Prevention & Treatment

Prevention & Treatment, Volume 5, Article 8, posted May 8, 2002

The Prevention of Depressive Symptoms in Low-Income Minority Middle School Students

Esteban V. Cardemil
Brown University School of Medicine and Rhode Island Hospital

Karen J. Reivich and Martin E. P. Seligman
University of Pennsylvania

ABSTRACT
We present data on the efficacy of the Penn Resiliency Program (PRP) with low-income minority children. This school-based depression prevention program teaches cognitive and social problem-solving skills to groups of middle-school students who might be at-risk for developing depressive symptoms by virtue of their low-income status. Our previous research had established the effectiveness of the original PRP with predominately middle-income Caucasian children. We administered the PRP to 2 cohorts of low-income minority children: African American and Latino 5th and 6th graders. We found a clearly beneficial effect for the Latino children up to 6 months after the conclusion of the depression prevention program, but no clear effect for the African American children.

Esteban V. Cardemil, Ph.D., Department of Psychiatry and Human Behavior, Brown University School of Medicine and Rhode Island Hospital; Karen J. Reivich & Martin E.P. Seligman, Department of Psychology, University of Pennsylvania.

This article was part of Esteban V. Cardemil's doctoral dissertation under the supervision of Martin E. P. Seligman. Preparation of this article was supported by National Institute of Mental Health Grants 5 RO1 MH52270–04 and F32 MH12855. We wish to express our appreciation to Rita Klein and Edi Page who helped make this project possible. We would also like to thank the children, parents, and teachers involved in this project and the undergraduate assistants who helped with the development, implementation, and evaluation of the program. Finally, we are grateful to Robert J. DeRubeis and John Sabini for their helpful suggestions at all stages of this project.

Correspondence concerning this article should be addressed to Esteban V. Cardemil, Rhode Island Hospital, 593 Eddy Street, Potter 3, Providence, Rhode Island 02903.
E-mail: Esteban_Cardemil@brown.edu

Depression is a likely target for prevention programs. Researchers have estimated that 5% (Robins et al., 1984) to 17% (Kessler et al., 1994; Kessler, Zhao, Blazer, & Swartz, 1997) of the general population meets criteria for a major depressive episode at some time in their lives. These numbers are even higher for children and adolescents: Estimates of the number of children who experience a depressive episode by the end of high school are as high as 20% (Garrison, Schluchter, Schoenbach, & Kaplan, 1989), and the majority of these episodes will go untreated (Hoagwood & Rupp, 1994). Moreover, research suggests that early onset of depressive episodes in childhood and adolescence increases the likelihood of future depressive episodes (e.g., Lewinsohn, Rohde, Klein, & Seeley, 1999). As such, programs that can prevent or forestall the development of depressive symptoms and depressive episodes in children have the potential to yield large benefits.

Preliminary research into the efficacy of depression prevention programs has shown that they can be effective, with both adults (e.g., Muñoz et al., 1995) and children (e.g., Clarke et al., 1995). Our research group designed and validated the Penn Resiliency Program (PRP), a cognitive-based depression prevention program that has prevented depressive symptoms in middle school children for up to 2 years after its conclusion (Gillham, Reivich, Jaycox, & Seligman, 1995; Jaycox, Reivich, Gillham, & Seligman, 1994). The positive results derived from this work and that of others in the depression prevention literature have encouraged us to continue exploring the efficacy of depression prevention programs.

In this article, we present the results from two studies designed to investigate the efficacy of a modified PRP with low-income minority children in two Philadelphia urban schools.

Rationale for Working With Low-Income Minorities

The relationship between minority status and mental illness has been difficult to ascertain because of the confounding relationships of such demographic variables as socioeconomic status, marital status, and education level (Somervell, Leaf, Weissman, Blazer, & Bruce, 1989). Both the Epidemiological Catchment Area (ECA) study (Robins et al., 1984) and the National Comorbidity Survey (Kessler et al., 1994) attempted to address this issue by statistically controlling for different demographic variables while investigating possible racial and ethnic differences in prevalence rates of depression. Analyses of both the ECA study (Regier et al., 1993) and the National Comorbidity Survey (Blazer, Kessler, McGonagle, & Swartz, 1994) consistently found lower 1-month and lifetime prevalence rates of major depression among African Americans than among Caucasians. However, differences in prevalence rates between Latinos and Caucasians were less clear. There was very little difference between the lifetime prevalence rates of Latinos and Caucasians in the National Comorbidity Survey, although Latinos appeared to have higher 1-month prevalence rates than Caucasians (Blazer et al., 1994).

