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Source: *Child Development*, Vol. 64, No. 1 (Feb., 1993), pp. 124-138

Published by: Blackwell Publishing on behalf of the Society for Research in Child Development

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Accessed: 28/09/2009 16:41

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An Attributional Intervention to Reduce Peer-directed Aggression among African-American Boys

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HUDLEY, CYNTHIA, and GRAHAM, SANDRA. *An Attributional Intervention to Reduce Peer-directed Aggression among African-American Boys*. CHILD DEVELOPMENT, 1993, 64, 124–138. An attributional intervention was designed to reduce aggressive males' tendency to attribute hostile intentions to peers following ambiguously caused peer provocations. African-American elementary school boys ($N = 101$), aggressive and nonaggressive, were randomly assigned to the attributional intervention, an attention training program, or a no-treatment control group. Data were collected on subjects' attributions about hypothetical and laboratory simulations of peer provocation, disciplinary referrals to the school office, and teacher ratings of aggressive behavior. Aggressive subjects in the attributional intervention were less likely to presume hostile intent by peers in hypothetical and laboratory simulations of ambiguous provocation. They were also less likely to endorse hostile retaliation on judgment measures and to engage in verbally hostile behaviors in the laboratory task. Further, intervention subjects were rated as less aggressive by their teachers following the treatment. Both the benefits of attributional change and its limitations in the African-American population are discussed.

Childhood aggression has been found to be remarkably stable over time (Olweus, 1979) and predictive of such serious negative outcomes as low academic achievement (Quay, 1987), school dropout in adolescence (Cox & Gunn, 1980), juvenile delinquency (Loeber & Stouthamer-Loeber, 1987), and even adult criminality and psychopathology (Robins, 1966; Wilson & Herrnstein, 1985). Related as they are to social and economic conditions, many of these correlates of childhood aggression are disproportionately prevalent among ethnic minorities, particularly African-American males (see Gibbs, 1988; Wilson & Herrnstein, 1985). Thus, the 20-year-old black male dropout, gang member, or convict is often the 10-year-old boy labeled as aggressive by teachers and peers.

In this article, we approach peer aggression and its prevalence among ethnic minorities from a treatment perspective. We report

the findings of a social cognitive intervention designed to lessen aggressive behavior in 10–12-year-old African-American boys. We were guided in the development of the intervention by attribution theory, which is concerned with the perceived causes of events and behaviors (see reviews in Graham, 1991; Weiner, 1985, 1986). This is an appropriate framework inasmuch as perceived causality has been recognized by developmental social psychologists as a key antecedent of deviant behavior in children and adolescents (Dodge & Crick, 1990).

Within this general attributional framework, one very robust finding documented by Dodge and others is that aggressive boys display a marked attributional bias to perceive their peers as acting with hostile intent, particularly in situations of causal ambiguity (e.g., Dodge, 1980, 1986; Dodge & Coie, 1987). For example, when a child is

This research was supported in part by the UCLA Center for Afro-American Studies and the Ford Foundation. This article is based on a dissertation submitted by the first author to the Graduate School of Education at UCLA under the supervision of the second author. Appreciation is extended to the faculty and students who participated in this study, as well as our co-experimenter, Anne Ikefwenigwe. We would like to thank Estella Williams, Andrea Forney, and Donna Borkman for their assistance in data collection, and Bernard Weiner for his helpful comments on the manuscript. Address all correspondence to Cynthia A. Hudley, Graduate School of Education, 2220 Phelps Hall, University of California, Santa Barbara, CA 93106.

instructed to imagine that a peer spilled milk on him or her in the lunchroom, and no other information is given, the student labeled as aggressive is more likely to state that the peer did this "on purpose" than is his or her nonaggressive counterpart. Such biased attributions of intent are then thought to lead to retaliatory behavior. Any child who attributes malicious intent to another can be expected to endorse some form of retaliation. Excessively aggressive children, however, often arrive at inappropriate, and therefore maladaptive, causal beliefs about others and thus feel justified in the endorsement and use of unwarranted aggressive retaliation.

Attribution theorists have elaborated on this assumed cognition-to-behavior linkage by incorporating a role for emotion. According to attribution theory, when we judge others as responsible for negative outcomes, this tends to elicit anger, and anger, in turn, leads to hostile behavior (Weiner, 1991). As conceptualized here, anger is a moral emotion, often associated with judgments of "ought," "should have," or "could have," and is therefore a key emotional determinant of aggression (also see Berkowitz, 1983; Ferguson & Rule, 1983). In a recent investigation examining this proposed thought-to-emotion-to-action linkage in African-American early adolescents, Graham, Hudley, and Williams (1992) found that aggressive minority youth made more attributions of biased intent on the part of a hypothetical peer provocateur, reported more anger, and were more likely to endorse aggressive behavior than were a comparable group of nonaggressives. There also was evidence of a temporal sequence in the data of aggressive children suggesting that causal thinking was an antecedent of both feelings of anger and aggressive action.

If biased attributions instigate a motivational sequence leading to aggression, then attributional change should mitigate anger as well as the tendency toward aggressive retaliation. There is some precedent for this hypothesis in the findings of attribution retraining research in the achievement domain. A number of studies document positive effects on children's achievement strivings when they are trained to attribute failure to lack of effort rather than to low ability (see review in Forsterling, 1985). The attribution principles guiding behavior change in the achievement domain are perhaps applicable to behavior change in the social domain.

A 12-session intervention curriculum was developed specifically to train aggressive African-American males to infer non-hostile intent following ambiguous peer provocation. Both before and after the intervention, data were collected on subjects' attributional reasoning about peer provocation, teacher ratings of aggressive behavior, and number of disciplinary referrals to school administrators. Across this entire set of dependent variables, we expected differences between aggressive intervention-group subjects and the other two comparison groups, in the direction of less perceived hostile peer intent, less anger, and a lower incidence of aggressive behavior.

