AN ATTRIBUTION RETRAINING PROGRAM TO REDUCE AGGRESSION IN ELEMENTARY SCHOOL STUDENTS

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The BrainPower Program, an attribution retraining intervention to reduce peer directed aggression, was implemented in four elementary schools in Southern California. We collected measures of children's behavior and self-reports of attributions for 12 months following the intervention to assess changes in social cognition and social behavior. Results suggest that improvements in behavior are related to changes in subjects' attributions. The intervention effects are moderate to strong for many students but not evident at all for some students. Further, treatment effects diminished over time. Results are discussed in terms of the role of psychological theory in intervention research. © 1998 John Wiley & Sons, Inc.

Children who display high rates of aggression are at substantial risk "because of the developmental continuity in patterns of aggressive behavior" (Feshbach & Fraczek, 1979, p. 2). Excessive levels of aggressive behavior in childhood are extremely stable over time (Kazdin, 1987; Olweus, 1979) and are often followed by a host of negative developmental outcomes. Longitudinal data have described a linear pattern of behavioral development that may lead from high rates of problem behaviors in the early years (e.g., pushing others in toddlerhood) to violence in adolescence (e.g., assault with an object; Patterson, 1992). For example, children who are highly aggressive in school settings, males in particular, are more likely than less aggressive children to engage in significantly higher rates of juvenile delinquency as they grow older (Loeber & Stouthamer-Loeber, 1987). These boys are also more likely to experience poor overall school adjustment, peer rejection, greater than average rates of school drop out, and higher than average rates of referral for clinical mental health interventions (Kupersmidt & Coie, 1990). In fact, surveys of child guidance clinic populations have determined that "excessive and inappropriate aggression . . . . poses one of the most common and serious problems of children referred for treatment" (Nasby, Hayden, & DePaulo, 1980, p. 460). Thus, the consequences of high levels of childhood aggression can be extremely damaging to perpetrators as well as their victims.

REDUCING AGGRESSIVE BEHAVIOR IN SCHOOL

Educators and researchers alike have turned their attention to developing effective means for reducing excessive displays of childhood aggression in school settings. One familiar strategy for reducing aggression in school is to simply suspend or expel highly aggressive students (Reed, 1988). Tragically, although removing troubled and troubling students may provide symptomatic relief for schools, such strategies ignore the root causes of aggressive behavior and banish those children who are most in need of the benefit of a strong academic foundation, a caring school environment, and positive peer relations.

A variety of school-based intervention programs are also being used in schools across the country to help aggressive children change their behavior (e.g., Hudley & Graham, 1993). Programs that take a person-centered approach (Durlak, 1995) can generally be categorized as reducing impulsiv-

ity, reducing negative affect, enhancing social skills, or comprehensive, multicomponent programs (also see Larson, 1998).

Interventions to reduce impulsivity presume that reactive aggression can be reduced by teaching children to use self-talk to plan and direct their own behavior (Camp & Bash, 1981). Programs that address negative affect work to reduce children's feelings of anger by having them either engage in covert self-talk, which is presumed to have a calming effect (Lochman, Lampron, Gemmer, & Harris, 1987; Novaco, 1978), or redefine the feeling to something other than anger (Feindler, 1986). Programs to improve social skills generally focus on developing cognitive problem solving skills (Guerra & Slaby, 1990; Spivak, Platt, & Shure, 1976), specific social behaviors (e.g., questioning, praising, group entry tactics), and/or supportive friendships (Selman & Schultz, 1990). The assumption is that excessively aggressive youth lack social interaction skills (Kazdin, 1985). Comprehensive programs may target secondary prevention efforts to a specific population of youth (e.g., delinquent, emotionally disturbed; Goldstein & Glick, 1987), or they may target a more general school, region, or age range for an array of support services that function as primary prevention (McCord & Tremblay, 1992; Peters & McMahon, 1996). However, outcome evaluations for many school-based prevention programs have often suffered from significant methodological flaws, including lack of placebo control groups, nonrepresentative samples, limited or nonexistent follow-up data and unreliable assessment instruments (Durlak & Wells, 1994; Kazdin, 1985; Urbain & Kendall, 1980). Comprehensive intervention programs are especially difficult to assess, as it is often impossible to determine which specific treatment element is actually responsible for any observed behavior change (Hudley, 1994a).

<div align="center">ATTRIBUTIONS AND AGGRESSION</div>

Attribution theory provides important insights into the display of high levels of aggression in childhood. In social situations, people try to understand how their own and others' behavior may cause the outcomes they experience in that situation. An attribution occurs when an individual assigns a cause to the behavior of others in a social interaction (Weiner, 1986). These causal attributions guide subsequent behavior because they facilitate decision making among possible courses of action (Kelley, 1973). Basic research in developmental psychology has generated a great deal of knowledge about the attributional antecedents of reactive aggression among children and adolescents; thus, principles of attribution theory may be especially helpful in designing programs to reduce childhood aggression.

