

IMITATION OF FILM-MEDIATED AGGRESSIVE MODELS¹

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In a test of the hypothesis that exposure of children to film-mediated aggressive models would increase the probability of Ss' aggression to subsequent frustration, 1 group of experimental Ss observed real-life aggressive models, a 2nd observed these same models portraying aggression on film, while a 3rd group viewed a film depicting an aggressive cartoon character. Following the exposure treatment, Ss were mildly frustrated and tested for the amount of imitative and nonimitative aggression in a different experimental setting. The overall results provide evidence for both the facilitating and the modeling influence of film-mediated aggressive stimulation. In addition, the findings reveal that the effects of such exposure are to some extent a function of the sex of the model, sex of the child, and the reality cues of the model.

Most of the research on the possible effects of film-mediated stimulation upon subsequent aggressive behavior has focused primarily on the drive reducing function of fantasy. While the experimental evidence for the catharsis or drive reduction theory is equivocal (Albert, 1957; Berkowitz, 1962; Emery, 1959; Feshbach, 1955, 1958; Kenny, 1952; Lövaas, 1961; Siegel, 1956), the modeling influence of pictorial stimuli has received little research attention.

A recent incident (San Francisco Chronicle, 1961) in which a boy was seriously knifed during a re-enactment of a switchblade knife fight the boys had seen the previous evening on a televised rerun of the James Dean movie, *Rebel Without a Cause*, is a dramatic illustration of the possible imitative influence of film stimulation. Indeed, anecdotal data suggest that portrayal of aggression through pictorial media may be more influential in shaping the form aggression will take when a person is instigated on later occasions, than in altering the level of instigation to aggression.

In an earlier experiment (Bandura &

Huston, 1961), it was shown that children readily imitated aggressive behavior exhibited by a model in the presence of the model. A succeeding investigation (Bandura, Ross, & Ross, 1961), demonstrated that children exposed to aggressive models generalized aggressive responses to a new setting in which the model was absent. The present study sought to determine the extent to which film-mediated aggressive models may serve as an important source of imitative behavior.

Aggressive models can be ordered on a reality-fictional stimulus dimension with real-life models located at the reality end of the continuum, nonhuman cartoon characters at the fictional end, and films portraying human models occupying an intermediate position. It was predicted, on the basis of saliency and similarity of cues, that the more remote the model was from reality, the weaker would be the tendency for subjects to imitate the behavior of the model.

Of the various interpretations of imitative learning, the sensory feedback theory of imitation recently proposed by Mowrer (1960) is elaborated in greatest detail. According to this theory, if certain responses have been repeatedly positively reinforced, proprioceptive stimuli associated with these responses acquire secondary reinforcing properties and thus the individual is predisposed to perform the behavior for the positive feedback. Similarly, if responses have been negatively reinforced, response correlated stimuli acquire the capacity to arouse anxiety which, in turn, inhibit the occurrence of the negatively valenced

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behavior. On the basis of these considerations, it was predicted subjects who manifest high aggression anxiety would perform significantly less imitative and nonimitative aggression than subjects who display little anxiety over aggression. Since aggression is generally considered female inappropriate behavior, and therefore likely to be negatively reinforced in girls (Sears, Maccoby, & Levin, 1957), it was also predicted that male subjects would be more imitative of aggression than females.

To the extent that observation of adults displaying aggression conveys a certain degree of permissiveness for aggressive behavior, it may be assumed that such exposure not only facilitates the learning of new aggressive responses but also weakens competing inhibitory responses in subjects and thereby increases the probability of occurrence of previously learned patterns of aggression. It was predicted, therefore, that subjects who observed aggressive models would display significantly more aggression when subsequently frustrated than subjects who were equally frustrated but who had no prior exposure to models exhibiting aggression.

METHOD

Subjects

The subjects were 48 boys and 48 girls enrolled in the Stanford University Nursery School. They ranged in age from 35 to 69 months, with a mean age of 52 months.

