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Reducing aggressive behavior and increasing motivation in school:

The evolution of an intervention to strengthen school adjustment

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Abstract

The pervasive linkages between problem behaviors and school adjustment suggest that effective intervention programs to enhance school adjustment must focus both on decreasing the motivation to aggress and increasing the motivation to achieve. We describe a program of intervention research to improve social behavior and academic motivation in elementary school students organized around principles of attribution theory. Our intervention curriculum initially focused on reducing children's aggression and was then expanded to include enhancing personal responsibility. A series of efficacy and effectiveness studies have demonstrated that children's attributions in both the social and academic domains can be changed with cost-effective, educational strategies. These changes in children's cognitions have reliably produced positive changes in behavior. We conclude with a discussion of the implications of our work for the design of effective interventions.

Reducing aggressive behavior and increasing motivation in school:

The evolution of an intervention to strengthen school adjustment

Although rates of youth violence have begun to decline (NCES, 2004), childhood aggression and youth violence have become more pervasive in the public consciousness over the past two decades than has ever been true before. One fairly obvious conclusion to be drawn from the literature on youth aggression and violence is that such behavior represents a significant problem in school. In our research with children who display high levels of physical and verbal aggression in school settings, we have seen first hand and clearly documented how disruptive they can be, distracting their teachers from the primary task of instruction and making learning difficult for both themselves and for their peers (Hudley et al., 2001). As well, a broad literature has found that children who display these types of aggression are at considerable risk for poor school adjustment, school dropout, and delinquency in childhood and adolescence (Loeber, 1990).

Elementary school students who engage in overt aggression are also inattentive, frequently off-task, and disruptive in the classroom (Kazdin, 1996). In middle school, students rated highly aggressive by peers are also rated by teachers as poorly motivated, lacking interest in school (Wentzel, 1993), more behaviorally disruptive, and more often off task (Coie, Lochman, Terry, & Hyman, 1992) when compared to their nonaggressive peers. Whether aggression is measured in elementary school (Risi, Gerhardstein, & Kistner, 2003), middle school (French & Conrad, 2001), or even as early as first grade (Ensminger & Slusarcick, 1992), it remains a powerful predictor of educational difficulties (low achievement, low motivation, poor adjustment) and early school leaving in high school.

The pervasive linkages between problem behaviors and school adjustment problems speak directly to intervention design and programming. Intervention programs to achieve optimum academic and social outcomes for children and adolescents will be most effective when they focus both on decreasing the motivation to aggress and increasing the motivation to achieve. In fact, that strategy precisely characterizes the direction we are now taking in the research program that we will describe here.

Principles of Attribution Theory: A Foundation for Intervention Research

As researchers who study attributional processes in academic motivation and social behavior, we have grounded our programmatic line of intervention research in the study of causal constructs. Attribution theorists are concerned with "why" questions or the perceived causes of behavior and events (see Weiner, 1986, 1995). For example, a student might ask: "Why did you bump into me?" or "Why did I fail the exam?" People often want to understand why an outcome (especially a negative outcome) has occurred, and in the act of assigning a cause to an outcome, the person is making an attribution. Because the specific content of attributions can vary greatly across domains of functioning (e.g., academic, marital, friendship) and across individuals, attribution theorists have focused on the underlying dimensions or properties of causes. The three dimensions that have been identified with some certainty (Weiner, 1986) include *locus*, or whether a cause is internal or external to a person; *stability*, or whether a cause is constant or changeable over time; and *controllability*, or whether a cause is subject to volitional influence. Controllability connotes both responsibility and intentionality for the self and for others.

Attributions of intent. Our intervention research has focused on the behavioral consequences of perceived controllability. In its first phase, our intervention work was specifically concerned with overt aggressive behavior and beliefs about intentionality in others. Some children consistently assume that others intend to cause them harm and attribute ambiguous behavior of peers to hostile intentions, even when the attribution is unwarranted or inaccurate. To make an attribution of harmful or hostile intent, the one who experiences a negative outcome must believe that it was not the result of conditions in the environment, that the peer was in control of the behavior that caused the negative outcome, and the peer intended the outcome to happen. Such an attribution can contribute directly and powerfully to the display of angry, aggressive behavior. If you bump my desk and knock my books to the ground, what was your intent? Is the classroom overcrowded because additional desks were brought in, so students can no longer walk around without bumping into the desks? Or, did you stuff your own backpack so full that it hangs down too low to fit through the rows between desks? Or, did you purposefully walk by my desk just so you could knock my books onto the floor and embarrass me? Only the third of these proposed explanations for the desk bump scenario fits the requirements for an accurate attribution of hostile intent. In the first situation, clearly the offending student is not in control of or responsible for the overcrowded conditions. In the second possible explanation, although the offending student is responsible for filling the backpack very full, there is no apparent intent to use it as a missile to knock books off of desks.