Children are typically able to accurately attribute accidental and deliberate intent by age 5 or 6 years(Shantz, 1983). However, it has been convincingly demonstrated that highly aggressive children often incorrectly attribute deliberately hostile intentions to peers (see Hudley, 1994a, for a review). For example, if asked to imagine being bumped by a peer while walking in the hallway at school, excessively aggressive children stated that the bump was "on purpose" more than twice as often as a less aggressive peer (Graham, Hudley, & Williams, 1992; Hudley & Graham, 1993) in the absence of any information regarding the cause of the bump. Less aggressive children most often presumed accidental causation or requested additional information (Waas, 1988). In ambiguous situations such as this example, highly aggressive boys typically made their social decisions quickly, ignored available social cues, and endorsed retaliatory aggression (Crick & Dodge, 1994). Thus, excessively aggressive boys may justify their endorsement and subsequent use of unwarranted aggressive retaliation by means of hastily made, inappropriate judgments about the intent of others. Of course, any child who believes that a peer has been intentionally harmful might be expected to retaliate with aggression. However, highly aggressive boys assume, often inappropriately, that peers' negative behavior toward them is most likely guided by hostile intentions and thus deserving of aggressive retaliation.

Biased attributions may explain why these boys are more likely to retaliate aggressively in inappropriate circumstances. Conversely, prior research found that children with a reputation for extreme aggression among peers were more likely to receive hostile attributions themselves from peers and to be the objects of retaliatory aggression (Dodge & Frame, 1982). A hostile attributional bias may therefore follow logically from aggressive boys' actual experiences with peers because children with a reputation as aggressive evoke a markedly more hostile environment in which they must interact. Aggressive boys' memories of previous social encounters lead them to expect hostile aggression from peers. In ambiguous situations (i.e., the intent of the peer is unclear), typical of childhood, the higher probability of aggression form others and their own biased attributions may lead them to retaliate aggressively. Peers also carry information about past behavior that leads them to expect aggression from aggressive boys. Consequently, they attribute hostility to these aggressive boys and behave aggressively toward them. Their behavior, in turn, strengthens the belief of aggressive boys that peers behave with hostile intention, which increases their tendency to retaliate aggressively in the next ambiguous situation. The reciprocal nature of the aggression must be somehow distorted, however, as prior observational data demonstrated that aggressive boys were far more often initiators than victims (Dodge, Pettit, McClaskey, & Brown, 1986). Because causal attributions may determine subsequent aggression among boys, programs that seek to modify patterns of attribution may be an important strategy for school-based prevention and intervention programs.

This Study

The wealth of empirical evidence connecting attributional bias to inappropriate aggression suggested that attribution retraining might successfully reduce childhood aggression by reducing or eliminating biased judgments of a peer's intent. The current study was designed to investigate that presumed link between attributions and aggression. The curriculum used in this study, the Brain-Power Program (Hudley, 1994b), is founded on two fundamental assumptions: Aggressive children can learn to recognize accidental causes in interactions with peers, and when negative outcomes are attributed to accidental (i.e., nonhostile causes, anger and aggression will become unlikely). Thus, we expected attributional change to reduce inappropriate retaliatory aggression, which should enhance peer relations and school adjustment for at-risk children. We hypothesized that boys would display lower levels of attributional bias after participation in the attributional intervention, as measured by a tendency to assign negative intentions to peers in hypothetical scenarios. We also expected intervention subjects to display significantly lower levels of aggressive behavior, as measured by teacher ratings of behavior, when compared to control group subjects.

Our hypotheses, however, were tempered by an understanding of the complex nature of aggressive behavior. There is clear evidence that multiple interpersonal processes contribute to the display of peer-directed aggression (Crick & Dodge, 1994). Initially isolating a single process linked to aggressive behavior (i.e., attributional bias) permitted a direct evaluation of the basic treatment component. The development of the BrainPower Program embodied a constructive treatment strategy (Kazdin, 1980) that focused on attributional change as a starting point. Ultimately, the program will be most effective as one part of a comprehensive intervention to reduce aggression and violence among children and adults (see Larson, 1998).

Method

Subjects

Study subjects were African American and Latino male elementary students ($N = 384$) enrolled in the third through sixth grades in four urban public schools in Southern California. The economic status of these students ranged from lower-middle class to those receiving public assistance. Each school had approximately 85% African American students, with the balance Latino students.

Participants were selected through a process involving a combination of teacher ratings and peer sociometric nominations. All students in general education classes who returned parent permission slips were eligible to participate in the sociometric activities. Students used a class roster to nominate peers who were liked least, liked most, and who represented any of five behavioral descriptors: three aggressive (starts fights, loses temper, disrupts the group) and two prosocial (works well with others, is helpful to others). From these nomination procedures, each child received a social preference score (liking minus disliking standardized scores), an aggression score (the mean of the standardized nominations for the three aggressive items), and a prosocial score (the mean of the standardized nominations for the two prosocial items). At the same time, teachers completed the 8-item aggression subscale of the Teacher Checklist (Coie, 1990) for each student enrolled in their class. Ratings were summed to produce a total aggression score with a range of 8–40. The higher the score, the greater the amount of perceived aggressiveness. Internal consistency for the subscale was quite high (Cronbach's $\alpha = .81$).

