)

E said to S:

**Hi.**

Do you remember me from a few months ago?\(^{14}\)

When I was last here one of the things I asked you to do was to help us give a hospital party for children of your age who have been in the hospital for a long time. We wanted to have this party in hopes that some of the children who may be lonely or scared might feel a little better.

The first part of my work has been completed now and I've decided to give all the people who helped me an extra fifty cents.\(^{15}\)

We hope to have the hospital party in a few weeks and if you'd like to donate any of the money I've just given you to the children's hospital party, you can put your contribution in the box marked "HOSPITAL PARTY".

The rest of the money you can put back into the envelope with your name on it and your teacher will

---

\(^{13}\) Testing was performed in a small art supply room. Two of the walls had shelves filled with paper, paint, glue and the like. The other two walls were plain. E utilized a small, child-sized desk.

\(^{14}\) Experiment No. 2 followed Experiment No. 1 by approximately two months.

\(^{15}\) E then opened a small envelope (the same size used to give out money in Experiment No. 1), and poured 10 nickels on the table in front of S. E then busied himself by writing E's name and classroom number on the envelope, and afterwards placed the envelope in the box marked "YOUR MONEY".
give it to you at the end of school today.\footnote{16} 
(Pause) You may do that now.\footnote{17}

Total time for testing each S in Experiment No. 2 was approximately 3-5 minutes.

Predictions

\(H_{1a}.\) ...that altruism, as assessed in Experiment No. 2, significantly correlates with grade level.

\(H_{2a}.\) ...that there is a significant correlation between altruism as assessed by Procedures in Experiment No. 1 and altruism as assessed by Procedures in Experiment No. 2, at each grade level tested (grades 1, 3 and 5).

\footnote{16}{All 57 children were run through Experiment No. 2 in one day.}

\footnote{17}{These directions were used by E as a guideline for conversation with each S. There was not a word for word rendering to each S. E attempted to develop an atmosphere of conversation with each S -- a conversation that stressed all relevant points of the situation.}
Results

The organization of this result section is designed to reiterate the organization employed in the methodology section of this paper.

Experiment No. 1. The Development of Recursive Thinking and Altruism in Boys Grades 1, 3 and 5

Procedure for the Treatment of Data (Recursive Thinking):

After transcribing the descriptions of the pictorial representations of recursive thinking (see Appendix A) from tape to paper, the verbal structure of each sentence was analyzed. The basic premise was that the verbal structure of the response indicated S's understanding of the representations.

A nine-point scale was devised for this analysis (-4, -3, -2, -1, 0, 1, 2, 3, 4). One point was given for the use of a connecting word between a sentence's phrases that indicated recursive thinking (the nesting of a person, action or thought within a thought). One point was deducted for the use of a connecting word between a sentence's phrases that did not indicate recursive thinking.

Correct: The boy is thinking (about, that, of)
the girl is thinking (about, that, of) father.
Incorrect: The boy is thinking (and) the
girl is thinking (and) father.\(^1\)

Only one point could be given to those sentences describing contiguity and action, while two points were given to those sentences describing a one-loop recursion (see p. 42).

One point was also given for the correct attribution of thinking. One point was deducted for the incorrect attribution of thinking.

Correct: The boy is thinking that the girl is thinking of father.
Incorrect: The boy is thinking of the girl and father.\(^2\)

Only one point could be given to those sentences describing contiguity and action, while two points were given to those sentences describing a one-loop recursion.

One point was deducted for the non-attrition of talking in the sentences describing representation of action within recursive thinking.

Correct: The boy is thinking that the girl is talking to father.
Incorrect: The boy is thinking of the girl and father.\(^3\)

In scoring the Ss of this sample for the verbal structures of their descriptions of recursive thinking, it was necessary to use only five points of the nine-point scale (0, 1, 2, 3, 4).

\(^{1-3}\) See Appendix A for pictorial representations of recursive thinking used in this study.
(Altruism):

Five indices were used to assess the level of altruism for each S. These indices were: 1) the total amount of money actually given to the hospital party, 2) the total amount of money actually given to oneself (this is a score of non-altruism and therefore an altruism score was derived from its inverse), 3) the total amount of money on the sheets for the hospital party at the end of the game (including index '1'), 4) the total amount of money on the sheets for oneself at the end of the game (including index '2') (an altruism score was derived from this score's inverse), and 5) the total number of trials in which the hospital party received more money than S (see Appendix D for a sample score sheet and scoring).

(Covertness):

Covertness is a discovered variable. For the present writer, a discovered variable is one that reveals itself during testing rather than during a search of the literature. The theoretical rationale of this discovered variable is considered in the discussion section.

Four indices were used to assess the degree of covertness for each S. These indices were: 1) the number of trials that S took between his seventh and eighth choices, in the allocation of money to himself (the eighth choice of a particular denomination actually gave that amount of money to himself), 2) the number of switches S made from
favoring himself to favoring the hospital party, 3) the number of trials S took before the sheet allocating money to himself was filled, and 4) the number of trials S took before the sheet allocating money to the hospital party was filled (see Appendix D for a sample score sheet and scoring).

No developmental trends were predicted for covertness. A relationship between altruism and covertness was predicted, and has become a post hoc fifth hypothesis of Experiment No. 1.

H5. ...that there is a significant negative correlation between altruism and covertness at each grade level tested (grades 1, 3 and 5).

Data Analysis

The correlations necessary for the testing of hypotheses 1 through 5 of Experiment No. 1 (H1-H5) were: 1) the correlations between recursive thinking and grade level, and altruism and grade level for the whole sample (grades 1, 3 and 5), and 2) the correlations between recursive thinking and altruism, and covertness and altruism at each grade level. (These correlations are presented in Figures 1 2, and Figures 3 and 4, respectively.)

In addition, graphic and tabular renderings of the following information have been included: 1) Percentages of perfect verbal exposition of each level of recursive thinking at each grade level (Fig. 5), 2) Actual altruism
at each grade level (Table 4a), and 3) Percentages of children at each grade level who exhibited selfish, egalitarian or generous behavior (Table 4b).