As a social cognitive intervention, the attribution retraining program developed for this research has some features in common with other recent successful treatments for aggressive populations that include causal thinking as a component (Guerra & Slaby, 1990; Pepler, King, & Byrd, 1991). However, given the multifaceted nature of these treatments, it is unclear how much of the improvement reported in either investigation was due specifically to attributional change. Therefore, we have adopted a constructive treatment strategy (Kazdin, 1980) by focusing on attributional change as a starting point in the development of a comprehensive program of aggression reduction. Though multiple interpersonal processes have been hypothesized to contribute to peer-directed aggression (Dodge & Crick, 1990), we have elected to isolate and investigate the causal role of one social cognitive process linked to aggressive behavior.

Method

Selection of Subjects

Participants were selected from two elementary schools in the greater Los Angeles area. Both schools received Chapter One compensatory education funds, and about 30% of the two student populations qualified for a free lunch program for economically distressed families. Thus, by all available indicators, the population from which the sample was drawn was of low socioeconomic status. Both schools also enrolled a majority African-American student body. Site no. 1 had 80% African-American students, and site no. 2 had 92% African-American students.

We used a combination of teacher ratings of aggression and peer nominations as criteria for subject selection. These data were collected on all students from 17 coed

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classrooms of third through fifth graders ($N = 529$) and for whom parental permission had been obtained. (Only six parents declined consent, perhaps due to the interest and assistance of teachers and principals in explaining the potential benefits of the program.) Only African-American boys ($N = 271$) were eligible as possible subjects.

Teacher ratings.—Data from classroom teachers were collected using the Teacher Checklist (Coie, 1990; Coie & Dodge, 1988). This scale was derived from a factor analysis of teacher ratings of a range of classroom behaviors including aggression, social withdrawal, social sensitivity, prosocial behavior, and task performance. Teachers responded to each item on a five-point scale (1 = not at all like this child; 5 = very much like this child). Behavior ratings were reduced to factor scores, and a principal components analysis was performed; thus the scale satisfies the demands of factorial and content validity.

Three subscales with a total of 17 items were employed during the course of this study: aggression, prosocial behavior, and school performance. The aggression subscale is comprised of eight items describing common types of childhood aggression (e.g., "This child starts fights") with an internal consistency of $\alpha = .95$ (Coie, 1990). The scale also provides specific items for both reactive (responding to perceived provocation) and proactive (initiating hostile behavior) aggression. The three items measuring reactive aggression refer directly to provocations by others (e.g., "This child overreacts to accidental hurt with anger and fighting") and were of special interest in this investigation. The five-item prosocial behavior subscale (e.g., "This child is good at understanding other people's feelings") has an internal consistency of $\alpha = .82$. Internal consistency for the four-item academic performance subscale (e.g., "This child has trouble completing assignments") is $\alpha = .85$ (Coie, 1990). Pilot tests using three classrooms ($N = 82$) in a third school whose student population was comparable to the two sites used for this study demonstrated excellent 6-week test-retest reliability coefficients (total aggression $r = .94$, prosocial $r = .93$, academic $r = .97$) and an internal consistency for the reactive items of $\alpha = .90$.

In the spring of 1990, 17 third- through fifth-grade teachers at the two school sites completed the eight-item aggression subscale for each boy and girl in their class. Scores ranged from 8 to 40, with higher num-

bers indicating more perceived aggressiveness.

Peer nominations.—All students in the same 17 classrooms were administered group-wide sociometric interviews by one of two African-American female experimenters. With the aid of a classroom roster, children were asked to write down the names of the three students in their class whom they liked most, the three whom they liked least, and the three who best fit each of five behavioral descriptions. Three of these descriptors portrayed aggressive behavior (i.e., starts fights, has a very short temper, disrupts the group), and two described prosocial behavior (i.e., works well with others, is helpful to other students). Children were encouraged to be honest in their responses, and they were assured of confidentiality. To alleviate any potential discomfort due to participation in negative evaluations of others, the sociometric procedure was followed by a competitive game with prizes, which served as an engaging distractor exercise.

The nominations each child received from classmates for each of the seven sociometric items were first summed. From these totals, we then derived a *social preference score* for each child, calculated as the number of "liked most" minus "liked least" nominations; an *aggression score*, which was the sum of the nominations on the three aggressive behavioral descriptions; and a *prosocial score*, the sum of the nominations for the two prosocial categories. We used raw scores rather than standardized scores in these calculations because class sizes across the 17 participating homerooms were quite comparable, ranging from 29 to 32 students per classroom.

Students classified as aggressive had to: (1) be above the teacher median on perceived aggressiveness, (2) have a social preference score less than 0, and (3) have at least twice as many aggressive as prosocial nominations. Thus children targeted for this study were both perceived as aggressive and generally disliked by their peers. From the initial pool of students, 78 African-American males met the above criteria and had the following characteristics: teacher rating, $M = 22.87$, $SD = 8.91$; social preference, $M = -2.02$, $SD = 1.34$; peer-nominated aggression, $M = 19.23$, $SD = 12.17$; and peer-nominated prosocial behavior, $M = 1.93$, $SD = 2.31$.

A sample of 42 nonaggressive African-American males was also identified. To be

classified as nonaggressive, a boy had to: (1) be at or below the teacher median on perceived aggressiveness; (2) have a social preference score greater than 0, and (3) have received at least twice as many prosocial as aggressive peer nominations. The nonaggressive boys differed significantly from the aggressive sample on all of the selection criteria: teacher rating, $M = 11.64$, $SD = 5.38$; social preference, $M = 1.68$, $SD = 2.41$; peer-nominated aggression, $M = 2.17$, $SD = 1.88$; and peer-nominated prosocial behavior, $M = 6.72$, $SD = 5.14$ (all p 's < .001).

