

ABSTRACT

PEER IMITATION BY THREE AND FOUR YEAR-OLD CHILDREN AS A FUNCTION OF THREE CONDITIONS OF TASK FAMILIARITY

by Martha G. Andrews

This research investigated the effects of three conditions of task familiarity upon the production of imitative responses by three and four-year old children.

The three conditions of task familiarity were:

Condition I: Neither the child who served as the subject nor the child who served as the model had previous experience with the task.

Condition II: Both children in the experimental pair had previous experience with the task.

Condition III: The child who served as the model had previous experience with the task and the child who served as the subject had not.

The total sample of 64 children was divided into pairs that were matched for sex and age. The three groups were also equated on these variables.

The task consisted of a 3-step game which involved building with tinker-toys, color and form matching, and choice of reward box. There was a possible total of 26 imitative acts in the sequence of two turns which each child in

the pair carried out. Imitation scores in the three conditions were subjected to a complex analysis of variance to assess the effects of experimental conditions, age, and sex.

The Hypotheses tested were:

(1) The three conditions of task familiarity will differentially affect the amount of imitation produced by the subjects. This hypothesis was supported by the results at the .01 level of significance.

(2) The amount of imitation in Condition II, in which both children had previous experience with the task, will be significantly less than in Condition I, in which neither child had previous experience with the task. This hypothesis was not supported by the data, but the results were in the predicted direction.

(3) The amount of imitation observed in Condition III, in which the child who serves as the model had previous experience with the task while the child who serves as the subject had not had previous experience with the task, will be significantly greater than the amount of imitation observed in Condition I. This hypothesis was borne out, applying Dunnett's test for comparisons of treatment conditions.

Implications of the study are: (1) children will imitate other children of the same age and sex in an

experimental setting; (2) task familiarity may be as important in determining the occurrence of imitative behavior in pre-schoolers as intra or interpersonal variables such as dependency or dependency-anxiety; and (3) conditions of task familiarity override the differences in imitative behavior previously attributed to sex and age factors.

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By

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TO AL--

without whom the adventure
would never have begun.

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INTRODUCTION

The imitative behavior of children has been studied in a variety of ways by psychologists. The conditions under which imitation occurs, the style of imitation adopted by children, and the experimental manipulations by which the amount of imitative behavior may be varied have been investigated quite extensively. All of the previous research has utilized experimental situations in which the child has imitated the behavior of an adult model who, typically, is exhibiting quite novel behaviors. This present research utilized a heretofore untried experimental situation. Pairs of children served as models and subjects under differing conditions of task familiarity. This design allowed investigation of effects of conditions of task familiarity upon imitative behavior of children, matched with peers.

Stated briefly, the purpose of the present research was to investigate the amount of peer imitation occurring under three conditions: (1) a condition in which neither the child who served as the model nor the child who served as the subject had previous experience with the experimental task; (2) a condition in which both children in the pair had previous experience with the experimental task; and (3) a condition in which the child who served as the model

had previous experience with the experimental task while the child who served as the subject had not.

Significance of Research: The research drew its rationale from the areas of study that are reviewed in the section below. One of these areas involves social learning and imitation and the other involves research centered around familiarity of tasks and situations.

Imitation research has not utilized situations in which children served as both models and subjects, and it has not focused on differences in the occurrence of imitation under varying conditions of task familiarity. This research, then, is significant because it focuses on the imitation of peers rather than adults and because it uses task familiarity as an independent variable in the study of imitative behavior..

RELATED RESEARCH

Imitation has been defined by Bandura as "the tendency for a person to match the behavior or attitudes as exhibited by actual or symbolized models." Such imitative behavior has been labelled as one type of social learning. It is important in the theory of human learning because concepts such as instrumental learning and conditioning do not account for the acquisition of responses not already in the behavioral repertoire. The more limited theorizing that involves the concepts of instrumental learning and conditioning has assumed that the acquisition of new responses is explained by the notion of successive approximation. This involves the reinforcement of the segments of behavior which the desired end-response contains and the eventual shaping of the elements into the total pattern of the desired behavior. The notion of successive approximation outlines a response acquisition procedure that is, obviously, remarkably tedious and most uneconomical as an explanation for the rapid production of total response patterns by human organisms. It should be noted that this research utilized the social learning theory rather than the more limited theorizing prescribed by the instrumental learning and conditioning theories. It concentrated on the imitative behavior of children in terms of acquisition of total patterns of social behavior.

Early History: Historically, imitation once held a solid position as a theoretical notion in the world of "simple and sovereign" theories. It was then that Tarde posited the Three Laws of Imitation (1903) and McDougall stated that imitation was an innate instinctual class of behavior. These men emphasized the role of imitation in the preservation of cohesiveness in a society, but did not offer any explanation of its workings within an individual beyond stating that imitation was the "invincible attraction to all men." (Tarde, 1903)

For almost forty years, the use of imitation as a theoretical construct fell into disrepute and it wasn't until the work of Miller and Dollard (1941) that imitation began to be investigated experimentally. Miller and Dollard conceptualized imitation as a kind of instrumental conditioning in which the responses of the learner matched the responses of the model. They called this kind of behavior "matched-dependent" imitation since the subjects were dependent on the behavior of the leader to determine which were the appropriate cues and responses. Miller and Dollard were affirmed in their view that "matched-dependent" imitation was a form of instrumental learning or conditioning because they did not use any experimental situations in which the imitator was not directly rewarded for production of the imitative behavior. This formulation overlooked the role of observational learning, or the learning of responses by observing

for a given response the consequences or outcome of that response for the model.

Also, Miller and Dollard's paradigm did not deal with the production of responses not in the subject's behavioral repertoire. In other words, the learner must produce a close approximation of the correct response before he can be rewarded for it. This makes the learning of novel responses and response patterns extremely difficult.

To correct such a difficulty, Mowrer (1950) presented a two-factor theory to account for the production of new patterns from partially integrated responses. Mowrer's position is that the responses are initially developed through a kind of classical conditioning in which the model controls or mediates the rewards available to a child for reproducing certain aspects of the model's behavior. Through such mediation, the behavior gains a secondary reward value, and the child can then reward himself by reproducing the positively valued behavior of the model even when the model is not present.