(See Appendix E for statistical procedures employed up to and including correlation matrixes from which the data presented in Figures were drawn.)
Fig. 1. Graphic Presentation of the Linear Pearson 'r' Correlations Between Recursive Thinking and Grade Level.

Means of Recursive Thinking

Grade Level

Linear Pearson 'r' Correlation (grades 1 to 5)

\( r = 0.1379 \)

\( r = 0.4007^b \)

\( r = 0.4269^a \)

\( a_p < .001 \)

\( b_p < .02 \)
Means of Altruism

Fig. 2. Graphic Presentation of the Linear Pearson 'r' Correlations Between Altruism and Grade Level (Experiment No. 1).
Fig. 3. Graphic Presentation of the Pearson 'r' Correlations Between Recursive Thinking and Altruism at Each Grade Level (Experiment No. 1).
Fig. 4. Graphic Presentation of the Pearson 'r' Correlations Between Covertness and Altruism at Each Grade Level (Experiment No. 1).
Fig. 5. Percentages of Perfect Verbal Exposition of Each Level of Recursive Thinking at Each Grade Level.
Table 4
Altruism at Each Grade Level (Experiment No. 1)

a) Actual Altruism (Experiment No. 1) at Each Grade Level

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Total Actual Amount Given by All Ss</th>
<th>Average Actual Amount Given by Each S</th>
<th>Total Actual Amount Kept by All Ss</th>
<th>Total Actual Amount Kept by Each S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>540 cents</td>
<td>27.0 cents</td>
<td>540 cents</td>
<td>27.0 cents</td>
</tr>
<tr>
<td>2</td>
<td>456 cents</td>
<td>22.8 cents</td>
<td>456 cents</td>
<td>22.8 cents</td>
</tr>
<tr>
<td>3</td>
<td>500 cents</td>
<td>25.0 cents</td>
<td>500 cents</td>
<td>25.0 cents</td>
</tr>
</tbody>
</table>

b) Percentages of Children at Each Grade Level Who Exhibited Selfish, Egalitarian or Generous Behavior (Experiment No. 1)

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Per Cent Selfish</th>
<th>Per Cent Egalitarian</th>
<th>Per Cent Generous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>45%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>3</td>
<td>50%</td>
<td>20%</td>
<td>30%</td>
</tr>
</tbody>
</table>
Success of Predictions in *Experiment No. 1*.

**H1.** ...there is a significant correlation between recursive thinking and altruism at each grade level tested (grades 1, 3 and 5).

(Significance of correlations evaluated by:

\[ t = \frac{r}{\sqrt{1-r^2}/(n-2)} \]

---McNemar, 1969, p. 156)

As may be seen in Fig. 3, there exists a significant correlation \((p < .05)\) between recursive thinking and altruism at grade level 5. This correlation, however, is spuriously high due to the high percentage of Ss in grade 5 who performed perfect verbal renderings of the pictorial representations of one-loop recursive thought (see Fig. 5).

**H2.** ...individually, both recursive thinking and altruism correlate significantly with grade level.

(Significance of correlations evaluated by:

\[ t = \frac{r}{\sqrt{1-r^2}/(n-2)} \]

---McNemar, 1969, p. 156)

As seen in Fig. 1, the correlation between recursive thinking and grade level is significant \((p < .02)\) between grades 1 and 3, and significant \((p < .001)\) between grades 1 and 5. A significant correlation between altruism and grade level was not found.

**H3.** ...correlations between recursive thinking and altruism increase in magnitude with progression in grade level.
(Significance of the difference between two correlation coefficients tested by):

\[ t = \frac{Z_1 - Z_2}{\sigma_{Z_1 - Z_2}} \]

\[ Z = 1.1513 \log \frac{1+r}{1-r} \]

\[ \sigma_{Z_1 - Z_2} = \sqrt{\frac{1}{n_1-3} + \frac{1}{n_2-3}} \]

--McNemar, 1969, pp. 157-158)

No significant differences between correlation coefficients were discovered (see Fig. 3).

H4. ...recursive thinking and altruism relate more strongly to each other than either relates to grade level.

(Significance of the differences between two correlation coefficients that are not independently distributed tested by):

\[ t = \frac{(r_1^2 - r_3^3) \sqrt{(N-3)(1+r_3^3)}}{\sqrt{2 (1-r_1^2 r_2^3 - r_1^2 r_2^2 - r_3^2 + 2r_1^2 r_2 r_3 r_2^3)}} \]

--McNemar, 1969, p. 156)

No significant differences between correlation coefficients were discovered (see Figs. 1, 2, 3, 4).

H5. ...that there is a significant negative correlation between altruism and covertness at each grade level tested (grades 1, 3 and 5).

(Significance of correlations evaluated by):

\[ t = \frac{r}{\sqrt{(1-r^2)/(N-2)}} \]

--McNemar, 1969, p. 156)
As may be seen in Fig. 4, no significant correlations were found between altruism and coveryness. However, when evaluating the significance of the differences between the correlations at each grade level, the difference between the correlation coefficient at grade level 1 and at grade level 3 was mildly evidenced (p<.1).

Experiment No. 2. The Existence of a Significant Developmental Trend in Altruism in Boys Grades 1, 3 and 5 as a Function of Methodology

As seen by the partial non-confirmation of H2, no significant correlation between altruism and age was found in Experiment No. 1. In a further test of the relationship between altruism and age in Experiment No. 1, involving only money which was actually given to the hospital party and money which was actually given to oneself (indicators 1 and 2 of altruism -- p. 57), a mildly significant (p<.1) correlation was obtained between altruism and grade level for grades 1 and 3. No significant correlation existed between altruism and grade level for grades 1 and 5 (see Fig. 6).

Procedure for the Treatment of Data in Experiment No. 2.

The relevant data in Experiment No. 2 are the amounts of money actually given by Ss to the hospital party.