Boys were classified as aggressive ($n = 256$) if scores fell above the median on the teacher ratings of aggression, below the median on social preference scores, and at or above the 70th percentile on peer nominations of aggressive behavior. Nonaggressive subjects ($n = 128$) were those who fell at or below the median on teacher ratings of aggression and social preference scores, and at or above the 50th percentile on peer nominations for prosocial behavior. The inclusion of nonaggressive students served three purposes: (a) to negate stigmatization of aggressive subjects, (b) to provide positive peer models, and (c) to allow nonaggressive peers to reappraise their attributions and behaviors directed toward the aggressive students as they progressed through the program. Such interaction between aggressive students and their peers is considered critical to the generalization of program effects beyond the treatment setting (Bierman, 1986). However, primary prevention programs for antisocial behavior have in the past sometimes adversely affected subjects, perhaps by using culturally inappropriate programming, by stigmatizing subjects, or by fostering unrealistic expectations among subjects (McCord, 1992). The emergence of possible adverse effects was closely monitored, as nonaggressive youths participated fully in the intervention activities.

Both aggressive and nonaggressive subjects at each school were randomly assigned to one of three groups: the attribution retraining program ($n = 96$ aggressive and 48 nonaggressive), an attention group that received training in nonsocial problem solving skills ($n = 96$ aggressive and 48 nonaggressive), and a no-attention control group ($n = 64$ aggressive and 32 nonaggressive). All subjects were fully proficient in English, and none were receiving special education services at the start of the study (students receiving special education services were specifically excluded from the selection process). Baseline data revealed that aggressive subjects across the four school sites did not significantly differ by teacher ratings of behavior and student suspension rates.

Treatment: The BrainPower Program

The BrainPower Program is a 12-lesson intervention with materials and activities appropriate for grades three to six. Lesson 1 provided an introduction to the program; an icebreaker was also included to build group cohesion. Lessons 2–11 comprised the three training components. The first component (Lessons 2–6) were designed to strengthen aggressive boys' ability to accurately detect others' intentions. A variety of instructional activities trained subjects to search for, interpret, and properly categorize the verbal, physical, and behavioral cues exhibited by others in social situations. After the subjects gained some skills in the interpretation of social cues, the second component (Lessons 7–9) were designed to increase the likelihood that aggressive boys would first attribute negative outcomes to accidental causes. Students were taught to associate inconsistent or uninterpretable social cues with attributions to "uncontrollable" or "accidental" causes. The third component (Lessons 10–11) linked appropriate, nonaggressive behavioral responses to ambiguously

caused, negative social outcomes. Participants applied these newly acquired interpretive skills by making the connection between unbiased thinking and less verbally and physically aggressive behavioral responses. Students generated decision rules about when to enact particular responses (e.g., "When I can't really tell why he did that, I should act as if it were an accident"). Such decision rules enhance maintenance and generalization of newly acquired processing skills beyond the treatment setting. Lesson 12 presented a review of the concepts presented in the program and provided an informal social setting for the group's interaction.

At each of the four schools, the intervention subjects met with a different team of two group leaders during the course of the regular school day in a quiet place separate from the regular classroom. Groups of six students met twice weekly in 60-min sessions for a total of 12 lessons in 6 weeks. Each group consisted of four excessively aggressive and two nonaggressive students.

Instruments and Procedures

Teacher ratings. Teachers rated students' behavior using the teacher elementary version of the Social Skills Rating System (SSRS-T; Gresham & Elliot, 1990). Psychometric properties for this scale are excellent. The coefficient α reliability for the self control subscale is .91, and the 4-week, test—retest reliability coefficient is .80 (Gresham & Elliot, 1990). Some examples of items from the questionnaire are "controls temper in conflict situations with peers," "responds appropriately to teasing by peers," and "responds appropriately when pushed or hit by other children." Teachers rated students on a 3-point scale ranging from *never* (0) to *very often* (2). Scores were summed across the total items, and ranged from 0–20, with higher numbers indicating greater perceived self-control. Ratings were collected during the 2 weeks prior to intervention activities, during the 2 weeks immediately following intervention activities, approximately 6 months after intervention, and again 12 months after the close of intervention activities.

Student attributions. Students, working in small groups outside the regular classroom, completed a questionnaire containing three hypothetical scenarios at each assessment point. Each of the stories presented a negative outcome for the student and involved an unnamed peer in either accidental (one story) or ambiguous (two stories) situations. Situations include destruction of property (e.g., a ruined homework paper), physical harm (e.g., a hard push by a peer while playing baseball), and social rejection (e.g., a peer who never showed up). For example, one scene 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.

