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A test of the "contiguity" and "generalized imitation" theories of social modeling processes

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**A TEST OF THE "CONTIGUITY" AND "GENERALIZED IMITATION"
THEORIES OF SOCIAL MODELING PROCESSES**

**A Thesis
Presented to the
Department of Psychology
and the
Faculty of the Graduate College
University of Nebraska at Omaha**

**In Partial Fulfillment
of the Requirements for the Degree
Master of Arts**

**by
Gerald R. Adams**

July 1971

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Abstract

Imitative behavior was studied using 36 kindergarten children who were either reinforced or not reinforced for imitative behavior prior to observing a male model exhibit aggressive behaviors. The children were tested for imitative aggressive behaviors in an 8-minute free-play situation using a five category rating scale. The results revealed that the reinforced group emitted significantly more physical, verbal, and nonimitative aggression than the nonreinforced group. A second test examined the retention of the model's aggressive behavior under an incentive condition. The incentive condition diminished the initial differences found in the first test, revealing a nonsignificant difference between the reinforced and nonreinforced groups. Hence, the study provided support for both the "contiguity" and "generalized imitation" theories of social modeling.

Introduction

Many explanations have been offered to account for the manner in which children acquire values, attitudes, and social behavior. This acquisition process is frequently referred to as imitation learning. A behavior is considered imitative if an observer matches the stimuli produced by a model's response. The basic paradigm used to demonstrate imitation learning is the witnessing of modeled responses with the subsequent emulation of these responses by the observer. In an early demonstration of this phenomenon, Lovass (1961) found that children who watched an aggressive model on film emitted more striking responses on a doll than children who watched a non-aggressive model.

Several variables have been found to influence the imitative behavior of children. For example, Bandura (1963a) manipulated the fictionality of the film-mediated model, showing that children who were exposed to real-life models demonstrated significantly more aggression than those who viewed real-life models on film or human-like cartoons. Bandura and Huston (1961) found that nursery school children who interacted with a model under a reward condition emitted more imitative responses than children who interacted under a nonreward condition. In a similar vein, Bandura, Ross, and Ross (1963b) showed that children who observed a model rewarded for aggression displayed significantly more aggression than children who either watched a model being punished or a nonaggressive model. Sex also appears to be a relevant variable. Bandura, Ross, and Ross (1963a) have shown that girls appear to perform less imitative aggression than boys.

Two Theoretical Views of Imitation Learning

While a great deal is known about the variables that control the imitative process, several different explanations have been offered to account for the phenomenon. Of these, two seem to stand out in the recent research literature. Bandura (1962, 1965) maintains that imitation learning is most adequately accounted for by a contiguity theory of learning. He proposes that imitation learning occurs when an observer witnesses some chain of modeled responses which are acquired by the observer through contiguous association of sensory, perceptual, and symbolic responses that possess cue properties. At some later date, these cue properties are capable of eliciting similar model-like responses by the observer. Hence, Bandura gives primary emphasis to contiguous sensory stimulation as the sufficient condition for imitation learning to occur and states that such variables as stimulus programming, set inducing operations that channel and enhance observing responses, reinforcement, etc., are performance rather than learning variables; they only facilitate the process of acquisition rather than constitute necessary preconditions for the learning of such responses.

The second theory of interest is that proposed by Baer and Sherman (1964, 1967). These investigators maintain that similarity of responding is a rewarding dimension. When the observer matches the modeling stimuli and is consistently rewarded, behavioral similarity acquires secondary reinforcing properties. Hence, a child will perform precise imitation responses because of their acquired reward value. A similar position has been offered by Mowrer (1960a, b). He proposed that through classical conditioning, response correlated stimuli acquire positive or negative

secondary reinforcing properties. Subsequently, they have the capability of eliciting "hope" or "fear" respectively, and thus serve to modify ongoing behavior by providing positive or negative "feedback". Therefore, when a model mediates reward for an observer's responses, the sensory events associated with the model's responding become secondary reinforcers. When the S then performs certain acts which have sensory consequences similar to those produced by the model, the S reinforces himself to the extent that his responses match the responses of the model.