Data Analysis

The correlations necessary for the testing of hypo-
theses 1 and 2 of Experiment No. 2 (H1a, H2a) -- see p. 55 -- are: 1) the correlations between altruism and grade level for the whole sample (grades 1, 3 and 5), and the differences in obtained correlations between each adjacent grade level of the sample (grades 1 and 3, grades 3 and 5), and 2) the correlations at each grade level, between altruism as assessed in Experiment No. 1 and altruism as assessed in Experiment No. 2. (These correlations are presented in Figs. 7 and 8, respectively.)

In addition, graphic and tabular presentations of the following information has been included: 1) Actual altruism at each grade level (Table 5a), and 2) Percentages of children at each grade level who exhibited selfish, egalitarian, or generous behavior (Table 5b).

Success of Predictions in Experiment No. 2.

H1a. ...that altruism, as assessed in Experiment No. 2, significantly correlates with grade level.

(Significance of correlations evaluated by:

$$t = \frac{r}{\sqrt{(1-r^2)/(n-2)}}$$ --McNemar, 1969, p. 156)

As may be seen in Fig. 7, the correlation between altruism and grade level is significant (p<.02) between grades 3 and 5 and significant (p<.01) between grades 1 and 5.

H2a. ...that there is a significant correlation be-
tween altruism as assessed by Procedures in Experiment
No. 1 and altruism as assessed by Procedures in Experi-
ment No. 2, at each grade level tested (grades 1, 3 and
5).

(Significance of correlations evaluated by:
\[ t = \frac{r}{\sqrt{(1-r^2)/(N-2)}} \] --McNemar, 1969, p. 156)

As may be seen in Fig. 8, a significant correlation
at grade 3 (p < .05) exists between altruism as assessed
in Experiment No. 1 and altruism as assessed in Experiment
No. 2.
Fig. 6. Graphic Presentation of the Linear Pearson 'r' Correlations Between Altruism (Experiment No. 1 -- Indices 1 and 2 Only) and Grade Level.
Fig. 7. Graphic Presentation of the Linear Pearson 'r' Correlations Between Altruism (Experiment No. 2) and Grade Level.

\[ r = 0.3726^b \]

\[ r = 0.0774 \]

\[ r = 0.3697^a \]

\[ a_p < 0.01 \]

\[ b_p < 0.02 \]
Fig. 8. Graphic Presentation of the Pearson 'r' Correlations Between Altruism (Experiment No. 1) and Altruism (Experiment No. 2) at Each Grade Level.
Table 5
Altruism at Each Grade Level (Experiment No. 2)

a) Actual Altruism (Experiment No. 2) at Each Grade Level

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Total Actual Amount Given by All Ss</th>
<th>Average Actual Amount Given by Each S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>300 cents</td>
<td>16.66 cents</td>
</tr>
<tr>
<td>3</td>
<td>340 cents</td>
<td>17.89 cents</td>
</tr>
<tr>
<td>5</td>
<td>515 cents</td>
<td>25.75 cents</td>
</tr>
</tbody>
</table>

b) Percentages of Children at Each Grade Level Who Exhibited Selfish, Egalitarian or Generous Behavior (Experiment No. 2)

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Per Cent Selfish</th>
<th>Per Cent Egalitarian</th>
<th>Per Cent Generous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>67%</td>
<td>28%</td>
<td>5%</td>
</tr>
<tr>
<td>3</td>
<td>58%</td>
<td>42%</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>60%</td>
<td>10%</td>
<td>30%</td>
</tr>
</tbody>
</table>
Discussion

As noted in the introductory section of this report, the original hypotheses were that there is concomitant growth between the development of recursive thinking and the development of altruism, and that there exist invariant developmental sequences in the acquisition of recursive thinking and altruism. Additional hypotheses dealt with the relationships between covertness and altruism, and post hoc after analysis of the data obtained in Experiment No. 2 between the data yielded by two different methodological approaches to the assessment of altruism.

The first three sections of the following discussion deal with the findings that support or fail to support these hypotheses. An additional section discusses some research suggestions for further investigations that appear to be generated by the findings of the present research.

Recursive Thinking and Altruism

Recursive thinking is a cognitive process by which one is able to conceive of the objects of another person's thought. These objects of thought may be persons, actions between persons, or thought itself. The development of
recursive thinking was conceived of as being a function of decentration as it applies to the interpersonal world.

Altruism is a helpful action which incurs some cost to the individual with the expectation of little or no gain relative to the magnitude of the investment. An altruistic action in this study was accomplished by foregoing gain for oneself in order to give to others.

No evidence of concomitant growth between the development of recursive thinking and the development of altruism was found -- except for what is interpreted as a spuriously high correlation at grade 5 (see Fig. 3). A significant developmental sequence was found in recursive thinking (Fig. 1); however, the development of altruism was not significantly correlated with grade level (see Fig. 2 -- the significance of this negative result is discussed in a later section of this study).

This study's hypothesis of concomitant growth between the development of recursive thinking and the development of altruism was based upon a hypothetical sequence of necessary prerequisite acquisition, and upon Piaget's conception of concurrent growth among different tasks calling for the same operation or among the processes of different operations. The sequence of necessary prerequisite acquisitions was that the level of cognitive development is a determining factor in the nature of role-taking activity; that the nature of role-taking activity is a determining
factor of empathic and vicarious experiencing, and that the acquisition of altruistic behavior is based upon the child's empathic and vicarious experiencing. For an hypothesis to be successful, based upon these conditions, all factors (concurrent growth and prerequisite conditions) must be correctly interpreted. Moreover, necessary prerequisite acquisitions must be so strongly related that their effects are statistically in evidence.