For each scenario, three questions assessed the student's judgment of intent (e.g., Do you think he did this on purpose?). We also had students rate perceived anger and behavior options; however, those data are not be included in this report. Previous research (Graham et al.,1992; Hudley & Graham, 1993) has found this story format to be a reliable method of eliciting biased intent attributions and discriminating between aggressive and nonaggressive subjects.

RESULTS

By the 12-month follow-up, subject attrition reduced the total sample size to 263 (68% of the original sample of 384). Thus, data reported here represent 168 aggressive students ($n = 66$, 79, and 23 for intervention, attention, and control groups respectively) and 95 nonaggressive students ($n = 37$, 47, and 11 for intervention, attention, and control groups, respectively).

Aggressive Students - Teacher Ratings
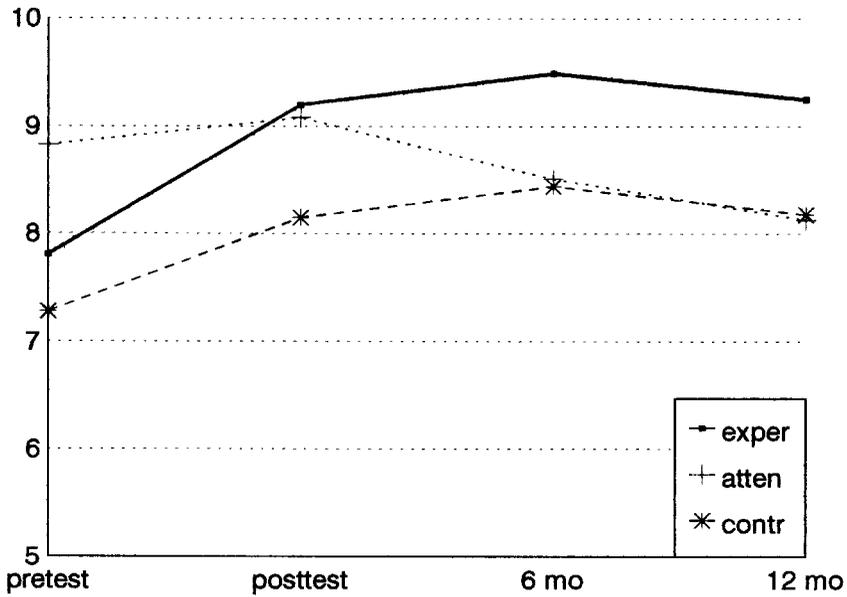
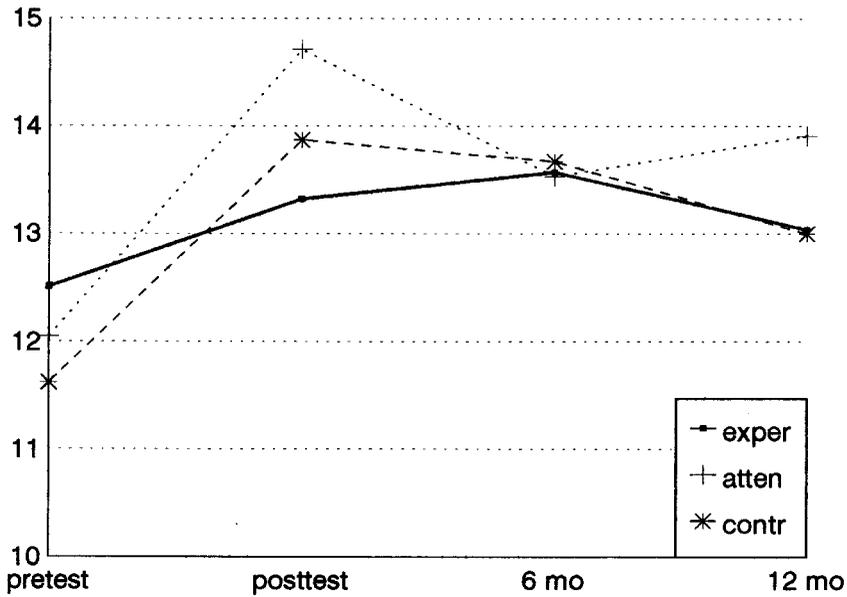## Nonaggressive Students - Teacher Ratings

FIGURE 1.   Mean teacher ratings of behavior as measured by the Social Skills Rating System. Lower numbers represent less self-control.

Teacher Ratings

The four teacher rating scores (pre- and post-intervention, as well as 6- and 12-month follow-up) were analyzed separately for aggressive and nonaggressive students with repeated measures analyses of variance (ANOVA), using intervention type as the grouping factor and time of measurement as the repeated factor. Scores for nonaggressive students did not differ significantly as a function of intervention type. For aggressive students, the group X time of measurement interaction did not reach conventional levels of statistical significance ($p = .14$). However, a visual inspection of group means suggested that over a 12-month interval following intervention activities, aggressive students who participated in the attributional program achieved and maintained improvements in teacher ratings of self control (see Figure 1). Scores for both comparison groups of students remained fairly consistent, with a slight decline for attention group students and a slight increase for control group students.