It is reasonable to expect a response of some kind from someone who perceives intentional harm from another. However, a child's reasoning about the social world can

lead to the perception of intentional harm where none exists. More than two decades ago, research with children displaying aggressive behavior identified a pattern of thinking that overestimates harmful intent in others when behavior is ambiguous, labeled *hostile attributional bias* (Dodge, 1980; Nasby, Hayden & DePaulo, 1980). If asked about our example of books being knocked off the desk by a peer, a child with a hostile attributional bias would quickly attribute the outcome to hostile intentions on the part of the offending peer, without regard to the possible extenuating factors that we have considered. However, the average child, given the possibility of crowded aisles or an overstuffed backpack, would attribute the scenario to accidental causes or seek more information before making an attribution (Waas, 1988).

This hostile attributional bias consistently co-occurs with children's display of overt, angry aggression (Hudley, 1994a). One of the earliest published studies linking attributional bias and aggression (Nasby et al., 1980) asked boys diagnosed with conduct disorder to match photographs of faces with emotion labels (e.g., hostility, sadness, fear). The boys rated most aggressive by adults most often incorrectly identified photographs as hostile. Other foundational studies using video tasks (Dodge, Murphy & Buchsbaum, 1984), contrived peer interactions (Dodge, 1980; Hudley & Graham, 1993), and hypothetical stories (Graham, Hudley, & Williams, 1992) found similar results in samples of boys without clinical levels of aggression.

An attributional bias leads the perceiver to incorrectly see intentional harm in ambiguous peer behavior where none exists and thus retaliate with inappropriate aggression. Displays of such angry, retaliatory aggression typically provoke peers to respond in kind with heightened aggression and rejection (Hymel, Wagner, & Butler,

1990). Consequently, children who are aggressive may experience an escalating cycle of aggression, rejection, and retaliation in interactions with peers. When we began our intervention research two decades ago, only a few researchers had considered the possibility of reducing this kind of aggressive behavior using principles of attribution theory. Our research program was one of the earliest to apply basic research on children's attributions to the reduction of overt aggressive behavior.

Reducing Attributional Bias Using the BrainPower Program

We developed a structured program to reduce overt, reactive aggression in childhood, *The BrainPower Program* (Hudley, 1994b, 2003; Hudley et al., 1998; Hudley & Friday, 1996; Hudley & Graham, 1993), that is founded on attributional principles and a rich empirical understanding of children's thinking. Two fundamental assumptions guided the program design: children who display aggressive retaliation can learn to recognize accidental causation, and when negative outcomes are attributed to accidental (i.e., nonhostile) causes, angry aggressive responses will become much less likely. Our curriculum teaches children to recognize that sometimes ambiguously caused, negative social outcomes with peers may result from accidental rather than intentionally hostile causes. This attribution retraining is accomplished by demonstrating to participants that events are not always under the intentional control of themselves or their peers.

The *BrainPower* curriculum is tailored to grades 3-6. We chose to concentrate on elementary aged students based on research on cognitive development and the development of aggression throughout life. Students of this age group have developed the cognitive capacity and the language skills to participate in the intervention activities more effectively than younger children. As well, late childhood and early adolescence

seem to be a time in development when aggressive behavior becomes a relatively fixed pattern that extends throughout the life span (Loeber & Stouthamer-Loeber, 1987). We reasoned that working with children just prior to this critical period would best allow us to identify students who were at greatest risk for developing lifelong patterns of aggressive behavior exactly when they were becoming a serious problem for the schools. A meta-analytic review of studies conducted between 1979 and 1999 has supported our early decision to focus on elementary school students (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Findings from this age group demonstrated the strongest relationships between attributional bias and aggression.

Program Characteristics

The curriculum consists of 12 lessons clustered into three components. The first component strengthens aggressive participants' ability to detect others' intentions accurately. A variety of instructional activities train participants to distinguish social cues for accidental, helpful, and hostile intents. To achieve these skills, students learn to search for, interpret, and properly categorize the verbal, physical, and behavioral cues exhibited by others in social situations. For example, in one lesson ("The Intention Detective") students act as observers on the playground for 2 days, during which they collect and categorize evidence about the intentions of others. They come back to the group and describe their data and explain their categorization decisions.

