DAN PETER FAWAZ. A Developmental Examination of the Modeling of Aggression and Altruism. (1976)
Directed by Dr. Garrett Lange. Pp. 67.

The present investigation examined the relative influence of three distinct model types, i.e., aggressive, altruistic and a model who displays both aggression and altruism, to elicit specific behaviors from children of two ages and both sexes. Sixty-four children, thirty-two (sixteen boys and sixteen girls) from the preschool and fourth grade levels were randomly selected as subjects. Each child observed a same sex model display the three model types in a specific task situation. Children, regardless of sex and age, imitated the altruistic model significantly more than the aggressive model and further, seemed to prefer altruistic responses over aggressive ones in all conditions. The implications of an altruistic predisposition are discussed in relation to the often cited male predisposition to be more aggressive.

B

A Developmental Examination of the Modeling of Aggression and Altruism

by

Dan Fawaz

A Thesis Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Greensboro
1976

Approved by

Thesis Adviser

APPROVAL PAGE

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

Thesis Adviser Brett Lyga

Committee Members J. Allen Watson

Jacquelyn Gaeke Cain

June 8, 1976
Date of Acceptance by Committee

ACKNOWLEDGEMENTS

Special thanks go to Garrett Lange my advisor whose encouragement, perseverance and patience were instrumental in the completion of this thesis. Also my appreciation to Jacquelyn Gaebelein and James Watson, members of my committee, whose insightful criticism and backing I could not have done without. I am also especially grateful to Linda Fawaz whose services as a female model and assistant were without peer and to Terry Fleming who provided his skills in the construction of the apparatus. Finally, thanks to all the children who made this thesis possible.

TABLE OF CONTENTS

Page

APPROVAL PAGE..... ii

ACKNOWLEDGEMENTS..... iii

LIST OF TABLES..... v

LIST OF FIGURES..... vi

CHAPTER

I. INTRODUCTION..... 1

II. REVIEW OF LITERATURE..... 3

Imitation and the Socialization of Aggression and Altruism.. 3
Existing Research on Imitation of Aggression..... 5
Existing Research on Imitation of Altruism..... 9

III. THEORETICAL FRAMEWORK FOR THE PRESENT RESEARCH..... 16

IV. THE RATIONALE FOR THE PRESENT RESEARCH..... 19

Hypotheses..... 23

V. METHOD..... 25

Subjects and Models..... 25
Task and Apparatus..... 25
Design..... 27
Procedure..... 28

VI. RESULTS..... 33

Percentage of Task Imitation..... 34
Percentage of Imitation by Trial..... 36
Overall Comparisons of Child versus Model Intensity Scores.. 36

VII. DISCUSSION..... 41

BIBLIOGRAPHY..... 53

APPENDIX..... 59

Summary Tables..... 59

LIST OF TABLES

Page

TABLE

I. Mean Percentage of Task Imitation..... 35

II. Mean Percentage of Task Imitation per Trial..... 37

III. Overall Comparisons of Child versus Model Intensity Scores.... 39

LIST OF FIGURES

Page

FIGURE

1. A Pictorial Representation of the Apparatus used in the present study..... 26

CHAPTER I

INTRODUCTION

During the past decade-and-a-half an extensive amount of research has been directed to the study of children's modeling of aggression (e.g., Bandura, Ross and Ross, 1961, 1963a, 1963b; Rosenkrans and Hartup, 1967; Dubanoski and Parton, 1971; Kniveton, 1973) and altruism (e.g., White and Rosenhan, 1966; Midlarsky and Bryan, 1967; Bryan and Walbek, 1970a, 1970b; Staub, 1971; Ruston, 1975). Without exception, the concept of aggression has been operationalized to mean the emission of some type of physical act such as hitting, kicking or administering an aversive stimulus such as shock. Prosocial measures have included the behaviors of helping, sharing and donating. In these two areas of modeling research a wide variety of model and observer variables have been manipulated such as the sex of the child, rewardingness and nurturance of the model and child observer group size. Moreover, a number of methodological innovations have been explored, e.g., mode of presentation(i.e., live, television, cartoon) and the type and amounts of reward available to both the model and the subject. However, very little of this research has been directed to the issue of developmental trends in children's tendencies to model aggressive and altruistic behavior, which is the major focus of the present investigation. Furthermore, there is no available literature concerning the effect of a model who exhibits both altruistic and aggressive behaviors. Potential models in the child's world are not consistent exemplars of aggression or altruism. They act aggressively on

some occasions and altruistically on other occasions. Consequently, the second issue to be dealt with in the present research is the relative influence of a model who manifests both antisocial and prosocial behaviors. The following sections of this initial chapter include a rather extensive review of the literature from which the present study's rationale and hypothesis were generated.

CHAPTER II

REVIEW OF LITERATURE

Imitation and the Socialization of Aggression and Altruism in Children

The present research on children's modeling was undertaken with the intent to yield findings pertinent to the impact of parent behavior on children's development. Contemporary western society views parents as socializing agents who model a diversity of behaviors to which their children are repeatedly exposed. Learning takes place under these conditions whether direct tuition occurs or not(Bandura and Walters, 1963). Consequently, the existing body of literature undertaken in the laboratory should serve to explicate some of the crucial variables that are relevant to the operations of the familial network.

The data from a number fo studies(Sears, Maccoby and Levin, 1957; Feshbach, 1970; Eron, Walder and Lefkowitz, 1971; Felling, 1972; Sethi, 1973) indicate a positive relationship between measures of parent's physical punishment and their children's physical aggressive responsiveness. Although many of the results stem from correlational analysis, the consistency of the parent/child correlations supports a socialization hypothesis. Bandura and Walters(1963) found that fathers of aggressive grade school boys were more aggressively punitive and less emotionally inhibited than fathers of withdrawn boys. The relationship between the use of physical punishment and aggressive behavior in children is further substantiated by the results of Sears et al.,(1957) and Eron et al.,(1971)

who consistently report positive correlations between these two variables for both sexes.

The critical nature of parent behavior for children can be further exhibited in the light of Schacter and Singer's(1962) paradigm. It is possible to suggest that the influence of parental models may be most potent when child observers are emotionally aroused and cannot readily attribute their feelings to stimuli other than the model's behavior. The aggressive behavior of a punitive parent may produce precisely this stimulus condition for the children in his family. Thus, particularly under these conditions, the child is in the unenviable position of relying on the parents as models for aggression.

Based on the results of the aforementioned research delineating the relationship between parental measures and children's aggression, the family can be viewed as the initial and primary teacher of violence via models. Furthermore, Sears(1961), in a follow-up of his previous study(Sears et al., 1957), found that although the relationship between severity of punishment and physical aggression had attenuated by age twelve, it was replaced by prosocial aggression, i.e., aggressive responses that are socially acceptable such as rejection and unfriendliness. Thus the pervasiveness of parental models is evidenced at a much later age even when peers have assumed a more dominant role as models of aggressive behavior (Cohen, 1971). While the most significant implication of the imitation research concerns the importance of parents as models for their children's aggressive behavior, very little laboratory research pertains directly to this relationship.

There is an unintentional absence of prosocial research regarding parents, as the area has not received the treatment accorded to aggression (e.g., Hoffman, 1975). Nevertheless, the implications concerning the modeling of altruism should be no different; therefore general conclusions regarding aggression should follow for altruism.

Existing Research on Imitation of Aggression

The most frequently examined issue in the aggression literature is the delineation of sex differences. A most consistent finding is the tendency for boys to perform significantly greater amounts of modeled physical aggression than girls(Madsen, 1968; Hapkiewicz and Roden, 1971; Maccoby and Jacklin, 1974). So strong are stereotypes for sex appropriate behavior that Parton and Geshyri(1971) had to omit three female subjects because of excessive crying in response to requests to perform inappropriate sex role behavior. This sex difference in responding has been demonstrated in correlational studies(Sears et al., 1957; Eron et al., 1971) as well as in experimental investigations(Bandura et al., 1961, 1963; Adams and Hamm, 1973). Nevertheless, the effect may be an artifactual problem of the difference between overt performance of the modeled act and the learning of it. Bandura(1965) administered a post test to ascertain the degree to which children were learning the aggressive behaviors displayed by the model. He found that girls were learning the behaviors but were reluctant to perform them; however, inducement by the experimenter provoked them to respond. Consequently, the sex difference in imitative aggression, i.e., performance, attenuated somewhat. One might conclude that performance significantly differentiates between male and female

children, while the acquisition of aggressive responses, on a contingent basis occurs to similar degrees in both sexes. Further corroboration for sex differences in modeling performance was demonstrated in an experiment by Hapkiewicz and Stone(1974). The children were required to observe a modeling sequence after which they were allowed to view a film. This was done in same sex pairs and the film was contained within an apparatus made for individual viewing. As both could not view the film simultaneously, one of the pair represented a barrier to the film which was highly desirable. The results of this study showed that sharing was maintained as a dominant response over time for girls, while boys quickly resorted to aggression to attain the desired goal.

Another major area of research concentration in the aggression literature concerns the rewardingness of the model. The influence of the model's reinforcement contingencies has been established by Bandura(1965); Rosenkrans and Hartup,(1967); Walters,(1968) and Joslin, Coates and McKown,(1973). The results are consistent and unambiguous. A model who is reinforced, as opposed to one who is punished or suffers no consequences for his aggressive acts, elicits from children significantly more imitative aggressive responses. These comparisons appear to be somewhat unnatural however, as no real life situation approaches this either/or dichotomy. The incidence of any model in the child's life space rewarding or punishing aggressive acts consistently without any oversight is of very low probability. Rather, most aggression is positively reinforced sometimes and punished at other times(Patterson, 1973), depending upon many factors such as context, cues, mood. In attempting to examine this contradiction between what occurs in the real world and the labaoratory

setting, Rosenkrans and Hartup(1967) set out to determine the effects of inconsistent reinforcement of a social model on imitative aggression in children. The results indicate that reward remains the most potent consequence, however, inconsistent reward and punishment elicits significantly more imitative aggression than a "punished" or "no model" condition. Although children imitate a rewarded model more often than other conditions, they are not reluctant to impose very negative evaluations on the model (Bandura et al., 1963). It appears that aggressive models present a double edged sword to their child observers, demonstrating the functional quality of aggression on the one hand, while allowing themselves to be denounced on the other. This is congruent with parent/child data regarding the assumptions of the child's regard for parental sanctions. Although the child suppresses physical aggression in the home, observing the usefulness of aggression to acquire desirable goals or solve problems predisposes the child to aggress against his peers(Eron et al., 1971) or in other settings where the model is absent(Bandura et al., 1961). Although the parent is considered the primary socializing agent, considerable controversy has arisen as to the relative power of the adult as a model as opposed to the peer. This led to some premature conclusions initially borne out by research stating that peers are the most salient referents of aggressive modeling(Cohen, 1971; Patterson, 1973). A well designed study(Hicks, 1965), seemingly overlooked by the peer advocates, dealt with this issue in terms of long-term and short-term effects. Hicks' purpose was to investigate short-term (immediate) and long-term (six months) effectiveness of peers and adults as transmitters of aggression. Short-term modeling of aggression supported the peer position, i.e., the peer was the most

powerful model. The retest, however, indicated that the adult model remains as the only relevant antecedant experience in shaping the form of children's aggressive behavior. This finding has recently been corroborated by Kniveton(1973). Interestingly enough, the male model exerted the greatest influence on boys and girls regardless of whether he was a peer or an adult. The appropriateness of aggressive behavior for males might account for this result somewhat; however, support through replication is needed.