Evidence has been provided by Baer and Sherman (1964) in support of their operant approach to imitation learning. These investigators exposed children to a nodding, mouthing, talking, and bar-pressing puppet. In an instrumental conditioning situation, all imitative responses except bar-pressing were socially reinforced by verbalizations from the puppet. The imitation of the bar-pressing responses, which were never reinforced, were found to increase in frequency when reinforcement followed the nodding, mouthing, and talking responses. The increase in imitative bar-pressing was taken to indicate that a generalized similarity of responding between puppet and child could be a reinforcing stimulus dimension in control of the child's behavior.

Further support has been provided by Parton and Fouts (1969) for the operant view that imitative responses are maintained by the relational stimulus of similarity that has acquired a secondary reinforcing effect through prior conditioning. These researchers investigated the effect of similarity arising from the matching of physical events. It was proposed that children would maximize similarity in a situation in which similarity was contingent on pressing the light which matched one lit by an E. The

results demonstrated that children increased their matching behavior across trials to the key that produced similarity and when similarity was made contingent upon a different key the responding to the key which produced similarity increased. These investigators maintain that the results are consistent with the hypothesis that the reproduction of observed events is reinforcing through the relational stimulus of similarity.

In contrast to Baer and Sherman's view, Bandura (1963a) suggests that acquisition of matching responses may take place through a process of contiguity, while reinforcement of model influences primarily the performance of imitation learning. To verify this contention, Bandura (1965) attempted to separate the learning and performance effects of reinforcement. Children observed a film-mediated model that performed unique physical and verbal aggressive behavior. Three treatment conditions were established, model-rewarded, model-punished, and a no-consequence group. These three groups were either rewarded, punished, or received no consequence, respectively, for their aggressive behavior. As was predicted, the model-rewarded group imitated more different classes of responses, followed by the no-consequence group, and then the model-punished groups. Following the first three treatment conditions and test for imitative behavior, children in all three groups were offered attractive incentives which were contingent on the reproduction of the model's unique responses. This second performance measure was used to obtain a more accurate index of learning. The results of the second performance measure showed that the introduction of a positive incentive removed the initial differences among the three treatment conditions; whereas the model-reward group's imitation was significantly greater than the model-punished and no-consequence group

on the first performance measure, the introduction of positive incentives which were contingent upon reproducing the model's responses removed the initial differences between the groups.

As a further test of the theory, Bandura and Barab (1969) conducted some preliminary studies to test the contiguity and reinforcement theories of imitation. First, a high level of imitative responses was established in retarded children by the reinforcement of matching responses. Second, these same children were reinforced for matching the behavior of the first E but not for a second E who modeled a number of responses during the same session. In the third stage of the experiment the reinforcing model demonstrated three sets of responses: (1) 20 of the original rewarded responses, (2) five nonrewarded and unrelated motor responses interspersed among rewarded modeled responses, and (3) a second set of five nonrewarded responses consisting of vocalizations rather than motor responses which made them more distinguishable. To increase the discriminability of this last group, all five responses were modeled one after the other.

Five children completed the three-phase program. Two of the children formed a discrimination between the models, never imitating the nonrewarded E, thus providing some supportive evidence for contiguity (discrimination) theory. However, during the third phase, Bandura and Barab report that the children initially exhibited a tendency toward "generalized imitation"--imitating both rewarded and nonrewarded Es. Bandura proposes that this generalized imitation effect is due to the inability of the Ss to initially discriminate between reinforced and nonreinforced response classes. Thus, the Ss imitated every response that was modeled.

The Purpose of the Present Study

The equivocalness of Bandura and Barab's findings suggest further research is necessary to test the adequacy of these two theories of imitation. As previously noted, Bandura (1962, 1969) has questioned the validity of reinforcement theories of imitation learning. Perhaps the following quotation presents Bandura's (1965) most cogent inditement of reinforcement theory:

...reinforcement theories of imitation fail to explain the learning of matching responses when the observer does not perform the model's responses during the process of acquisition, and for which reinforcers are not delivered either to the model or to the observer (p. 589).