Treatment

Procedure.—During the fall 1990 school semester, when the identified boys were fourth through sixth graders, 72 aggressives (M age = 10.5 years) and 36 nonaggressives (M age = 10.2 years) were randomly assigned to one of three treatment groups: the attributional intervention, an attention training group, and a no-treatment control group. Three intervention and three attention training groups met at each of the two sites, in locations away from the regular classroom. Groups met twice weekly during the school day in 40–60-min sessions, for 6 weeks, and consisted of six students, four aggressives and two nonaggressives, in each group. Nonaggressives were included in the treatment groups to avoid stigmatizing research subjects and to give aggressives the opportunity to interact with positive peer models. Students in both experimental and attention groups were required to attend a minimum of 10 sessions; all subjects fulfilled this requirement.

The treatments were conducted by two African-American females, both educators with experience in small group instruction. Each experimenter, after completing 16 hours of training with the curriculum developer, individually conducted three experimental and three attention training groups, distributed across both sites. Experimenters met with the curriculum developer on a weekly basis to monitor and discuss implementation integrity for the duration of the intervention.

Participants in both experimental and attention training groups were told they were selected especially to assist the school in evaluating a program which might be used with students in schools throughout the city. Teachers were told that some students would receive curriculum to assist them in getting along with peers and some students would receive an academic enrichment pro-

gram. Individual students' group assignments were not identified to teachers, and teachers were asked to refrain from questioning students about their respective programs.

Attributional intervention.—The attributional treatment was a 12-lesson cognitive intervention designed specifically for this research, with materials and activities appropriate for the late elementary grades (Hudley, 1991). The primary goal of the intervention was to train aggressive boys *not* to infer hostile peer intent in negative social encounters of ambiguous causal origin. By focusing on changing cognitions (i.e., attributions to hostile intent) it was assumed that changes in feelings of anger and hostile behavior would then follow.

There were three components to the intervention. The primary, and largest component (Lessons 2–6) was designed to strengthen aggressive boys' ability to accurately detect intentionality. Through role play, discussion of personal experiences, and other activities, participants were trained to search for, interpret, and properly categorize the verbal and behavioral cues emitted by others in social dilemmas. For example, in Lesson 3 children played a game in which they identified intent from facial expressions. In a subsequent activity (Lesson 6), children produced videotapes to demonstrate their understanding of the difference between prosocial, accidental, hostile, and ambiguous peer intent.

The second component of the intervention (Lessons 7–9) was designed to increase the likelihood that aggressive boys would make attributions to nonhostile intent when negative social encounters were portrayed as ambiguous. For example, Lesson 8 had students role play an ambiguously caused negative social situation (e.g., a peer spills milk on you in the lunchroom). The group then brainstormed possible causes, categorized them as deliberate or unintentional, and decided which causes were more likely given uncertainty about the peer's intent.

The third component (Lessons 10–11) elaborated on the meaning of intentionality in the context of linking appropriate behavioral responses to ambiguously caused negative outcomes. For example, children read vignettes of ambiguously caused peer provocation (Lesson 10), some of which were selected for role play (Lesson 11). They practiced generating attributions to nonhostile intent and were subsequently taught to gen-

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erate decision rules about when to enact particular nonhostile responses (e.g., "When I don't have the information to tell what he meant, I should act as if it were an accident"). This portion of the intervention continued to focus on attributional change by discussing the logical relation between particular causal beliefs and specific behavioral responses.

In sum, the curriculum of the intervention provided: (1) specific activities for understanding the concepts of intent and ambiguity in interpersonal interactions, (2) practice in identifying intentionality in others, (3) specific activities for distinguishing between intended and unintended outcomes, (4) practice in making attributions and generating decision rules about how to respond given attributional uncertainty. The program focused entirely on peer-directed social behavior and used familiar playground situations typical of elementary school social life. Further, the presentation was entirely task focused, with no reference to an individual student's behavioral difficulties.

Attention training.—An attention training condition was included to control for possible effects of simple participation in a special program. The 12-session treatment, based on the Building Thinking Skills program (Black & Black, 1984), used an instructional format similar to that employed in the attributional intervention and focused on nonsocial problem solving skills such as classifying information and following directions.

Control group.—The 24 aggressive and 12 nonaggressive subjects who comprised the control group participated in pretesting and posttesting only.

Dependent Measures

Data were collected on three categories of dependent variables: (1) aggressive children's judgments of intent, feelings of anger, and aggressive behavior in response to both hypothetical and actual peer provocation; (2) teacher ratings of aggressive behavior; and (3) number of formal referrals for school disciplinary action.

Hypothetical peer provocation.—A questionnaire was developed to examine subjects' attributions for hypothetical peer provocations. Adapted from Graham et al. (1992), the questionnaire consisted of five story themes that described a negative outcome occurring to the respondent, initiated

by a hypothetical peer provocateur, with the intent of the provocation manipulated to be either prosocial, accidental, ambiguous, or hostile. The negative outcomes included damage to one's property (e.g., a homework paper that gets soiled), physical harm (e.g., a hard push from a peer while playing baseball), and social rejection (e.g., making plans with someone who fails to show up). For example, the homework paper theme with an ambiguous intent read: "Imagine that as you walk onto the playground one morning, you notice that your shoelace is untied. When you set your notebook down to tie your shoelace, an important homework paper that you worked on for a long time falls out. Just then, another kid you know walks by and steps on the paper, leaving a muddy footprint right across the middle. This other kid looks down at your homework paper and then up at you." Prosocial intent was shown by the peer's statement that he stepped on the paper to prevent it from blowing away, accidental intent was conveyed by the peer's apology that he did not see the homework paper lying there, and hostile intent was depicted by the peer who stepped on the paper and then laughed.

For each scenario, subjects made six judgments. Three questions elicited judgments of the hypothetical peer's intent (e.g., "Do you think he did this on purpose?") to which subjects responded on seven-point rating scales anchored at "yes for sure" and "surely not." Two questions tapped negative affective/evaluative reactions to the peer provocateur: subjects rated how angry they would feel, as well as the degree to which they would blame the peer ("not at all—very much"). Finally, subjects were presented with six behavioral alternatives and asked to indicate what they would do first if the negative outcome described actually happened to them. The behaviors ranged logically along a continuum and could be categorized as prosocial ("do something nice for this other kid"), neutral ("do nothing; just forget it"), appropriately assertive ("ask the other person why he did that"), appealing to authority ("tell an adult"), indirectly hostile ("do something to get even"), and directly and immediately hostile ("have it out right then and there"). Behavioral choices were assigned values from 1 ("do something nice") to 6 ("have it out").