However, the statistical analysis of group means appeared to obscure the fact that some individual students' behavior had changed greatly as a function of the intervention, whereas other students may have received little benefit. Observed standard deviations, which ranged from 3.8 to 4.7, suggested wide variability in individual students' scores. To assess individual differences, we next tested for clinical significance. Clinically significant change (Jacobsen & Truax, 1991) implies movement on the part of treated individuals out of the dysfunctional population and into a functional, or normative, population (Jacobsen, 1988). Following Jacobsen and Truax (1991), clinical significance was operationally defined as a post intervention or follow-up score that falls closer to the mean of the normative population than to the mean of the dysfunctional population. We used pre-intervention ratings for the aggressive and nonaggressive students for the specified normative and dysfunctional populations. Our analyses revealed that improvement among individual students in the attributional intervention group occurred at a rate twice that of students in either comparison group from pre- to post-intervention assessment. Although in all groups some students' behavior declined to former levels by 12-month follow-up, that decline represents 50% of the comparison groups and only 28% of the attributional group (see Table 1 for percentage of improved students for each group).
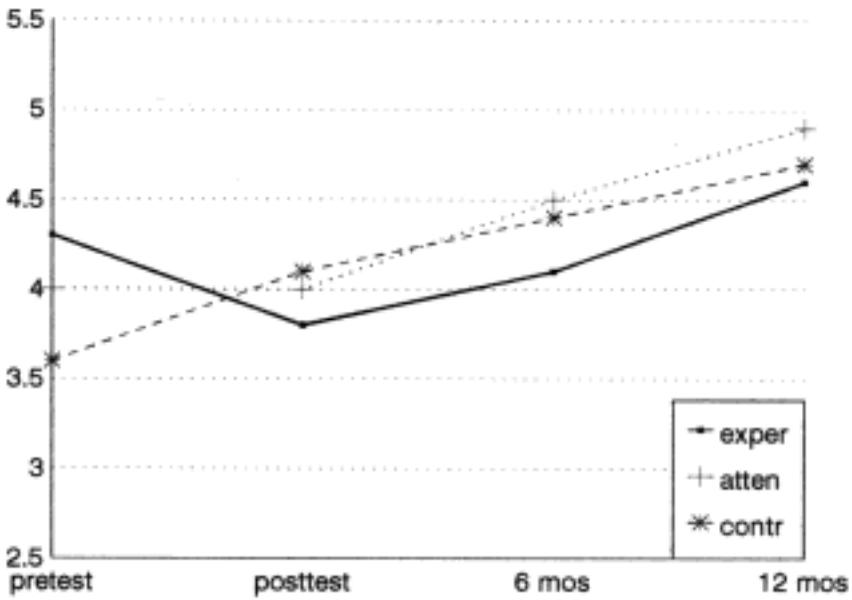
Judgments of Intent

Recall that each hypothetical scenario was accompanied by three questions that directly assessed intent: "Do you think he meant to do this? Do you think he did this on purpose? Do you think it is his fault that it happened?" We combined these three responses across the two scenarios that presented ambiguous situations to create a single, composite response index at each of the assessment points (pre and postintervention, 6-month and 12-month follow-up). Item intercorrelations ranged from a low of .31 to high of .74 (all $p < .05$).

Preliminary analyses were conducted on students' pre and postintervention judgments of intent (Hudley, 1995). At that time, separate repeated measures ANOVAs for aggressive and nonaggressive students' scores revealed a significant group X time of measurement interaction, $F (2, 150) = 3.25, p > .05$. Immediately following intervention activities, ratings by students in the attributional intervention declined significantly. Ratings by those in the attention program remained the same, and

Table 1
Percent of Clinically Significant Change in Teacher Ratings of Behavior

	Experimental Group	Attention Group	Control Group
Pre to Post	43%	21%	18%
12-month follow up	31%	12%	9%

Aggressive Students - Intent Judgments

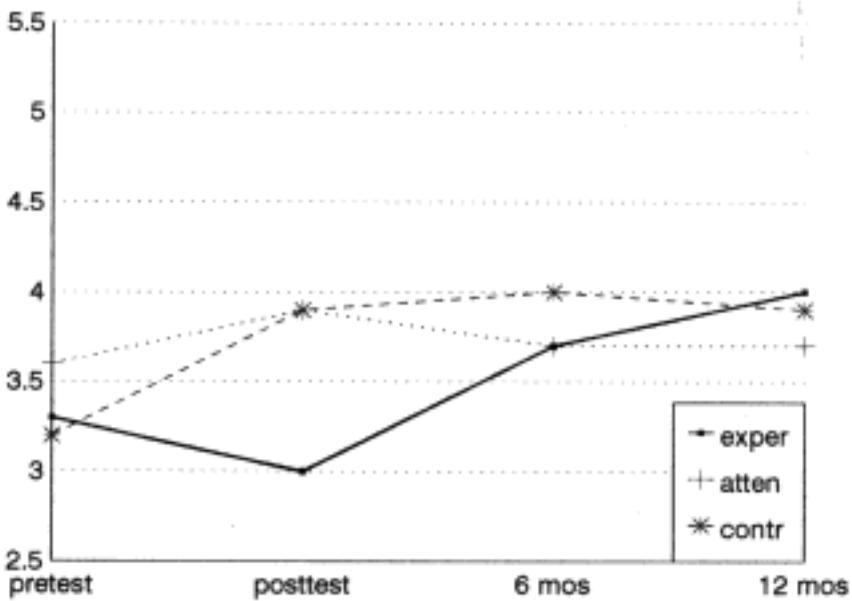## Nonaggressive Students - Intent Judgments