Two adults, a male and a female, served in the role of models both in the real-life and the human film-aggression condition, and one female experimenter conducted the study for all 96 children.

General Procedure

Subjects were divided into three experimental groups and one control group of 24 subjects each. One group of experimental subjects observed real-life aggressive models, a second group observed these same models portraying aggression on film, while a third group viewed a film depicting an aggressive cartoon character. The experimental groups were further subdivided into male and female subjects so that half the subjects in the two conditions involving human models were exposed to same-sex models, while the remaining subjects viewed models of the opposite sex.

Following the exposure experience, subjects were tested for the amount of imitative and nonimitative aggression in a different experimental setting in the absence of the models.

The control group subjects had no exposure to

the aggressive models and were tested only in the generalization situation.

Subjects in the experimental and control groups were matched individually on the basis of ratings of their aggressive behavior in social interactions in the nursery school. The experimenter and a nursery school teacher rated the subjects on four five-point rating scales which measured the extent to which subjects displayed physical aggression, verbal aggression, aggression toward inanimate objects, and aggression inhibition. The latter scale, which dealt with the subjects' tendency to inhibit aggressive reactions in the face of high instigation, provided the measure of aggression anxiety. Seventy-one percent of the subjects were rated independently by both judges so as to permit an assessment of interrater agreement. The reliability of the composite aggression score, estimated by means of the Pearson product-moment correlation, was .80.

Data for subjects in the real-life aggression condition and in the control group were collected as part of a previous experiment (Bandura et al., 1961). Since the procedure is described in detail in the earlier report, only a brief description of it will be presented here.

Experimental Conditions

Subjects in the Real-Life Aggressive condition were brought individually by the experimenter to the experimental room and the model, who was in the hallway outside the room, was invited by the experimenter to come and join in the game. The subject was then escorted to one corner of the room and seated at a small table which contained potato prints, multicolor picture stickers, and colored paper. After demonstrating how the subject could design pictures with the materials provided, the experimenter escorted the model to the opposite corner of the room which contained a small table and chair, a tinker toy set, a mallet, and a 5-foot inflated Bobo doll. The experimenter explained that this was the model's play area and after the model was seated, the experimenter left the experimental room.

The model began the session by assembling the tinker toys but after approximately a minute had elapsed, the model turned to the Bobo doll and spent the remainder of the period aggressing toward it with highly novel responses which are unlikely to be performed by children independently of the observation of the model's behavior. Thus, in addition to punching the Bobo doll, the model exhibited the following distinctive aggressive acts which were to be scored as imitative responses:

The model sat on the Bobo doll and punched it repeatedly in the nose.

The model then raised the Bobo doll and pommelled it on the head with a mallet.

Following the mallet aggression, the model tossed the doll up in the air aggressively and kicked it about the room. This sequence of physically aggressive acts was repeated approximately three times,

interspersed with verbally aggressive responses such as, "Sock him in the nose . . .," "Hit him down . . .," "Throw him in the air . . .," "Kick him . . .," and "Pow."

Subjects in the Human Film-Aggression condition were brought by the experimenter to the semi-darkened experimental room, introduced to the picture materials, and informed that while the subjects worked on potato prints, a movie would be shown on a screen, positioned approximately 6 feet from the subject's table. The movie projector was located in a distant corner of the room and was screened from the subject's view by large wooden panels.

The color movie and a tape recording of the sound track was begun by a male projectionist as soon as the experimenter left the experimental room and was shown for a duration of 10 minutes. The models in the film presentations were the same adult males and females who participated in the Real-Life condition of the experiment. Similarly, the aggressive behavior they portrayed in the film was identical with their real-life performances.

For subjects in the Cartoon Film-Aggression condition, after seating the subject at the table with the picture construction material, the experimenter walked over to a television console approximately 3 feet in front of the subject's table, remarked, "I guess I'll turn on the color TV," and ostensibly tuned in a cartoon program. The experimenter then left the experimental room. The cartoon was shown on a glass lens screen in the television set by means of a rear projection arrangement screened from the subject's view by large panels.