Another important variable that has been investigated in order to accurately test the effectiveness of various models in eliciting imitative responses has been mode of presentation(Dubanoski and Parton, 1971; Parton and Geshuri, 1971; Wolf and Cheyne, 1972; Hapkiewicz and Stone, 1974). These investigators demonstrated the relative efficacy of real life models as opposed to the lesser influence evidenced by televised or partial models. The exception to this general trend(Bandura et al., 1963b) is a function of methodology rather than a contradiction. Bandura and his associates analyzed total physical aggression performed by the children in addition to imitative aggression. The results pertaining to imitative aggression were congruent with the previously mentioned studies; however, total aggression scores relegated the real-life model to a lesser position. It seems that televised models elicit greater amounts of non-imitative aggression while real-life models elicits specific responses. Nevertheless, the role of real life models relative to other modes of presentation is unambiguous regarding imitative aggression. They elicit significantly more imitative aggression while televised models, i.e., human and cartoons, facilitate expansion of the observed behaviors as evidenced by the total aggression scores.

The few remaining studies available in western literature represent new inroads into the parameters which define various influences of models. Nelson, Gelfand and Hartmann(1969) and Christy, Gelfand and Hartmann(1971) have examined the effect of aggressive models followed by participation in competitive games on children's aggressiveness responsiveness. Both concur in that competition augments the power of aggressive models so as to increase imitative aggression relative to participation in non-competitive games. Moreover, failure was found to elicit more aggression than succes, however, winning resulted in considerable amounts of aggression as well. Thus, given that competitive games regardless of outcome, i.e., success or failure, produced significantly more aggression than non-competitive games, the implication for school is obvious. Furthermore, the family situation may be analogous to this contrive game situation whereby a number of siblings might be required to compete for parental love and attention, predisposing children to be aggressive.

Existing Research on Imitation of Altruism

Comparable to the aggression literature, interest in altruism dates back quite far in the twentieth century(Murphy, 1937). However, not until the seventies have empirical investigations behun to focus on the modeling of prosocial behavior with the possilbe exception of White and Rosenhan (1966). There seems to be a number of reasons for the sparcity of research on modeling of altruism. Perhaps the inclusion of prosocial behaviors under the heading of moral behavior and/or development(Semin-Ugurel, 1952; Hoffman, 1963, 1975) has interferred with the separate examination of these behaviors. Regardless of the problems inherent in such a

relationship, i.e., moral development and prosocial behavior, a number of investigators have begun to examine the area, most notably Staub(1970, 1971a, 1971b) and Bryan(1971, 1972).

Age of the observer was the central variable studied by a number of investigators(Semin-Ugurel, 1952; Handlon and Gross, 1959; Elliot and Vasta, 1970; Staub, 1970; Green and Schneider, 1974). This emphasis appears to be largely due to Piagetian conceptions of children's intellectual development. According to Piaget(1932, 1951) the young child is unable to decenter, i.e., shift his attention from one aspect of an object or situation to another. This inability appears to underlie the preoperational child's egocentric thought and immature moral judgment. Consequently, research was undertaken to examine the validity of this position, albeit non-modeling. The previously noted studies found that altruistic responses increased with age. Moreover, Semin-Ugurel(1952) proposed that selfishness, i.e., very little sharing, was at its zenith during the ages of four-to-six years of age. These findings are further supported by the finding that a child's ability to decenter is positively related to the amount of helping behavior manifested(Rubin and Schneider, 1973). The one exception to linear age trends in prosocial behaviors was obtained by Staub(1970). Staub studied children aged five, six, seven, nine and eleven years. Two groups were found least likely to help another child; the five year olds which is consistent with the other research and eleven year olds. The finding is surprising, particularly since helping behavior increases with age until the fourth grade, i.e., nine year olds, at which point it levels out and begins to decline. Upon closer scrutiny, this apparent contradiction becomes a function of situational constraints. The

older age group is subject to a number of factors which say nothing of the spontaneous growth of prosocial behavior that is undoubtedly taking place up to this point. Societal mores regarding the social responsibility of helping an individual in distress are mitigated by the presence of the experimenter and the laboratory setting which induces fear in the older children, thereby decreasing the amount of helping behavior manifested by eleven year olds. Despite the introduction of situational factors influencing eleven year olds, children manifest greater amounts of prosocial behavior as they grow older peaking at age nine.

Maccoby and Jacklin(1974) state the common belief that girls exhibit more prosocial behavior than boys. This is based on the fabricated premise that young girls are more concerned with behaving in ways that would be approved of by adults than are young boys. Although there are some findings in the parent/child literature(Hoffman, 1975) indicating a correlation between identification and the socialization of prosocial behavior whereby boys identify solely with the father while girls identify with both the mother and the father, little empirical justification supports such a conclusion. The only conclusive and significant finding(Moore, Underwood and Rosenhan, 1973) was obtained in a non-modeling study. These investigators attempted to ascertain the relationship between affect, i.e., feelings of happiness or sadness in the children, and altruism. The general finding was that girls exhibited more donating behavior than boys overall, however, feelings of happiness or sadness did not differentiate the sexes. Two other investigations provided varying degrees of support for sex differences in prosocial behavior. Bryan and Walbek(1970a) undertook a series of studies, three of which examined model efficacy as a

function of sex. The first study found no sex differences while the second demonstrated a tendency for girls to donate more to charity. The final experiment to be considered obtained a race by sex interaction with black boys modeling the white male more than the black model. The only other instance of research(Staub, 1970) to establish sex differences requires qualification. Staub measured types of prosocial behavior, relative to each other, whereas the aforementioned studies examined the degree to which one particular response was performed by the two sexes. He found that kindergarten boys evidenced more sharing behavior while girls manifested more helping, thus indirectly refuting the incidence of sex differences.

Notwithstanding these few findings of sex differences which appear difficult to interpret, the great majority of research provides no evidence of sex differences(Semin-Gurel, 1952; Handlon and Gross, 1959; Elliot and Vasta, 1970; Harris 1970; Staub, 1970; Presbie and Coiteaux, 1971; Staub, 1971; Rosenhan, Underwood and Moore, 1974; Ruston, 1975).

Another area of investigation concerns situational state variables of the benefactor(Krebs, 1970), i.e., internal feelings of the individual resulting from stimuli or events impinging on him at the time. Staub and Sherk(1970) examined the relationship between need for approval and liking for each other with sharing. Surprisingly, a high need for approval was significantly associated with fewer candies shared while liking for a peer positively influenced sharing behavior.

Another series of experiments(Isen, Horn and Rosenhan, 1973; Moore et al., 1973; Rosenhan et al., 1974), which led to Hoffman's(1975) formulation of an altruistic motivation, considered the effects of feeling

good or bad on prosocial behavior. Isen et al.,(1973) examined the effect of feelings associated with success and failure while Rosenhan et al., (1974) manipulated feelings of happiness or sadness as precursors to donating behavior. The results indicate that the experimental arousal of positive moods and feelings in children facilitated altruism while arousal of negative states inhibited it with one qualification. Isen et al.,(1973) found that public failure, i.e., the experimenter conveyed his awareness of the children's failure to them, led to increased generosity. It appears that generosity provided an alternative for the child to redeem himself in the eyes of the experimenter. Thus, the generosity evidenced in this condition was qualitatively different from the others, being characterized as more selfishly motivated and under distinct situational constraints. Regardless, it appears that fulfillment of one's own needs reduces subsequent preoccupation with one's own concerns and thus leaves one open and responsive to the needs of others.

Several investigators(Rosenhan and White, 1967; Rosenhan, 1969; Bryan and Walbek, 1970a, 1970b; Midlarsky, Bryan and Brickman, 1973) have implicitly or explicitly indicated the importance of behavbral examples in effecting altruistic responses. Without exception, modeling conditions have been successful in increasing the children's tendencies to aid another. The emergence of real-life considerations whereby models presented to children were not consistent exemplars led to some interesting innovations. The series of experiments by Bryan and Walbek(1970a, 1970b) shed some light on the impact of inconsistency upon altruism by means of one treatment condition in which the model preaches charity and practices greed, or the converse. They also contrived a number of variations to

these two treatment conditions, not only to ascertain the relative efficacy of each variation, but the influence of interpersonal attractiveness as well. The outcome in each case was unequivocal, that is, the model's actions were the differentiating factor. Although verbalizations made by the model during the performance did not alter the subjects behavior, it did modify the model's attractiveness. Preaching of selfishness significantly decreased attractiveness of the model, while generous exhortations by the model did not significantly affect the child's evaluations although there was a tendency for the model to receive higher ratings of attractiveness. The differential efficacy of model actions and verbalizations to elicit imitative responses is quite puzzling in light of the attractiveness data. Yet the age of the children, i.e., eight and nine years old, preempts cognitive deficiencies as a valid explanation of this finding. Children either disregarded model verbalizations, or the visual modality was more salient than the auditory modality either of which might help to explain these results.

A recent study(Ruston, 1975) similarly compared model behavior with model exhortations. Ruston found that model actions were highly effective both in the short and the long run; however, preaching was highly effective in the long run only. The temporal constraints of the Bryan and Walbek studies appear to be the key regarding their inability to demonstrate the power of verbalizations to elicit imitative prosocial behavior. Thus model actions are most salient in short term considerations while exhortations attain parity with behavior only in the long run.

Finally, as with the aggression literature, the consequences of a model's actions have been the focus of research on the modeling of

prosocial behavior. The reinforcement or non-reinforcement of model's behavior or verbalizations(Bryan, Redfield and Mader, 1971); the contiguity or non-contiguity of positive affect expressed by the model following the model's practices or words(Bryan, 1971; Midlarsky and Bryan, 1972) and the presence or absence of social approval expressed by the experimenter following the model's actions(Midlarsky, Bryan and Brickman, 1973) are the principal types of reinforcement that were investigated. Bryan et al.,(1971) found the model who exhorted and practiced charity and socially reinforced it elicited the greatest number of charitable responses. If social reinforcement was not forthcoming, however, the model elicited only a small number of altruistic responses.

There is some evidence that self-disclosure of feelings by the model tends to facilitate imitation of prosocial behavior, i.e., donating(Bryan, 1971; Midlarsky and Bryan, 1971). If the model immediately after completing a donation said one of a number of positive affect expressions, e.g., "It feels good to give money," the observer more readily imitated the model's actions regardless of type, i.e., greedy or charitable. If the affect expressions did not immediately follow the model's behavior, then imitative altruism was not facilitated. Thus, the temporal relationship between act and affect appears to be a determinant of altruistic behavior.