The purpose of this study was to test the second criticism--reinforcement theories fail to explain the learning of imitation when reinforcement is not delivered either to the model or to the observer.

It should be noted that Bandura may be short-sighted in his view of imitation learning. He may be falsely restricting this deficiency of reinforcement theory to his immediate experimental condition. He fails to examine the S's prior history of reinforcement for imitative behavior and neglects the possibility that imitative behavior may become functionally autonomous. In other words, imitation may become functionally self-reinforcing; that is, children may imitate for imitation's sake alone. Indeed, Baer and Sherman (1964) contend that the similarity between the observer's and model's behavior acquire reinforcing value. In a somewhat similar manner, Gewirtz and Stingle (1968) state that it is inevitable that a child will be extrinsically reinforced for matching the responses of a model during the process of social development. Thereafter, intermittent reinforcement of imitative behavior may account for the generalized

imitation of both reinforced and nonreinforced responses of a model.

To test the validity of generalized imitation, the present study established imitation as a conditioned reinforcer by reinforcing matching responses by the observer. Shortly thereafter, the observer watched a model on television perform aggressive responses, but not receive reinforcement for his behavior. These imitative behaviors were seen by the observer in a staged playroom setting. The aggressive behavior of the model was physical, verbal, and directed at a large Bobo doll. Immediately following the modeling of the aggressive behavior, the child was given 8 minutes of free time alone in a playroom that was similar to the one in which the model's aggressive behavior was observed by the child. The child's behavior was observed through a one-way mirror. The imitation of the modeled aggressive responses was recorded using two measures. The first measure was obtained while the child was alone in the room for 8 minutes. The second measure of imitative behavior was obtained when the E returned to the room and offered rewards for imitating the modeled responses which the child had observed earlier. Each time the child correctly matched the model's aggressive responses he was rewarded and the number of correctly matched responses recorded.

Method

Subjects

The Ss were 36 kindergarteners from Karen-Western Elementary School, Ralston Public School System, Omaha, Nebraska. The experimental (reward) and control (nonreward) groups consisted of nine boys and nine girls each. The mean age of the Ss was 65 months.

Apparatus

A 9 x 27 foot research trailer was located near the classroom. The trailer consisted of two rooms with a one-way mirror.

The smaller of the two rooms was designated as the reward-control room. This room contained a small table and two chairs. On the table there was an electrical panel box with two rows of lights. The top row of lights was controlled by the E using switches located on the back side of the panel box. The S controlled the bottom row of lights by using push-button switches located directly under each of the three lights. Some small rewards (marbles and trinkets) were placed within reach of the E but hidden from the immediate view of the S. Also located in the room was a Sony CU-2600 video tape recorder, a Sony CUM-220U television, and a Lafayette RK-100 cassette recorder.

The larger room was called the experimental playroom. It contained a Bobo doll, some balls, a mallet and pegboard, a cap gun, cars, toy kitchen utensils, plastic animals, a fire engine, a baseball bat, and an assortment of dolls. This array of toys was similar to those used in Bandura's (1965) experimental surprise playroom.

Procedure

The experimental procedure was divided into three stages: Stage 1: Differential Reinforcement for Imitation; Stage 2: Test for Imitative Responses; Stage 3: Retention of Model's Aggression.

Differential Reinforcement for Imitation. The experimental modeling procedure used was a derivation of that used by Nelson, Gelfand, and Hartmann (1969). The Ss were taken one at a time by the E from the

classroom to the reward-control room (see Appendix A for instructions). The S and a male E were seated at the table with the electrical panel box. The reinforcement of the experimental group was contingent upon matching the responses of the E (see Appendix B for instructions). The imitative response required was the matching of the same positioned light in the S's row as that which was lit in the E's row. Each time the S matched the E's response he was rewarded with physical (trinkets and marbles) and verbal ("That's good," "Fine," "Well done") reinforcers. Each S in the experimental group was run until they completed 10 reinforced trials.