The sequence of aggressive acts in the cartoon was performed by the female model costumed as a black cat similar to the many cartoon cats. In order to heighten the level of irreality of the cartoon, the floor area was covered with artificial grass and the walls forming the backdrop were adorned with brightly colored trees, birds, and butterflies creating a fantasyland setting. The cartoon began with a close-up of a stage on which the curtains were slowly drawn revealing a picture of a cartoon cat along with the title, *Herman the Cat*. The remainder of the film showed the cat pommeling the Bobo doll on the head with a mallet, sitting on the doll and punching it in the nose, tossing the doll in the air, and kicking it about the room in a manner identical with the performance in the other experimental conditions except that the cat's movements were characteristically feline. To induce further a cartoon set, the program was introduced and concluded with appropriate cartoon music, and the cat's verbal aggression was repeated in a high-pitched, animated voice.

In both film conditions, at the conclusion of the movie the experimenter entered the room and then escorted the subject to the test room.

Aggression Instigation

In order to differentiate clearly the exposure and test situations subjects were tested for the amount

of imitative learning in a different experimental room which was set off from the main nursery school building.

The degree to which a child has learned aggressive patterns of behavior through imitation becomes most evident when the child is instigated to aggression on later occasions. Thus, for example, the effects of viewing the movie, *Rebel Without a Cause*, were not evident until the boys were instigated to aggression the following day, at which time they re-enacted the televised switchblade knife fight in considerable detail. For this reason, the children in the experiment, both those in the control group, and those who were exposed to the aggressive models, were mildly frustrated before they were brought to the test room.

Following the exposure experience, the experimenter brought the subject to an anteroom which contained a varied array of highly attractive toys. The experimenter explained that the toys were for the subject to play with, but, as soon as the subject became sufficiently involved with the play material, the experimenter remarked that these were her very best toys, that she did not let just anyone play with them, and that she had decided to reserve these toys for some other children. However, the subject could play with any of the toys in the next room. The experimenter and the subject then entered the adjoining experimental room.

It was necessary for the experimenter to remain in the room during the experimental session; otherwise, a number of the children would either refuse to remain alone or would leave before the termination of the session. In order to minimize any influence her presence might have on the subject's behavior, the experimenter remained as inconspicuous as possible by busying herself with paper work at a desk in the far corner of the room and avoiding any interaction with the child.

Test for Delayed Imitation

The experimental room contained a variety of toys, some of which could be used in imitative or nonimitative aggression, and others which tended to elicit predominantly nonaggressive forms of behavior. The aggressive toys included a 3-foot Bobo doll, a mallet and peg board, two dart guns, and a tether ball with a face painted on it which hung from the ceiling. The nonaggressive toys, on the other hand, included a tea set, crayons and coloring paper, a ball, two dolls, three bears, cars and trucks, and plastic farm animals.

In order to eliminate any variation in behavior due to mere placement of the toys in the room, the play material was arranged in a fixed order for each of the sessions.

The subject spent 20 minutes in the experimental room during which time his behavior was rated in terms of predetermined response categories by judges who observed the session through a one-way mirror in an adjoining observation room. The 20-minute session was divided in 5-second intervals by means