Upon reassessment of the studies from which these factors were drawn (pp. 31-37), both incorrect interpretation of prerequisite acquisition and statistically insufficient relationships between prerequisites are plausible explanations of the failure in the present study to establish a relationship of concomitant growth between recursive thinking and altruism. Those studies which were interpreted as indicating a relationship of concomitant growth between role-taking activity as an affective response (empathy) and altruism (Aronfreed and Paskel, reported in Aronfreed, 1968; Midlarsky and Bryan, 1967; Aderman and Berkowitz, 1969; and Krebs, 1970b) can also be interpreted as demonstrating nothing more than the efficacy of the classical conditioning paradigm as it applies to vicarious experiencing. The acquisition of a pervasive, enduring dimension of empathy does not appear to be a necessary condition for the explanation and prediction of the observed altruistic behavior.
Previous studies which have been interpreted as indicating a relationship of concomitant growth between role-taking activity as an underlying cognitive process (such as recursive thinking) and the incidence of altruism may owe a part of their statistical significance to methodological considerations. Studies by Baldwin, et al. (1969), Baldwin and Baldwin (1970), Grove (1970), and Selman (1971a) have all involved the verbal assessment of some cognitive aspect of role-taking ability, and the verbal assessment, by either the child or a verbal assessment of the child by others, of some aspect of prosocial behavior. Prosocial behavior for Baldwin, et al. (1969), and Baldwin and Baldwin (1970) was the ability to evaluate another's prosocial behavior by higher-order guidelines (see footnote 4, p. 36). For Grove (1970), prosocial behavior was the subjective reporting (by teachers' ratings) of the ethical goodness of the child. For Selman (1971a), prosocial behavior was evaluated by the child's moral judgements about conflict situations depicted in stories. A study by Staub (1971) was presented as demonstrating the effectiveness of role-playing and how it affected the willingness of kindergarten children to share candy and attempt to aid a distressed peer. However, the role-playing may not have affected any enduring dimension of awareness of another's point of view, but rather may have served merely as a rehearsal of behaviors considered by
the Ss as expected in the testing situation.

Methodologically, the present study differs from the five aforementioned studies of role-taking activities as cognitive processes in that this investigation attempted to establish that a significant correlation exists between a verbal measure of role-taking (recursive thinking) and a performance measure of a prosocial action (altruism). The five studies of role-taking as a cognitive activity previously cited involved the establishment of a significant relationship between either a performance measure of role-taking and a performance measure of altruism (Staub, 1971), or a verbal measure of role-taking and a verbal measure of prosocial behavior (Baldwin, et al., 1969; Baldwin and Baldwin, 1970; Grove, 1970; and Selman, 1971a). On the basis of the findings of the present study, there would seem to be some question as to the generality of previously found significant correlations. Do these previously obtained significant correlations result from some as yet obscure commonality of their means of measuring role-taking and prosocial behavior (performance-performance or verbal-verbal) rather than a significant general relationship between role-taking and prosocial behavior, or do such commonalities in the dimensions and loci of measurement simply allow significant relationships between the variables of interest to be seen more clearly?
Covertness and Altruism

As noted in the section of the results of this study, covertness is a "discovered" variable. As previously noted, the present writer defines a discovered variable as one that E notes during testing rather than during a search of the literature or during prior reflection.

Covertness, as a factor involved in the altruism situation, was revealed to E by the various patterns of choice used by the children in this study, and by the varying degrees of emotional strain this situation seemed to evoke among some of the Ss. Factors related to choices which seemed to define these patterns were: 1) the number of trials between the seventh and eighth choice of money to be given to oneself, 2) the number of switches made between favoring oneself and favoring the hospital party, 3) the number of trials taken before the first of the actual money was given to oneself, and 4) the number of trials taken before the first actual money was given to the hospital party. All of these indices of covertness involve the delay of gratification to the child -- whether gratification came from giving to oneself or from giving to the hospital party.

To many psychologists, when the term covertness is applied to behavior in a testing situation, it usually evokes thoughts of strategies employed by the experimenter to hide the 'true' purpose of the study from the subject.
In the present study, the term covertness is used to characterize strategies adopted by the subject to hide his 'true desires' from the experimenter.

It was predicted (H5) that there would be a significant negative correlation between altruism and covertness at each grade level tested. It was thought that those children who were altruistic would have less need to be covert in their choice strategies since they were displaying socially acceptable behavior. For those children who were more selfish, the need for covertness in their choice strategies would be due to what they might regard as socially unacceptable behavior.

No significant negative correlations were found at any grade level; in fact, a negative correlation was found only in the third grade children. However, there was a mildly significant (p<.1) difference between correlations at grade level 1 and at grade level 3 (+.3744 to -.2877), and a non-significant return to a positive correlation at grade level 5 (-.2877 to +.2387) (see Fig. 4).

These trends suggest to the present writer the possibility of a distinctly different degree (or schema) of altruism in children of grade level 3. At grade level 3, those children who are altruistic are openly altruistic -- their test-taking strategy is not covert. At grade levels 1 and 5, even when the child is altruistic, he still adopts a substantially covert test-taking strategy. Im-
lications of this distinctly different degree of altruism which appears to characterize children of grade level 3 are further discussed in the next section.

Altruism$^1$ - Altruism$^2$

As may be seen in Figs. 1 and 6, altruism$^1$ was not found to correlate significantly with grade level. However, as noted in the review of developmental studies on altruism (pp. 28-30), all previous studies have found the incidence of altruism to be positively correlated with age. In a reassessment of those studies which involved the actual giving of some tangible objects (tokens, money, food) (Wright, 1942; Ugurel-Semin, 1952; Handlon and Gross, 1959; Midlarsky and Bryan, 1967; Staub, 1968; and Harris, 1970), a minor methodological difference was noted between the assessment of altruism$^1$ and all prior assessments of altruism that were concerned with the evaluation of a developmental trend. That methodological difference intertwined the placement of the opportunities for donation with the procedures whereby S gradually acquired those goods (in this study, money that he could keep for himself or altruistically give to others. In the assessment of

$^1$Altruism$^1$ is that prosocial behavior assessed in Experiment No. 1.