The attributional questionnaire consisted of the five story themes, each paired with an intent manipulation: one prosocial scenario, one accidental, one hostile, and

two that were of ambiguous intent. Five stimulus orders were created by varying the pairing of the five story themes with different intent conditions. In our previous research (Graham et al., in press) we found this story format to be a reliable method of eliciting biased intent attributions in a comparable group of aggressive African-American boys.

Approximately 1 month prior to the intervention, the attributional questionnaire was read aloud to subjects individually by one of four African-American women not associated with the treatment. Within 2 weeks after the completion of the intervention, a parallel form of the questionnaire, using different story themes, was individually readministered to each subject.

Laboratory analog task.—Responses to an actual peer were examined in a laboratory simulation. About 1 month after the intervention, aggressive subjects were brought individually to an unoccupied classroom to participate in a task supposedly unrelated to the earlier treatment. The task was run by the same two experimenters who had conducted the intervention, but each experimenter tested only subjects who had not been part of her treatment groups. The experimenter told the subject: "We're trying to make up a new game, and we want to see how easy or hard it will be for kids your age. Since we've been here before, we thought that we would come back, try the game out, and give you a chance to win a prize."

The subject communicated with an unseen (nonaggressive) male peer seated behind a barrier. Both students received simple grid maps depicting buildings and streets, and were told that they would take turns being direction giver and direction receiver. The receiver was to follow the directions so that he could arrive at a destination known only to the direction giver, with the goal of winning a prize. On the first trial, the peer was always assigned the role of direction giver, and the subject received directions and attempted to win the prize. But, unknown to either child, the peer's map was different from the subject's. Thus incorrect directions were necessarily given, the destination was not reached, and no prize was awarded.

While the two children engaged in the task, an observer unobtrusively recorded the subject's communications to the peer, which constituted the measure of aggressive verbal behavior. After the first trial, when it was

clear that the subject had not successfully completed the task, he provided judgments of the peer's intent and of his own feelings of anger on separate seven-point scales. Once these measures were collected, two additional trials of the task were administered, with the two participants alternating the roles of direction giver and receiver. On both of these trials, the direction receiver successfully reached the destination, and both participants received comparable prizes.

We chose this kind of referential communication task as the laboratory analog for several reasons. First, causal attributions have been found to be an important part of the listener's role and are closely tied to concerns for accuracy. Typically the listener makes judgments of intent when evaluating the accuracy of the speaker's message, and in competitive tasks the listener's major cognitive emphasis is judging communicative accuracy (Higgins, Fondacaro, & McCann, 1981). Second, research has demonstrated that this kind of task is well within the range of fourth graders and not strongly related to verbal or cognitive ability (Asher, 1979). Finally, this subject-to-subject interaction with the task of "telling how" is an ecologically valid analog of childhood interpersonal communication (Dickson, 1981).

Teacher ratings.—Two weeks prior to the onset of the intervention and again 2 weeks after its conclusion (i.e., 2 months later), classroom teachers rated each child's behavior using the previously described aggression, prosocial, and school performance subscales of Coie's (1990) Teacher Checklist. Although teachers were aware that students were removed from class to participate in the study, they were blind to the treatment condition for each student.

Formal disciplinary referrals.—A records search was conducted at each school site to determine the number of times subjects were referred to an administrator's office for formal disciplinary action. Logs were reviewed for the school year immediately preceding the intervention program (1989–1990) as well as for the school quarter following the intervention (January–March 1991).

Results

During the 4-month course of the study, subject attrition reduced the aggressive sample size by six, for a final *N* of 66. Four subjects in the attributional intervention moved

TABLE 1

AGGRESSIVE SUBJECTS' MEAN RATINGS OF INTENT, ANGER, AND BEHAVIOR AS A FUNCTION OF INTERVENTION GROUP AND CAUSAL SCENARIO CONDITION

GROUP	CAUSAL CONDITION							
	Hostile		Ambiguous		Prosocial		Accidental	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Intent:								
Experiment ^a	6.04	6.81	5.31	2.63 _a	2.55	2.05 _a	2.11	1.65
AttenTrng ^b	6.21	6.40	5.18	5.21 _b	2.65	3.10 _b	2.59	2.07
NoAttCont ^c	6.43	6.32	4.63	4.69 _b	2.22	3.14 _b	2.53	2.09
Anger:								
Experiment.....	6.75	6.78	5.51	3.39 _a	2.50	1.78 _a	3.22	2.25
AttenTrng.....	6.71	6.57	5.53	5.31 _b	3.11	3.09 _{ab}	3.52	2.32
NoAttCont.....	6.73	6.46	5.18	4.71 _b	3.10	3.67 _b	3.06	2.50
Behavior:								
Experiment.....	4.90	5.26 _a	4.45	2.85 _a	2.63	1.79	2.90	2.63
AttenTrng.....	4.96	4.96 _{ab}	4.23	3.81 _b	2.60	2.36	2.91	2.64
NoAttCont.....	4.63	4.38 _b	3.81	3.65 _b	2.30	2.16	2.63	2.91

NOTE.—Subscripts denote differences within columns at $p < .05$. Higher numbers indicate greater hostile intent, anger, and aggression.

^a $n = 20$.

^b $n = 22$.

^c $n = 24$.

away, and two attention training subjects withdrew because of scheduling conflicts. Thus the data of 20 subjects in the attributional intervention, 22 attention training subjects, and 24 control group subjects were analyzed.