Mowrer's secondary reinforcement theory of imitation did much to revive flagging interest in the experimental investigation of imitation. Many studies grew out of the theorizing of Mowrer. One of these, a study by Bandura and Huston (1961) hypothesized that children would learn to imitate the behavior exhibited by a model and that nurturant interaction between the child and the adult would enhance

the secondary reward properties of the model's behavior and thus facilitate learning. The reward presented was a "social" one; the children were exposed to nurturant or non-nurturant female models. The hypothesis that nurturant interaction would facilitate imitation was borne out, and the authors concluded that the association of a model with rewards promotes imitation of the specific behaviors and also increases the probability of whole classes of behavior being reproduced.

Extension of Mowrer's theory finds further support in a study by Gewirtz and Baer (1958). These authors state that the purely social initiation of the child into the adult role is carried on through "approval." A deprivation condition, consisting of low intensity interaction with the model, and a non-deprivation condition, consisting of a high social interaction with the model preceded the test situation in which approval of the female experimenter was contingent on one of two responses in a simple discrimination game. The deprivation group found the solution more quickly, leading the authors to believe that this drive in children responds to deprivation and satiation like the primary appetitive drives.

Further extensions of the role of nurturant interaction in enhancing imitative behavior have been presented by Rosenblith (1959, 1961) and by Stein and Wright (1964). Rosenblith (1959) found that imitation by kindergarten children was facilitated by interaction with a model and

that a condition with the model present was more effective in producing imitative behavior than a condition in which the children had experience with the task in conjunction with the model and then the model left the situation. She also found that boys show more direct imitative behavior than girls and that the male model was the most effective in producing imitative behavior on the part of all children. In 1961 Rosenblith found that imitative color choices by kindergarten children were affected by attention or the withdrawal of attention on the part of the model. The color-matching was not directly rewarded but was incidental learning that took place in the context of the interaction. Stein and Wright (1964) hypothesized that nurturance should elicit more imitation than non-nurturance and that nurturance followed by sharp withdrawal on the part of the model should elicit the strongest imitation because the interaction would arouse dependency anxiety. They found that the nurturance followed by sharp withdrawal on the part of the model did increase the imitative responses but that nurturance alone did not significantly increase imitation. They interpreted this to mean that the child had grown accustomed to direct need satisfaction and thus resorted to more primitive dependency patterns instead of using the indirect method of imitating the model's behavior in hopes of reward.

The studies discussed above tested Mowrer's notions about the secondary reinforcement theory of imitation in

situations where the model did not leave the presence of the child. To test whether the child would self-administer the secondary reward, several researchers devised schemes for testing the amount of imitation that occurred when the model left the room. Bandura, Ross and Ross (1961) tested the hypothesis that when the model was out of the room children would reproduce the acts of the model, an aggressive model for one group, non-aggressive for the other. Further, the experimenters predicted that subjects presented with non-aggressive models would inhibit aggressive responses even more than would the control group which had no model. Their predictions were confirmed.

Wilson (1958) focused on the performance of an appropriate response in the absence of the model. Using a simple discrimination learning task, he found that children imitated the behavior of the model directly when they were dependent on such behavior of the model for the cues to task solution. He also found that further work on the task without the model present showed evidence that imitation had facilitated the learning of appropriate responses by use of other incidental cues in the situation.

Another possible explanation of imitative behavior has been forwarded by Maccoby (1959). Her theory has been labelled the "social power" theory of imitation. In this theory, the child is seen as imitating the controller of rewards in the social situation. The child sees the dispenser

of rewards as having an advantageous position in the situation, identifies with him, and imitates his behaviors. In this way, the child is socialized into the appropriate adult roles by covertly practicing the behaviors that he sees the controller of rewards practice. Such covert practice will continue so long as the child remains in the dependent position in which rewards are mediated by others. The covert practice will obviously be more efficient for verbal skills for which the cues are internal; motor skills that require overt practice are not readily acquired in this fashion. To test these hypotheses, Maccoby and Wilson (1957) studied observational learning from films by 7th grade children. They found that the character with whom the child identified was a determining factor in what the child "learned" and remembered from the film. They further found that the relevance of the need expressed in the film to the need of the child was a determining factor in what was remembered in a post-questioning period.

A third possible theoretical explanation for imitative behavior and identificatory learning that involves interpersonal interaction was advanced by Whiting (1957). He called his theory the "status-envy" theory of imitation. In his formulation, the child envies the adult who is seen as the "consumer" of social rewards from others in the environment, and this envy leads the child to imitate the behavior of the consumer adult. Little experimental evidence

has been produced for this theory but Bandura, Ross and Ross (1963) executed a comparative study in which the "status-envy" theory of Whiting, the "social power" theory of Maccoby and the "secondary reinforcement" theory of Mowrer were all utilized. The experiment had two separate conditions to which each child was exposed: (1) the adult was the controller of rewards and positive reinforcement for a second adult while the child was the non-involved, passive onlooker; (2) the adult was the controller of rewards and positive reinforcement but gave these to the child while the other adult in the situation was subordinate and powerless. Then, each of the adults, controller and consumer, gave divergent responses in the test situation. The critical datum for determining which theory was most adequate was which response the child imitated. They found that the child imitated and identified with the powerful adult. Since the adults were of the opposite sex, the power vs. sex of model interaction could also be tested. The results again clearly showed that children favored the source of the power rather than the same-sex model if that same-sex model was in the powerless position.

Bandura, Ross, and Ross (1963b) further studied the social power theory in a study of vicarious reinforcement and imitative learning. They found that the consequences accruing to the model as a result of his behavior and which the subjects viewed partly influenced the degree of imitation. A model punished for the behavior which was supposed

to be imitated by the child was less imitated than a non-punished model. But the effectiveness of vicarious experience is limited as is demonstrated in a study by Lewis and Duncan (1958). Their research utilized vicarious experience in learning a game for one experimental group and participating experience for the other group. In an extinction series, the group that had participated in learning the game was slower to extinguish the response under conditions of non-reward. In addition, participating subjects who were intermittently reinforced were the slowest to extinguish. The group that only had vicarious observational experience with the game before they tried it alone extinguished rapidly.