$^2$Altruism$^2$ is that prosocial behavior assessed in Experiment No. 2.
altruism\textsuperscript{1}, donations occurred throughout the period that
the child was actively engaged in the attainment of money
for the hospital party and for himself. An attempt to re-
plicate the designs of prior studies of developmental
trends in altruism has been described in Experiment No. 2
of this study. All aspects of the testing situation used
in Experiment No. 2 were the same as those used in Experi-
ment No. 1 -- same Ss, same room for testing, same choice
(either to give to the hospital party or to oneself), and
similar amounts of money available for donation. As seen
in a comparison of Figs. 6 and 7, there is a distinctly dif-
ferent relationship between altruism\textsuperscript{1} and grade level and
altruism\textsuperscript{2} and grade level.

Any attempt to explain the difference between altruis-
ism\textsuperscript{1} and altruism\textsuperscript{2} would appear to revolve around two ques-
tions: 1) how does the methodology employed in assessing
altruism\textsuperscript{2} produce such divergent results from those used
to assess altruism\textsuperscript{1}, and 2) what developmental changes in
children enrolled in grades 1, 3 and 5 could influence them
to react so strongly to what appear to be minor methodolo-
gical differences between the assessment of altruism\textsuperscript{1} and
altruism\textsuperscript{2}?

The following rationalization is, of course, a post
hoc review. The methodology employed to measure altruism\textsuperscript{2}
is interpreted by this writer as a highly stereotyped dona-
tion situation. It seems reasonably clear that any child
of school age who has developed even a most modest number of altruistic tendencies, would recognize the social expectations or 'demands' of this situation -- to give much to others and to keep little for himself. The methodology employed to measure altruism\(^1\) seems, to this writer, to represent a culturally more realistic donation situation. For the child who has at least partially internalized the salient values of our society, altruism is a strong virtue but so is the acquisition of personal wealth. In the assessment of altruism\(^1\), the child must weigh the relative strengths of these and possibly other competing values; in the assessment of altruism\(^2\), fewer cognitive-social processes related to evaluating altruism appear to be influential.

A plausible explanation of the developmental changes which may occur in the children of this sample to effect so strong a reaction to the methodological differences between the assessment of altruism\(^1\) and altruism\(^2\) may follow this psychological scenario. In first grade the children are basically selfish, yet are beginning to realize the social pressures to be altruistic. In third grade the children adopt a generous mode of behavior; in addition they are more open in their altruistic behavior (as evidenced by the negative correlation between altruism and covertness in Fig. 4, and by the positive correlation between altruism\(^1\) and altruism\(^2\) (see Fig. 8) which seems to indicate a level
of altruism less affected by methodological manipulation]. In fifth graders, the same social pressures which caused the adoption of a generous mode of behavior in third graders, cause even more generous behavior in altruism\(^2\). However, in the assessment of altruism\(^1\) there was a slight drop in altruism from grades 3 to 5, fifth graders adopted covert behavior even when being altruistic, and there was a low (\(r = .0518\)) correlation between altruism\(^1\) and altruism\(^2\) at grade level 5. All these factors indicate that another motive — perhaps the desire to acquire wealth and a feeling of justification that one should be permitted to keep a substantial part of what he honestly earns — was operating in many children in fifth grade, that was not evident in third graders. Procedures in Experiment No. 1 activated these competing values and depressed the altruism score of the fifth graders. Procedures in Experiment No. 2 activated only the values of altruism and the altruism scores of the fifth graders reflected this one-dimensional nature of the situation.

Research Proposals

Two major findings have been reported by this study:
1) no significant correlations were found between recursive thinking and altruism at the grade levels tested and
2) the assessment of a developmental trend in altruism may hinge upon methodological considerations. The lack of
commonality in the measures of recursive thinking and altruism (verbal-performance, respectively) was proposed as an explanation of the insignificant correlation between these two variables. Covertness in the child's test-taking strategy was discussed as a factor which could be susceptible to methodological manipulation in the assessment of a developmental trend in altruism.

Two studies are proposed which relate to these findings. The first study employs a research methodology based upon correlational data which involves an experimental manipulation more powerful than merely assessing developmental trends in two distinctly different areas of development. This study is designed to assess the possibility of the existence of a significant positive correlation between a performance measure of role-taking activity and a performance measure of altruism. The second study is designed to study the effects of methodological manipulation on altruism. The methodological manipulations attempt to vary the possibilities for the child to employ covert test-taking strategies.

1. The reactions of role-taking activity and altruism in children ages 6 through 8 to conditions of mild frustration.

Although correlational data cannot unequivocally establish the existence of a cause and effect relationship,
it is most suggestive of a true interaction in two instances of data analysis: a) when parallel lines of growth can be established in a sample of children between two distinctly different areas of development throughout a rather broad age span, b) when parallel changes can be observed in behavior related to two distinctly different areas of development when children are exposed to the same experimental treatment. If the factors to be correlated are related through an extended sequence of necessary but not sufficient relationships (as are role-taking activity and altruism -- see p. 35), the latter instance of data analysis would be more likely to reveal this relationship if it employed a moderately strong experimental manipulation.

The study described in Appendix F employs such an experimental manipulation. Its primary hypothesis is that there is a significant positive relationship in the effects on the levels of role-taking activity and the levels of altruism after the experiencing of a mildly frustrating experience. The development of recursive thinking would be assessed by a performance measure of role-taking activity. It is proposed that a replication or adaptation of De Vries' (1970) study (see p. 22 for a description of this task) would be an appropriate performance measure.

2. Opportunities for S's adoption of covert test-taking strategies as a factor in the assessment of altru-
The present study has demonstrated that a slight methodological adjustment in a donation situation can result in strongly divergent relationships between altruism and age (children in grade levels 1, 3 and 5). It was proposed that this slight methodological adjustment varied the opportunity for covert test-taking strategies by the Ss in the sample. The study described in Appendix G is designed to manipulate further these opportunities for covertness and to assess the effects of these methodological variations on altruism.