CHAPTER III

THEORETICAL FRAMEWORK FOR THE PRESENT RESEARCH

The theoretical framework underlying the present research is comprised of principles derived from the conceptual frameworks of both Piaget (1932, 1962) and Bandura(1969, 1971). Bandura's contiguity theory of imitation can be briefly stated as follows: Stimuli from the model's behavior elicit perceptual responses in the observer that become associated with each other through their temporal contiguity. After repeated contiguous stimulation, these perceptual responses come to form verbal or imaginal representational systems of the stimuli that are pertinent to the model's begavior pattern. The representational systems mediate response retrieval and reproduction, in that they provide cues which elicit clearly discriminable overt responses similar to those originally performed by the model. According to Bandura(1971), it is primarily on the basis of stimulus contiguity and symbolic mediation that imitative responses are acquired. Moreover, this modeling phenomenon involves four interrelated subprocessess: attention, retention, motivation and reinforcement which are necessary preconditions for modeling to occur. In essence Bandura provides a cognitive interpretation of imitative learning.

Piaget's position, which is amenable to Bandura's provides the much needed developmental dimension that Bandura's contiguity theory neglects. Piaget's(1962) careful analysis of the changes evidenced in the child's imitative behavior are organized under the cognitive levels of development he has theorized. Piaget stated that "from two to seven years of

age,(i.e., the preoperational stage), representative imitation develops spontaneously, oftern being unconscious because of its ease and egocentric quality, whereas at about seven or eight(the onset of concrete operations), it becomes deliberate and it takes its place in intelligence as a whole(p. 74)."

The younger child is egocentric, i.e., he possesses an inability to take another's viewpoint, and focuses largely on perceptual as opposed to conceptual experiences, whereas the older child has the ability to decenter and an increasing capacity to convey information through speech. More specifically, the preoperational child's thought is irreversible and attentive to limited amounts of information. The concrete operational child on the other hand, is able to focus on several aspects of a situation simultaneously, is sensitive to transformations, and can reverse the direction of his thinking.

Piaget's findings are easily incorporated within contiguity theory. Characteristics of the young child mitigate the model's effectiveness and the amount and quality of information that can be extracted from his behavioral displays. The young child's egocentrism manifests itself by a lack of adapatation to the model's behavior as well as an inferior ability to maintain an orientation to the model's perspective. What is suggested here is that the egocentric nature of the young child directly influences the manner in which imitative behaviors are acquired. Furthermore, the young child's reliance on perceptual cues limits his processing of information to imaginal representations thereby restricting the number of distinct behaviors that he can focus on. This characteristic puts the young child at a disadvantage when observing a model who performs both altruistic and aggressive behaviors.

Older children, on the other hand, have more advanced cognitive achemata at their disposal, which allow them to encode the model's behavior as it occurs with higher accuracy and diversity, i.e., using symbolic and imaginal representations. Their ability to adapt to the model's behavior and maintain attention to his perspective will increase the learning of imitative responses. Moreover, a model who displays more than one kind of behavior will not present a problem to the older children as they can focus on several aspects simultaneously as well as reverse their thinking. Consequently, their imitation of a model is more deliberate and integrated within intelligence as a whole. Imitation is not only subject to social learning considerations such as identification and reinforcement, but cognitive levels of development are inherent to an objective analysis of modeling as an emerging process. Thus, the integration of Piagetian principles with those of Bandura would seem to produce a viable framework for the further study of the development of imitative aggression and altruism.

CHAPTER IV

THE RATIONALE FOR THE PRESENT RESEARCH

Assuming the validity of the frameworks of Bandura and Piaget, stronger modeling effects should be apparent with increasing age. Several investigations(Flavell, Beach and Chinksy, 1966; Coates and Hartup, 1969; Collins and Westby, 1975) provide data demonstrating that older children manifest higher levels of self-verbalizing behavior which enable them to extract more information from presented stimuli than younger children, thus demonstrating the efficacy of verbalizations in facilitating learning. Given Banura's conclusion, one would posit that imitatbn, being facilitated by symbolic processes, would likewise increase with age. Yet given this deduction and the aforementioned studies, most aggression research(Bandura et al., 1961, 1963a; Hicks, 1965; Cohen, 1971) as well as the altruism literature(Bryan and Walbek, 1970a, 1970b; Staub, 1971; Rosenhan, et al., 1974) with respect to modeling have neglected the developmental issue. Neglect for developmental concerns become more puzzling in light of Piaget's findings(1932, 1962; Ginsburg and Opper, 1969) with respect to imitation and intellectual development. Observation of the aggresive and/or altruistic model may have less impact and differential meaning for the young child. Furthermore, Rubin and Schneider91973) found a positive relationship between the child's ability to decenter and the amount of prosocial behavior he displays. The young child is at a further disadvantage due to experiential factors. He has had less opportunity to observe altruistic models, to learn prosocial norms and be reinforced for altruistic responses than the older child.

Two studies(Grusec, 1972, 1973) that do address themselves to age differences in imitation were conducted by Grusec. In the first study, Grusec(1972) observed the effects on subsequent imitation of observing an altruistic model perform a particular behavior or merely say that he thought it was appropriate. No age differences were found; however, each of the two age groups tested(7-11 years) were within the concrete operations period. The second study undertaken by Grusec(1973) examined the effect of the experimenter's evaluations on the imitation displayed by five and ten year old children. Here, it was found that the five year olds imitated all models regardless of evaluations, while the ten year olds were more selective in attending to positive and neutrally evaluated models. This latter investigation is the only developmental study that deals directly with the imitation of aggression and altruism; however, it is endemic to evaluated imitative aggression. Nevertheless, this finding is congruent with theoretical principles and integration outlined above and indicates the importance of developmental research concerning imitation.

The impact of aggressive and altruistic models has been previously documented, yet these two areas of concern have been treated separately. Furthermore, the significance of parents personifying aggressive or altruistic behaviors has been demonstrated several times(Sears et al., 1957; McCord, McCord and Howard, 1967; Eron et al., 1971; Straus, 1973; Hoffman, 1963; Rutherford and Mussen, 1968; Rosenhan, 1969). Without exception, however, these studies have considered the modeling of aggression and altruism as distinct behaviors without regard to their mutual interdependence. Leifer(1975) has tentatively concluded that aggressive responses,

as opposed to altruistic responses, might be more salient and/or utilitarian and therefore, more easily generalized. Leifer posits that children may have more well developed cognitive schema for aggressive behavior thus accounting for the predominance of aggressive as opposed to prosocial behavior. Consequently, an aggressive model might be presumed to be more powerful than an altruistic one. The incidence of a model presenting a picture of consistency, i.e., displaying either altruistic or aggressive behaviors only, in the real world is nil. A model who performs both aggressive and altruistic responses will presumably have a particular effect on the observers, notably the older children. Conceptually, the older children will more readily deal with the duality of a "multiple" model, i.e., one who displays aggression and altruism, therefore, it will exert a greater imfluence on subsequent imitation. This leads to the second major purpose of the present investigation: to conduct a direct test of the differential efficacy of aggressive and altruistic models as well as a model who incorporates both types.

Another aim of this study is to examine sex differences. Sex differences have been consistently identified in the aggression literature (Sears et al., 1957; Hicks, 1965; Martin et al., 1971) demonstrating what one might label a male predisposition. This is congruent with literature concerning sex role development(Hartup, 1970). A recent and comprehensive review of sex differences accounting for male and female discrepancies in levels of aggression: males are more aggressive in all human societies; sex differences are seen early in life, before the socializing agent has differentially influenced the sexes; similar discrepancies are observed in man and primates; and aggression is related to levels of sex hormones

and can be altered by experimental manipulations of these hormones. The findings pertaining to altruism, on the other hand, are contradictory and possibly manifestations of the methodology. Some investigations indicate that girls manifest more prosocial behavior(Bryan and Walbek, 1970; Hapkiewicz and Stone, 1974) while other studies find that boys exhibit more altruism(Harris, 1970; Bryan and Walbek, 1970). The predominate viewpoint is that there are no sex differences(Maccoby and Jacklin, 1974). Only one research design utilizing modeling conditions obtained significant results(Staub, 1971). Staub examined types of prosocial behavior. He found that kindergarten boys displayed more sharing behavior, but girls demonstrated more helping behavior. Nevertheless, the issue remains unresolved as to a sex typed predisposition to behave altruistically.

The literature summarized thus far concerns three of four fundamental aims of the present stydy; i.e., the differential efficacy of aggressive, altruistic or multiple models, examination of the modeling of aggression and altruism as it unfolds developmentally and determination of whether developmental trends are similar for boys and girls. An additional aim of this study, for which there is no related literature on modeling and imitation, is derived from the theoretical integration posited earlier. The symbolic processes that are an integral part of Bandura's theory require differential mediational responses on the part of the child. More specifically, the young child is at a disadvantage in processing the information presented to him, since he is less likely to actively attend to specific features of the model's behavior patterns. As the final proposal of this study, half the present children will be required to make explicit recordings of the model's responses as a means of testing

Bandura's suggestion of the importance of attention of the child, as well as Piaget's emphasis on egocentrism. This manipulation should serve to enhance the younger child's acquisition of representational systems. Children in the concrete operations period are likely to do this spontaneously, and therefore, not benefit by the orienting manipulation.

Hypotheses

The foregoing rationale suggest the following typotheses for test in the present study:

1. The effect of the model, for both aggression and altruism, will be more pronounced among older children(i.e., those less egocentric) than younger children.

2. The inability of the young child to focus on two or more dimensions will compromise the effectiveness of the mixed model, i.e., one who displays both altruistic and aggressive behaviors, thereby making this model least effective for younger children.

3. Due to its salience and dominance, aggressive behavior will be more highly imitated than altruistic responses by children at each level of cognitive maturity in each of the conditions.

4. The predominance of aggressive imitation will be more pronounced for boys than girls.

5. The stability of the sex roles of older girls, manifested by their identification solely with the same sex parent, as opposed to the dual identification of younger girls, will augment the effectiveness of the altruistic model. Consequently, older girls will show relatively higher levels of imitation to the altruistic model than younger girls.

6. Sex differences will be more pronounced in the older age group with girls displaying more imitative prosocial behavior and boys more imitative aggression due to increasing sex-role stability.

7. Younger children who are required to record the responses of the model, will show greater amounts of imitative behavior, whereas this effect should not be evident among older children.