FIGURE 2.   Mean ratings for students' judgments of intent. Lower numbers represent less perceived hostile intent.

students in the control condition demonstrated increases in ratings of perceived hostile intent. However, full analyses were subsequently conducted at the close of the follow-up period, using intent judgment measures from all four assessment times. Although an inspection of means (see Figure 2) suggested some improvement for aggressive students in the attributional intervention, there were no statistically significant differences by group for either aggressive or nonaggressive students over the full 12-month period.

Relationships Between Intent Judgments and Teacher Ratings

Analyzing the two variables independently revealed short-term changes in attributions and relatively long-term improvements in behavior for aggressive subjects in the BrainPower attributional intervention. Therefore, our next set of analyses assessed the relationship between attributional change and behavior change. We computed a series of correlations between teacher ratings of behavior and student judgments of intent for aggressive students separately by intervention group. Correlations were also computed for all nonaggressive students. Concurrent relationships were assessed by correlating teacher and student measures taken at postintervention assessment, as well as at 6- and 12-month follow-up. Prospective relationships were assessed by correlating postintervention student measures with teacher ratings at 6- and 12-month follow-up.

For students in the attributional intervention, at post assessment the composite index of perceptions of intent was strongly negatively related to teacher ratings of self-control ($r = -.51, p > .01$). The concurrent relationship between the two variables persisted at 6-month follow-up ($r = -.28, p > .05$), but was no longer significant at 12-month follow-up. Attributions at postassessment were also related to teacher ratings at 6-month follow-up ($r = -.24, p > .05$); however, no other prospective relationships were significant. For aggressive students in the attention group, the concurrent relationship at 12-month follow-up was significant ($r = -.27, p > .05$). No other relationships were significant for the attention group. No significant relationships between attributions and teacher ratings of behavior emerged for the aggressive students in the control condition or for the nonaggressive students.

DISCUSSION

A great deal of empirical research has demonstrated that highly-aggressive children are more likely to presume that their peers behave toward them with hostile intentions. However, little research has investigated whether this attributional bias is amenable to change, or whether the reduction of this cognitive bias also significantly reduces aggressive behavior. Results reported here suggest that both questions can be answered in the affirmative.

Overall, these data suggest that participation in an attributional intervention, such as the BrainPower Program can improve the positive social behavior of ethnic minority males of elementary school age and that this behavior change is related to changes in students' perceptions of intent. Consistent with our original hypothesis, changes in self control, as rated by teachers, were greatest for students in the attributional intervention, and these behavioral improvements persisted across time. Further, subjects in the attributional intervention displayed reductions in judgments of hostile intent as hypothesized, although these changes were not maintained beyond postintervention assessment. However, behavior ratings were significantly related to student attributions. The correlational analyses suggest a causal relationship between attributions and aggression, in that earlier measures of intent related significantly to later measures of behavior, and this prospective relationship was true only for students who participated in the attributional intervention. A specific (i.e., nonhostile) attribution was related to concurrent as well as subsequent behavior.

Thus, our findings have important theoretical as well as practical significance. Relatively little data are available that speak directly to the causal role of biased information processing in generating aggressive behavior. This study, and others in this line of intervention research (Hudley, 1994b,

1995; Hudley & Graham, 1993) are among the few studies with children that experimentally manipulate features of social cognition to explore the theoretical relationships between cognition and behavior. The current study supports the hypothesis that cognitive bias serves an important regulatory function in displays of aggression among children.

As a practical solution to the problem of excessive aggression in school settings, these data suggest that the behavior of some students can be changed through participation in an attributional intervention conducted by school site staff. Further, the BrainPower Program offers a research-based curriculum, as mandated by the federally funded Safe and Drug Free Schools Program. No matter how successful a curriculum might be under experimental research conditions, ultimately it must be successfully implemented and evaluated in an ecologically valid context. Our current round of intervention was the first to be conducted by school site staff rather than university research staff, and results indicate that attribution retraining is a viable intervention option. Of note also is the finding that this program had no deleterious effects on nonaggressive subjects. 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.