After the participants gain skills in discerning social cues, the second component trains participants to initially attribute ambiguous negative outcomes (i.e., when social cues are inconsistent or uninterpretable) to "uncontrollable" or "accidental" causes. For example, students role play ambiguous peer interactions (e.g., a peer spills your milk in

the lunchroom). Students then brainstorm possible causes for the actions, categorize those causes as deliberate or unintentional, and then decide which attributions would be good decisions given uncertainty about the peer's intent. In this lesson, the group leader points out several benefits of initially attributing such outcomes to accidental causes (e.g., maintain relationships with peers, minimize negative sanctions from teachers and parents).

The third component links negative social outcomes to appropriate, nonaggressive behavioral responses. Lessons teach students to connect a more careful appraisal of peer interactions to more positive evaluation of behavioral responses that are less verbally and physically aggressive. This component also teaches children to develop decision rules for potentially dangerous situations (e.g., “If someone threatens me, find an adult right away”) to minimize the possibility of lethal confrontations. We understand clearly that many children live in a world where peers sometimes want to do them intentional harm; our goal is not to teach that all behavior is benign but rather to teach skills for accurately discerning and acting on the intent of others. The three components of the curriculum, i.e., perceiving, interpreting, and acting on ambiguous peer behavior, together provide an instructional sequence that can best develop those skills.

Implementation. Participants typically receive 12 BrainPower lessons in six weeks (i.e., twice weekly) in a small group setting with two trained group leaders. Each group consists of four students displaying excessive aggression and two students with average behavior. Average students are included to avoid stigmatizing participants with high levels of aggressive behavior, provide aggressive participants with positive peer models, and allow average students to reappraise their perceptions of the peers who are

perceived as aggressive as they proceed through the curriculum and reduce their levels of angry, reactive aggression. Such interaction is considered critical for the generalization of program effects (Bierman, 2004) and for counteracting peer biases that are based on a child's reputation for aggression (Hymel, Wagner, & Butler, 1990).

We initially implemented the curriculum with programs specifically for boys. The evidence is overwhelming that in the middle childhood years, males are substantially more physically aggressive than girls (Aber, Brown, & Jones, 2003), although this gender difference is decreasing (Chesney-Lind & Belknap, 2004). Physical aggression is seen as a major problem in schools, both in the classroom and on the playground by students, parents, and teachers (Markow & Scheer, 2002) as well as the public at large (Rose & Gallup, 2003). As well, boys may be more likely to demonstrate an attributional bias (Schultz, Izard, & Ackerman, 2000), and evidence linking aggression and attributional bias was derived almost entirely from studies with boys at the time we began our program of intervention research.

Because our research is the product of our interest in and concern with the healthy development of ethnic minority youth, inner-city schools serving African-American and Latino populations became the primary intervention sites. Our research initially focused specifically on African-American youth, not because we believe them to be uniquely prone to aggression but because we believed that keeping the samples constant by gender and race allowed us to make clear conclusions about initial efficacy. As well, language minority youth have particular needs, and our heavily language dependent curriculum requires specific efforts to include only participants who are fully English proficient. In

subsequent effectiveness studies of *BrainPower*, we have included English proficient Latino youth in the samples, although their numbers remain small.

Program Effects

Efficacy, Study 1. The initial efficacy study (Hudley, 1994b; Hudley & Graham, 1993), a controlled experiment, tested the link between changes in attributional patterns and changes in children's aggression. We assessed participants' attribution of intent, angry feelings, and endorsement of aggressive behavior using hypothetical scenarios. We also collected teacher ratings of behavior and archival records of disciplinary events (i.e., suspension, detention). In addition, students with aggressive behavior participated in an insoluble puzzle task with a peer partner; the task was completed within one month after the intervention.

Male, African-American elementary school students ($N = 108$) were selected using a combination of teacher ratings and peer nominations of aggressive behavior. Students with higher than average ratings of aggression from teachers and greater than the standardized classroom average of peer nominations for aggression were identified as behaviorally aggressive. Participants were randomly assigned to one of three groups: the attributional intervention, a placebo curriculum, or a no-treatment comparison group (see Hudley & Graham, 1993 for a full description of the study methodology). The placebo condition was included to control for possible effects of simple participation in a special, pull-out program. Intervention and placebo groups were conducted by trained graduate students who were blind to aggression status, and teachers were blind to students' aggression status and intervention type.