Hypothetical Peer Provocation

At both pre- and posttesting, ratings on the three measures of intent were highly correlated within a story theme (average $r = .64$). These judgments were therefore combined into a single intentionality index, with an alpha coefficient of .88. Ratings of anger and blame were similarly interrelated (average $r = .73$) and were also combined to create a single index of negative affect with an alpha coefficient of .81.¹ Aggressive subjects' judgments of intent, reported feelings of anger, and behavior tendencies given prosocial, accidental, ambiguous, and hostile intent were then examined in separate 3 (treatment group) \times 2 (time of measurement) \times 4 (causal condition) analyses of variance (ANOVA) with repeated measures on the second two factors (see Table 1).

Findings for all three variables were quite similar. There were main effects of causal condition for each judgment: intentionality, $F(3, 189) = 252.44$; anger, $F(3, 189) = 179.55$; and endorsement of aggressive action, $F(3, 189) = 107.70$ (p 's $< .0001$). Table 1 shows that these aggressive youth were all quite sensitive to the causal cues depicted in the scenarios. The highest ratings for attributions to malicious peer intent, anger, and aggression were reported in the scenarios of hostile peer intent. Prosocial and accidental negative outcomes, in contrast, resulted in substantially lower ratings, and judgments about ambiguously caused peer provocation were between these two extremes. These effects replicate our previous findings (Graham et al., in press) using a similar attributional questionnaire.

The effects of the intervention were quite systematic, as revealed by the significant group \times time \times causal condition interaction for each variable: intentionality, $F(6, 122) = 10.17$; anger, $F(6, 122) = 4.32$; and behavior, $F(6, 122) = 3.84$ (p 's $< .01$).

¹ In adult attribution research, both blame and intentionality are often considered to be causal judgments, although theoretical distinctions remain unclear (see Shaver, 1985). With our aggressive subjects, however, judgments of blame more closely resembled an affective reaction. Blame was highly correlated with anger, not intent ($r = .35$). The decision was therefore made to combine blame and anger into one affective index.

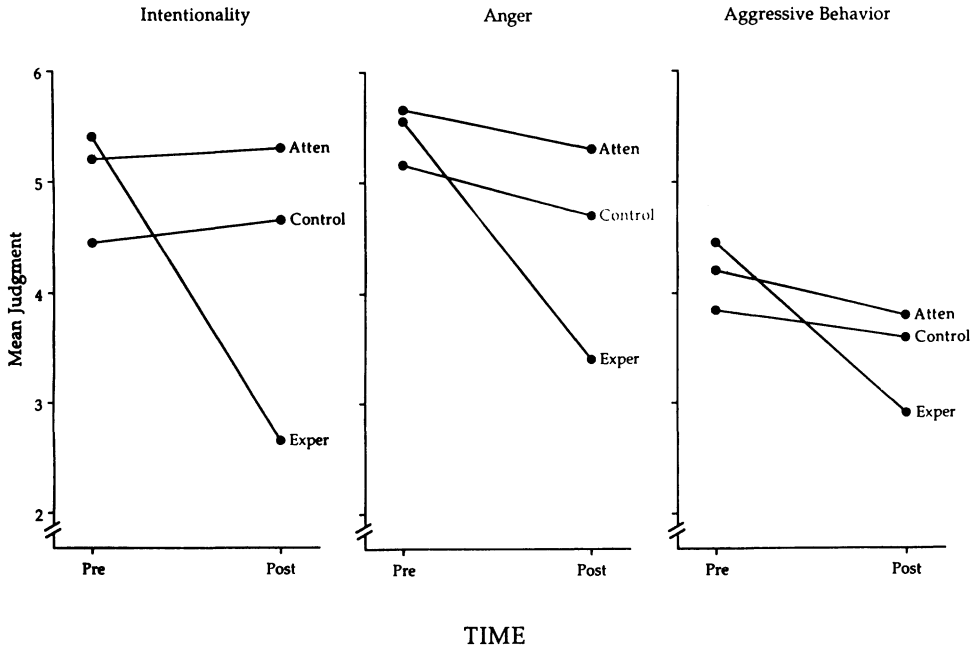


FIG. 1.—Aggressive subjects' ratings of intentionality, anger, and preferred behavior for the ambiguous scenario, as a function of time of measurement and intervention type.

Simple effects analyses indicated that the attributional intervention influenced aggressive subjects' judgments in the ambiguous stories only. Ratings in the other three causal conditions did not change significantly from pre- to posttest for any treatment group.

The meaning of these three-way interactions is displayed graphically in Figure 1, which shows judgments for each variable in the ambiguous causal conditions as a function of treatment group and time of measurement. The first panel of data shows that before the intervention, all aggressive children rated the hypothetical peer provocateur's intent in the ambiguous scenario as relatively hostile ($M = 5.04$ on a seven-point scale). Postintervention measures revealed, however, that only the boys who participated in the attributional change program significantly altered their judgments in the direction of less perceived intentionality, $t(19) = 8.08$, $p < .001$. These ratings did not change significantly for children in the attention training and control groups (both t 's < 1).

The same pattern prevailed for anger and behavior data, shown in the second and third panels of Figure 1. Following the intervention, aggressive experimental group boys reported significantly less anger, $t(19) = 5.75$, $p < .001$, and less endorsement of hos-

tile behavior, $t(19) = 3.01$, $p < .05$. These ratings did not decrease significantly for either of the other two treatment groups (t 's < 2 , p 's $> .05$).

Relative contribution of variables.—The intent, anger, and behavior ratings from the ambiguous scenarios were next analyzed to determine their relative contribution to the overall difference between treatment groups. Change scores were first calculated by subtracting postintervention from preintervention ratings, and a multivariate analysis of variance (MANOVA) was conducted with the change scores as multiple dependent variables and treatment group as the independent variable. This analysis revealed a significant effect of the intervention, $F(6, 122) = 5.86$, $p < .001$, with 33% of the multivariate variance explained by treatment group membership.