The control group performed the same task as the experimental group except any imitative responses exhibited were not reinforced. This group was run for a total of 10 consecutive trials regardless of the number of imitative responses exhibited.

The S was then asked to watch on television an adult male model physically and verbally attack a Bobo doll for 3 minutes (see Appendix C for instructions). Three distinctive behaviors were exhibited accompanied by highly aggressive verbalizations. These model responses were for the most part those used by Nelson et. al. (1969). The E kicked the Bobo doll and said, "Out of my way, Bobo"; the E pushed the Bobo doll down, sat on it, and while punching it in the nose said, "Pow, right in the nose"; finally, E knocked the Bobo down with a mallet while he said, "Sockeroo, stay down." This sequence of highly unique responses was repeated five times.

Test for Imitative Responses. The S was then taken into the experimental playroom (see Appendix D for instructions). The second E then joined the first E in the reward-control room. The S was left in the room alone for 8 minutes. After approximately 4 minutes, the first E returned to assure the S he was not alone in the trailer. In addition, the E told the S he would return again with some refreshments and that the S was to continue playing with the toys until then.

The first and second E served as the observational judges who recorded the matching responses through the one-way mirror. Inter-rater reliability was established by having the judges score the Ss independently. Every 15 seconds for 8 minutes the judges scored the S's behavior using the following five categories adopted from Nelson et. al. (1969):

(1) imitative physical aggression: kicking Bobo, sitting on the Bobo and punching him in the nose, hitting Bobo with a mallet; (2) imitative verbal aggression: "Out of my way, Bobo," "Pow, right in the nose," "Sockeroo, stay down"; (3) partial imitation: sitting on Bobo but not punching him in the nose, throwing Bobo doll down, etc.; (4) nonimitative aggression: shooting cap gun, aggressing Bobo in ways not demonstrated by the model; and (5) nonaggressive play: any other play behavior, including standing or sitting with or without toys (see Appendix F for scoring sheet).

Retention of Model's Aggression. The final phase of the experimental procedure consisted of the E returning with some attractive refreshments (pretty pictures and juice treats) to the experimental playroom. The E asked the S to show what the television model did, rewarding him immediately after each imitative response (note Appendix E for instructions). If the

S merely verbalized the model's responses, the E asked for a demonstration of his behavior (motor and verbal).

The judge behind the one-way mirror then recorded the number of responses that matched the modeled responses. Each S was then rated in terms of the number of matching responses that fit the first two categories of the five proposed by Nelson et. al. (1969).

Results

The dependent variable was the E's frequency rating of S's imitative behavior made over a period of 32 fifteen-second observations. That is, every 15 seconds the E checked the number of responses which occurred in the following categories: (1) imitative physical aggression, (2) imitative verbal aggression, (3) partial imitation, (4) nonimitative aggression, and (5) nonaggressive play. These five categories were then examined as a function of two treatment conditions--reward for imitative responses versus nonreward for imitation.

Inter-rater reliability was determined for each of the five rating categories. Of the 36 Ss in the experiment, eight Ss were used to check reliability. For these eight Ss, two raters were present, one rater was aware of the S's treatment condition, while the second E was not. The correlations were: (a) physical aggression ($r = .98$), (b) verbal aggression ($r = 1.00$), (c) partial aggression ($r = .99$), (d) nonimitative aggression ($r = .92$), and (e) nonaggressive play ($r = .98$). Furthermore, a test of significance was completed between the experimental and control groups on the number of matching responses to substantiate the position that the two groups were differentially treated. The t-test revealed that the experimental group emitted significantly more matching responses in the training session than the control group ($t = 5.06$, $df = 34$, $p < .005$).