Attributions of hostile intent, reported anger, and endorsement of aggressive retaliation declined significantly only for boys who participated in the intervention program. In the laboratory task, boys initially rated as aggressive who had participated in the attributional intervention were significantly less likely than boys in the other two conditions to infer that a peer partner intentionally caused them to fail to read a puzzle correctly. As well, teacher ratings of behavior declined significantly following the intervention only for boys initially rated aggressive who participated in the experimental group. Changes were not significant for either of the comparison groups. The intervention had no effect on the overall pattern of formal disciplinary action; however, the data aggregated referrals for all types of school infractions (e.g., truancy), which were unrelated to the intervention curriculum.

Our measures did not change significantly from pre- to post-intervention as a function of intervention type for any of the students with average behavior. It is safe to say that the *BrainPower Program* had no deleterious effects on these participants. These promising findings demonstrated the efficacy of our theory that changing attributions would change behavior. However, we needed to examine the effectiveness of our curriculum in an ecologically valid context, and we wondered about the duration of treatment effects.

Effectiveness, Study 2. To address these questions, our next study implemented the *BrainPower Program* in four elementary schools serving African-American and Latino youth and examined behavior change over 1.5 years (Hudley, 2003; Hudley et. al, 1998; Hudley & Friday, 1996). Boys ($N=384$; 70% African-American) were again randomly assigned to one of three intervention conditions. Sample selection, study

procedures, and measures were similar to those described for the previous study; however, we measured teacher ratings of self-control rather than aggressive behavior, using the *Social Skills Rating System* (Gresham & Eliot, 1990). We also did not include the laboratory task in this study. As well, intervention groups were conducted by two trained instructional aides rather than graduate students.

Again judgments of intent, self-reported anger, and endorsement of aggressive behavior by participants in the attributional intervention who were initially rated as aggressive declined significantly and remained lower than comparison groups even at 12-month follow up. Analyses of teacher ratings of behavior did not reveal statistically significant differences by group. However, to understand the impact of the intervention on individual children, we next tested for clinical significance. Clinically significant change measures movement on the part of individuals who receive some kind of therapeutic treatment out of a clinically defined dysfunctional population and into a functional or normative population (Jacobsen, 1988). Following Jacobsen and Truax (1991), we operationally defined clinical significance as a post intervention or follow-up score that falls closer to the mean of the normative population than to the mean of a dysfunctional population. We used pre-intervention scores for the aggressive and nonaggressive students as measures of the normative and dysfunctional populations. Our analyses revealed that students in the attributional intervention group experienced clinically significant improvement at a rate at least twice that of students in either comparison group from pre- to post intervention assessment (43%, 21%, and 18% for intervention, placebo, and no-treatment conditions respectively). By 12-month follow-up, half of the significantly improved students in the comparison groups had declined to

former levels of behavior ratings, compared to only 28% of the improved students in the intervention group.

We were also able to examine relationships between attributional change and behavior change over time by correlating teacher and student measures taken at post intervention assessment as well as 6- and 12-month follow-up. For students in the *BrainPower Program* who were initially rated aggressive, perceptions of hostile intent and teacher ratings of self-control were concurrently, negatively related at post assessment ($r = -.51, p < .01$), and at 6-month follow up ($r = -.28, p < .05$). As well, attributions measured at post assessment were prospectively related to teacher ratings of self-control at 6-month follow-up ($r = -.24, p < .05$). In contrast, relationships between attributions and teacher ratings were largely nonsignificant for students in the other two comparison conditions. Again, no significant changes in attributions or behavior were evident for students with average behavior. Overall, these data confirmed that behavior can be changed over time with an attributional intervention conducted by school staff in school settings.

Comprehensive programming, Study 3. The final link in this chain of evaluation examined the intervention curriculum as one part of a comprehensive youth development program delivered in an after school setting (Hudley, 2001, 2003). Given the overwhelming evidence that the display of peer-directed aggression is shaped by multiple determinants (Greenberg, Domitrovich, & Bumbarger, 2001), we believed the most important test would assess the effectiveness of this intervention in conjunction with a comprehensive intervention to support positive developmental outcomes. This also represents the first time our thinking turned toward what has become our more

comprehensive vision of an intervention curriculum that addresses both social behavior and academic motivation.

As a starting point for our expanded vision of an intervention program, the *BrainPower Program* became one part of the ongoing activities of the 4H After School Activity Program. This is a community-based organization providing services to predominantly African-American and Latino elementary school students who reside in public housing projects in southern California. Social and economic isolation, high rates of violence, easy availability of drugs, and poorly resourced schools all combine to pose a cumulative and highly toxic set of risk factors for youth living in public housing. (Dunworth & Saiger, 1994). The 4H program sites, each staffed by 2 adult leaders, offer a range of youth development activities (e.g., academic tutoring, recreation activities, social skills development, community service projects, and field trips to cultural and recreational events) that are designed to buffer youth against these multiple, pervasive risk factors in their environments.