A stepdown analysis, analogous to stepwise multiple regression, was next conducted to determine each variable's independent contribution to the shared multivariate variance. In stepdown analysis, the highest priority variable is tested in univariate ANOVA, and all subsequent variables are tested in a series of analyses of covariance (ANCOVA) (Tabachnik & Fidell, 1989).

TABLE 2

STEPDOWN TESTS FOR DIFFERENCE SCORES OF AGGRESSIVE SUBJECTS IN THE AMBIGUOUS CAUSAL CONDITION ($n = 66$)

Variable Entered	Univ F	df	Stepdown F	df
Intent.....	19.14*	2/63	19.14*	2/63
Anger.....	8.00*	2/63	.359	2/62
Action.....	8.17*	2/63	.627	2/61
Anger.....	8.00*	2/63	8.00*	2/63
Intent.....	19.14*	2/63	9.20*	2/62
Action.....	8.17*	2/63	.627	2/61

* $p < .01$.

A comparison of the univariate and step-down F 's reveals that controlling for changes in intent attributions removed significant group differences in reported anger, and controlling for either intent or anger removed group differences in aggressive action tendency (see Table 2). On the other hand, entering reported anger as the highest priority variable did not eliminate significant group differences in perceived intent (univariate $F = 19.14$, stepdown $F = 9.20$, both p 's $< .01$). These analyses indicate that the variability among treatment groups both in reported affect and behavior choice is best explained by differences in attributions to intent.

Actual Peer Provocation: Analog Task

Recall that each aggressive subject experienced goal frustration at the hands of an

unseen peer partner, and there was some uncertainty about the partner's responsibility for that outcome. Aggressive boys who had participated in the attributional intervention were significantly less likely, $F(2, 64) = 9.85$, $p < .001$, to infer that the unseen peer had intentionally caused them to fail than were the other two groups, who did not differ from one another (see Table 3). The ANOVA on affect ratings failed to reach significance, $F(2, 64) = 2.15$, $p < .15$, although the data were in the expected direction, with less intense anger reported by experimental subjects.

Subjects' verbal behaviors during the task were subsequently coded as one of four types: *neutral*, defined as nonjudgmental statements (e.g., "That road is a dead end"); *complaint*, which captured negative com-

TABLE 3

ATTRIBUTIONS OF INTENT, REPORTED AFFECT, AND BEHAVIORS IN THE ANALOG TASK AS A FUNCTION OF INTERVENTION GROUP

VARIABLE	INTERVENTION GROUP		
	Experimental Treatment ^a M	Attention Training ^b M	Control ^c M
Intent attributions...	2.25 _a	4.45 _b	4.72 _b
Reported anger	1.65	2.48	2.62
Behaviors:	($n = 31$)	($n = 41$)	($n = 48$)
Neutral (%).....	61	29	31
Complain (%).....	19.5	24.5	31
Criticize (%).....	19.5	29	23
Insult (%).....	0	17.5	15

NOTE.—Means within rows with different subscripts differ significantly at $p < .05$. Higher numbers indicate greater presumed hostility and reported anger. Behavioral data are expressed as percentages of total behaviors for each group. Total behaviors for each group are listed as the first entry in each percentage column.

^a $n = 20$.^b $n = 22$.^c $n = 24$.

TABLE 4
TEACHER RATINGS OF AGGRESSIVE SUBJECTS' BEHAVIOR AS A FUNCTION
OF INTERVENTION GROUP

INTERVENTION GROUP	SUBSCALE			
	Total Aggression	Reactive Aggression	Prosocial Behavior	School Behavior ^a
Experimental:				
Pre	27.55	11.05	13.05	14.80
Post	24.05	9.55	14.65	14.40
Attention:				
Pre	24.05	10.18	14.00	14.45
Post	26.23	12.27	14.73	14.82
Control:				
Pre	26.83	11.38	14.79	13.17
Post	25.71	11.13	15.62	12.17

^a Higher numbers indicate more negative school behavior.

ments regarding the subject's own performance (e.g., "I can't do this"); *criticize*, defined as negative remarks to the peer about his performance (e.g., "You obviously don't know how to read a map"); and *insult*, which described negative personal comments directed toward the peer (e.g., "You're dumb").

Neutral comments were by far the preferred verbal behavior of experimental subjects (61%), and not one of these children resorted to insult. Among the two comparison groups of subjects, the four classes of behavior were more evenly evoked, with approximately one in six responses classified as an insult.

The four verbal behaviors were also combined into a composite score for each subject by assigning numerical weights to each category of behavior. Neutral and insulting behaviors, considered the strongest contrast between instrumentally appropriate and inappropriately aggressive behavior, were assigned weights of 1 and -1, respectively. Complaining and criticizing received weights of .5 and -.5, to reflect more moderate levels of behavioral intensity. An ANOVA on these data revealed a significant effect of treatment group, $F(2, 64) = 5.01, p < .01$. Boys who had participated in the experimental intervention received higher scores ($M = .91$) than either attention training ($M = .24$) or control group boys ($M = .35$), who did not differ ($p > .05$). In sum, the data from the laboratory analog task indicate that the effects of the intervention did generalize to an actual situation of ambiguously caused peer provocation.

Teacher Ratings of Behavior

Before and after the intervention, subjects were rated by their classroom teacher (who was blind to experimental condition) on the previously described four subscales of the Teacher Checklist (Coie, 1990). The eight-item aggression subscale was first analyzed in a 3×2 (treatment group \times time of measurement) repeated-measures ANOVA. The analysis yielded a significant group \times time interaction, $F(2, 63) = 3.48, p < .05$. Only aggressive boys in the experimental group were rated by their teachers as significantly less aggressive following the intervention, $t(19) = 2.63, p < .05$. Differences in teacher ratings were not significant for either the attention training or control group (see Table 4).

Scores on the prosocial, school performance, and reactive aggression subscales were next analyzed in a 3×2 (group \times time) multivariate analysis of variance (MANOVA). There was a significant group \times time interaction, multivariate $F(2, 126) = 2.85, p < .05$, which was explained entirely by univariate differences on the reactive aggression subscale, $F(2, 63) = 3.76, p < .05$. Teacher-rated prosocial and academic behavior were unaffected by the intervention, while perceived reactive aggressiveness declined at postintervention for only experimental group subjects, $t(19) = 2.32, p < .05$.