TABLE 1
MEAN AGGRESSION SCORES FOR SUBGROUPS OF EXPERIMENTAL AND CONTROL SUBJECTS

Response category	Experimental groups					Control group
	Real-life aggressive		Human film-aggressive		Cartoon film-aggressive	
	F Model	M Model	F Model	M Model		
Total aggression						
Girls	65.8	57.3	87.0	79.5	80.9	36.4
Boys	76.8	131.8	114.5	85.0	117.2	72.2
Imitative aggression						
Girls	19.2	9.2	10.0	8.0	7.8	1.8
Boys	18.4	38.4	34.3	13.3	16.2	3.9
Mallet aggression						
Girls	17.2	18.7	49.2	19.5	36.8	13.1
Boys	15.5	28.8	20.5	16.3	12.5	13.5
Sits on Bobo doll ^a						
Girls	10.4	5.6	10.3	4.5	15.3	3.3
Boys	1.3	0.7	7.7	0.0	5.6	0.6
Nonimitative aggression						
Girls	27.6	24.9	24.0	34.3	27.5	17.8
Boys	35.5	48.6	46.8	31.8	71.8	40.4
Aggressive gun play						
Girls	1.8	4.5	3.8	17.6	8.8	3.7
Boys	7.3	15.9	12.8	23.7	16.6	14.3

^a This response category was not included in the total aggression score.

of an electric interval timer, thus yielding a total number of 240 response units for each subject.

The male model scored the experimental sessions for all subjects. In order to provide an estimate of interjudge agreement, the performances of 40% of the subjects were scored independently by a second observer. The responses scored involved highly specific concrete classes of behavior, and yielded high interscorer reliabilities, the product-moment coefficients being in the .90s.

Response Measures

The following response measures were obtained:

Imitative aggression. This category included acts of striking the Bobo doll with the mallet, sitting on the doll and punching it in the nose, kicking the doll, tossing it in the air, and the verbally aggressive responses, "Sock him," "Hit him down," "Kick him," "Throw him in the air," and "Pow."

Partially imitative responses. A number of subjects imitated the essential components of the model's behavior but did not perform the complete act, or they directed the imitative aggressive response to some object other than the Bobo doll. Two responses of this type were scored and were interpreted as partially imitative behavior:

Mallet aggression. The subject strikes objects other than the Bobo doll aggressively with the mallet.

Sits on Bobo doll. The subject lays the Bobo doll on its side and sits on it, but does not aggress toward it.

Nonimitative aggression. This category included acts of punching, slapping, or pushing the doll,

physically aggressive acts directed toward objects other than the Bobo doll, and any hostile remarks except for those in the verbal imitation category; for example, "Shoot the Bobo," "Cut him," "Stupid ball," "Knock over people," "Horses fighting, biting."

Aggressive gun play. The subject shoots darts or aims the guns and fires imaginary shots at objects in the room.

Ratings were also made of the number of behavior units in which subjects played nonaggressively or sat quietly and did not play with any of the material at all.

RESULTS

The mean imitative and nonimitative aggression scores for subjects in the various experimental and control groups are presented in Table 1.

Since the distributions of scores departed from normality and the assumption of homogeneity of variance could not be made for most of the measures, the Freidman two-way analysis of variance by ranks was employed for testing the significance of the obtained differences.

Total Aggression

The mean total aggression scores for subjects in the real-life, human film, cartoon film, and the control groups are 83, 92, 99, and 54,

respectively. The results of the analysis of variance performed on these scores reveal that the main effect of treatment conditions is significant ($\chi^2 = 9.06$, $p < .05$), confirming the prediction that exposure of subjects to aggressive models increases the probability that subjects will respond aggressively when instigated on later occasions. Further analyses of pairs of scores by means of the Wilcoxon matched-pairs signed-ranks test show that subjects who viewed the real-life models and the film-mediated models do not differ from each other in total aggressiveness but all three experimental groups expressed significantly more aggressive behavior than the control subjects (Table 2).

Imitative Aggressive Responses

The Freidman analysis reveals that exposure of subjects to aggressive models is also a highly effective method for shaping subjects' aggressive responses ($\chi^2 = 23.88$, $p < .001$). Comparisons of treatment conditions by the Wilcoxon test reveal that subjects who observed the real-life models and the film-mediated models, relative to subjects in the control group, performed considerably more imitative physical and verbal aggression (Table 2).