Our research examined a universal preventive intervention that incorporated the *BrainPower Program* aggression reduction curriculum for both boys and girls (for the first time) in an after school setting. We wondered if this combined program would forestall the development of high levels of aggression as well as support perceptions of both academic and social competence. All 4H children at 2 sites in grades 3-6 who participated in at least 75% of the *BrainPower* activities and were present for all data collection activities at 6 month and 12 month follow-up ($n=46$) became the intervention group. Comparison students ($n=40$), matched on ethnicity, grade, and school cooperation grades, were children living in the same public housing complexes and attending the

same elementary schools but not the 4H program. The sample was 93% African-American, with mean ages of 9.30 for the 4H group and 9.28 for the comparison group. The gender balance differed significantly between the 4H program (37% boys) and the comparison group (68% boys). We again measured participants' attributions and beliefs about aggression and also collected behavior ratings from classroom teachers at the elementary school and from parents. As well, we assessed perceived academic competence as rated by both classroom teachers and the students themselves. Teachers were blind to students' after school program status.

The program seemed to counter for all 4H students a naturally occurring increase in either aggressive behavior (for boys) or attitudes supporting aggression (for girls), and the effect was particularly beneficial for boys. Teachers and parents also perceived the behavior of 4H students more positively; this effect was strongest for teacher ratings of boys and parent ratings of girls. Specifically, both boys and girls in 4H declined or remained constant in inappropriate perceptions of hostile intent and attitudes endorsing aggression. For comparison students, intent attributions and endorsement of aggression either increased or remained steady at levels higher than 4H students. Teacher ratings of self-control for both boys and girls in 4H improved over time, while comparison boys' (but not girls') scores declined consistently. Parents' ratings of their children's self-control also improved for 4H but not comparison children. Finally, self-perceptions of academic competence remained significantly higher for 4H participants than for comparison students, but teacher ratings of academic competence did not differ significantly by group (see Hudley, 2003 for full details of this study).

Relationships among cognitive and behavioral variables were again strongest for intervention group students. Teacher ratings of behavioral self control were concurrently related to 4H students ratings of perceived intent at 6 month follow up ($r = .72, p < .001$) but unrelated for the comparison group ($r = .14, ns$). As well, parent ratings of cooperation at 6 month follow up were concurrently related to student attitudes about aggression ($r = .64, p < .01$) for 4H students but not for comparison students ($r = .17, ns$).

Overall, the *BrainPower Program* seemed to be a promising vehicle for improving social behavior. Our research with the broad based, 4H program suggested that a motivational intervention might be equally effective in changing student attitudes about academic engagement. However, the 4H program was not grounded in theoretical principles in a manner similar to the *BrainPower Program* and did not concentrate explicitly on training skills relevant to sustaining motivation in school. We wondered, therefore, if an expanded, theoretically grounded intervention curriculum would prove effective in simultaneously addressing social behavior and academic motivation.

Best Foot Forward: A Motivational Intervention for Aggressive Youth

Moving from Intentionality to Responsibility

Recall that our attributional dimension of interest in the reduction of inappropriate aggression, perceived controllability, comprises intentionality and responsibility.

Building upon the *BrainPower* findings regarding perceived intent, we added a component to help students understand their personal responsibility for the success of peer interactions. As we described earlier, youth with an attributional bias engage in high rates of angry, overt aggression that creates hostility in others. They may also lack other social skills to manage peer relationships that we felt could be addressed within our

attributional framework. We began with effective account giving, an impression management skill that protects relationships and helps people present themselves favorably. This skill may be especially valuable to children who display excessive aggression that disrupts peer relationships.

Accounts are explanations for social transgressions, including apology, excuses, justifications, and denials (Scott & Lyman, 1968). A skilled account giver is not likely to deny an action that others plainly saw ("You can't prove I knocked over your books"), but understands the need to acknowledge and apologize for the misdeed ("Sorry, I just wasn't looking where I was going"). Accounts that take personal responsibility for obvious transgressions are more likely to evoke forgiveness than are those that deny or minimize wrongdoing (Weiner, Graham, Peter, & Zumidinas, 1991). Boys who are aggressive show less understanding of the functions of accounts and may be less willing to forgive peers (Graham, Weiner, & Benesh-Weiner, 1995). Thus we wanted to teach effective account giving, or the value of accepting responsibility and apologizing for one's misdeeds. We also wanted participants to honor the accounts of others by displaying forgiveness when others apologize.