Control versus Experimental Imitation on Test I. The first test was completed to examine the effect that prior reinforcement for imitation had upon the acquisition of later nonreinforced modeled behavior. Frequency ratings for the 18 control Ss were compared with the 18 experimental Ss' frequency ratings on the five categories listed above. A chi square (χ^2) test was performed to determine the overall differences between the five rating categories and a series of binomial tests were used to examine various group differences. The χ^2 test yielded a value of 64.85 (df = 4, $p < .001$). The following binomial tests were significant, (df = 1): physical aggression ($p < .001$), verbal aggression ($p < .001$), and non-imitative aggression ($p < .008$).

Figure 1 contains the mean frequency rating for the control and experimental groups on the five categories of behavior. Once again, this figure shows that the experimental group responded with significantly more physical, verbal, and nonimitative responses. However, it might be noted that the actual differences between the control and experimental groups are relatively small in magnitude. For additional comparisons, the frequency ratings for each of the five categories were converted to proportions. For each category, the denominator consisted of the sum of the frequency ratings for both the experimental and control groups. The numerator consisted of the number of responses the experimental or control group emitted in that category. The fraction was multiplied by 100 to yield a percentage of total responses for each of the five categories.

As Table 1 demonstrates, the two groups did not differ greatly on the partial imitation and nonaggressive behavioral categories. However, as hypothesized, the proportions reveal that the experimental group exhibited more physical, verbal, and nonimitative aggressive responses than the control