The proponents of secondary reinforcement, status envy, and social power theories all have corroborating evidence for their positions, but Bandura, Ross, and Ross' (1963b) study seems to suggest that the social power theory holds the most promise. But even here the evidence is not overwhelmingly conclusive since the behaviors presented for modelling have usually been quite unique and designed to catch the attention of the child quickly. Of course, aggression is easy to spot in the experimental situation, and this is of help to the raters, but the almost exclusive use of behavioral situations which involve aggression causes one to wonder how the social power theory would cope with more mundane behaviors that children imitate. Variables other than purely interactive ones seen in the experimental setting must have some part in determination of the imitative behavior.

Additional studies with media other than human-to-human interaction would seem to support both the secondary reinforcement theory and the social power theory of imitation. Lovaas (1961) found that children viewing an aggressive motion picture significantly more often chose to see aggressive doll-play upon the completion of the film. Baer (1961) found that children quickly learned to extinguish a response of getting peanuts when the consequence of the act was that a cartoon turned off. The withdrawal of reinforcement of viewing cartoons was considered to be an effective punishment technique for extinguishing the instrumental response of getting peanuts. Baer (1962) found that a mechanized puppet could be used as the social reinforcer and that children would learn instrumental responses to keep the puppet's "attention" just as they had learned these responses with other humans. Bandura and Ross (1963) found that films using human aggressive models produced as much imitative behavior on the part of children as did real-life human models, but that cartoon models produced significantly less imitative behavior. Another approach to the study of imitative behavior in children has been the attempt primarily identified with Hartup. He emphasized a personality dimension of the child who imitates--dependency--and posited this as the primary motivating force in the production of imitative responses. Hartup (1958) studied the relationship between the withdrawal of nurturance by the adult in the situation

and the emergence and acquisition of responses which elicit adult approval. He found that for all female subjects and the high-dependent boys the withdrawal of nurturance was associated with more efficient performance on the prescribed learning tasks than was consistent nurturance. Low-dependent boys, however, were most successful under the conditions of consistent nurturance. Hartup and Himeno (1959) assumed that isolation or inconsistent nurturance would serve to increase a child's dependency anxiety, and this increase would subsequently be demonstrated in more aggressive doll play. Their predictions were supported. Hartup further pursued the notion that dependency and nurturance were related in pre-school children and that these antecedent variables were determinants of social learning. To test this, Hartup and Keller (1960) sought consistent patterns in the relationship between nurturance and dependency in pre-school children. They found that the total amount of nurturant behavior exhibited by one child toward others was positively associated with the dependency measures of "seeking help" and "seeking physical attention." A further step is the Hartup (1963) study of the correlates of parental imitation in young children. In this study he explored the hypothesis that children prefer to imitate the same-sex parent. He found that this was more true for boys than for girls and that imitation generally increased with age. This corroborated a 1960 study with Zook (Hartup and Zook, 1960) that found the sex-role

behavior of boys to be more highly stereotyped than for girls and the behaviors of the boys to be more stereotyped in the experimental setting.

Stein and Wright's (1964) study could also be interpreted in the dependency paradigm; they concluded that the reason nurturance followed by nurturance withdrawal fostered the most imitative behavior was that this condition aroused the most severe dependency anxiety. Cairns (1961) also investigated the nature of the relationship between dependency and imitation. He found that the inhibition of dependency responses raised the effectiveness of social reinforcement and led to the faster acquisition of the desired learning response. Hartup's (1964) study is the final attempt in his series that sought to identify components of imitation. Hartup looked for the patterns of imitation in children rather than attempting to identify or isolate the determinants of such behavior. The major hypothesis was that a characteristic of imitative behavior in young children is a high degree of generality across various situations. To test this, a doll play interview was utilized and Hartup had the children choose between two endings to a given story. He predicted that children would more frequently imitate the same sex model; that the children would prefer a model of either sex to a non-model situation; and that children would tend not to imitate opposite-sex models. The results indicated that like-sex imitation in boys was greater than in girls, that there was

no indication that children imitate parent as opposed to non-parent models, and that children do imitate in a generalized fashion, such as would seem "role-appropriate" when the alternative is not imitating anything. However, the specific behaviors of the model have the greatest pull for imitative behavior.

Neither dependency nor the notion of generalized patterns seems to be the complete answer. The studies have produced both positive and negative results, the patterns are not clear-cut. Also, it would seem that dependency, used either as an antecedent condition found in the child's personality or as an intervening state of the organism, is not adequate as prediction or explanation of resulting imitative behavior in pre-schoolers.

Research on the study of reinforcement of aggressive responses by Cowan and Walters (1963) and by Hops and Walters (1963) seems to corroborate the idea that dependency alone does not provide the necessary conditions for the emergence of imitative behavior. Cowan and Walters (1963) found that both institutionalized and non-institutionalized children acquired an aggressive hitting response to obtain a reward under imitative conditions that used both continuous and fixed ratio scheduling of rewards. They further found that the institutionalized and non-institutionalized children acquired the response faster when they were emotionally aroused. Hops and Walters (1963) then systematically studied the effects of

arousing emotion as an antecedent condition. They found that: (1) children who have been isolated or otherwise made anxious will show more aggressive behavior in the face of an aggression-arousing stimulus than will children who have not been made anxious; (2) the effectiveness of positive reinforcement for increasing the incidence of aggressive responses is greater for children who have been made anxious than for those who have not been made anxious; and (3) during subsequent extinction periods by use of non-reinforcement for the aggressive response, the response rate of the anxious children decreases less rapidly than the response rate of the non-anxious children.

Haner and Brown's (1955) study on the "instigation to action" concept in the frustration-aggression hypothesis could be interpreted in the same manner. They report that the proximity of the goal when frustration is introduced will affect the resulting aggressive response. In other words, if the goal is nearly attained when the frustration is introduced, the resulting aggressive response will be greater than if the subject is further from the goal. Thus, it would seem that generalized states of emotion are conducive to the acquisition and maintenance of an imitative response, and the greater the degree of emotionality introduced, the slower the extinction of the response so learned. Also, it would seem that these states of anxiety or emotionality may be aroused in many ways, not only through the channels of dependency, isolation, or proximity of goal.

The study of Patterson and Anderson (1964) used a peer to dispense rewards in the conditioning of a simple motor response. They found that the reinforcement value of direct reward by a peer increases with age and that both male and female subjects showed fastest conditioning when rewarded by a preferred peer as opposed to a non-preferred peer. However, there seems to be a difference in the reward value of pictures of preferred peers as opposed to the live presence of preferred peers. Horowitz (1962) found that the pictures of preferred peers were looked at for a longer period of time than pictures of neutral peers or a blue light. He further found that the incentive value of the picture was greatest at the younger age level and that the difference between the pictures of preferred and non-preferred peers disappeared in the older age group. Horowitz' and Patterson and Anderson's studies seem to suggest, then, that younger children more than older children are attracted by pictures of preferred peers and that the actual presence of the preferred peer is of greater reinforcement value as the age of the child increases.