Introducing Academic Responsibility

We also added four new intervention components focused on academic outcomes. Our basic assumption is that responsibility for achievement outcomes may be attributed to the self (e.g., poor effort following failure) or to factors beyond one's control (e.g., poor teaching), which effectively diminishes personal responsibility. Attributions of personal responsibility are more motivationally adaptive, as they are more likely to result in high expectancy for success and sustained effort (Graham & Weiner, 1996).

To promote attributions of personal responsibility for achievement, we grounded the academic component of the intervention in the motivational principles of choice (whether a student prefers easy, intermediate, or difficult achievement tasks) and persistence (how a student manages challenge). Classic studies of Atkinson (1964) suggest that motivation is enhanced when a student selects tasks of intermediate difficulty, rather than very difficult or very easy tasks, because the outcomes are perceived as more the responsibility of the self. A student can attribute failure at a very difficult task or success at a very easy task to the properties of the task rather than the self, and thus neither experience will influence personal academic effort. However, even a large, seemingly very difficult task can be decomposed into manageable components to be accomplished, in a process known as proximal goal setting. Similar to selecting intermediate difficulty tasks, this skill increases a student's sense of responsibility and motivation to persist by providing immediate incentives for performance, a basis for judging progress, and the opportunity to make adjustments as needed (Bandura & Schunk, 1981).

Intermediate task selection and proximal goal setting are more likely to take place when students are task-focused, or concerned with mastery of a task or skill, rather than ego focused, or concerned with demonstrating high ability or concealing low ability relative to others (Nicholls, 1984). A focus on task mastery promotes personal responsibility for achievement because success and failure are judged by self-standards rather than comparisons with others. Students are also more likely to take responsibility for achievement and persist in the face of academic difficulty if they attribute failure to factors they can control, such as lack of effort or poor choice of strategy, rather than to

uncontrollable causes, like low ability or task difficulty (see Weiner, 1986). A large literature documents that students can be taught to attribute failure to controllable causes in academic tasks (see review in Perry, Hechter, Menec, & Weinberg, 1993). The most motivated student says: “I failed because I didn’t give enough effort, but I can try harder next time” as opposed to “I failed because the work is too hard, and I can’t change that”.

In summary, research on academic motivation indicates that students' attributions of personal responsibility for academic achievement are related to their choice of academic activities, how long they persist, and how well they adapt in the face of failure. Both academic motivation and achievement outcomes are enhanced when students choose tasks of intermediate difficulty, set proximal as opposed to distal goals, are task focused rather than ego-focused, and attribute failure to controllable causes. We therefore organized the academic component of the intervention around these principles.

Curriculum Content

Best Foot Forward extended the *BrainPower Program* to a 32 lesson curriculum that focuses on enhancing social and academic motivation skills. The social skills component comprises two sections, account giving and intent attributions. The lessons on effective use of accounts present the defining properties of 4 types of accounts (i.e., denial, justification, excuse, apology), the potential impact of each type of account on one’s reputation with peers (e.g., apology vs. denial in our desk bump example), and the likely response of the recipient. As well, this section of the curriculum explicitly teaches the value of a complete apology, which we distilled into a mnemonic device we called *The 4 A’s: Admit, Apologize, Amend, Assure*.

Our second social skills section comprises the 8 lessons from the *BrainPower Program* that teach students to accurately read available social cues and to initially attribute ambiguous negative outcomes to accidental causes. Although we continue to be concerned with reducing hostile attributional bias and inappropriate retaliatory aggression, we also remain very aware of the potential that peers sometimes intend harm. This intervention maintains the realistic goal of strengthening skills for accurately discerning and acting on the intent of others.

The academic motivation component of the curriculum was divided into four sections covering intermediate risk taking, goal setting, task focus, and failure attributions. Students learned to determine what makes a problem easy, medium, or hard and to recognize the benefits of intermediate difficulty. For example, each student played the weekly Spelling Game after studying individualized word lists that were easy, medium, or hard as determined by individual pretests conducted at the start of the intervention. Points were assigned according to the degree of word difficulty, and participants learned that the best strategy for earning points to be traded for prizes over the long run was to concentrate on intermediate difficulty words. The goal setting section taught students to develop proximal or short-term goals that provide more immediate feedback, can be more quickly attained, and accumulate to achieve longer-term or distal goals. Over the course of the intervention, students kept a weekly log of daily, weekly, and monthly goals and learned strategies for monitoring their behavior and for revising their goals in response to success or failure. In order to develop a task mastery orientation, our third section taught students to focus on improvement rather than absolute performance, to monitor their effort on specific tasks, and to become more