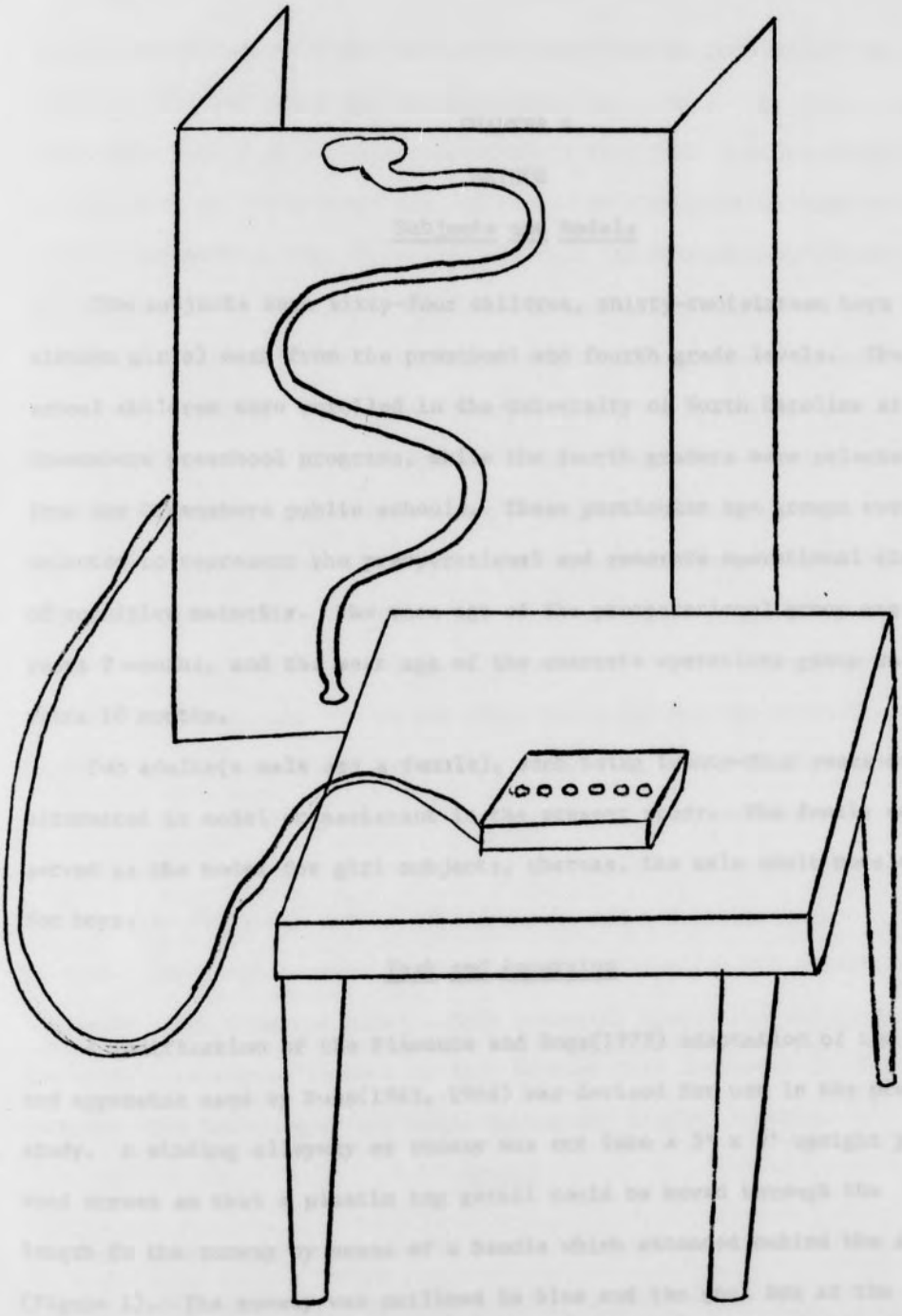

Figure 1. A pictorial representation of the apparatus used in the present study.

CHAPTER V

METHOD

Subjects and Models

The subjects were sixty-four children, thirty-two(sixteen boys and sixteen girls) each from the preschool and fourth grade levels. The preschool children were enrolled in the University of North Carolina at Greensboro preschool programs, while the fourth graders were selected from the Greensboro public schools. These particular age groups were selected to represent the preoperational and concrete operational stages of cognitive maturity. The mean age of the preoperational group was 5 years 9 months, and the mean age of the concrete operations group was 9 years 10 months.

Two adults(a male and a female), each being twenty-four years of age, alternated as model or assistant in the present study. The female adult served as the model for girl subjects, whereas, the male adult modeled for boys.

Task and Apparatus

A modification of the Piamonte and Hoge(1973) adaptation of the task and apparatus used by Buss(1963, 1966) was devised for use in the present study. A winding alleyway or runway was cut into a 5' x 9' upright plywood screen so that a plastic toy gerbil could be moved through the length fo the runway by means of a handle which extended behind the screen (Figure 1). The runway was outlined in blue and the goal box at the end

of the runway was red. The toy gerbil was directed from behind the screen by the assistant who was completely concealed. The subject and model were seated at a table approximately four feet from the screen.

A panel of six buttons was positioned on the table in front of the subject and model. The child was told that the buttons were either painful or helpful to the gerbil and would affect his progress down the runway. He was also told that the first three buttons gave increasing degrees of pain, i.e., poke(1), jab(2) and kick(3); while the last three buttons were pleasing to the gerbil and would make him feel more comfortable, i.e., light stroke(4), pat between the ears(5) and rubbing under the neck (6). Under each button was a pictorial representation of the action performed by the button. The child was told that either type of response could be used to make sure the gerbil runs to the end of the alley as fast as he could. Any use of the first three buttons was defined as an aggressive response, while depressing any of the latter buttons was considered an altruistic response. Two dependent variables were used: the percentage of imitative responses, i.e., the number of imitative responses over the total number of responses, and a relative response intensity. This last measure was obtained by subtracting the child's mean intensity score from the model's mean intensity score, thereby reflecting the child's responses as more or less intense than the model's. These measures were recorded by the model during the testing session.

Design

Each child was exposed to the three modeling conditions: the model responding aggressively, the model responding altruistically, and the

modeldisplaying both aggressive and altruistic responses. Presentation of the model conditions was randomly ordered so that each condition occured first for approximately one-third of the subjects. The two age groups represented the intellectual levels of development previously mentioned, i.e., five years-preoperational and nine years-concrete operations. Further, as a means to manipulate the child's attention to the model, half of the children in each age group were instructed to actively record the model's responses by crossing out the appropriate box on a sheet provided at the beginning of the testing session. Thus, the basic design for the present study included the between-group factors of cognitive level(2) x sex of subject(2) x attention(2), with eight subjects assigned to each cell, and the within-group factor of modeling condition(3).

Procedure

Each child was individually escorted by the model from his classroom to testing room, i.e., nearby room in the elementary school for the older children and the University of North Carolina at Greensboro testing center for the five year olds. The model utilized this time to make the child more comfortable by engaging in "friendly conversation". At this time the model gave his reasons for using children:

> I like to learn as much about children as I can. The way in which I do this is by playing games with children. We are going to play a game together to help me learn. It is a fun game which I think you will enjoy.

This introductory conversation hopefully reduced any anxiety the child might be experiencing. Both the child and the model sat at the table upon which the response panel was positioned. At the time the child and model

entered the room the assistant was already concealed behind the screen. The model first explained the mechanics of the apparatus to insure conceptual understanding of the relationship between the child's responses and gerbil's behavior:

> See the gerbil in that cage. He is going to play that game with us. After I tell you how to play this game, I am going to take that gerbil and his wheel and put him in a special cage I made that is behind the screen. The gerbil can only run in this cage, but that is what we want him to do. Attached to the special cage are some fake fingers and a boot which touch the gerbil in different ways when you press one of these buttons. The fingers and boot are hooked up to the wheel with these wires(pointing to the wires that begin from within the panel and tracing them back to the screen). That toy gerbil you see on the screen is also attached to the wheel in the special cage, so that when the real gerbil behind the screen is running fast enough, it moves the toy gerbil up the alleyway. Are there any questions about how we get the toy gerbil to move.

The model then explained the purpose of the task and rules as follows:

> The toy gerbil you see on the screen lets you know how fast a real gerbil behind the screen is running. The faster he runs, the more he moves along the runway. We need to help the gerbil reach the red circle(pointing to the red goal). He must be running fast enough to move this toy gerbil through the winding alleyway, otherwise he will not make it. We can do this in two different ways: poking, jabbing or kicking him; or stroking, patting or rubbing him(indicating the appropriate buttons). We will each get three turns with six chances in each turn.

Also, exactly what function was performed by each was explained in detail:

> These first three buttons do not feel good to the gerbil. This one is a poke which the gerbil feels a little. The next button hurts a little more and it jabs him. The last button hurts the most as the gerbil is kicked. The other three buttons are pleasing to the gerbil and make him feel more comfortable. The first one is a light stroking on his back which makes him feel good. The next button is a pat between the ears which the gerbil likes more and the last button rubs him under the neck. This he likes the best(as the model gave the instructions he pointed to the appropriate button which he was describing as well as assuring the child's understanding).

Each child was allowed to manipulate the buttons on the response panel as

well. The order of describing the pleasant or painful buttons was varied so that each one was presented first half the time insuring absence of order effects. Half the children were also given a piece of paper with the buttons pictorially reproduced in rows for each model response. These children were told to cross out on paper the button that was depressed by the model each time he did so:

> On this paper are pictures of what is done to the gerbil when pressing the buttons. Each time I press one of these buttons, I want you to watch closely and cross it out on this paper. For example: if I press this button you will mark this box on the paper. Okay? I will do the same when you take your turn. I will go first to make sure you understand, as I already know how to do this.

The other half were not given any representational aid, however, they were given a blocked off sheet of paper to tally the model trials. The child was told to mark off a box each time the model pressed a button so that he would not exceed his six chances per task. The model also tallied the child's responses in similar fashion. In this way all children were equal in that they performed some tallying of responses.

The children and the models were restricted to six chances per task. In the aggression-only condition the model administered six aggressive responses, two of each intensity, in random order(1-3-2-1-3-2). The altruism-only model in analogous fashion randomly administered each level of the pleasurable responses twice(5-6-4-5-6-4). The modeling both aggression and altruism performed each level of pleasure and pain once(1-5-4-6-3-2). The order of responding was randomized. At approximately twenty second intervals, the model depressed the appropriate button continuing until six trials were completed. After completion of his first task, the model said, "You try it"., and the child began his trial block,

alternating for three tasks. A two minute interval was utilized between each model/child task to insure discontinuity between model behaviors on each task. The children were given small table games, i.e., pinball and a maze, during this interval and told that the gerbil needed a rest, thereby providing justification for the two minute break. Each task lasted approximately three minutes. The model was to provide a verbal orienting response(i.e., "I am going to press this button now".), which would insure attention of the child observer. This verbalization was presented to all children in all conditions as attention is a critical precursor to modeling.