The studies presented thus far have not included those which relate to another important aspect of the present research--that of the effects of task and situation familiarity on the acquisition of imitative responses. The situational aspects of imitative behavior have also been studied from a variety of perspectives. The ambiguity of the environmental

or imitative cues, perceived similarity of self to a social model, the success of a partner in a pair and its effect on the imitation of the response by a second subject, and the effects of instruction induced set on the acquisition of imitative or opposition responses have also received attention from various researchers.

McDavid (1959) began his research into situational determinants of imitation in a general investigation of imitation in young children. He posited that imitation and inter-individual variance in its acquisition was affected by the genetic or given biological traits and by a learned system of habits. McDavid (1959) then set out to explore the individual differences in the process of acquiring an "imitation habit." A brief summary of his findings is: (1) imitative behavior is unrelated to tested IQ; (2) first-born children are more inclined to produce imitative responses than are later siblings; and (3) child-rearing antecedents expressed as parental attitudes on the PARI that are related to the presence of high incidence of imitative behavior are the strict control of the child's autonomy by parents, the intrusion of the parents on the child's activity and exploration, and the over-protection of the child by intrusiveness on the part of the parents.

McDavid (1962, 1964) next turned to two complementary studies on the effect of ambiguity of imitative cues and environmental cues and their effects on the acquisition of

an imitative response. McDavid's first study (1962) utilized a situation that explored the role of information on the acquisition of an imitative response. The adult models varied the potential relevance of information about color cues by responding to colors with different frequencies while the actual solution to the task was direct imitation of the adult model. Four-year old subjects did learn over time what the correct solution was, but they learned fastest when the relevant social cues were consistently paired with the irrelevant color cues. He concluded that the directing of the child's attention to some aspect of the stimuli was an important part of the imitative process. McDavid's (1964) study explored the learning of an imitative response when children were required to learn a color discrimination in social interaction with a model. The models again gave different degrees of potential relevance to the color cue. In one group, the model's choice matched the color cue 100% of the time, in another group 67% of the time, and in a third group at the random level. McDavid found that the group exposed to continuous association between the color cues and the choices of the model learned most quickly, the random group next, and the 67% group acquired the correct response most slowly. McDavid (1964) again pointed out that the directing of the imitator's attention to the relevant cues is an important aspect of learning to imitate and that the degree of ambiguity in the association between the social

cues and the non-social ones has a direct effect on the learning process.

A further study into the problem of attaining the correct response when the environmental and irrelevant cues are intermittently reinforced was done by Gormezano and Grant (1958). In a card-sorting task, they found that as the ambiguity of the relevant cues was increased, the attainment of the appropriate concept became progressively more difficult. Burnstein, Stotland, and Zander (1961) studied the hypothesis that identification with another person can lead to a generalization that the interpersonal attitudes and structures are similar. They posited that the "first similar attributes" of the model would be introjected if the subjects were themselves much like the model. The model's preferences and likes or dislikes as stated in the experimental situation were called the "derived similar attributes" and the researchers hypothesized that grade school children who were told that the model was very similar to themselves would show stronger agreement with the model's "derived similar attributes." Their predictions were confirmed. It would seem then, that identificatory learning can be enhanced by providing a model who is perceived as being similar to the imitator.

A situational aspect introduced by means of the instructions given to the subject was studied by Karanefff (1958). He gave instructions to one group that stated they would be

disapproved for imitating the response of a partner and to another group the instructions that they would be approved for imitating the response of the partner. Their expectancies aroused different reactions to the situation and the knowledge that either opposition or imitation would be approved affected the subjects' responses. However, if the partner is quite successful, the subject will often imitate anyway and deny the existence of the negative sanctions given in the instructions. In other words, the competence of the model overrides the importance of the instruction-induced set.

The success of the partner as the overriding determinant of whether or not imitation of responses occurs in adults was also found by Rosenbaum and Tucker (1962). They used a horse-betting game that produced a simulated partner for each subject; subjects were told that their "partner" was right 80% of the time, 50% of the time, or 20% of the time in their prediction of outcome of the race. Rosenbaum and Tucker found that the greater the announced competence of the partner the more imitation ensued with learning of the appropriate response. If the model was defined as incompetent, the subjects did not imitate him but, could learn the appropriate responses quite readily anyway. The group that had the greatest difficulty learning the appropriate responses in the situation was the group of subjects that was told that their partners were right 50% of the time.

If the competence of the model as perceived by the subject affects the learning of a matching or imitative response, it would seem reasonable that one's perception of self-competence in the given situation would also affect the learning of an imitative response. Mausner (1954a,b) set out to investigate this. Mausner (1954a) found that subjects who were told that their own judgments were not right soon learned to imitate the response of their partner. Mausner (1954b) then studied the convergence of judgments of two partners. He concluded that convergence in a judgment was a function of two factors; the tendency to continue to make the same judgment and the tendency to agree with the partner. Mausner thought that subjects would show greater convergence toward a partner who has recently demonstrated success in a related task than toward a partner who had failed. The hypothesis was borne out and Mausner concluded that the success of a partner in relation to success of self may be a significant antecedent condition to the determination of degree of convergence of judgments.

The studies reviewed above seem to be the ones most related to the present research. They cover the areas of social learning that are related to the experimental situation chosen--those of personal variables of the imitators and the manipulations possible that will enhance imitation, and the area of the situational variables that affect imitation.

Again, none of the research reviewed has dealt with the topic of this research--the use of peers as models and subjects in the study of imitative behavior and the manipulation of task familiarity as an independent variable in the study of imitative behavior.