Limitations

On a cautionary note, changes in attributions of intent among aggressive students are somewhat inconsistent, and differences between group means are of a relatively small magnitude. Clearly, not all of our intervention subjects experienced benefits from the program. Subsequent intervention research must work to identify individual differences within any sample of aggressive children that make some more likely than others to profit from an attributional intervention, perhaps in ways as suggested by Furlong and Smith (1998). For example, research on childhood aggression distinguishes between reactive (response to perceived provocation) and proactive (initiation of hostile behavior) aggression (Dodge, 1991). It seems reasonable to assume that only the former type of aggression will be effectively reduced by attributional interventions.

Further, recall that our original hypotheses were tempered by our realization that aggressive behavior is subject to multiple determinants. That fact is demonstrated most clearly in our data by the tendency for any treatment effects to have disappeared by 12-month follow-up. The ability of the BrainPower Program to reduce aggressive behavior independent of other intervention efforts will undoubtedly be limited in both power and duration of effects; the best treatment will be a comprehensive program. However, our constructive treatment strategy (Kazdin, 1980) will allow us to build an intervention package by independently evaluating both the separate and complementary effects of multiple components. We would recommend a similar strategy for education professionals who are developing or implementing programs that address behavior problems in children.

Finally, we must acknowledge the limitations of our sample. Participants were African American and Latino males, two groups frequently targeted for inquiry in the study of youthful aggression and violence. How our findings reflect the behavior of females, or of other ethnic and cultural groups is unclear. Parenthetically, this research should in no way be construed as an indictment of minority males. Although African American and Latino male youth are disproportionately both victimized by violence and engaged in violent criminal activities (Bureau of Criminal Statistics, 1990), these boys overall are a highly diverse group, and most of these youth seldom or never engage in excessive aggression or violence.

Sample attrition, which is an equally pressing problem typical of longitudinal research, may have had an impact on our results. Children with behavior problems are most likely to experience

school transience; thus our unlocated students may be those who are most troubled. Their absence in the follow-up samples may pose a significant source of bias. Future longitudinal research on intervention programs, including our ongoing analyses, must carefully compare the relevant characteristics of students who remain throughout follow-up with students who become unavailable after postassessment.

School-based interventions for aggression reduction, such as the BrainPower Program, may be important components of a strategy to improve the life chances of children at risk for deviant behavior during childhood. Such theory-driven, applied research creates an optimal synergy between theory and practice by marshaling the resources of scientific psychology to work for solutions to pressing social problems. The most successful interventions will be those that combine a theoretical understanding of human behavior and a practical understanding of the best methods of securing and maintaining behavior change. The future of our children demands no less.

References

BIERMAN, K. (1986). Process of change during social skills training and its relationship to treatment outcome. *Child Development, 57,* 230–240.

BUREAU OF CRIMINAL STATISTICS (1990). *Crime and delinquency in California, 1990.* Sacramento, CA: California Dept. of Justice.

CAMP, B. W., & BASH, M. S. (1981). *Think aloud: Increasing social and cognitive skills—A problem-solving program for children.* Champaign, IL: Research Press.

COIE, J. (1990). *Teacher checklist.* Unpublished manuscript.

CRICK, N., & DODGE, K. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115,* 74–101.

DODGE, K. (1991). Emotion and social information processing. In J. Garber & K. Dodge (Eds.), *The development of emotion regulation and dysregulation* (pp. 159–181). New York: Cambridge University Press.

DODGE, K., & FRAME, C. (1982). Social cognitive biases and deficits in aggressive boys. *Child Development, 53,* 620–635.

DODGE, K., PETTIT, G. S., MCCLASKEY, C. L., & BROWN, M. M. (1986). Social competence in children. *Monographs of the Society for Research in Child Development, 51* (2, Serial no. 213).

DURLAK, J. A. (1995). *School-based prevention programs for children and adolescents.* Thousand Oaks, CA: Sage.

DURLAK, J. A., & WELLS, A. M. (1994, October). *An evaluation of secondary prevention mental health programs for children and adolescents.* Paper presented at the First Annual Kansas Conference on Child Clinical Psychology, Lawrence, KS.

FEINDLER, E. L. (1986). *Adolescent anger control: Cognitive behavioral techniques.* New York: Pergammon.

FESHBACH, S., & FRACZEK, A. (1979). Changing aggression: The need and the approach. In S. Feshbach & A. Fraczek (Eds.), *Aggression and behavior change: Biological and social processes* (pp. 1–5). New York: Praeger.

FURLONG, M. J., & SMITH, D. C. (1998). Raging Rick to Tranquil Tom: An empirically based multidimensional anger typology for adolescent males. *Psychology in the Schools, 35*(3), 229–245.

GOLDSTEIN, A., & GLICK, B. (1987). *Aggression Replacement Training.* Champaign, IL: Research Press.

GRAHAM, S., HUDLEY, C., & WILLIAMS, E. (1992). Attributional and emotional determinants of aggression among African American and Latino young adolescents. *Developmental Psychology, 28,* 731–740.

GRESHAM, F., & ELLIOT, S. (1990). *The Social Skills Rating System.* Circle Pines, MN: American Guidance Service.

GUERRA, N., & SLABY, R. (1990). Cognitive mediators of aggression in adolescent offenders: 2. Intervention. *Developmental Psychology, 26,* 269–277.