Illustrations of the extent to which some of the subjects became virtually "carbon copies" of their models in aggressive behavior are presented in Figure 1. The top frame shows the female model performing the four novel aggressive responses; the lower frames depict a male and a female subject reproduc-

ing the behavior of the female model they had observed earlier on film.

The prediction that imitation is positively related to the reality cues of the model was only partially supported. While subjects who observed the real-life aggressive models exhibited significantly more imitative aggression than subjects who viewed the cartoon model, no significant differences were found between the live and film, and the film and cartoon conditions, nor did the three experimental groups differ significantly in total aggression or in the performances of partially imitative behavior (Table 2). Indeed, the available data suggest that, of the three experimental conditions, exposure to humans on film portraying aggression was the most influential in eliciting and shaping aggressive behavior. Subjects in this condition, in relation to the control subjects, exhibited more total aggression, more imitative aggression, more partially imitative behavior, such as sitting on the Bobo doll and mallet aggression, and they engaged in significantly more aggressive gun play. In addition, they performed significantly more aggressive gun play than did subjects who were exposed to the real-life aggressive models (Table 2).

Influence of Sex of Model and Sex of Child

In order to determine the influence of sex of model and sex of child on the expression of imitative and nonimitative aggression, the data from the experimental groups were combined and the significance of the differences between groups was assessed by *t* tests for

TABLE 2
SIGNIFICANCE OF THE DIFFERENCES BETWEEN EXPERIMENTAL AND CONTROL GROUPS
IN THE EXPRESSION OF AGGRESSION

Response category	χ^2	<i>p</i>	Comparison of treatment conditions ^a					
			Live vs. Film <i>p</i>	Live vs. Cartoon <i>p</i>	Film vs. Cartoon <i>p</i>	Live vs. Control <i>p</i>	Film vs. Control <i>p</i>	Cartoon vs. Control <i>p</i>
Total aggression	9.06	< .05	<i>ns</i>	<i>ns</i>	<i>ns</i>	< .01	< .01	< .005
Imitative aggression	23.88	< .001	<i>ns</i>	< .05	<i>ns</i>	< .001	< .001	< .005
Partial imitation								
Mallet aggression	7.36	.10 > <i>p</i> > .05						
Sits on Bobo doll	8.05	< .05	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	< .05	< .005
Nonimitative aggression	7.28	.10 > <i>p</i> > .05						
Aggressive gun play	8.06	< .05	< .01 ^b	<i>ns</i>	<i>ns</i>	<i>ns</i>	< .05	<i>ns</i>

^a The probability values are based on the Wilcoxon test.

^b This probability value is based on a two-tailed test of significance.



FIG. 1. Photographs from the film, *Social Learning of Aggression through Imitation of Aggressive Models*.

uncorrelated means. In statistical comparisons involving relatively skewed distributions of scores the Mann-Whitney U test was employed.

Sex of subjects had a highly significant effect on both the learning and the performance of aggression. Boys, in relation to girls, exhibited significantly more total aggression ($t = 2.69, p < .01$), more imitative aggression ($t = 2.82, p < .005$), more aggressive gun play ($z = 3.38, p < .001$), and more nonimitative aggressive behavior ($t = 2.98, p < .005$). Girls, on the other hand, were more inclined than boys to sit on the Bobo doll but refrained from punching it ($z = 3.47, p < .001$).

The analyses also disclosed some influences of the sex of the model. Subjects exposed to the male model, as compared to the female model, expressed significantly more aggressive gun play ($z = 2.83, p < .005$). The most marked differences in aggressive gun play ($U = 9.5, p < .001$), however, were found between girls exposed to the female model ($M = 2.9$) and males who observed the male model ($M = 19.8$). Although the overall model difference in partially imitative be-