As the child or model depressed a button, a click was heard which signaled the assistant, in position behind the screen, to move after a three second interval, the toy gerbil a fraction of the distance to the goal. The child was told to continue after the movement of the gerbil was observed, proceding in this manner until his number of chances for that particular task were depleted. The gerbil was then returned to the starting position for the series of trials proceeding in like manner for the remaining child and model tasks. The gerbil failed to reach the goal during any model tasks, thereby precluding any demand characteristics that might arise if the model was successful. The child on the other hand, failed to get the gerbil to the goal on his first two tasks only. Upon completion of the third task, the gerbil reached the goal, thereby precluding the elicitation of negative affective states that might arise from failure(Isen, Horn and Rosenhan, 1973).

Once the game was completed by the child, he was thanked and then brought back to his classroom. Once all thirty two children at each

school completed the task they were shown a gerbil moving freely in a cage with the apparatus unattached. This was done at the very end, rather than after each child, to assure that each child knew nothing of the procedure prior to their participation. Otherwise, the children would have undoubtedly told their peers and jeopardized the study.

CHAPTER VI

RESULTS

Initially, the results were analyzed in an age(2) x sex(2) x response record(2) x modeling task(3) repeated measures analysis of variance. Separate analyses were performed on each of three dependent measures. The first measure, i.e., percentage of task imitation, was calculated as a ratio of the number of responses of the child that matched the responses of the model, irrespective of differences in the order in which the child and the model gave these responses. This measure enables an estimate of imitation unconfounded by age differences in the children's abilities to repeat the serial order of the model's responses. The second measure analyzed, i.e., the percentage of imiatation by trial was calculated as a ratio of the number of responses the child made on the trials of his task that were identical to those made by the model on corresponding trials of his task. A perfect score on this measure required that the child's first response match the model's first, his second match the model's second, etc. These two measures focus on the reproductive quality of modeling. The third dependent measure submitted to analysis assessed the more general relationship between the intensity of the model's responses and that of the child's. This score was obtained by substracting the child's mean response intensity, per task, from the model's mean intensity score for the same task.

Percentage of Task Imitation

The percentage of task imitation did reveal a significant main effect for model condition, F (2, 112)=19.84, p .001, but no significant effects were obtained for the sex, age or response recording conditions(p .05). Contrary to prediction, the aggressive model was the least effective. Children demonstrated higher imitative behavior in the mixed and altruistic modeling conditions than in the aggressive condition. As shown in Table 1 the means for the aggressive, altruistic and mixed conditions were .46, .60 and .69, respectively.

There was a significant sex x modeling condition interaction, F (2, 112)=4.21, p .02. Girls imitated the aggressive, altruistic and mixed condition at an approximately equal rate(.52, .60, .64), whereas boys differentially imitated the various models. The boys showed the greatest amount of imitation of the mixed model(.74), followed by the altruistic model(.59) with the aggressive model being the least effective(.40). Post hoc comparisons, with Scheffe's test, revealed significant differences between the aggressive condition and each of the mixed and altruistic conditions were significant for girls.

To interpret the aforementioned results, i.e., the significant main effect of modeling condition and the sex x modeling condition interaction, requires caution. Ofter, the children depressed the buttons successively, thus, depressing all six buttons and demonstrating 100% imitation. To the degree that this tendency not only contributes disproportionately to the main effect and sex x model interaction results, but also precludes an accurate understanding of the effects of the aggressive and altruistic

TABLE 1

Mean Percentage of Task Imitation

Age	Modeling Condition					
	Aggression		Altruism		Mixed	
	Males	Females	Males	Females	Males	Females
5 years	.40	.56	.58	.61	.81	.67
9 years	.41	.47	.61	.60	.67	.59

conditions, it was deemed necessary to re-analyze the task imitation data with another repeated measures analysis of variance which excluded the mixed model data. The results of this subsequent analysis confirmed the initial main effect for model condition, F (1, 56)=13.04, p .001. The summary table for these ANOVAS are shown in Table 5(see appendix). The previously significant sex x modeling condition interaction was not apparent. An investigation of the individual data confirmed the suspicion that boys were more likely than girls to depress all six buttons in the mixed condition, thereby, accounting for the first found condition x sex interaction. An additional repeated measures analysis of variance of the task imitation percentages, conducted to assess the effect of task order, indicated that children of each grade level evidenced greater amounts of task imitation in the first task than in subsequent tasks, F (2, 112)=3.77, p .05. However, as task order was counterbalanced in the present study, this finding does not alter the interpretation of the results.

Percentage of Imitation by Trial

Repeated measures analyses of variance were similarly performed on this measure. However, in this case none of the main or interaction effects reached an acceptable level of significance, regardless of whether the mixed condition data were included in the analysis. Also, there was no task order effect for this measure(see Table 2).

Overall Comparisons of Child versus Model Intensity Scores

The difference score analysis used to determine the relationship between the model's response intensity and the child's in each of the

TABLE 2

Mean Percentage of Task Imitation per Trial

Age	Modeling Condition					
	Aggression		Altruism		Mixed	
	Males	Females	Males	Females	Males	Females
5 years	.06	.13	.56	.23	.20	.20
9 years	.10	.24	.19	.16	.20	.16

modeling conditions revealed a significant main effect for modeling conditions, F (2, 112)=11.29, p .001, but no main effects for sex, age or response recording condition and no significant interactive effects. The children's responses were more altruistic than those of the model in both the aggressive and the mixed condition, but slightly less altruistic in response intensity in the altruistic condition. A summary of the data is shown in Table 3.

Response intensity ranged from one-to-six. Consequently, a difference of five was the maximum. The model's mean response intensities for the aggressive, altruistic and mixed conditions were 2.00, 5.00 and 3.50, respectively. A negative difference score indicated greater altruism, relative to the model, which was the case in both the aggressive and mixed conditions. A positive score was indicative of more aggression, however, the positive direction of the altruism score is somewhat misleading. A difference of .78, reported in Table 3, remains in the altruistic range, i.e., four-to-six, therefore, all three conditions tended toward altruistic responsiveness by the children.

The possibility that the mixed model condition artificially inflated the F value was again considered as a confounding factor as it had been for the percentage of task imitation measure. Exclusion of the mixed model condition from the analysis provided results consistent with the previous findings, F (1, 56)=14.74, p .001. Children were more altruistic following the aggressive task while not as altruisitc following the prosocial condition. The task order repeated measures analysis of variance of this measure failed to detect a significant order effect. However, the analysis revealed a sex x task order interaction which was marginally

TABLE 3

Overall Comparisons of Child versus Model Intensity Scores

Age	Modeling Condition					
	Aggression		Altruism		Mixed	
	Males	Females	Males	Females	Males	Females
5 years	.21	-1.47	1.04	.73	-.16	-.56
9 years	-1.97	-1.72	.63	.72	-.46	-.64

Note. These values represent difference scores derived by subtracting the child's mean response intensity, per task, from the model's mean intensity score for the same task. The more positive the score, the more aggressive.

significant, F (2, 112)=2.28, p .09. The younger children's mean intensity score became less like the model's while the older children's mean intensity score approached that of the model's as each task was performed.

CHAPTER VII

DISCUSSION

A major hypothesis of the present study was that developmental differences in modeling are associated with differential cognitive abilities of children in different age groups. However, it appears for the present results that older children were no more likely to imitate the model than younger children. Both age qroups imitated approximately 60% of the model responses. Additionally, the absence of effects due to response recording indicate that attention to the responses was not an influential factor. The no record condition shows 58% task imitation, while the record condition resulted in 60% imitation.

The aggressive model was presumed to be the most powerful one; however, the present results indicate otherwise. An examination of main and interaction effects including the factor of aggression reveals the lowest percentage of imitation. More specifically, the percentage of task imitation data show that the aggressive model was imitated approximately 45% of the time as opposed to 60% and 70% for the altruistic and mixed model, respectively. Furthermore, it was hypothesized that sex differences would appear as a function of age and model type. Overall all conditions and age groups, both sexes imitated 58% of the model's responses.

The concurrent examination of three distinct model types was undertaken to reveal the relative strengths of each model type to elicit specific behaviors from children of two ages and both sexes. The present study examined the effects of both aggressive and altruistic models

separately and in combination on children's behaviors, whereas, previous research(Bandura et al., 1961, 1963a, 1963b; Hicks, 1965; Bryan and Walbek, 1970a, 1970b; Staub, 1971; Ruston, 1975) has been restricted to exclusive considerations of either, but not both types of models.

The findings revealed that the aggressive model was the least effective for both boys and girls regardless of whether the children were in the preoperational stage of development, i.e., five years, or concrete operations, i.e., nine years. Moreover, the intensity data demonstrated the children's tendency to manifest significantly more altruistic behavior than the model in the aggressive condition. The limited ability of the aggressive model to elicit imitative behavior is further accentuated by the altruistic model's strength. The fact that the children imitated the altruistic model significantly more than the aggressive model, clearly contradicts Leifer's(1975) proposal that children have more well developed cognitive schema for aggressive behavior, and thus, find it easier to learn specific behaviors from an aggressive model.

Several factors can be considered to account for the superior effectiveness of the altruistic model. The most obvious difference between the present study and previous research is that the present subjects were able to choose among various intensity levels of both aggressive and altruistic consequences, as opposed to the restrictions of one response type. Rarely did the present subjects consistently depress aggressive buttons without also depressing one or more prosocial buttons. On the other hand, the incidence of responding altruistically for all six trials of any particular task was quite common. One child chose to depress the most altruistic response button on all eighteen trials and verbally

assured the model of this "fact" prior to any behavior by the model. On no occasion did the children display such a straightforward preference for aggressive responding. The results obtained under the free choice conditions here do not provide causal answers indicating why the alturistic model was more effective. However, some of the present data furnish information concerning specific environmental stimuli that might contribute to the occurence of prosocial behavior. One source of information stems from the spontaneous verbalizations made by the children during the testing sessions. The children frequently expressed displeasure at the possibility of hurting the gerbil prior to the beginning of the task. Examples of verbalizations included such statements as "I am not going to press those buttons, because they will hurt him," "I do not think I should hurt the gerbil", etc. Other predominant verbalizations demonstrated the child's tendency to prefer the prosocial buttons, e.g., "I am only going to press the good buttons," "These are the buttons that he likes so I am going to use them." These unsolicited verbalizations clearly reflect a concern for the welfare of the gerbil, and further, that the children entered the task situation predisposed not only to administer positive sanctions but also predisposed to avoid administering negative consequences. One way to account for the occurence of these spontaneous exhortations emitted by the children might be the direct result of the model's presence. A child's need for adult approval would greatly enhance the "good"(prosocial) behaviors of the model while relegating the "bad"(aggressive) behaviors to a lessor role. Thus, children seeking this approval would undoubtedly behave more altruistically to satisfy this need. However, the situational constraints of the present investigation are

comparable to the Siegel and Kohn(1959) study which was characterized by an absence of consequences to the behavior emitted by the model and the child observer. This absence of consequences is interpreted by the children as positive reinforcement or at least tacit approval by the adult. Consequently, the children were not responding to the expectations of the adult, but were equitably reinforced for any type of task behavior.