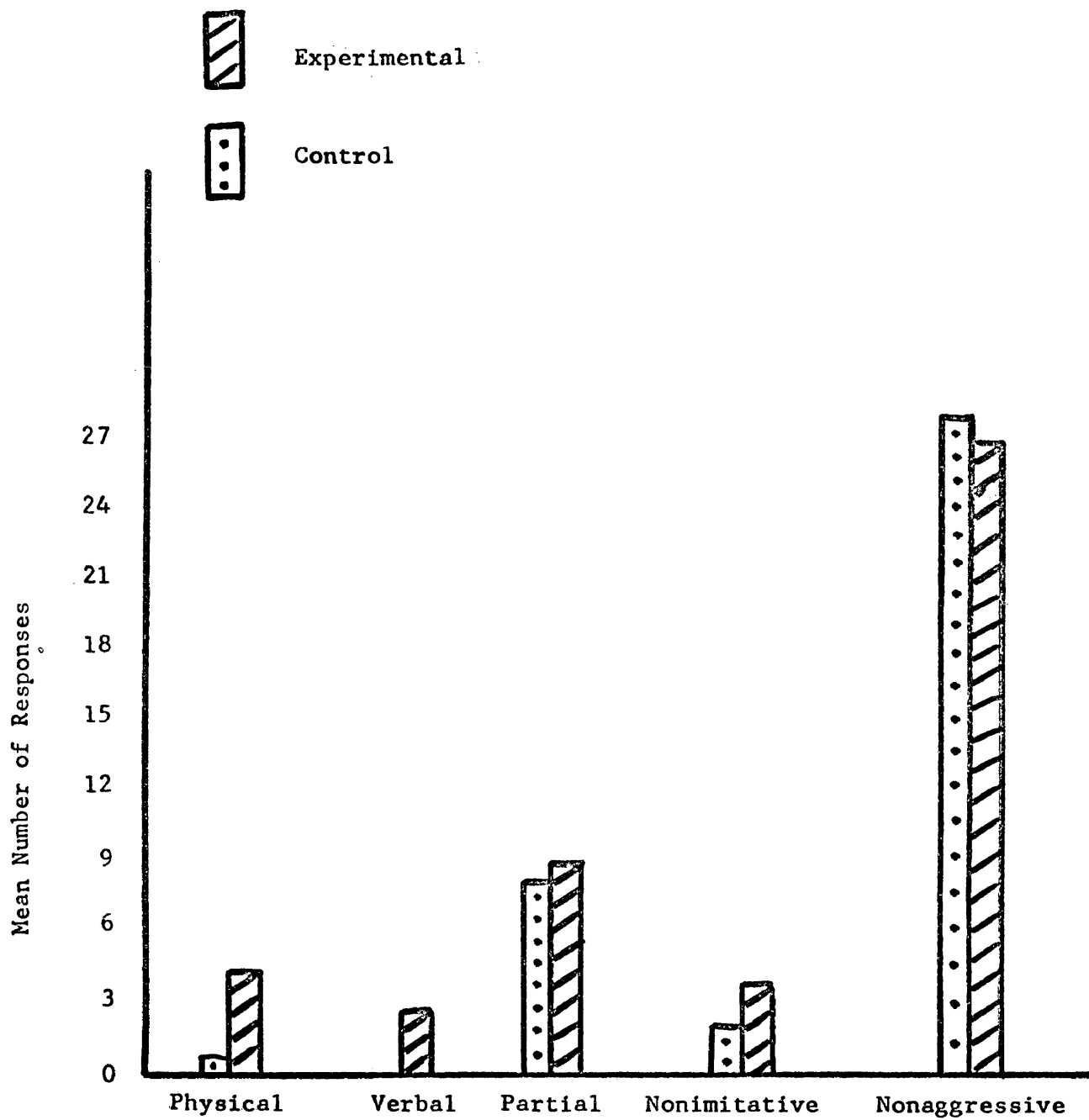


Figure 1

Mean number of imitative, nonimitative, and nonaggressive play responses

Table 1

Percentage of total imitative, nonimitative,
and nonaggressive play responses for the
experimental (reward) and control (nonreward) groups

	EXPERIMENTAL	CONTROL
PHYSICAL AGGRESSION	95%	5%
VERBAL AGGRESSION	100%	0%
PARTIAL IMITATION	52%	48%
NONIMITATIVE AGGRESSION	66%	34%
NONAGGRESSIVE PLAY	49%	51%

group. Hence, it appears that rewarding children for imitation does increase their tendency to model adult behavior.

Control versus Experimental Retention of Imitation on Test II. The second test was completed to verify Bandura's assertion that reinforcement is a performance and not a learning variable. Specifically, this test examined the retention of physical and verbal aggression during the second test in which Ss were rewarded for correct imitative responses. The test consisted of an examination of the frequency of physical and verbal aggression for the experimental and control groups ascertained during Test II. Only the first two rating categories were used since they were the

only two modeled on television by the adult. The χ^2 was found to be non-significant ($\chi^2 = .89$, $df = 1$, $p < .80$). However, it should be noted that the difference was in the predicted direction; the experimental group exhibited 31 instances of physical aggression and 17 instances of verbal aggression as compared to 23 and 8 instances, respectively, for the control group.

An Examination of Practice Effects Across Trials for the Experimental and Control Groups. The third analysis was completed to determine if there was an increase or decrease in imitation during the first test session. This test was divided into two parts. The first analysis contrasted the experimental groups frequency scores during the first 16 rating periods with the last 16 periods. The second analysis examined the control group's frequency ratings in like manner. The results for the experimental group were nonsignificant ($\chi^2 = 5.08$, $df = 4$, $p < .30$). The results for the control group were significant ($\chi^2 = 11.91$, $df = 4$, $p < .02$). While individual comparisons using the binomial test revealed no behavioral categories in which significant practice effects occurred, it should be noted that there was a nonsignificant decrease of 79 to 44 partial imitative responses from the first 16 to the last 16 trials, while the frequency of responding for the other four categories remained relatively constant across trials.

An Examination of Imitative Responses as a Function of Sex and Treatment Condition. The fourth analysis examined the frequency of imitative responses as a function of sex and treatment condition. The four reinforcement conditions were (a) female (reinforced) experimental group, (b) male

(reinforced) experimental group, (c) female (nonreinforced) control group, and (d) male (nonreinforced) control group.