HUDLEY, C. (1994a). Perceptions of intentionality, feelings of anger, and reactive aggression. In M. Furlong & D. Smith (Eds.), *Anger, hostility and aggression: Assessment, prevention, and intervention strategies for youth* (pp. 39–56). New York: Wiley.

HUDLEY, C. (1994b). The reduction of childhood aggression using the BrainPower Program. In M. Furlong & D. Smith (Eds.), *Anger, hostility and aggression: Assessment, prevention, and intervention strategies for youth* (pp. 313–344). New York: Wiley.

HUDLEY, C. (1995, April). *Reducing peer directed aggression in the elementary grades: The effects of an attribution retraining program.* Paper presented at the 61st Biennial Meeting of the Society for Research on Child Development, Indianapolis, IN.

HUDLEY, C., & GRAHAM, S. (1993). An attributional intervention to reduce peer-directed aggression among African American boys. *Child Development, 64,* 124–138.

JACOBSEN, N. (1988).   Defining clinically significant change: An introduction. *Behavioral Assessment, 10,* 131–132.

JACOBSEN, N., & TRUAX, P. (1991).   Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12–19.

KAZDIN, A. (1980).   *Research design in clinical psychology.* New York: Harper and Row.

KAZDIN, A. (1985).   *Treatment of antisocial behavior in children and adolescents.* Homewood, IL: Dorsey Press.

KAZDIN, A. (1987).   *Conduct disorders in childhood and adolescence.* Newbury Park, CA: Sage.

KELLEY, H. (1973).   The process of causal attribution. *American Psychologist, 28,* 107–128.

KUPERSMIDT, J. B., & COIE, J. (1990).   Preadolescent peer status, aggression, and school adjustment as predictors of externalizing problems in adolescence. *Child Development, 61,* 1350–1362.

LARSON, J. (1998).   Managing student aggression in high schools: Implications for practice. *Psychology in the Schools, 35*(3), 283–295.

LOCHMAN, J., LAMPRON, L., GEMMER, T., & HARRIS, S. (1987).   Anger coping intervention with aggressive children: A guide to implementation in school settings. In P. Keller & S. Heyman (Eds.), *Innovations in clinical practice: A source book* (pp. 339–356). Sarasota, FL: Professional Resource Exchange.

LOEBER, R., & STOUTHAMER–LOEBER, M. (1987).   Prediction. In H. Quay (Ed.), *Handbook of juvenile delinquency.* New York: Wiley.

McCORD, J. (1992).   The Cambridge—Somerville study: A pioneering longitudinal—experimental study of delinquency prevention. In J. McCord & R. E. Tremblay (Eds.), *Preventing antisocial behavior: Interventions from birth through adolescence.* New York: Guilford.

McCORD, J., & TREMBLAY, R. E. (1992).   *Preventing antisocial behavior: Interventions from birth through adolescence.* New York: Guilford.

NASBY, W., HAYDEN, B., & DEPAULO, B. M. (1980).   Attributional bias among aggressive boys to interpret unambiguous social stimuli as displays of hostility. *Journal of Abnormal Psychology, 89,* 459–468.

NOVACO, R. (1978).   Anger and coping with stress. In J. Foreyt & D. Rathjen (Eds.), *Cognitive behavior therapy: Research and applications* (pp. 135–173). New York: Plenum Press.

OLWEUS, D. (1979).   Stability of aggressive reaction patterns in males: A review. *Psychological Bulletin, 86,* 852–875.

PATTERSON, G. (1992).   Developmental changes in antisocial behavior. In R. D. Peters, R. McMahon, & V. Quinsey (Eds.), *Aggression and violence throughout the life span* (pp. 52–82). Newbury Park, CA: Sage.

PETERS, R. D., & McMAHON, R. J. (1996).   *Preventing childhood disorders, substance abuse, and delinquency.* Thousand Oaks, CA: Sage.

REED, R. (1988).   Education and achievement of young, Black males. In J. Gibbs (Ed.), *Young, Black, and male in America: An endangered species* (pp. 37–96). Dover, MA: Auburn House.

SELMAN, R., & SCHULTZ, L. (1990).   *Making a friend in youth: Developmental theory and pair therapy.* Chicago: University of Chicago Press.

SHANTZ, C. (1983).   Social cognition. In P. Mussen (Ed.), *Handbook of child psychology: Volume 3. Cognitive Development* (pp. 495–547). New York: Wiley.

SPIVAK, G., PLATT, J., & SHURE, M. (1976).   *The problem-solving approach to adjustment.* San Francisco: Jossey–Bass.

URBAIN, E., & KENDALL, P. (1980).   Review of social cognitive interventions with children. *Psychological Bulletin, 88,* 109–143.

WAAS, G. (1988).   Social attributional biases of peer-rejected and aggressive children. *Child Development, 59,* 989–975.

WEINER, B. (1986).   *An attributional theory of motivation and emotion.* New York: Springer–Verlag.