In light of this position, the possibility that the children entered the situation not simply to attain adult approval, but rather predisposed to act as benefactors is quite attractive. An examination of the mean intensity levels administered by the children tends to corroborate the percentage of task imitation data. The children hesitated to include the model's aggressive actions in their performance, thereby accounting for the significant altruistic tendency in the aggressive condition. More specifically, they chose to act significantly more altruistic than the model in the aggressive condition which resulted in higher intensity scores. Furthermore, the children's responses in the mixed condition were more altruistic than the model's despite the model's use of prosocial behavior for half the task situation.

In summary, it appears that children enter situations not as passive recepients of information conveyed by adults, but evaluate this information on the basis of previously acquired information and attitudes regarding social behavior. Moreover, this other information is seemingly acquired early in the socialization process as even the five year olds demonstrated this preference. The present situation indicates that children are socialized to behave altruistically when the opportunity is clearly available to them to choose among a variety of responses.

The absence of sex differences in the present study, is quite puzzling in view of the voluminous amount of previous literature which cites a male predisposition to be more aggressive(see Maccoby and Jacklin, 1974 for a review of this literature). Again the choices available to the present subjects seems to be a critical variable in understanding the present findings. Previous investigations, beginning with Bandura, Ross and Ross(1961, 1963), have offered the children no behaviorally distinct choices. It appears that boys are more likely to imitate the aggressive models than girls in aggression only situations, however, the provision of alternatives seems to attenuate this aggressive dominance. The absence of a difference between boys' and girls' imitative aggression in the present study suggests a need for qualification concerning male aggressiveness, thereby limiting the explanatory power of biological explanations(Maccoby and Jacklin, 1974). The results indicate that the delineation of specific behavioral settings is necessary in order to predict any differential aggressive quality between the sexes. As long as there are obvious alternatives, boys are not necessarily more aggressive than girls.

The prediction of sex differences regarding altruistic behavior was developmentally based. It was assumed that increasing sex role stability would accentuate the differences between the sexes. Thus older boys were expected to demonstrate more imitative aggression while older girls would display more imitative prosocial behavior. Furthermore, the aforementioned link between identification and the socialization of prosocial behavior, was thought to augment the effectiveness of the altruistic model for older girls. The present finding, however, are consistent with the majority of

past research(Harris, 1970; Staub, 1970; Presbie and Coiteaux, 1971; Ruston, 1975) although not developmental in nature; which produced no evidence for sex difference.

One of the principal hypotheses of the present study was that age differences would emerge in the amount and quality of imitation displayed by the children. It was assumed that selection of the five-year-old and nine-year-old age groups would accentuate developmental differences as these age groups denote distinctly different cognitive levels of development, i.e., preoperational and concrete operational abilities. The underlying theoretical framework which was derived from the conceptual frameworks of both Piaget(1932, 1962) and Bandura(1969, 1971), predicted age differences in imitation on the basis of the children's differential cognitive abilities. Yet, no age differences were found. The younger children imitated the adult model equally as well as the older children in each of the conditions.

Given the credibility of a cognitive interpretation of age differences, the absence of a developmental trend is surprising. The possibility that the two age groups were more cognitively similar than dissimilar might account for this absence of differences. Children's abilities to successfully deal with another's perspective on perceptual and cognitive tasks increases with age, the most substantial jumps occurring between four-and-one-half and five years of age(Leifer, 1975). The mean ages of the present groups were five years nine months and nine years ten months, the younger obviously beyond the peak period cited by Leifer. Also, the fact that the task was quite simple and straightforward may have been a factor. The model's responses were single-action units which presumably

could have been easily assimilated by children in both age groups, whereas, the matching process required in much of the previous works frequently involves the reproduction of multi-unit paterns of behavior(Bandura, 1969). Thus, although the older children were able to symbolically represent the model's responses rather easily, it did not necessarily pose a more difficult representational process for the younger children of the present study. Representations of these distinct single unit responses were as easy to formulate among younger children as they were for the older children. Although learning may have been slower for the five year olds, it appears to have been no less complete. Consequently, the selection of five year olds, who were approaching the upper limit in the preoperational stage, as well as the simplicity of the task may well have contributed to the absence of developmental difference.

However, an equally plausible interpretation responsible for no difference relates to the socialization process. It is frequently observed that very early in a child's development the home and school explicitly promote prosocial behavior while concommitantly discouraging aggressive behavior. The rules children learn concerning "socially appropriate" behavior bring them to a level of performance in this study which compensates for the cognitive deficiencies of the five-year-old. Even the most egocentric children could have responded altruistically without reflecting upon the feeling state of the gerbil. Thus, as a result of rote learning, even the youngest of school age children have a basis for judging the model's behavior along a good/bad continuum, and therefore, know to imitate only the most appropriate behaviors of the model.

The similarity of the two age groups in the no record condition concomitant with the absence of a main effect of recording for children at each age level, suggests that the task was sufficiently easy for the younger children without the requirement that they attend to the model's responses necessary for symbolic representation. It was predicted that younger children, characterized by egocentrism and relying primarily on perceptual experiences to order their world, would benefit symbolically by recording, and thereby having to verbally process pictorial representations of the model's responses. Bandura' contiguity theory with its emphasis on symbolic factors provided the basis for this prediction. It appears that the task was too simple to be differentially affected by mediational process, i.e., pictorial representations, used in the present study. Previous research by Bandura, Grusec and Menlove(1966) and Gerst (1968) support this interpretation. They found that the observational learning of complex sequences of behavior was differentially successful depending upon the representational process employed by the child. Those children who generated verbal equivalents were the most successful. The simplicity of the model's actions in the present study, appear to be so clear that recording failed to significantly aid the younger child's representational processes, as he already possessed the mental capabilities to deal with what now appears to be a limited amount of information.

By including the mixed modeling condition, information could be provided concerning the relative strength of a model who is ecologically more valid than one who displays aggression or altruism exclusively. Although the present findings point to the superiority of this model over both the altruistic and aggressive models, two major problems arose by

including this modeling condition. First of all, they frequently depressed all six buttons in rote fashion, i.e., (1), (2), (3), (4), (5) and (6) or vice versa, without forethought of model behavior or consequences of their actions. Consequently, many children obtained 100% imitation in this condition, although imitation might not have been taking place. The analyses performed on the data confirmed this, as the removal of the mixed condition from the analyses decreased the F ratios for modeling condition effects for both the percentage of task imitation and the difference score measures. Secondly, it is possible that the use of repeated measures design precludes a meaningful interpretation of the mixed condition. After two model presentations, the model could be perceived as a mixed model regardless of the quality of the responses he gave during the final task. This perception would have been derived by the subject even sooner if the first task was under the mixed model condition. In an attempt to rectify this problem a two-minute interval was included between tasks. The interval appeared to serve its purpose. Subsequent inspection of the data, i.e., comparison of the means of the three modeling conditions with regard to order, revealed similar modeling effects for the three modeling conditions. More specifically, the aggressive, altruistic and mixed model conditions maintained their relation to each other regarding the imitation. The means of the three conditions for each task are as follows: .48, .62 and .72 for the first aggressive, altruistic and mixed conditions, respectively. The second and third tasks showed similar values.

It is also possible that the use of repeated measures design served to confound the effect of modeling condition with task order. The task

order analysis revealed differential efficacy of model presentation depending upon serial order. The first task was significantly more influential than either the second or third presentation. The aforementioned findings may indicate that the child's perception of the model was interferred with by the repeated presentations. Consequently, the children may have responded to the model's initial responses made during the first task, so that on subsequent tasks the children attended to the first task rather than the task immediately prior to the child's actions. However, order per se, may not have been the critical factor accounting for the order effects. Failure concomitant with each model task may have jeopardized the competency rating of the model. It has been demonstrated that the potency of model increases with the extent to which the model is perceived as possessing a high degree of competence(Bandura et al., 1963b). It is reasonable that the children, upon viewing the model's initial failure to move the gerbil to the goal box, were less likely to be influenced by it significantly. The fact that the first task elicited more imitative behavior than subsequent tasks, as shown by the percentage data, demonstrates the initial status of the model in spite of such failure. Nevertheless, this possible decrease in model potency may have induced the children to rely on their own judgment when performing subsequent tasks.

Although the results of the present study failed to confirm any of the study's hypotheses, underestimation of the socialization levels of the children, i.e., the rules they possess upon entering the task setting, and task simplicity would seem to be the most fundamental reasons for such failure. Observational learning involves two representational

systems, i.e., imaginal and verbal, the latter of which the present study neglected to adequately investigate due to task simplicity. Despite this shortcoming, a major finding emerges which requires some qualification of previously cited assumptions concerning a child's imitation of aggressive and prosocial behavior. The preference of children at both age groups and sexes to imitate the altruistic model significantly more than the aggressive model, as well as their tendency to behave altruistically in the face of aggression by the model, necessitates a reassessment of previous literature. Children of both sexes seem to be well socialized to behave in an altruistic fashion if the situation clearly provides a choice. Furthermore, this tendency is stable throughout the early school age period. The present findings indicate further, that children are not as malleable as assumed, given specific situational variables.

Further study must be undertaken in an attempt to rectify some of the difficulties inherent in studying observational learning with a repeated measures design. Notwithstanding these problems, the use of a repeated measures design will provide a more accurate assessment of adult/child interaction as parents and other significant adults interact with children on a continual basis. Furthermore, task complexity should be varied and/or the intellectual capabilities of the children need specific assessment in order to accentuate their intellectual differences. In addition, the built-in failure of the model should be counterbalanced with success to assess the presumed decreased competency rating of the model.

The present investigation has also indicated new directions for research to take. The use of repeated measures is probably more

ecologically valid than a between groups design, as interactions with chil- are not on a once only basis. Consequently, investigators should work more thoroughly at using a repeated measures design to assess a variety of social measures in addition to imitation. The need for developmental studies concerning imitation is demonstrated by the lack of age differences in order to more adquately determine the effects of models and the limitations of contiguity theory imposed by situational variables. Finally, the influence of parents is implied by the stability of the altruistic tendency on the part of the five year old children. Social comparison studies should be undertaken to reveal the differential efficacy of parental models and other adult models.

BIBLIOGRAPHY

Adams, G. R. and Hamm, N. H. A partial test of the 'contiguity' and 'generalized imitation' theories of social modeling process. Journal of Genetic Psychology, 1973, 123, 145-154.

Bandura, A. Influence of model's reinforcement contingencies on the acquisition of imitative responses. Journal of Personality and Social Psychology, 1965, 1, 589-595.

Bandura, A. Social learning theory of identificatory processes. In D. A. Goslin(Eds.) Handbook of socialization theory and research. Chicago: Rand McNally, 1969, 213-263.

Bandura, A. Psychological modeling: Conflicting theories. Chicago: Aldine-Atherton, 1971.

Bandura, A., Grusec, J. E. and Menlove, F. L. Observational learning as a function of symbolization and incentive set. Child Development, 1966, 37, 499-506.