strategic help seekers. For example, one lesson explored how and why help seekers who demonstrate to others that they have tried and genuinely reached an impasse are most successful in receiving assistance. The final section developed adaptive explanations for achievement failure. Participants worked on unfamiliar achievement tasks that required persistence (e.g., origami puzzles) and learned to focus on controllable factors (i.e., lack of effort) and avoid attributions to uncontrollable factors (i.e., low ability, bad luck), in the face of failure.

Program Effects

Implementation and evaluation. We have conducted an initial, controlled efficacy investigation testing the proposed linkages between our theoretically derived intervention components and changes in student behavior. We have begun again with African-American, male elementary school students in grades 3-5. Participants displaying aggressive and nonaggressive behavior ($N = 66$) were selected using a combination of teacher and peer ratings in a manner similar to our prior intervention research. The boys were randomly assigned to either the intervention ($n = 31$) or a no-treatment comparison group ($n = 35$). Intervention groups of 6 boys met after school for one hour three days a week for 12 weeks. Two African American female graduate students who participated in the development of the curriculum served as group leaders.

Assessments collected before and after the intervention included students' attitudes about the legitimacy of aggression (e.g., "It's okay to hit someone if you don't like them") (Slaby & Guerra, 1988). We also measured account giving with written hypothetical scenarios of social transgressions that required participants to select the most appropriate account (i.e., apology, excuse, denial) or no account necessary (i.e., "so

what”). Scenarios in which a peer transgressed and offered one of 3 account types were used to assess how participants honored accounts of peers. Beliefs relevant to academic motivation were assessed with the School Attitude Measure (Wick, 1990), which includes subscales to assess motivation for schooling, sense of control, and perceived mastery. To measure changes in attributions for academic failure, participants were asked to recall the last time they did poorly on a test and to rate each of four attributions (low ability, lack of effort, a bad teacher, and bad luck) as possible explanations for their failure. Teachers, who were blind to students’ after school placement, rated students’ social behavior, school motivation, and task persistence.

About one month after the intervention ended, participants completed an insoluble puzzle task with a peer, similar to our earlier intervention study. However, in this study students had the opportunity to choose the puzzle, ranging from very easy to extremely difficult. Prizes varied in attractiveness with the difficulty of the puzzle. We added this procedure to assess whether respondents appropriately modified their goals after a failure experience (i.e., chose an easier puzzle). Finally, at the end of the semester following participation in the intervention we also collected language arts and math grades and teacher comments from each student’s cum record.

Findings. Attitudes about the legitimacy of aggression declined and endorsement of adaptive accounts increased for intervention participants but remained unchanged for comparison students. Similarly, only intervention students more often honored the accounts of hypothetical peers who apologized or offered an excuse, but they did not increase their willingness to forgive the peer. For comparison group boys, we found no

differences from pre- to post-test. Teacher ratings of negative social behavior did not differ for either group.

In the achievement domain, only intervention participants' ratings of external and uncontrollable causes for recalled failure declined significantly at post-test, and all participants tended give high ratings to internal causes for failure at both pretest and posttest. Thus, at posttest, intervention participants rated lack of effort very high and lack of ability and external factors very low as causes for failure, making their attributional patterns more adaptive than those of the comparison boys. Teacher ratings of cooperation/motivation increased significantly only for intervention boys, while ratings of persistence increased for intervention boys and actually declined for comparison boys. Our archival search revealed that 40% of intervention participants received the highest levels of positive written teacher comments (i.e., improvement in all areas), while no control group boys received a similar teacher evaluation. In contrast, 41% of control students but only one intervention participant received the very lowest possible comments (i.e., worsening in all areas).

Finally, in our laboratory task, intervention participants attributed significantly less hostile intent to their unseen peer partner. As well, our participants selected a puzzle of intermediate difficulty at rates more than twice our comparison boys. Our observation data revealed that two-thirds (67%) of the intervention boys' verbal statements were focused on the task and 30% were negative, while 40% of comparison boys' comments were directed toward the task and 54% were classified as negative.