havior, Sits on Bobo, was not significant, Sex \times Model subgroup comparisons yielded some interesting results. Boys who observed the aggressive female model, for example, were more likely to sit on the Bobo doll without punching it than boys who viewed the male model ($U = 33, p < .05$). Girls reproduced the nonaggressive component of the male model's aggressive pattern of behavior (i.e., sat on the doll without punching it) with considerably higher frequency than did boys who observed the same model ($U = 21.5, p < .02$). The highest incidence of partially imitative responses was yielded by the group of girls who viewed the aggressive female model ($M = 10.4$), and the lowest values by the boys who were exposed to the male model ($M = 0.3$). This difference was significant beyond the .05 significance level. These findings, along with the sex of child and sex of model differences reported in the preceding sections, provide further support for the view that the influence of models in promoting social learning is determined, in part, by the sex appropriateness of the model's behavior (Bandura et al., 1961).

Aggressive Predisposition and Imitation

Since the correlations between ratings of aggression and the measures of imitative and total aggressive behavior, calculated separately for boys and girls in each of the experimental conditions, did not differ significantly, the data were combined. The correlational analyses performed on these pooled data failed to yield any significant relationships between ratings of aggression anxiety, frequency of aggressive behavior, and the experimental aggression measures. In fact, the array means suggested nonlinear regressions although the departures from linearity were not of sufficient magnitude to be statistically significant.

DISCUSSION

The results of the present study provide strong evidence that exposure to filmed aggression heightens aggressive reactions in children. Subjects who viewed the aggressive human and cartoon models on film exhibited nearly twice as much aggression than did subjects in the control group who were not exposed to the aggressive film content.

In the experimental design typically employed for testing the possible cathartic function of vicarious aggression, subjects are first frustrated, then provided with an opportunity to view an aggressive film following which their overt or fantasy aggression is measured. While this procedure yields some information on the immediate influence of film-mediated aggression, the full effects of such exposure may not be revealed until subjects are instigated to aggression on a later occasion. Thus, the present study, and one recently reported by Lövaas (1961), both utilizing a design in which subjects first observed filmed aggression and then were frustrated, clearly reveal that observation of models portraying aggression on film substantially increases rather than decreases the probability of aggressive reactions to subsequent frustrations.

Filmed aggression, not only facilitated the expression of aggression, but also effectively shaped the form of the subjects' aggressive behavior. The finding that children modeled their behavior to some extent after the film characters suggests that pictorial mass media, particularly television, may serve as an im-

portant source of social behavior. In fact, a possible generalization of responses originally learned in the television situation to the experimental film may account for the significantly greater amount of aggressive gun play displayed by subjects in the film condition as compared to subjects in the real-life and control groups. It is unfortunate that the qualitative features of the gun behavior were not scored since subjects in the film condition, unlike those in the other two groups, developed interesting elaborations in gun play (for example, stalking the imaginary opponent, quick drawing, and rapid firing), characteristic of the Western gun fighter.

The view that the social learning of aggression through exposure to aggressive film content is confined to deviant children (Schramm, Lyle, & Parker, 1961), finds little support in our data. The children who participated in the experiment are by no means a deviant sample, nevertheless, 88% of the subjects in the Real-Life and in the Human Film condition, and 79% of the subjects in the Cartoon Film condition, exhibited varying degrees of imitative aggression. In assessing the possible influence of televised stimulation on viewers' behavior, however, it is important to distinguish between learning and overt performance. Although the results of the present experiment demonstrate that the vast majority of children *learn* patterns of social behavior through pictorial stimulation, nevertheless, informal observation suggests that children do not, as a rule, *perform* indiscriminately the behavior of televised characters, even those they regard as highly attractive models. The replies of parents whose children participated in the present study to an open-end questionnaire item concerning their handling of imitative behavior suggest that this may be in part a function of negative reinforcement, as most parents were quick to discourage their children's overt imitation of television characters by prohibiting certain programs or by labeling the imitative behavior in a disapproving manner. From our knowledge of the effects of punishment on behavior, the responses in question would be expected to retain their original strength and could reappear on later occasions in the presence of appropriate eliciting stimuli, particularly if

instigation is high, the instruments for aggression are available, and the threat of noxious consequences is reduced.