Bandura, A., Ross, D. and Ross, S. A. Transmission of aggression through imitation of aggressive models. Journal of Abnormal and Social Psychology, 1961, 63, 575-582.

Bandura, A., Ross, D. and Ross, S. A. Imitation of film-mediated aggressive models. Journal of Abnormal and Social Psychology, 1963a, 66, 3-11.

Bandura, A., Ross, D. and Ross, S. A. Vicarious reinforcement and imitative learning. Journal of Abnormal and Social Psychology, 1963b, 67, 601-607.

Bandura, A. and Walters, R. H. Social learning and personality development. New York: Holt, Rinehart and Winston, 1963.

Bryan, J. H. Model affect and children's imitative altruism. Child Development, 1971, 42, 2061-2065.

Bryan, J. H. Why children help: A review. Journal of Social Issues, 1972, 28, 87-104.

Bryan, J. H. and Walbek, N. H. Preaching and practicing generosity: Children's actions and reactions. Child Development, 1970a, 41, 329-334.

Bryan, J. H. and Walbek, N. H. The impact of words and deeds concerning altruism upon children. Child Development, 1970b, 41, 747-757.

Bryan, J. H., Redfield, J. and Mader, S. Words and deeds about altruism and the subsequent reinforcement power of the model. Child Development, 1971, 42, 1501-1508.

Buss, A. H. Physical aggression in relationship to different frustrations. Journal of Abnormal and Social Psychology, 1963, 67, 1-7.

Buss, A. H. Instrumentality of aggression, feedback and frustration as determinants of physical aggression. Journal of Personality and Social Psychology, 1966, 3, 153-162.

Christy, P. R., Gelfand, D. M. and Parton, D. A. Effects of competition induced frustration on two classes of modeled behavior. Developmental Psychology, 1971, 5, 104-111.

Coates, B. and Hartup, W. W. Age and verbalization in observational learning. Developmental Psychology, 1969, 1, 556-562.

Cohen, S. Children's observation and integration of aggressive experiences. 1971(unpublished manuscript).

Cohen, S. The development of aggression. Review of Educational Research, 41, 71-85.

Cohen, S. Peers as modeling and normative influences in the development of aggression. Psychological Reports, 1971, 28, 995-998.

Collins, W. A. and Westby, S. D. Children's processing of social informationfrom televised programs. Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, 1971.

Dorr, D. and Fey, S. Relative power of symbolic adult and peer models in the modification of children's moral choice behavior. Journal of Personality and Social Psychology, 1973, 29, 335-341.

Dubanoski, R. A. and Parton, D. A. Effect of the presence of a human model on imitative behavior in children. Developmental Psychology, 1971, 4, 463-468.

Elliot, R. and Vasta, R. The modeling of sharing: Effects associated with vicarious reinforcement, symbolization, age and generalization. Journal of Experimental Child Psychology, 1970, 10, 8-15.

Eron, L. D., Walder, L. O. and Lefkowitz, M. M. Learning of aggression in children. Boston: Little Brown, 1971.

Felling, J. P. The relation between family variables and aggression among boys. Dissertation Abstracts International, 1972, 33(4-B), 1788.

Feshbach, S. Aggression. In Mussen, P. H.(Eds.) Carmicheal's Manual of Child Psychology(Vol. 2). New York: John Wiley and Sons, 1970, 159-260.

Flavell, J. H., Beach, D. R. and Chinsky, J. M. Spontaneous verbal rehearsal in a memory task as a function of age. Child Development, 1966, 37, 283-299.

Gerst, M. S. Symbolic coding operations in observational learning. Unpublished doctoral dissertation, Stanford University, 1968.

Ginsberg, H. and Opper, S. Piaget's theory of intellectual development. New Jersey: Prentice Hall, 1969.

Green, F. P. and Schneider, F. W. Age differences in the behavior of boys on three measures of altruism. Child Development, 1974, 45, 248-251.

Grusec, J. E. Demand characteristics of the modeling experiment: Altruism as a function of age and aggression. Journal of Personality and Social Psychology, 1972, 22, 139-148.

Grusec, J. E. Effects of co-observer evaluations on imitation: A developmental study. Developmental Psychology, 1973, 8, 141.

Handlon, B. J. and Gross, P. The development of sharing behavior. Journal of Abnormal and Social Psychology, 1959, 59, 425-428.

Hapkiewicz, W. G. and Roden, A. H. The effect of aggressive cartoons on childrens interpersonal play. Child Development, 1971, 42, 1583-1588.

Hapkiewicz, W. G. and Stone, R. D. The effect of realistic versus imaginary aggressive models on children's interpersonal play. Child Study Journal, 1974, 4, 47-58.

Harris, M. B. Reciprocity and gererosity: Some determinants of sharing in children. Child Development, 1970, 41, 313-328.

Hicks, D. J. Imitation and retention of film mediated aggressive peer and adult models. Journal of Personality and Social Psychology, 1965, 2, 97-100.

Hoffman, M. L. Parent discipline and the child's consideration for others. Child Development, 1963, 31, 573-588.

Hoffman, M. L. Altruistic behavior and the parent/child relationship. Journal of Personality and Social Psychology, 1975, 31, 937-943.

Hoffman, M. L. Developmental symthesis of affect and cognition and its implications for altruistic motivation. Developmental Psychology, 1975, 11, 607-622.

Isen, A. M., Horn, N. and Rosenhan, D. L. Effects of success and failure on children's generosity. Journal of Personality and Social Psychology, 1973, 27, 239-247.

Joslin, D., Coates, B. and McKown, A. Age of child and rewardingness of adult model in observational learning. Child Study Journal, 1973, 3, 115-124.

Kniveton, B. H. Social class and imitation of aggressive adult and peer models. Journal of Social Psychology, 1973, 89, 311-312.

Krebs, D. C. Altruism: An examination of the concept and a review of the literature. Psychological Bulletin, 1970, 73, 258-302.

Leifer, A. D. How to encourage socially-valued behavior. Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, 1975.

Maccoby, E. E. and Jacklin, C. N. The psychology of sex differences. Stanford: Stanford University Press, 1974.

Madsen, C. Nurturence and modeling in preschoolers. Child Development, 1968, 39, 221-236.

Martin, M. F., Gelfand, D. M. and Hartmann, D. P. Effects of adult and peer observers on boys and girls responses to an aggressive model. Child Development, 1971, 42, 1271-1275.

McCord, W., McCord, J. and Howard, A. Familial correlates of aggression in nondelinquent male children. In G. R. Medinnus(Eds.) Readings in the psychology of parent-child relations. New York: John Wiley, 1967, 180-200.

Midlarsky, E. and Bryan, J. H. Training charity in children. Journal of Personality and Social Psychology, 1967, 5, 408-415.

Midlarsky, E., Bryan, J. H. and Brickman, P. Aversive approval: Interactive effects of modeling and reinforcement on altruistic behavior. Child Development, 1973, 44, 321-328.

Moore, B. S., Underwood, B. and Rosenhan, D. L. Affect and altruism. Developmental Psychology, 1973, 8, 99-104.

Murphy, L. B. Social behavior and child personality. New York: Columbia University Press, 1937.

Nelson, J. D., Gelfand, D. M. and Hartmann, D. P. Children's aggression following competition and exposure to a model. Child Development, 1969, 40, 1085-1097.

Parton, D. A. and Geshuri, Y. Learning of aggression as a function of presence of a human model, response intensity, and target of the response. Journal of Experimental Child Psychology, 1971, 11, 491-504.

Patterson, G. R. Reprogramming the families of aggressive boys. Behavior modification in education: The seventy-second yearbook of the National Society for the study of education. Chicago: University Chicago Press, 1973, 72(part 1), 154-195.

Piaget, J. The moral judgement of the child. Gencoe, Illinois: Free Press, 1948(originally published in 1932).

Piaget, J. Play, dreams and imitation in childhood. New York: Norton, 1962.

Piamonte, J. S. and Hoge, R. D. An investigation of the frustration aggression hypothesis in children. Canadian Journal of Behavioral Science, 1973, 5, 362-370.

Presbie, R. J. and Coiteaux, F. Learning to be generous or stingy: Imitation of sharing behavior as a function of model generosity and vicarious reinforcement. Child Development, 1971, 42, 1033-1038.

Rosenhan, D. L. The kindnesses of young children. Young Children, 1969, 25, 30-45.

Rosenhan, D. L., Underwood, B. and Moore, B. Affect moderates self-gratification. Journal of Personality and Social Psychology, 1974, 30, 546-552.

Rosenkrans, M. A. and Hartup, W. W. Imitative influences of consistent and inconsistent response consequences to a model on aggressive behavior in children. Journal of Personality and Social Psychology, 1967, 7, 429-434.

Rubin, K. and Schneider, F. W. The relationship between moral judgement, egocentrism and altruistic behavior. Child Development, 1973, 44, 661-665.

Ruston, J. P. Generosity in children: Immediate and long term effects of modeling, preaching and moral judgement. Journal of Personality and Social Psychology, 1975, 31, 459-466.

Rutherford, E. and Mussen, P. Generosity in nursery school boys. Child Development, 1968, 39, 755-765.

Schacter, S. The interaction of cognitive and physiological determinants of emotional state. In L. Berkowitz(Eds.) Advances in experimental social psychology(Vol. 1). New York: Academic Press, 1964.

Sears, R. R. Relation of early socialization experiences to aggression in middle childhood. Journal of Abnormal and Social Psychology, 1961, 63, 466-492.

Sears, R. R., Maccoby, E. E. and Levin, H. Patterns of child rearing. Evanston, Illinois: Row, Peterson, 1957, 218-269.

Semin-Ugurel, R. Moral behavior and moral judgement of children. Journal of Abnormal and Social Psychology, 1952, 47, 463-474.

Sethi, R. R. Parent/child similarity in choice of responses to frustrating situations. Psychological Reports, 1973, 32, 1227-1233.

Siegal, A. E. and Kohn, L. G. Permissiveness, permission and aggression: The effect of adult presence or absence on aggression in children's play. Child Development, 1959, 30, 131-141.

Staub, E. A child in distress: the influence of age and number of witnesses on children's attempts to help. Journal of Personality and Social Psychology, 1970, 14, 130-140.

Staub, E. A child in distress: The influence of nurturance and modeling on children's attempts to help. Developmental Psychology, 1971, 5, 124-132.

Staub, E. The use of role playing and induction in children's learning of helping and sharing behavior. Child Development, 1970, 42, 805-816.

Staub, E. and Sherk, L. Need for approval, children's sharing behavior and reciprocity in sharing. Child Development, 1970, 41, 243-253.

Walters, R. H. and Parke, R. D. The influence of punishment and related disciplinary techniques on the social behavior of children: Theory and empirical findings. In R. A. Maher(Eds.) Progress in experimental personality research(Vol. 4). New York: Academic Press, 1967, 179-222.

White, G. M. and Rosenhan, D. L. Elicitation of charitable behavior in children. American Psychologist, 1966, 21, 628(abstract).