A χ^2 test yielded a significant value of 154.34 ($df = 12, p < .001$). Group difference tests were then completed on each rating category if a χ^2 for that row was found to be significant. All five categories were found to be significant at the .01 level. Individual comparisons (binomial tests) revealed that the male experimental group exhibited significantly more responses ($df = 1, p < .001$) on all five rating categories than the female experimental group, suggesting that the experimental male Ss were, in general, more active in the free play situation. Furthermore, the male control group responded with significantly more nonimitative aggression ($df = 1, p < .01$) than the female control group, while the differences between the groups on the remaining four categories were found to be nonsignificant.

Discussion

In general the results of this study support the proposed hypothesis that the extent to which imitative behavior is performed is a function of prior reinforcement for the imitation of modeled behavior. The χ^2 test revealed that the experimental (reinforced) group emitted significantly more physical, verbal, and nonimitative aggression than the control (nonreinforced) group as a result of prior reinforcement for imitative responses. These results provide further evidence for the position that similarity of responding acquires a reinforcing value through a conditioning procedure (Baer and Sherman, 1964, 1967; Parton and Fouts, 1969; Mowrer, 1960a, b).

The data also support the notion that matching responses can acquire self-rewarding properties which may become functionally autonomous, i.e., children may imitate for imitation's sake. Thus, as stated previously, Bandura (1962, 1969) may be short-sighted in his view of imitation learning. A closer examination of a S's prior history of reinforcement for imitative behavior is necessary before one takes the criticism seriously that reinforcement theories fail to explain the learning of imitation when reinforcement is not delivered to the model or to the observer.

As previously mentioned, Bandura maintains that the cognitive equivalent of learned imitative behavior may be acquired during a modeling process but not exhibited in a motoric form unless an incentive is present. In the context of the present study, it might be expected in Test I that the experimental group would emit significantly more imitative aggression than the control group; however, according to Bandura, these differences might disappear under an incentive-to-imitate condition. The results indicated a nonsignificant difference between the experimental and control groups, thus providing support for Bandura's distinction between learning and performance. Apparently, prior history of reinforcement for imitation of modeled behavior does affect the level of imitative behavior emitted in a situation where neither the model nor the observer is reinforced; however, prior reinforcement does not appear to influence the amount of learning when Ss are measured for imitation under an incentive to imitate condition. Therefore, the results in this study support Bandura's hypothesis that reinforcement is a performance, not a learning variable.

The third analysis examined the frequency of responding across trials. From reinforcement theory, it was expected that the effects of secondary

reinforcement would diminish across trials, reflecting an extinction effect. However, this effect did not occur; the results for both the experimental and control groups demonstrated that responding during the first 16 trials, as compared to the last 16 trials, did not decrease significantly. Such a result might be interpreted as providing support for the hypothesis that imitative behavior may become self-reinforcing. However, the apparent absence of extinction may be due to a disinhibitory process. That is, upon entering the playroom, the novelty of the situation may have served to inhibit aggressive behavior; subsequently, as the novelty of the situation diminished the Ss may have become less inhibited as they adapted to the situation, thus counteracting the effects of extinction by decreasing inhibition of responding across trials. Hollenberg and Sperry (1951) completed a study which dealt with doll play aggression that may provide some support for the preceding explanation. An examination of their control (nonpunished) group revealed that aggressive responses increased from session to session, and that this steady increase in aggressive responding may be interpreted in terms of weakening of inhibitions. In the present study, therefore, no change in aggressive responding occurred across trials because any extinction may have been counteracted by a disinhibition of aggressive behavior across successive rating periods.

The fourth analysis examined sex differences as a function of treatment conditions across the 32 observation trials. To avoid a potentially confounding effect between sex differences and reinforcement effects, the control group data were examined first. The results clearly demonstrated that the control males exhibited significantly more nonimitative aggression than the control females. However, these two control groups did not differ

significantly on the remaining four rating categories of behavior. This finding questions Bandura, Ross, and Ross' (1961, 1963) statement that males exhibit significantly more total aggression than females. Perhaps the hypothesis that males are more susceptible than females to aggressive modeling needs further testing.