This research drew its rationale from the two areas of study that were reviewed above, one involving research in the area of social learning and imitation and the second involving research centered around task and situation familiarity. Investigators have studied the imitative behavior of children as a function of many possible variables: e.g., imitative behavior as a function of the interaction with a nurturant or non-nurturant model, imitation as a consequence of dependency or dependency anxiety, imitation as it relates to the response consequences for a model, attributes of the child's personality that are expressed in sex-role identity, attributes of the experimental situation that involve various media for presenting the behavior to be modeled, and variations in the degree or type of frustration to the child before the test for imitation. The situational aspects of imitation have also received attention. Ambiguity of the environmental or imitative cues, perceived similarity of self to a social model, the success of a partner in a pair and its effect on the imitation of a response by a second person, and the effects of instruction-induced set on the acquisition of imitative or opposition responses have been investigated and the research reported above.

Imitative behavior has not been examined under conditions in which pairs of children serve as both the model and the subject. Neither has the research focused on the differences in the amount or occurrence of imitative behavior seen when the children or subjects have varying amounts of familiarity with the task utilized to test for imitative behavior. One may infer, however, that differences in familiarity in the task, and thus in the defined competence of the model relative to the subject, will be a significant determinant of differences in imitation. This is suggested by the findings of Karanef, of Rosenbaum and Tucker, and of Mausner reviewed above.

The significance of this research, then, lies in the use of children as both models and subjects and in the use of task familiarity as an independent variable in the study of imitative behavior. The hypotheses to be tested will give information about the nature of peer imitation and will contribute to data about situational differences that may affect imitation in pre-school children.

DESIGN OF THE EXPERIMENT

HYPOTHESES:

- (1) The three conditions of task familiarity will differentially affect the amount of imitation produced by the subjects.
- (2) The amount of imitation in Condition II, in which both children had previous experience with the task will be significantly less than in Condition I, in which neither child had previous experience with the experimental task.
- (3) The amount of imitation observed in Condition III, in which the child who serves as model had previous experience with the task while the child who serves as subject has not had previous experience with the task, will be greater than the amount of imitation observed in Condition I.

SUBJECTS:

Subjects were children between the ages of 3 years, 6 months and 4 years, 11 months. The total sample numbered 64 children, half boys and half girls. The children were divided into same-sex pairs and matched within each pair for age within a two-month period. Each condition of task

familiarity used 32 children or 16 pairs of models and subjects. Condition I, in which both children were unfamiliar with the task, was first run, children from this group were utilized as models or subjects in Condition II, or as models in Condition III. Of the 16 children who were models in Condition I, 8 became subjects in Condition II and 8 were used as models in Condition III. Of the 16 children who were subjects in Condition I, 8 became models in Condition II and 8 were used as models in Condition III. The other children used as subjects or models in Condition II had their previous training with the adult experimenter before being paired with a child who had experience under Condition I. All Condition II pairs were different from the pairs in Condition I. Each of the three groups was equated for sex and age.

CONDITIONS OF TASK FAMILIARITY:

The experiment utilized three conditions of task familiarity. They were:

Condition I, or the condition in which neither the child who served as the model nor the child who served as the subject had previous experience with the task.

Condition II, or the condition in which both children in the experimental pair had previous experience with the task.

Condition III, or the condition in which the child who served as the model had previous experience with the

task while the child who served as the subject had not had previous experience with the task.

THE TASK:

The task involved three basic steps which each child had to complete in a specified order to receive a candy reward at the conclusion of his turn. Each child in a given pair was present during the total time of the experiment and observed the turns of the other child in the pair.

Step I: The child walked to a table, chose 3 pieces of tinker-toy set and put these together in any fashion that he wished. Each type of tinker-toy was available in various colors.

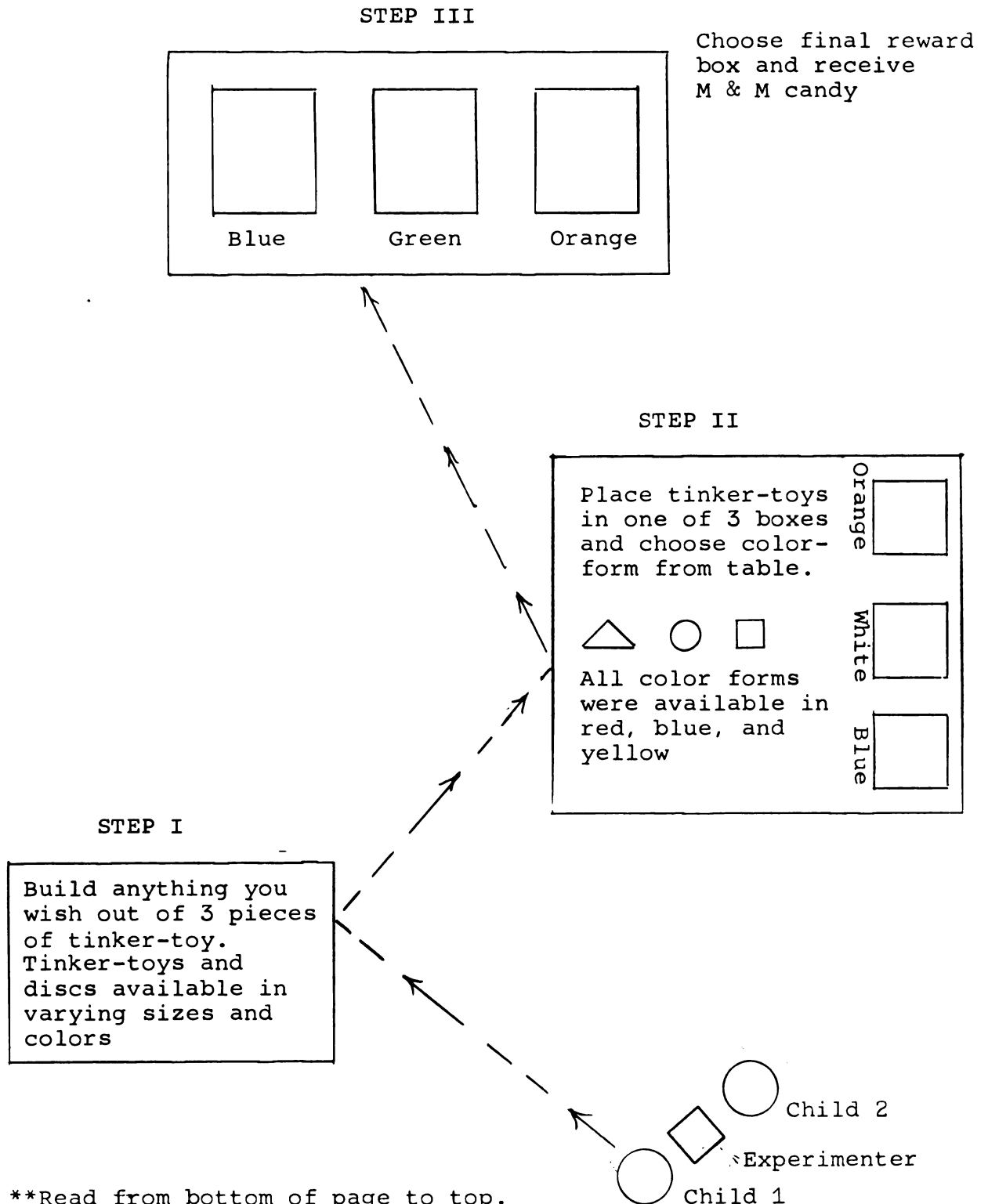
Step II: The child proceeded to the opposite side of the room, put what he built in one of three boxes, and picked up a color form from the table. The color forms were available in red, yellow, or blue, and the varying shapes were squares, circles, or triangles.