Wolf, T. M. and Cheyne, J. A. Persistence of effects of live behavioral, televised behavioral and live verbal model on resistance to deviation. Child Development, 1972, 43, 1429-1436.

TABLE 4

Summary Table for Percentage of Task Imitation

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	66.10	66.10	*******
2 A(age)	S(AXR)	1	.11	.11	2.23
3 X(sex)	S(AXR)	1	.50	.50	.10
4 R(record)	S(AXR)	1	.57	.57	1.11
5 C(model)	SC(AXR)	2	1.79	.90	19.85**
6 AX	S(AXR)	1	.15	.15	.29
7 AR	S(AXR)	1	.59	.59	1.14
8 XR	S(AXR)	1	.46	.46	.88
9 AC	SC(AXR)	2	.14	.68	1.52
10 XC	SC(AXR)	2	.38	.19	4.21*
11 RC	SC(AXR)	2	.43	.21	.05
12 AXR	S(AXR)	1	.46	.46	.88
13 AXC	SC(AXR)	2	.31	.16	.35
14 ARC	SC(AXR)	2	.10	.53	1.17
15 XRC	SC(AXR)	2	.59	.30	.06
16 S(AXR)		56	2.89	.52	
17 AXRC	SC(AXR)	2	.12	.61	.13
18 SC(AXR)		112	5.06	.45	

TABLE 5

Summary Table for Percentage of Task Imitation

with Mixed Condition Removed

Source	Error Term	Degrees of Freedom	Sum of Aquares	Mean Square	F
1 Mean	S(AXR)	1	36.25	36.25	958.18
2 A(age)	S(AXR)	1	.60	.60	.16
3 X(sex)	S(AXR)	1	.61	.61	1.62
4 R(record)	S(AXR)	1	.17	.17	.46
5 C(model)	SC(AXR)	2	.65	.65	13.04**
6 AX	S(AXR)	1	.55	.55	.14
7 AR	S(AXR)	1	.19	.19	.05
8 XR	S(AXR)	1	.47	.47	1.25
9 AC	SC(AXR)	1	.18	.18	.36
10 XC	SC(AXR)	1	.13	.13	2.71
11 RC	SC(AXR)	1	.37	.37	.74
12 AXR	S(AXR)	1	.37	.37	.98
13 AXC	SC(AXR)	1	.18	.18	.36
14 ARC	SC(AXR)	1	.20	.19	.04
15 XRC	SC(AXR)	1	.26	.25	.52
16 S(AXR)		56	2.12	.38	
17 AXRC	SC(AXR)	1	.27	.27	.54
18 SC(AXR)		56	2.79	.50	

TABLE 6

Summary Table of Order Analysis of Percentage of Task Imitation

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	66.10	66.10	*******
2 A(age)	S(AXR)	1	.11	.11	2.15
3 X(sex)	S(AXR)	1	.47	.47	.01
4 R(record)	S(AXR)	1	.14	.14	.25
5 C(model)	SC(AXR)	2	.45	.22	3.77*
6 AX	S(AXR)	1	.54	.54	.10
7 AR	S(AXR)	1	.14	.14	.27
8 XR	S(AXR)	1	.36	.36	.67
9 AC	SC(AXR)	2	.78	.39	.66
10 XC	SC(AXR)	2	.95	.47	.80
11 RC	SC(AXR)	2	.35	.17	.29
12 AXR	S(AXR)	1	.57	.57	1.06
13 AXC	SC(AXR)	2	.55	.27	.46
14 ARC	SC(AXR)	2	.12	.61	1.03
15 XRC	SC(AXR)	2	.26	.13	.22
16 S(AXR)	S(AXR)	56	2.99	.53	
17 AXRC	SC(AXR)	2	.18	.90	.15
18 SC(AXR)		112	6.65	.59	

TABLE 7

Summary Table for Percentage of Task Imitation by Trial

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	7.88	7.88	32.76
2 A(age)	S(AXR)	1	.13	.13	.55
3 X(sex)	S(AXR)	1	.70	.70	.29
4 R(record)	S(AXR)	1	.19	.19	.78
5 C(model)	SC(AXR)	2	.75	.37	1.47
6 AX	S(AXR)	1	.15	.15	.62
7 AR	S(AXR)	1	.13	.13	.54
8 XR	S(AXR)	1	.13	.13	.56
9 AC	SC(AXR)	2	.77	.38	1.51
10 XC	SC(AXR)	2	.64	.32	1.25
11 RC	SC(AXR)	2	.29	.14	.57
12 AXR	S(AXR)	1	.28	.28	1.18
13 AXC	SC(AXR)	2	.24	.12	.48
14 ARC	SC(AXR)	2	.43	.21	.84
15 XRC	SC(AXR)	2	.56	.28	1.09
16 S(AXR)		56	13.47	.24	
17 AXRC	SC(AXR)	2	.15	.75	.29
18 SC(AXR)		112	28.59	.25	

TABLE 8

Summary Table for Percentage of Task Imitation

by Trial with Mixed Condition Removed

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	5.61	5.61	15.95
2 A(age)	S(AXR)	1	.17	.17	.49
3 X(sex)	S(AXR)	1	.72	.72	.20
4 R(record)	S(AXR)	1	.35	.35	.98
5 C(model)	SC(AXR)	1	.73	.73	1.96
6 AX	S(AXR)	1	.31	.31	.89
7 AR	S(AXR)	1	.22	.22	.64
8 XR	S(AXR)	1	.26	.26	.73
9 AC	SC(AXR)	1	.73	.73	1.96
10 XC	SC(AXR)	1	.68	.68	1.84
11 RC	SC(AXR)	1	.19	.19	.52
12 AXR	S(AXR)	1	.39	.39	1.10
13 AXC	SC(AXR)	1	.13	.13	.34
14 ARC	SC(AXR)	1	.39	.39	1.04
15 XRC	SC(AXR)	1	.59	.59	1.59
16 S(AXR)		56	19.70	.35	
17 AXRC	SC(AXR)	1	.13	.13	.35
18 SC(AXR)		56	20.86	.37	

TABLE 9

Summary Table for Order Analysis of Percentage of Task Imitation by Trial

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	5.68	5.68	248.73
2 A(age)	S(AXR)	1	.33	.33	.14
3 X(sex)	S(AXR)	1	.25	.25	1.08
4 R(record)	S(AXR)	1	.33	.33	.14
5 C(model)	SC(AXR)	2	.83	.41	1.54
6 AX	S(AXR)	1	.13	.13	.06
7 AR	S(AXR)	1	.21	.21	.01
8 XR	S(AXR)	1	.32	.32	.14
9 AC	SC(AXR)	2	.26	.13	.49
10 XC	SC(AXR)	2	.10	.52	1.93
11 RC	SC(AXR)	2	.30	.15	.56
12 AXR	S(AXR)	1	.12	.12	.51
13 AXC	SC(AXR)	2	.21	.11	.40
14 ARC	SC(AXR)	2	.94	.47	1.75
15 XRC	SC(AXR)	2	.21	.10	.04
16 S(AXR)		56	1.28	.23	
17 AXRC	SC(AXR)	2	.88	.44	1.64
18 SC(AXR)		112	2.99	.27	

TABLE 10

Summary Table for Overall Comparisons of Child versus Model Intensity Scores

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	17.74	17.74	2.89
2 A(age)	S(AXR)	1	13.88	13.88	2.26
3 X(sex)	S(AXR)	1	6.63	6.63	1.08
4 R(record)	S(AXR)	1	1.56	1.56	.25
5 C(model)	SC(AXR)	2	132.18	66.09	11.29**
6 AX	S(AXR)	1	8.74	8.74	1.42
7 AR	S(AXR)	1	3.34	3.34	.54
8 XR	S(AXR)	1	7.77	7.77	1.26
9 AC	SC(AXR)	2	10.46	5.48	.93
10 XC	SC(AXR)	2	3.07	1.53	.26
11 RC	SC(AXR)	2	14.23	7.12	1.21
12 AXR	S(AXR)	1	8.06	8.06	1.31
13 AXC	SC(AXR)	2	6.97	3.49	.59
14 ARC	SC(AXR)	2	9.82	4.91	.84
15 XRC	SC(AXR)	2	6.66	3.33	.57
16 S(AXR)		56	343.87	6.14	
17 AXRC	SC(AXR)	2	10.45	5.22	.89
18 SC(AXR)		112	655.79	5.85	

TABLE 11

Summary Table for Overall Comparisons of Child versus Model Intensity Scores with Mixed Condition Removed

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	6.72	6.72	.80
2 A(age)	S(AXR)	1	16.27	16.72	1.93
3 X(sex)	S(AXR)	1	3.67	3.67	.43
4 R(record)	S(AXR)	1	1.75	1.75	.21
5 C(model)	SC(AXR)	1	130.03	130.03	14.74**
6 AX	S(AXR)	1	8.32	8.32	.99
7 AR	S(AXR)	1	5.28	5.28	.63
8 XR	S(AXR)	1	10.10	10.10	1.20
9 AC	SC(AXR)	1	8.01	8.01	.91
10 XC	SC(AXR)	1	4.24	4.24	.48
11 RC	SC(AXR)	1	15.14	15.14	1.72
12 AXR	S(AXR)	1	7.52	7.52	.89
13 AXC	SC(AXR)	1	6.28	6.28	.71
14 ARC	SC(AXR)	1	7.83	7.83	.89
15 XRC	SC(AXR)	1	3.02	3.02	.34
16 S(AXR)		56	471.80	8.42	
17 AXRC	SC(AXR)	1	8.34	8.34	.94
18 SC(AXR)		56	593.83	8.82	

TABLE 12

Summary Table of Order Analysis for Overall Comparisons of Child versus Model Intensity Scores

Source	Error Term	Degrees of Freedom	Sum of Squares	Mean Square	F
1 Mean	S(AXR)	1	43.48	43.48	36.04
2 A(age)	S(AXR)	1	1.81	1.81	1.50
3 X(sex)	S(AXR)	1	.13	.13	.11
4 R(record)	S(AXR)	1	1.12	1.12	.93
5 C(Model)	SC(AXR)	2	1.55	.78	.38
6 AX	S(AXR)	1	.51	.51	.00
7 AR	S(AXR)	1	.23	.23	.19
8 XR	S(AXR)	1	.13	.13	.11
9 AC	SC(AXR)	2	9.23	4.61	2.28
10 XC	SC(AXR)	2	6.79	3.39	1.68
11 RC	SC(AXR)	2	6.55	3.27	1.62
12 AXR	S(AXR)	1	.17	.17	.14
13 AXC	SC(AXR)	2	.46	.23	.11
14 ARC	SC(AXR)	2	2.44	1.22	.60
15 XRC	SC(AXR)	2	1.60	.80	.40
16 S(AXR)		56	67.55	1.21	
17 AXRC	SC(AXR)	2	.84	.42	.21
18 SC(AXR)		112	226.69	2.02	