An analysis of the experimental group data demonstrated that experimental males exhibited significantly higher frequencies on all five rating categories than did the experimental females. At face value, such a result might suggest that male children, in general, are more active in a playroom setting than females. However, in the current study, interpretation of the results must be carefully examined in light of the fact that both the E and television model were males. Therefore, as Bandura et. al. (1961, 1963) have found, there may have been a sex by model effect. Specifically, males exhibited more aggression following exposure to an aggressive male model than did female Ss. In contrast, female Ss exposed to a female model performed considerably more imitative aggression than did the male Ss. Therefore, in the present study the male Ss may have imitated more frequently than the female Ss because historically they have been more frequently reinforced by an adult male to act aggressively.

It might also be noted that the notion that girls are prone to imitate verbal aggression (Bandura, 1961), while boys are more likely to imitate physical aggression was not supported in this study. It was found that the control male Ss and control female Ss did not emit significantly different rates of verbal and physical aggression. However, as previously mentioned, the male control group did emit significantly more nonimitative aggression than the control female group. Hence, it might be hypothesized

that differential imitation of verbal and physical aggression for males and females might appear at a later stage of development in children.

In conclusion, this study has provided tentative support for both the "contiguity" and "generalized imitation" theories of social modeling. The study has provided evidence that the extent to which imitative behavior is performed is a function of prior reinforcement for imitation of modeled behavior. Furthermore, the study has supported the assumption that the acquisition of imitative behavior takes place through a process of contiguity, while reinforcement influences primarily the performance of imitation.

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APPENDIX A

Instructions on the Way to the Trailer

Instructions on the Way to the Trailer

(First name of child) do you like to play games? Well then, we should have fun today. What kind of fun games do you play? Yes, all those games are fun. The games we will play today in the trailer will be different than any games you have ever played. I think you'll find them fun to play.

Appendix B

Instructions in the Reward-Control Room

Instructions in the Reward-Control Room

You know that all games have rules. Since you must know the rules to play this game, please listen carefully to the rules of this game. There are two rows of lights (pointing to them separately). The bottom row of lights you can control by the little switches just underneath each light. Would you push all three of the switches and watch and see the light above the switch go on. Now would you do it once more. See, the light just above the switch will always go on when you push the switch. (Experimental group only--when we play the game if you press the right buttons you will receive a prize--experimenter then demonstrates the trinkets and marbles.)

I will start the game by lighting one of the lights in my row (pointing to the experimenter's row). Then you can light a light in your row. After each of us has a light on, we must wait for the lights to go out before we can start again. Now remember, don't light a light in your row until you see one go on in my row. (Experimental group only--try to press the right button and win a prize.) Why don't we play the game now.

Appendix C

Video-Tape Instructions

Video-Tape Instructions

I have a very special friend who has made a special television program just for you and me. My friend's name is Mr. Roberts. Only you and I can see this program because you need a special television. Would you like to watch it with me? You sit here in front of the television, and I'll turn it on so we can watch this special program. Let's watch Mr. Roberts very closely.

Appendix D

Instructions in Experimental Playroom

Instructions in Experimental Playroom

Part One. (Name) do you see the toys in the corner? Do you like the toys? Well then, why don't you play with the toys while I'm doing some work in the next room. Now don't be afraid, you're not alone in the trailer. I'm just inside the next room. Play and have a good time.

Part Two. Is everything okay? I've got a little more work to do in the next room; and when I'm done, I'll bring some orange juice with me for us to drink. While I'm busy, play with the toys and have fun.

Appendix E
Instructions in Final Reinforcing Condition

Instructions in Final Reinforcing Condition

Do you remember the special television program we watched? For each thing you can tell me that Mr. Roberts did I'll give you a small orange juice drink and a pretty picture card. What did Mr. Roberts do? What did Mr. Roberts say? Do you remember?

Appendix F
Scoring Sheet