Step III: The child took the color form to the end of the room where he chose among three boxes placed there and got a candy reward. The boxes were three different colors, but all contained the same reward of an M & M candy. Figure 1 below shows the 3 steps in diagrammatic form.

Both children left the room while the experimenter refilled the reward boxes. The children re-entered the room

FIGURE I

THE THREE STEPS IN THE EXPERIMENTAL TASK**



**Read from bottom of page to top.

and the second child (subject) had his turn. Each pair of children repeated the game until both had two turns.

The crucial instances of peer imitation that were recorded as data with which to test the hypotheses were: color-matching and choice of tinker-toys, choosing the same box in which to deposit the object built, choosing the same color or form from the table, and choosing the same final reward box as the model chose. Other possible instances of peer imitation were observed in direct imitation of verbalizations, in imitation of walking and posture and in imitation at the direction of the other child in the pair. The total possible number of imitative acts in any one turn was 13 and the total for both turns was 26. The frequencies with which the various stimulus objects and categories were used are recorded in Appendix II.

INSTRUCTIONS:

Condition I: (Both children have no previous experience with the task.) "We're going to play a game. (Name) will go first. He will go to that table (point) and make something out of three pieces of tinker-toy (show tinker-toys). He may make anything he likes out of the three pieces he chooses. (Name) then will take the pieces over to that table (point). When he gets there he will put what he made out of tinker-toys in one of those three boxes--either the orange one, the blue one, or the white one. (Name) will then take a circle, triangle or square from the table. (Name) will

then go to the end of the room (point) and guess which box has the surprise in it. When he thinks he knows, he'll open the box and see if he is right. Then (Other name) will take his turn and do the same things. We will watch you while you play the game, (name). OK? Let me tell you that once more. You go to the table and make a tinker-toy out of three pieces, then go to the other table and choose a color form from the table and then go to the end of the room and guess which box has the surprise in it. OK, go ahead (name)."

Condition II: (Both children have had previous experience.) "You remember this game. You have both played it before, remember? You will go first (name). First you go over to that table and make a tinker-toy out of three pieces in any way that you want to, then you go over to that other table and put the tinker-toy in one of the three boxes and ~~then~~ you go to the end of the room and guess which of those boxes has the surprise in it. When you think you know, you open up the box and see if you are right. OK, (name). You go ahead and we will watch."

Condition III: (One child--the model--had previous experience with the task and the other child--subject--has not.) "(Name) has played this game before and he knows all about it, don't you (name). Do you want to tell (other child) about the game? We will listen carefully and (name) will teach you how the game goes and then he'll show you how it's done." (Get model to describe steps and repeat these for the

subject. Then ask the model to complete the steps of the task while standing with the subject and commenting on what the model is doing.)

SCORING OF IMITATION:

The protocols for each pair of children were scored for amount of imitation on the part of the subjects. The second-turn imitation by the models of the subjects' first turn was also scored. Each time the subject chose the same stimulus object as the model had chosen on the previous turn, he was given a score of 1. The individual scores were summed over both turns, and these scores formed the basis of the statistical analysis.

For example, if the model chose blue tinker-toys and orange knobs on Step I, then put what he built in the white box and chose a yellow triangle from the table on Step II, and finally chose the green reward box on Step III, these acts were all checked off on the rater's coding sheet (see Appendix I for a reproduction of the rating sheet). The behavior of the subject on the three steps was also recorded. Then, the scores were derived by comparing the choices of the children for each step on each turn. Thus if the subject chose the same color tinker-toys he received a score of 1 for that step; if he placed the object he built in the box the model had chosen he was given another 1. In any one turn, the greatest amount of imitation possible was 13 and a score

of 26 represented the highest possible score for the series of two turns.

RATER RELIABILITY:

The reliability of the ratings on the imitative behavior was checked at three different times during the experimental testing. The four raters worked in pairs and a different pair of raters was used each time the reliability was sampled. The high degree of reliability that they obtained justified the use of one rater at other times during the testing. All raters were not informed about the nature of the experiment, nor about the effects that the various conditions were supposed to have upon the children, and therefore their ratings represent an unbiased recording of the children's behavior. The overall reliability coefficient was .98.

RESULTS

The hypotheses to be tested were:

- (1) The three conditions of task familiarity will differentially affect the amount of imitation displayed by the subjects.
- (2) The amount of imitation observed in Condition II, in which both children had previous experience with the experimental task will be significantly less than in Condition I, in which neither child had earlier experience with the experimental task.
- (3) The amount of imitation observed in Condition III, in which the child who serves as model had earlier experience with the task while the child who serves as subject has not had previous experience with the task, will be significantly greater than the amount of imitation observed in Condition I.

The first hypothesis, which deals with the over-all effects of the conditions of task familiarity was tested by means of a factorial design analysis of variance. The results for this hypothesis are significant and are presented in Table I. It should also be noted that there are no significant interactions between the conditions of task familiarity and any other factor in the experiment,

Table I. Analysis of Variance: Total Imitation Under
Experimental Conditions, Age, and Sex

Source	Sums of Squares	df	Mean Square	Value of F
Conditions	771.88	2	385.94	43.22**
Age	.33	1	.33	.037
Sex	10.08	1	10.08	1.13
Cond. x Sex	35.54	2	17.77	1.99
Cond. x Age	36.29	2	18.15	2.03
Sex x Age	1.34	1	1.34	.15
Cond. x Sex x Age	43.29	2	21.65	2.42
Error	322.50	36	8.93	
Total	1221.25	47		

** Significant at .01 level.

therefore it is tenable to assume that the main effect of varying task familiarity conditions accounts for the variance in means.