It is proposed by the present writer that the significance of the relationship between altruism and covertness is based upon the child's desire to expend the least amount of energy possible. Expenditure of energy is conceived of as consisting of both expenditure of physical energy and expenditure of psychological energy. In a donation situation the child experiences social pressures to be altruistic. To relieve himself of these pressures he performs an action of some cost to himself. By manipulating the opportunities for covertness for the child, the experimenter creates a new psychological environment for the child. The child can now avoid, to some extent, the expenditure of physical effort (performance of those altruistic actions of some cost to himself) because he has been provided with mechanisms by which he can avoid the expenditure of psycho-
logical effort (the resistance to social pressures to be altruistic). Opportunities for coveryness permit the child to construct rationalizations for his non-altruistic behavior, or at least provide a situation in which a child does not have to demonstrate his non-altruistic behavior so openly.
Summary

Initially, the two primary hypotheses of this research were: 1) There exists a relationship of concomitant growth between the development of recursive thinking and the development of altruism in boys of grades 1, 3 and 5. 2) There exist invariant developmental sequences in the acquisition of both recursive thinking and altruism. An additional primary hypothesis was generated from the testing of the initial two hypotheses: 3) The existence of a significant developmental trend in altruism in boys of grades 1, 3 and 5 is, in part, a function of methodology. The testing of the first two hypotheses comprised the initial study (Experiment No. 1); the third hypothesis was tested in a follow-up study (Experiment No. 2).

Sixty, male, caucasian children of grades 1, 3 and 5 (20 children from each grade) comprised the sample of Experiment No. 1. Recursive thinking was assessed by using an adaptation of a test developed by Miller, Kessel and Flavell (1970). Altruism was assessed by using an adoption of a four-choice discrimination task described by Witryol and Fisher (1960), and by Witryol, Tyrrell and Lowden (1964, 1965). No significant correlations were found between recursive thinking and altruism at the grade
levels tested. The lack of commonality in the measures of recursive thinking and altruism (verbal-performance, respectively) was proposed as a possible explanation of the insignificant correlations between these two variables. The correlation between recursive thinking and grade level was significant \((p<.001)\). The correlation between altruism and grade level was not significant.

Fifty-seven, male, caucasian children of grades 1, 3 and 5 (18 children from grade 1, 19 children from grade 3, and 20 children from grade 5) comprised the sample of Experiment No. 2. These 57 children were the same children (minus three no longer available) who comprised the subjects for Experiment No. 1. Altruism was assessed in what has become a fairly standard donation situation: the children were given money and then asked to donate from that money. All other conditions were the same as those in Experiment No. 1, except that in Experiment No. 1, to be altruistic the children had to forego the possible attainment of money for themselves in order to give to others. The correlation between altruism and grade level in this experiment was significant \((p<.01)\). Methodological manipulations -- manipulations which affected certain relevant psychological factors in each donation situation -- were proposed to explain the disparity between the correlation of altruism and grade level as assessed in Experiment No. 1 and as assessed in Experiment No. 2.
Appendix A

Pictoral Depictions of Recursive Thinking
(three depictions -- one representative of each recursive level)
Contiguity: The boy is thinking of himself.
Action: The boy is thinking that the girl is talking to him.
One-Loop Recursion: The boy is thinking that the girl is thinking of father.
Appendix B

24 Nonsense Planometric Figures
<table>
<thead>
<tr>
<th>Black</th>
<th>Green</th>
<th>Red</th>
<th>Blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C

Sample Sheet Used in Assessment of Altruism
--Experiment No. 1
Appendix D

Sample Score Sheet and Scoring Used in the Assessment of Altruism and Covertness in Experiment No. 1
<table>
<thead>
<tr>
<th>Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penny</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dime</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Quarter</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trials</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penny</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dime</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Quarter</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1<sup>st</sup> choice is for the hospital party, 2<sup>nd</sup> choice is for oneself.
### Altruism

<table>
<thead>
<tr>
<th>index</th>
<th>score from sample sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35 cents</td>
</tr>
<tr>
<td>2</td>
<td>10 cents</td>
</tr>
<tr>
<td>3</td>
<td>345 cents</td>
</tr>
<tr>
<td>4</td>
<td>310 cents</td>
</tr>
<tr>
<td>5</td>
<td>12 switches</td>
</tr>
</tbody>
</table>

### Covertness

<table>
<thead>
<tr>
<th>index</th>
<th>score from sample sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 trials</td>
</tr>
<tr>
<td>2</td>
<td>10 switches</td>
</tr>
<tr>
<td>3</td>
<td>14 trials</td>
</tr>
<tr>
<td>4</td>
<td>20 trials</td>
</tr>
</tbody>
</table>
Appendix E
Statistical Procedures Employed for Generation of Correlational Matrixes

1. Selection of reliable indices of recursive thinking, altruism and covertness

Each index of recursive thinking, altruism and covertness, was converted from a raw score into a scale score. To accomplish this, the end points of the raw score distributions for each index were found, and the distribution was divided into five equal parts. Each raw score was then converted into an appropriate scale score. (Since each index of altruism by this procedure was a measure of selfishness, it was inverted to avoid the necessity of negative weighting.)

Scale Analysis -- A standard computer program which results in Kuder-Richardson reliabilities (Formula 8) was used to process each proposed index of recursive thinking, altruism and covertness. Initially, eight indices of recursive thinking were proposed (the score of each verbal depiction of a pictorial representation of recursive thinking in which the sample showed some variability) [sentences 1 through 6 (p. 45), depicting recursive thinking involving contiguous people were not included (see Fig. 5)], fourteen
indices of altruism and ten indices of covertness. After an initial run of the scale analysis program, five sentences depicting a one-loop recursion (p. 45) (each sentence considered as an index of recursive thinking), five indices of altruism (p. 57), and four indices of covertness (p. 57), were chosen on the basis of the high intercorrelations obtained for the indices representing each variable.

A second run of the scale analysis program utilizing only these fourteen indices yielded the following estimates of reliability:

Kuder-Richardson Reliabilities (Formula 8)

** Recursive Thinking overall = .939
items: 1. .867
2. .814
3. .911
4. .818
5. .870

** Altruism overall = .861
items: 1. .616
2. .566
3. .817
4. .778
5. .929

** Covertness overall = .858
items: 1. .614
2. .802
3. .802
4. .779
2. Combining the indices for recursive thinking for altruism and for covertness into three scores for each S.