Conclusions from Our Intervention Research Program

We set out nearly two decades ago to develop theoretically grounded, ecologically valid interventions that would promote successful developmental outcomes. Our original focus was on reducing aggressive behavior among African-American boys, and our research program has evolved from there to include both girls and Latino youth in several of our evaluation samples and a broadened focus on both social and academic behavior. What do we conclude from the knowledge generated by our research program? We now know that children's attributions in both the social and academic domains can be changed with cost-effective, educational strategies, and changes in social cognitions seem to produce changes in children's behavior. In the social domain, our participants learned to presume nonhostile intent in ambiguous situations, to select nonaggressive responses, to be more strategic in their use of accounts, and to honor the accounts of peers. In the academic domain, boys learned to use intermediate risk taking, realistic goal setting, task focus, and attributions to controllable causes for failure. In all of our studies, these social and academic motivation skills were related to improved behavior in the eyes of others, whether it was teachers or parents.

This lesson is one of the most important and heartening conclusions that we draw from two decades of research. Our work provides concrete evidence that early social behavior is not destiny; it can be changed and more serious behavior forestalled. Similarly, academic motivation skills can be learned; the 8 year old disengaged pupil does not have to become the adolescent dropout or the functionally illiterate adult. To our knowledge, this is the first successful intervention for children displaying high rates of aggression that blended social skills training with motivation skills training under one unifying theoretical framework. As well, two of our intervention studies provided

structured activity for youth in high-risk environments during a portion of the after-school hours, times when most delinquent activity is likely to take place and adult supervision is minimal. (Flannery, Williams, & Vazsonyi, 1999).

One other conclusion that we draw from our research actually reflects a guiding principle that we recognized from the start of this work. School-based interventions that address difficult social and academic behaviors are most often implemented in urban schools and thus serve primarily ethnic minority children. Yet one rarely sees discussion of the cultural relevance of intervention materials (but see Hudley, 2001; Hudley & Taylor, 2006). We are clear that challenging behaviors are not the particular province of any one gender or ethnic group, and the principles and programs we have developed could be deployed to benefit any child. Yet, because the specific program content addresses social skills, intervention activities must enable students to succeed within their unique cultural context. From its inception, the BrainPower curriculum materials were developed to be culturally responsive for a multicultural audience. For example, open ended stories are the vehicles through which participants discuss their experiences with peer aggression. A story about two friends meeting allows students to define the most likely meeting place within their ecocultural context (e.g., the park, the mall, the schoolyard). From there, the discussion would center on the specific issues, skills, and behaviors that are relevant to that specific niche. We wonder if the absence of cultural awareness in constructing and implementing interventions in multicultural contexts may explain inconsistencies in research on prevention efficacy.

Implications for Intervention Design

Preventive intervention has become a major strategy for supporting children's mental health. Yet, school based prevention programs are often developed by entrepreneurs with little specific training in education, psychology, or prevention science; or they are created *ad hoc* to meet an immediate and often temporary problem. Many of those programs also remain largely unevaluated (Greenberg, Domitrovich , & Bumbarger, 2001). Our intervention research provides insights that can align school-based intervention programs with the guidelines of good prevention science.

Interventions must be theory guided. Absent grounding in a clear theory about what causes aggression, school disengagement, or other problem behaviors, curricula may devolve into a “laundry list” approach – a program with a bit of everything and nothing specific to the targeted behavior. Our intervention was informed by a particular theoretical perspective that was able to capture the cognitions and behaviors relevant to social competence and academic motivation. That perspective guided the choice of both curriculum activities and outcome measures. Thus, when the intervention “worked”, we were able to refer back to testable hypotheses about why it was successful.

Interventions require multiple components and multiple informants. Comprehensive intervention programs are clearly most successful in reducing antisocial behavior and promoting healthy development (Greenberg, Domitrovich , & Bumbarger, 2001). We moved toward a more comprehensive curriculum by joining social skills and academic motivation training into a novel program to improve student outcomes. Further, multiple sources of data are essential for rigorous, unbiased evaluation. Participant self-report and parent reports are vulnerable to memory distortions and social desirability concerns. Teacher reports are susceptible to the subtle biases or unconscious

stereotypes that teachers may hold, particularly about problem students. Archival data in school records are constrained by the accuracy and completeness of school recordkeeping, as well as the accuracy and validity of existing assessments. Using these data sources in combination provides the best assessment of program effectiveness.

There is a chilling tendency in our society to give up on children much too quickly and declare them casualties of societal risk factors. Effective intervention programming can reduce the risk that children will become delinquent adolescents, and the cost savings are substantial in comparison to incarcerating even one juvenile. If we add human capital to the equation, i.e., increased educational success that leads to responsible and financially contributing citizens, the potential benefits to society of effective school-based interventions are enormous.

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