The second hypothesis, which deals with the differences in amount of imitation observed in Conditions II and I, was tested by Dunnett's test for comparisons of the treatment conditions against a control condition. Condition I, in which neither child had previous experience with the task, may be considered an indicator of the base rate for imitative behavior in this particular study. Thus, it is logical to compare the mean amount of imitative behavior in Condition I with the mean amount of imitative behavior in Condition II. The magnitude of the difference between the means which must obtain in order for the difference to be significant is 5.30. Table II, which follows, shows the means of the imitative behavior in the three experimental conditions as well as the magnitude of the differences when Conditions II and III are compared with Condition I. The difference between the means of Condition I and Condition II is not great enough to attain significance. Therefore, it cannot be concluded that children who serve as subjects in Condition II, in which both model and subject had previous experience with the task, show more imitative behavior than do children who serve as subjects in the condition in which neither child had previous experience with the task. Hypothesis 2 is therefore rejected; the results, however, are in the predicted direction even though they do not attain statistical significance.

Table II. Amount of Imitation Produced by Subjects Under Each Condition of Task Familiarity and Comparisons of the Mean Amounts of Imitation by Dunnett's Test

	Neither Familiar		Both Familiar		One Famil., One Unfam.	
	1st Turn	2nd Turn	1st Turn	2nd Turn	1st Turn	2nd Turn
3 Yr. Old Boys X for 2 turns	7 6 4 5	7 3 4 10.75	1 2 7 4	0 5 2 8	8 10 8 9	8 10 8 17.50
3 Yr. Old Girls X for 2 turns	5 3 5 5	5 3 3 8.50	3 5 2 1	4 6 5 7.00	8 8 8 11	9 11 7 18.50
4 Yr. Old Boys X for 2 turns	4 8 6 7	8 5 2 11.25	2 0 1 4	3 3 1 4	3 9 8 13	9 6 7 16.50
4 Yr. Old Girls X for 2 turns	7 3 5 5	3 4 7 10.25	5 5 4 5	6 4 4 8.75	7 7 8 5	5 7 8 13.25
Total	85	78	51	57	130	133
Total for Both turns		163		108		266
Means		10.19 ^a		6.75 ^b		16.44 ^{a,b}

^aMeans marked with superscript "a" differ significantly at .05 level.

^bMeans marked with superscript "b" differ significantly at .01 level.

The third hypothesis deals with the differences in amount of imitation observed under Conditions III and I. This hypothesis was also tested by means of Dunnett's test. Again, the magnitude of the difference between the means of Condition I and III which must obtain to be significant is 5.30 (see Table II). The difference between these means did reach significance, and the prediction that subjects who serve in the condition in which the model had previous experience and the subject did not will show more imitation than subjects who serve in the condition in which neither the model nor the subject had previous experience is borne out.

Another obvious conclusion that may be drawn is that Condition II and III differ significantly from one another. A t-test on the differences between these two means yielded a statistic significant at the .01 level. The amount of imitative behavior observed in the children who served as subjects under the three conditions may therefore be rank-ordered. The most imitation was observed in Condition III--the condition in which the model had previous experience while the subject had not. Condition I, the condition in which neither child had previous experience with the task, ranked second in the amount of imitative behavior. Condition II, the condition in which both children had previous experience with the task ranked last in the amount of imitative behavior that was observed.

Additional Analyses: The analyses presented above were the only ones that produced any significant results. Parts of the data were also looked at in other ways, and these are presented below.

"Reverse imitation": The second-trial behavior of the models was scored for imitation. This scoring allowed the comparison of the imitative behavior of the model on the second trial with the imitative behavior of the subject on the first trial. From the total thus obtained, the imitative acts that were repetitions of the model's first turn behavior were subtracted. The resulting totals of imitation did not differ over conditions. This suggests that the definition of models as models remained fairly constant throughout all conditions of task familiarity.

"First and second turn differences": The amount of imitation produced by the subjects may be examined by turns (see Table II). The amount of imitation seen on a comparison of turn 1 with turn 2 does not differ significantly. In other words, imitation is not determined merely by whether the subject has had one previous turn after the condition of task familiarity has been defined.

"Condition II--Adult-trained vs. child-trained": One-half of the children who were utilized in Condition II were trained in conjunction with an adult and the other half were trained in previous experience with another child. The total amount of imitation of the 16 children who were trained in

conjunction with the adult was compared with the total amount of imitation for the 16 children who served as subjects in Condition I. There was no significant difference in the amount of imitation. In other words, differences in the amount of imitation were not attributable merely to differences in the age of the model.

DISCUSSION

The results, in the main, support the a priori predictions made about the research. The experimental conditions did differentially affect the amount of imitation seen in the children who served as subjects. The total amounts of observed imitative behavior did fall in the hypothesized rank-order; the most imitation was observed in the group in which the model had previous experience with the task while the subject had not. Second in observed amount of imitation was the group in which neither the models nor the subjects had previous experience with the task. Third was the group in which the models and the subjects both had previous experience with the task.

These data indicate, then, that the imitative behavior of pre-schoolers is not only a function of intrapersonal variables such as dependency or dependency-anxiety. Neither is imitation always a result of nurturance followed by nurturance-withdrawal on the part of an adult model. In fact, the pre-schoolers act much like adults seen in studies that varied the interpreted competence of the model and its effect on imitative responses. Competence seems to play an important part in the imitative process when the model is defined as competent and the subject as not competent in

relation to the task. This was observed in Condition III, where the model is defined as "knowing all about the game" and the subject is defined as knowing nothing about the game. Lesser amounts of imitation are evident where no such differential definition of competence is contained in the instructions given to the pair of children.

Another interesting aspect of these results is that the use of children as both models and subjects does not curtail the occurrence of imitation. This would seem to indicate that an extension of the theories of Mowrer (1950) and Maccoby (1959) is necessary. Both of these theorists have emphasized the importance of potential reward or positive interaction in the model-subject interaction, but neither theory has tested hypotheses using children as both models and subjects. The question that must be asked of such theories thus becomes: do children reward one another and provide significant positive interactions for one another in the same way an adult rewards a child in an interpersonal relationship? In other words, is the peer-peer culture as good a reward source as the adult-child culture? Or, alternately, is the interaction between the two peers an attempt on both their parts to obtain indirect rewards from the adult experimenter? This point becomes even more interesting when one considers Hypothesis 2 of the present research.