Office Referrals

A records search of office referrals for formal disciplinary action was conducted in order to examine the impact of the intervention on ecologically valid, school-based antisocial behavior. These records represent re-

TABLE 5
 FREQUENCY OF OFFICE REFERRALS AS A FUNCTION OF INTERVENTION GROUP

TIME OF MEASUREMENT	TREATMENT GROUP			TOTAL
	Experimental	Attention	Control	
Pre ^a	158 (40%)	105 (26%)	136 (34%)	399
Post ^b	22 (41%)	13 (25%)	18 (34%)	53

NOTE.—Percentages sum across rows to 100%. Experimental aggressives $n = 20$, attention aggressives $n = 22$, control aggressives $n = 24$.

^a Covers a 9-month period.

^b Covers a 3-month period.

ferrals for all types of infractions, including physical and verbal aggression, disruptiveness, deliberate disobedience, theft, and vandalism.²

The intervention had no effect on the overall pattern of formal disciplinary action, $\chi^2(2, N = 66) = .09$, N.S. (see Table 5). Intervention subjects who were frequently sent to the principal's office before retraining were just as likely so be so disciplined within the first 3 months after the intervention was over.

Comparison with Nonaggressives

Data on nonaggressives were analyzed to both examine what effects participation in such a program might have on their perceptions and behavior and to provide a standard of comparison for positive changes in the thoughts, feelings, and behavior of aggressive participants in the experimental intervention. Hypothetical scenario data revealed that, prior to the intervention, all aggressive subjects differed significantly from all nonaggressives only in their judgments of the ambiguous scenarios. Aggressives were more likely to infer hostile intent ($M's = 5.04$ vs. 2.53), report feeling angry ($M's = 5.32$ vs. 3.61), and endorse retaliatory aggression ($M's = 4.17$ vs. 2.73) (all $p's < .001$). This finding replicates previous research and attests to the power of our scenario instrument to discriminate between the two status groups. Nonaggressive subjects' judgments of the ambiguous scenarios did not change significantly from pre- to postintervention as a function of intervention type. Separate repeated-measures analyses of variance (ANOVA) yielded nonsignificant group \times time interactions for judgments of intent, $F(2, 32) = .58$, N.S.,

anger, $F(2, 32) = .15$, N.S., and endorsement of aggressive behavior, $F(2, 32) = 1.61$, N.S. Moreover, after the intervention, ambiguous scenario ratings of aggressive participants in the experimental treatment were most similar to nonaggressives (see Table 1). The effect of the treatment on aggressive subjects was to alter their judgments in the direction of nonhostility, so that they alone among aggressives were comparable to nonaggressives.

All subscales of teacher ratings differed significantly by status group prior to intervention. Subjects initially classified as aggressive were rated by their current teachers as more aggressive overall ($M's = 26.15$ vs. 14.53), more prone to aggressive retaliation ($M's = 10.88$ vs. 6.18), more likely to display negative school behavior ($M's = 14.11$ vs. 10.47), and displaying fewer prosocial behaviors toward peers ($M's = 13.94$ vs. 17.00) when compared to subjects designated nonaggressive. At the close of intervention, teacher ratings of nonaggressive subjects did not change significantly as a function of intervention type (posttest $M's = 15.41$, 6.29, 10.44, and 16.06 for overall aggression, reactive aggression, negative school behavior, and prosocial behavior, respectively; all $p's > .05$). Although experimental group aggressive subjects showed significant reductions in teacher ratings of aggression (see Table 4), they were still rated as significantly more aggressive than all nonaggressive subjects, $F(1, 94) = 11.82$, $p < .01$.

Finally, status group differences in the frequency of office referrals were evident both before and after the intervention, $F(1, 87) = 51.09$, $p < .001$. During the year prior to intervention, aggressive subjects ac-

² Office referral records were accessible only as year-long summaries for the school year preceding the experiment. Furthermore, no breakdowns concerning the nature of the student transgression were made available to us.

counted for 87% of office referrals for the total sample. This ratio did not change significantly in the 3-month period following the intervention, $\chi^2(2, N = 101) = .49, N.S.$

Discussion

Guided by our grounding in attribution theory, we designed the study reported here to answer two basic questions not yet addressed in the peer aggression literature. First, is the aggressive child's tendency toward biased attributions amenable to retraining efforts? And if so, will such retraining have a significant impact on aggressive behavior? Our results indicate that both questions can be answered in the affirmative, and these answers suggest a causal relation between biased cognition and aggressive behavior.

Compared to their counterparts in the attention training and control groups, aggressive subjects in the attribution retraining program showed a marked reduction in both the bias to presume hostile intent and a preference for aggressive behavior in both hypothetical and laboratory simulations of ambiguous provocation. Furthermore, aggressive intervention subjects were rated as significantly less aggressive by their teachers, who remained blind to treatment condition throughout the study. Even in the achievement change literature, there are few studies that report such clear cognitive and behavioral change based on an attributional intervention. Previous research on the relation between aggressive behavior and attributional bias has been correlational and thus unable to speak directly to the causal role of biased information processing in generating aggressive behavior. This may be one of few, if not the only, documented study with children that shows positive effects of specific attribution retraining on subsequent social behavior. As such, it supports the hypothesis that attributional bias regulates aggression.