The absence of any relationships between ratings of the children's predisposition to aggression and their aggressive behavior in the experimental setting may simply reflect the inadequacy of the predictor measures. It may be pointed out, however, that the reliability of the ratings was relatively high. While this does not assure validity of the measures, it does at least indicate there was consistency in the raters' estimates of the children's aggressive tendencies.

A second, and perhaps more probable, explanation is that proprioceptive feedback alone is not sufficient to account for response inhibition or facilitation. For example, the proprioceptive cues arising from hitting responses directed toward parents and toward peers may differ little, if any; nevertheless, tendencies to aggress toward parents are apt to be strongly inhibited while peer aggression may be readily expressed (Bandura, 1960; Bandura & Walters, 1959). In most social interaction sequences, proprioceptive cues make up only a small part of the total stimulus complex and, therefore, it is necessary to take into consideration additional stimulus components, for the most part external, which probably serve as important discriminative cues for the expression of aggression. Consequently, prediction of the occurrence or inhibition of specific classes of responses would be expected to depend upon the presence of a certain pattern of proprioceptive or interoceptive stimulation together with relevant discriminative external stimuli.

According to this line of reasoning, failure to obtain the expected positive relationships between the measures of aggression may be due primarily to the fact that permissiveness for aggression, conveyed by situational cues in the form of aggressive film content and play material, was sufficient to override the influence of internal stimuli generated by the commission of aggressive responses. If, in fact, the behavior of young children, as compared to that of adults, is less likely to be under internal stimulus control, one might expect environmental cues to play a relatively im-

portant role in eliciting or inhibiting aggressive behavior.

A question may be raised as to whether the aggressive acts studied in the present experiment constitute "genuine" aggressive responses. Aggression is typically defined as behavior, the goal or intent of which is injury to a person, or destruction of an object (Bandura & Walters, 1959; Dollard, Doob, Miller, Mowrer, & Sears, 1939; Sears, McCoby, & Levin, 1957). Since intentionality is not a property of behavior but primarily an inference concerning antecedent events, the categorization of an act as "aggressive" involves a consideration of both stimulus and mediating or terminal response events.

According to a social learning theory of aggression recently proposed by Bandura and Walters (in press), most of the responses utilized to hurt or to injure others (for example, striking, kicking, and other responses of high magnitude), are probably learned for prosocial purposes under nonfrustration conditions. Since frustration generally elicits responses of high magnitude, the latter classes of responses, once acquired, may be called out in social interactions for the purpose of injuring others. On the basis of this theory it would be predicted that the aggressive responses acquired imitatively, while not necessarily mediating aggressive goals in the experimental situation, would be utilized to serve such purposes in other social settings with higher frequency by children in the experimental conditions than by children in the control group.

The present study involved primarily vicarious or empathic learning (Mowrer, 1960) in that subjects acquired a relatively complex repertoire of aggressive responses by the mere sight of a model's behavior. It has been generally assumed that the necessary conditions for the occurrence of such learning is that the model perform certain responses followed by positive reinforcement to the model (Hill, 1960; Mowrer, 1960). According to this theory, to the extent that the observer experiences the model's reinforcement vicariously, the observer will be prone to reproduce the model's behavior. While there is some evidence from experiments involving both human (Lewis & Duncan, 1958; McBready, Marston,

& Kanfer, 1961; Sechrest, 1961) and animal subjects (Darby & Riopelle, 1959; Warden, Fjeld, & Koch, 1940), that vicarious reinforcement may in fact increase the probability of the behavior in question, it is apparent from the results of the experiment reported in this paper that a good deal of human imitative learning can occur without any reinforcers delivered either to the model or to the observer. In order to test systematically the influence of vicarious reinforcement on imitation, however, a study is planned in which the degree of imitative learning will be compared in situations in which the model's behavior is paired with reinforcement with those in which the model's responses go unrewarded.

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