Hypothesis 2, that the amount of imitation observed when both children had previous experience would be

significantly less than when neither child had previous experience was not supported by the data. A possible theoretical interpretation of this negative finding is the reward value of the interaction between the two peers became more important to the subjects than was the knowledge that they were as competent as the models with the experimental task. The subjects were more involved in a positive interaction with the peer than in the pursuit of their individual competence and therefore imitated the model to some degree to enhance the positive interaction. The importance of the positive interaction thus counterbalanced to some degree the competing factor of equal competence on the part of models and subjects.

The significant positive results for hypothesis 3 may be interpreted in the same framework. Hypothesis 3 predicted that children who served as subjects when unfamiliar with the task while the model was familiar with the task would show more imitation than children who served as subjects when both model and subject were unfamiliar with the task. In this case, differential competence further enhanced the pull toward imitation since the imitation is greater than under the condition in which both children are familiar with the task and greater than under the condition in which both children were unfamiliar with the task. Therefore, it seems that defined competence is important in the production of imitative behavior but not the total answer since competence enhances the on-going process of peer imitation but its

absence does not cause significant decline in the base rate of imitative interaction. One cannot, therefore, adopt competence attained through task familiarity as a new "simple and sovereign" theory.

The significance of the data, then, is that they point to a new dimension that must be carefully investigated if we are to understand imitative behavior in pre-schoolers. Theorists have long pursued the notions of dependency and other intra- or inter-personal manifestations as the antecedents of imitative behavior. It would seem, however, that imitative behavior is more likely a result of an interaction between the inter- or intra-personal manifestations and the situational factors present in the environment. Such a notion is further supported by these data since no significant differences obtained between the sex or age groupings. It would seem, therefore, that the competence of the model as defined by degree of task familiarity overrides differences in imitative behavior previously ascribed to sex or age difference, when age and sex are not varied within a given model-subject pair.

Further research on aspects of imitation, then, should point toward determining how situational factors interact with an intra- or inter-personal dimension. For example, how would pre-schoolers react to three conditions of task familiarity when the groupings have been previously selected to represent different levels of dependency or dependency-anxiety? Or, are the reward properties of the adult-child

interaction greater than the reward properties of peer interaction when these interactions are observed in the context of differing levels of competence on the part of the models and subjects? Answers to these questions can help shed additional light on the nature of imitative behavior in young children.

SUMMARY

The purpose of this research was to investigate the imitative behavior of 3 and 4 year old children under three conditions of task familiarity. The task consisted of a three-step game which involved building with tinker-toys, matching of colors and forms, and choosing of reward boxes. The children were tested in pairs matched for sex and age, with one child serving as the model and one child serving as the subject.

The three conditions of task familiarity were: (I) a condition in which neither the child who served as the model nor the child who served as the subject had previous experience with the task; (II) a condition in which both the model and the subject had previous experience with the task; and (III) a condition in which the child who served as the model had previous experience with the task while the child who served as subject had not.

The hypotheses tested were:

- (1) The three conditions of task familiarity will differentially affect the amount of imitation produced by the subjects. This hypothesis was confirmed by the data.
- (2) The amount of imitation in Condition II, in which

both children had previous experience with the task, will be less than in Condition I, in which neither child had previous experience with the task. This hypothesis was not supported, but the results were in the predicted direction.

- (3) The amount of imitation in Condition III, in which the child who served as model had previous experience with the task while the child who served as subject had not had previous experience with the task, will be significantly greater than in Condition I. This hypothesis was confirmed.

The sample was counterbalanced for sex and age within a given condition and the imitative acts of both the models and subjects were recorded by raters. The data were analyzed by use of a factorial design analysis of variance.

The implications of the study are that children will imitate other children of the same age and sex in an experimental setting, that task familiarity may be as important in determining the occurrence of imitative behavior in pre-schoolers as such conditions as dependency or dependency-anxiety, and that imitative behavior is most likely determined by an interaction between the intra- or inter-personal factors and situational determinants.

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APPENDICES

APPENDIX I

SCORING SHEET FOR IMITATION

Model (Name)	Condition	1st turn	2nd turn	1st turn	2nd turn	Subject
Adult pre-training Condition II						
Tinker-toys						
Large						
Medium						
Small						
Green						
Orange						
Blue						
Knobs						
Regular						
Corrugated						
Plain disc						
Blue						
Orange						
White						
Form Built						
Box chosen						
White						
Blue						
Orange						
Form chosen						
Square						
Circle						
Triangle						

	Model		Subject	
	1st turn	2nd turn	1st turn	2nd turn
Color of form				
Yellow				
Blue				
Red				
Final choice box				
Green				
Blue				
Orange				
Verbal identities				
Posture				
Walking behavior				
Other imitative behavior				

APPENDIX II

FREQUENCY TABLE FOR 9 OBJECTIVE STIMULI

FREQUENCY TABLE FOR THE 9 OBJECTIVE STIMULUS CATEGORIES

	Boys 3	Girls 3	Boys 4	Girls 4	Totals
<u>Tinker Toys</u>					
Large	29	27	28	25	109
Medium	10	16	14	19	59
Small	15	13	16	14	58
Green	26	21	14	21	82
Orange	14	16	10	14	54
Blue	15	9	16	13	53
<u>Knobs</u>					
Regular	31	35	29	33	128
Corrugated	18	14	15	14	61
Plain Disc	19	15	18	15	67
Blue	29	18	21	15	83
Orange	17	23	13	21	74
White	17	13	17	18	65
<u>Box Chosen</u>					
Blue	15	14	18	15	82
White	16	20	14	18	68
Orange	17	14	16	15	62
<u>Color and Form</u>					
Triangle	11	15	19	11	56
Circle	20	20	13	18	71
Square	17	13	16	19	75
Blue	20	19	15	11	65
Yellow	16	18	16	17	67
Red	12	11	17	20	60
<u>Final Choice Box</u>					
Green	12	17	19	20	68
Blue	24	17	17	14	72
Orange	7	15	12	14	48

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