Score All -- A standard computer program which simply added the scaled scores of each index for each major variable (recursive thinking, altruism and covertness) was run.

3. Correlation matrixes

Wherry Test Selection -- The Score All data for recursive thinking, altruism, and covertness (along with grade level) were analyzed for intercorrelations within each grade level, and across grade levels by using a standard computer program. Means and standard deviations for each variable were also obtained.
Appendix F

The Reactions of Role-Taking Activity and Altruism in Children of Ages 6, 7 and 8 to Conditions of Mild Frustration

For the purposes of this study frustration will be defined as the behavioral manifestation elicited from S by his inability to solve what is represented as a relatively easy jigsaw puzzle. It has been established that frustration can lead to regression in such areas as perceptual discrimination, memory, problem solving (Lawson and Marx, 1958), play behavior (Barker, et al., 1941), concrete reasoning ability (Larcom, 1972), and the cognitive maturity level of seven-year olds (Buchsbau, 1965). Excellent reviews of this phenomena are available in Buchsbaum (1965), and Larcom (1972).

The present study will evaluate the effects of frustration on regression in role-taking activity and altruism, employing a methodology described by Larcom (1972). This methodology's major advantages are its ease of administration and its ability to elicit overt measures of frustration.

Population and Sample

Sixty, male, caucasian, middle-class children of ages
6, 7 and 8 (20 children from each age group) from intact nuclear families of two to five children will comprise the sample. Children will have I.Q.'s within the high normal population range (approximately 100 through 120).

**Design**

Behavioral manifestations of frustration will be induced by a child's inability to solve what is represented as a relatively easy puzzle.

The degree of frustration will be assessed by use of a behavioral rating scale devised by Larcom and Giblin (reported in Larcom, 1972, pp. 33-35).

The behavior rating scale consists of four categories -- persistence, persistence-frustrative behavior, escape behavior, and giving up. Persistence-frustrative behavior is considered to be the category indicating a high level of frustration in the child. Escape behavior indicates an intermediate degree of frustration. Persistence and giving up are indications of a lack of frustration.

**Persistence** (P). The child actively tries to solve the problem of forming the T (experimental condition) or places the pieces of plastic in their appropriate place or is trying to do so (control condition). A list of behavioral sequences is given to illustrate this category. He may be using a trial-and-error method, placing blocks together one by one, looking at the puzzle, and moving pieces to roughly start the forming of a T. He might pause while holding a piece, look at the figure, and begin again. No frustrative behaviors are present.

**Persistence and/or frustrative behaviors** (barrier behaviors) (PF). These behaviors and behavioral sequences are displayed while the child is actively involved in putting the puzzle together, and they resemble the following: The child is sighing heavily, ramming the pieces together, dropping pieces on the floor, looking at the ex-
perimenter under the above conditions, restlessly squirming or fidgeting, biting his lips, moving his hands rapidly about his face, and/or displaying aggression towards either the experimenter or his immediate environment.

**Escape behaviors (EB).** The child displays defensive withdrawing behavior, yet shows some involvement. The child gives rationalizations as to why he cannot put the puzzle together. He says the puzzle is too hard, pauses frequently, looks off into space, holds onto pieces for over fifteen seconds, acts in a peripheral manner; and makes passive gestures toward the goal.

**Giving up (GU).** Very little or no attempt is made to put the puzzle together. The child in a matter-of-fact manner says it is impossible to put together or says he will not continue to do the task.

These descriptions will be abbreviated during the scoring and arranged in columns. If a behavior is observed within the fifteen-second interval (fifteen-second intervals to be marked by the onset of a flash of light), it is checked in the appropriate cell or recorded in the larger space provided under each major category for behaviors not listed. For each fifteen-second interval, the rater(s) will also indicate, by checking one of the four cells labelled "overall rating", which of the four behavioral categories appeared during that time period. It is these overall rating checks that are to be summed for each category to derive indices of frustration.

The three indices of frustration measured by the behavioral rating scale will be a total frustration score (TF), a persistence-frustration score (PF), and an escape behavior score (EB). (As noted previously, the categories of persistence and giving up are not considered to be indices of frustration.) They are obtained in the following manner: A TF score is derived for each boy by adding the number of times a rater checked the overall rating cells for the categories of PF and EB for the entire twelve minutes that the boy is observed in the frustrating situation. A PF score is derived by adding the total frequency of the "overall rating" checks for the category of PF over the same period. The same is done to compute the EB scores.
Procedure

The inducement of frustration will take place within the framework of the assessment of role-taking activity and altruism. Role-taking activity will be assessed by an appropriate performance task—perhaps an adaptation of the study performed by De Vries (1970). Altruism will be assessed by the same procedure used to assess altruism (see p. 39). The sixty children will be divided into four experimental conditions—fifteen children for each condition, five children for each condition from each age (6, 7 and 8).

**Condition A:** To the normal procedures for testing role-taking activity and altruism the following changes will be made:

1. The assessment of role-taking activity will be interrupted at the one-third and two-thirds stages of testing.

   Testing of altruism will be interrupted after the eighth and after the sixteenth discrimination tasks are completed.

2. The first interruption will begin when the experimenter says:

   Now I would like you to put this easy puzzle together in the shape of this T, as carefully as you can. (The boy is shown an outline of the T.) Boys who are as old as you can easily put it together in a few minutes. You may now begin.
The boy will have to put together a T from the seven geometrically shaped pieces of colored plastic. The child will be given three minutes to complete the puzzle during each of the four interruptions. The experimenter does not help the child and gives two warnings: "Time is getting short" after two minutes and "Time is up" after three minutes.

During this time at least two raters, using the behavior rating scale described in the preceding design section, will rate the amount and kinds of frustrative behaviors elicited during these three minutes.