Prior intervention research suggests that the success attained by a particular treatment may depend on a "close fit between the content of the intervention and the social deficiencies of the intervention sample" (Coie, 1985, p. 149). The attribution retraining program developed for this study supports such a conclusion. For example, teacher ratings on general prosocial behavior and academic performance, domains of competence not pertinent to the intervention, did not change from pre- to postintervention. Nor were there changes in children's attributional inferences in the

hypothetical social dilemmas that were manipulated to be of prosocial, accidental, or hostile intent (see Table 1). Both before and after the intervention, all of the aggressive children in our research "correctly" perceived prosocial and accidental peer provocations as unintended and hostile provocations as maliciously caused. On the other hand, previous research indicates that aggressive children have the greatest problems with accurate inferences about others' intent in situations of attributional ambiguity (e.g., Dodge, 1980; Graham et al., in press). Therefore, we are impressed by the finding that the intervention was most sensitive to this particular dimension of social cognitive deficit. Focusing on one specific cognitive antecedent of aggression at a time may prove more manageable in developing interventions than approaches designed to simultaneously address the multitude of social cognitive processes linked to aggression.

Related to the issue of intervention and sample "fit," our program had no deleterious effects on nonaggressive participants. Their judgments of hypothetical scenarios and teacher ratings of their behavior remained stable over the duration of the program. Kazdin (1987) has cautioned those conducting programs of primary prevention to assure themselves that their treatments are not creating negative behaviors among their subjects. Increases in aggressive behavior among nonaggressive subjects are not generated by the attributional treatment reported here.

While our results clearly support the importance of cognitive change for aggressive subjects, the data are not so convincing with regard to emotional change. We had anticipated that anger might mediate the relation between perceived intent and aggressive action; that is, the effect on behavior of changes in judgments of intent would be accounted for by changes in reported anger. However, the stepdown analyses of the hypothetical data showed the relatively noncentral role of anger after taking into account changes in perceived intent. And in the laboratory task, reported anger (unlike perceived intent) was relatively uninfluenced by participation in the experimental intervention. It may be that the self-report measure was not sufficiently sensitive for this population, which has been found to have difficulty in identifying anger within the self (Goldstein & Glick, 1987). Thus, from a treatment perspective, we are less sure about the effectiveness of interventions

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that focus on emotional change (e.g., anger control) in the absence of accompanying cognitive change. It may also be the case that anger does not always follow attributions to hostile intent. From a theoretical perspective, then, we remain uncertain about the role of anger as an antecedent to peer aggression.

The Limits of Attributional Change

It must be acknowledged that the major outcome variables involved either hypothetical judgments or a simulation, and these data were not collected longitudinally. The single "real-world," follow-up behavioral variable, office referrals, was not influenced by the intervention. Three months after the intervention ended, experimental subjects were just as likely to be sent to the principal's office for inappropriate behavior as they were during the school year prior to the intervention. Inasmuch as office referrals were made for any number of student transgressions (peer aggression, defiance of authority, vandalism, and theft), in retrospect it seems unlikely that this measure would be influenced by changes in attributional beliefs. In this report, therefore, follow-up data are insufficient to establish the maintenance of behavior change beyond the period of posttreatment assessment. Future research must develop more sensitive indicators and include multiple measures to address the questions of maintenance and generalizability. As one alternative, naturally occurring peer interactions (e.g., playground activities) may be appropriate contexts for observing behavioral indicators of treatment efficacy.

We also acknowledge that some might see our intervention program to be comprised of independent attribution retraining and social decision making elements, thus obscuring the causal path we have drawn between attributional bias and aggressive behavior. Given a bidimensional intervention, the behavioral change may have resulted from either improved response decisions or unbiased cognitive appraisals. However, our stepdown analyses did not reveal behavioral changes in the absence of changes in judgments of intent, as would be expected if only decision making were affected. This intervention was designed as a unified program linking attributional change to behavioral change, and our outcome data support the proposed causal relation between cognition and behavior. Future research, however, might compare the relative effects of attribution retraining programs that differ in curriculum content.

As with any intervention, not all of the boys who participated in the attributional treatment experienced beneficial effects. Hence, there are probably individual differences within the sample labeled as aggressive that make some children more likely than others to profit from attributional change. Along these lines, Dodge has suggested that a distinction should be made between children who are reactively aggressive (those who respond impulsively to perceived provocation) versus proactively aggressive (those who instigate hostile behavior without provocation), for it is only the former type of aggressive boy who is likely to benefit from an intervention focused on altering cognitions about peer provocation (Dodge, 1991; Dodge & Coie, 1987).

It is also important to consider the efficacy of attributional change within the broader sociocultural context from which our subjects were drawn. This was made clear to us in our posttreatment debriefing, when we interviewed some of our experimental subjects who did not benefit from the intervention (i.e., teacher ratings of aggression did not change following the treatment and inferences about others were not altered in the direction of less perceived intentionality). One such subject poignantly described the danger of playing after school at the local park where "gangbangers are in there at certain times, smoking crack and acting wild. They take our balls and stuff if they catch us." Later in the interview, this same 10-year-old boy disclosed his belief that aggressive retaliation is usually justified because "if somebody does something to you, then you got to show them that they can't get away with it."

For some of our young research participants, violence and aggression are part of everyday experience. It is therefore unclear to what extent being quick to assign blame or having a low threshold for retaliatory behavior might operate as genuine survival strategies for coping with the perilous conditions that have become common in racially isolated, economically depressed, inner-city neighborhoods. Some children by the age of 10 or 12 are already so traumatized by the conditions of their existence that an intervention based on attributional change is likely to have insufficient impact on their lives to change their behavior.

We raise this issue partly because it has become common practice for studies of attributional bias to include large numbers of Af-

frican-American males in their samples. This is not surprising since these boys are overrepresented among school-aged children labeled as aggressive (Reed, 1988). But often the racial characteristics of the sample are noted only parenthetically as part of the sample description. These studies rarely attempt to relate their findings to social conditions relevant to the sampled population. African-American boys are a highly diverse group of individuals, some of whom might benefit from an attributional change program such as the one presented here. On the other hand, we also recognize that for some boys labeled similarly as aggressive this intervention would be neither viable nor appropriate. In sum, we remain cautious in our belief about the efficacy of attributional retraining as a treatment for childhood aggression, as well as acutely aware of the complex array of nonattributional (and nonsocial cognitive) factors that are known determinants of aggression among African-American youth.

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