The remaining three three-minute interruptions will be begun by the experimenter simply presenting the child with the puzzle and directing him to continue trying to make a T. The rest of the procedure is the same as described for the first interruption.

3. After the testing of each child is completed, the experimenter will perform a debriefing procedure which consists of the experimenter's having some trouble putting the puzzle together himself and telling the boy that this was a much harder puzzle than he had thought.

Condition B: The second condition will operate as a control group. The control group is designed to control for possible effects of such reactions as fatigue or satiation with the puzzle experiences, while eliminating the frus-
tation caused by the inability to solve a puzzle. (The task for the control group will be easily accomplished by this age group.) The key controlling feature here is completing a building assignment on the same task for the same amount of time. The controls hopefully control for the effects of task interruption and the possible effects from the boys' inability to decenter mentally when going from one task to another.

In the control condition, interruptions of the testing for role-taking activity and altruism will occur at the same stages of testing as in Condition A. The procedure differs from Condition A's procedures in the following manner.

Upon the first interruption, the experimenter will say:

Now I would like you to put the pieces of plastic in the lined forms over here. (The boy is shown pieces of white paper, each of which has a letter of the alphabet on it with the lines marking the approximate shapes of the plastic pieces.) You don't have to put a certain number of them together, just do the best you can.

The control group will also have three minutes in which to complete this task and are observed on the same rating scale as the children in the other experimental condition. The child will stop in the middle of one of his puzzles after the same two warnings given in Condition A. The child will have gone through the same procedures as in Condition A, with the exception that the debriefing
procedures are eliminated.

**Condition C:** In this condition the same procedure described in Condition A will be applied to the first two three-minute interruptions which occur during the testing of role-taking activity. The same procedure described in Condition B will be applied to the last two three-minute interruptions which occur during the testing of altruism.

**Condition D:** The same procedure described in Condition C will be used, with the exception that the procedures of Condition B will now be introduced during the assessment of role-taking activity, and the procedures of Condition A will now be introduced during the assessment of altruism.

**Predictions**

1. ...there is a significant positive relationship in the effects on both the levels of recursive thought and the levels of altruism after the experiencing of a mildly frustrating experience.

2. ...the more cognitively advanced children (in terms of recursive thinking ability) will be less affected by a mildly frustrating experience than the less cognitively advanced children.

3. ...children who are in a transitional phase of the development of concrete operational processes will be most influenced by a mildly frustrating experience.
Appendix G

Opportunities for Ss’ Adoption of Covert Test-Taking Strategies as a Factor in the Assessment of Altruism

Krebs (1970b) has contended that there exists no absolute form of altruism; rather, there exists a continuum of less altruistic to more altruistic actions. Less altruistic actions are dependent upon expectations of material rewards, more altruistic acts are dependents upon social approval, while the most convincing altruistic actions are based upon internal rewards.

For those whose altruism is based upon social approval or expectation of reward, an experimental manipulation of opportunities for coveryness (covert in the sense that the complexity of the experimental designs provide S with a possible rationalization for non-altruistic behavior) would be expected to affect the performance of altruism. An inverse relationship between opportunities for coveryness and altruism is proposed.

Population and Sample

Sixty, male, caucasian, middle-class children of grades 3, 4 and 5 (20 children from each age group), from intact nuclear families. Children will have I.Q.'s within

113
the high normal population range (approximately 100 to 120).

The rationale for the grade levels chosen is the distinctly different relationships that existed between grade level and altruism as a function of methodological assessment (reported in the result section of the present study, pp. 55-74).

Design

Altruism will be assessed by the amount given to others, versus the amount given to oneself.

The least complex experimental procedure will be Condition A; the most complex will be Condition D. Opportunity for covertness is a function of this complexity.

Procedure

Each child will be tested individually. The sixty children will be divided into four experimental conditions -- fifteen children for each condition, five children for each condition from each grade (grades 3, 4 and 5). Objects for donation will be a penny, a nickel, a dime and a quarter.

Condition A: Each S will be given twenty-four opportunities to give to a hospital party and to give to himself. Each donation trial will be a paired comparison situation (there are six possible paired comparisons using the four
donation denominations of coin). The child will be instructed to give one denomination to a hospital party and one denomination to himself.

**Condition B**: Each S will be given twenty-four donation trials. All four denominations of coin will be placed on a table between S and E. E will manipulate a deck of 48 cards --- 24 black and 24 red. S will be instructed to choose a denomination for the hospital party when E turns up a red card, and to choose a denomination for himself when a black card is turned up. After each trial, the two denominations of coin that have been chosen by S will be replaced on the table by E.

**Condition C**: Same procedure for the assessment of altruism as described in Experiment No. 1 of the present study.

**Condition D**: Same procedure as Condition C with the following adjustments: 1) denomination -- symbol on cup relationship not explained, and 2) all money is replaced and cup positions rearranged out of view of S.

Finally, the procedure described in Experiment No. 2 of the present study will be employed for all Ss. It is viewed as the condition in which the least number of opportunities for coverture exist.
Predictions

1. ...a significant negative relationship exists between the amount of altruism shown and the opportunities for covertness.

2. ...the older children's degree of altruism will be most affected by the conditions of covertness they experience.
Bibliography


Gage, N.L., and Cronbach, L.J. Conceptual and methodological problems in interpersonal perception. *Psychological*


Hastorf, A.H., and Bender, I.E. A caution respecting the measurement of empathic ability. *Journal of Abnormal and Social Psychology*, 1952, 47, 574-576.

Kellogg, W.N., and Eagleton, E.M. The growth of social perception in different racial groups. *Journal of Educa-


Larcom, L.R. The regressive effects of frustration upon the concrete reasoning ability of seven year-old boys. Unpublished doctoral dissertation, The Ohio State University, 1972.


Masters, J.C. Effects of social comparison upon the imitation of neutral and altruistic behaviors by young children. *Child Development*, 1972, 43, 131-142.


Milgram, N., and Goodglass, H. Role style versus cognitive maturation in word associations of adults and chil-


1963, 66, 532-540.