Although research findings are mixed with respect to minority status and depression, researchers have consistently noted high rates of depressive symptoms among low-income populations (e.g., Biafora, 1995; Blazer et al., 1994; Bruce, Takeuchi, & Leaf, 1991; Regier et al., 1993). Given that the proportion of poor individuals among African Americans and Latinos is more than three times higher than among Caucasians (Danziger, Sandefur, & Weinberg, 1994), low-income minorities are an especially at-risk population for the development of depression and other Axis I disorders. The Hispanic Health and Nutrition Examination Survey found that among Puerto Ricans, the odds of receiving a diagnosis of major depression was 3.47 times higher for those reporting an annual income under $5,000 than those reporting an annual income over $20,000 (Potter, Rogler, & Moscicki, 1995). Brown, Ahmed, Gary, and Milburn (1995) reported similar findings among African Americans: The odds of having major depression in the past year was 1.41 times greater

for those reporting annual incomes below $10,000 than for those reporting annual incomes above $20,000.

This high-risk status for low-income minorities is particularly troubling, given data showing the underutilization of mental health services by both low-income and minority clients (Cheung & Snowden, 1990; Dworkin & Adams, 1987; Snowden, 1999; Vega, Kolody, Aguilar-Gaxiola, & Catalano, 1999). As such, it seems plausible that low-income minority populations could benefit significantly from the development of effective large-scale depression prevention programs that engage participants who might not otherwise seek mental health services.

Two studies in the adult depression prevention literature have successfully focused on minority populations (Muñoz et al., 1995; Vega, Valle, Kolody, & Hough, 1990), but to date, no literature details the design or the implementation of prevention programs for minority children or adolescents that specifically target depression. And yet, low-income minority children, like adults, represent a population that could potentially reap large benefits from a depression prevention program. Although no large-scale multisite epidemiological studies have explicitly identified the prevalence rates of depression in minority adolescents and children (Roberts, Attkisson, & Rosenblatt, 1998), some studies with relatively large samples suggest that prevalence rates of depressive symptoms in minority youth may be comparable, or slightly higher, than in Caucasian youth (e.g., Roberts, 1992; Roberts & Chen, 1995; Roberts, Chen, & Solovitz, 1995).

More indirectly, some researchers have suggested that low-income minority children are exposed, either directly or indirectly, to chronic levels of neighborhood violence and other uncontrollable life events (Barreto & McManus, 1997), which may put them at risk for the development of depression (Freeman, Mokros, & Poznanski, 1993). In light of these factors, we modified the original PRP for African American and Latino low-income middle school students and implemented it in two Philadelphia urban schools.

Definition of Prevention

We considered this project to be a combination of a primary and a secondary prevention effort (Goldston, 1977), and so we hypothesized that the PRP produces both treatment and prevention effects. We hypothesized that the PRP (a) would produce enduring relief of symptoms for those students displaying depressive symptoms at the start of the program and (b) prevent the development of symptoms in those students who were nonsymptomatic or experiencing low levels of symptoms at the start of the program. We examine these effects on depressive symptoms in both the immediate (pre-post differences, termed *intervention effects*) and the longer term (3- and 6-month follow-up, termed *prevention effects*). We also examined the overall effect of the PRP on other psychological variables that have been found to be associated with depression, including explanatory style, negative cognitions, and self-esteem.

Method

Participants

This research was conducted in two different low-income schools in Philadelphia. School 1 is a middle school in urban North Philadelphia with 977 students in grades 5–8. Of these students, 77.2% were Latino children predominately of Puerto Rican descent (n = 754), 11.7% were African American (n = 114), 7.8% were Caucasian (n = 76), and 2.8% were Asian (n = 27); 95.3% of the

students from School 1 come from low-income families (School District of Philadelphia, 1996). School 2 is a middle school in urban West Philadelphia with 828 students in grades 5–8. Of these students, 98.9% were African American (n = 819), 0.6% were Asian (n = 5), 0.2% were Latino (n = 2), and 0.2% were Caucasian (n = 2); 89.8% of the students from School 2 come from low-income families (School District of Philadelphia, 1996).

Cohort Differences

There were three significant differences between the two cohorts of children who participated in this research program. First, the racial–ethnic composition was significantly different at the two schools in the study: 77.2% of the students at School 1 were Latino and 98.9% of the students at School 2 were African American. Second, analyses of the demographic data from the two studies revealed two significant differences between the populations in the two schools. Mothers' and fathers' education levels, along with family income levels, were lower in the participants in School 1 (predominately Latino) than in School 2 (predominately African American). Finally, different intervention providers were assigned to the children who participated in the program. The first author was the primary group leader for the African American children. He then supervised four masters-level graduate students in the implementation of the program for the Latino children.

These three differences led to the decision to separate the results from this research into two separate studies (see Table 1).

Table 1
Sample Characteristics of Study I & II

	Study I: Latino children		Study II: African-American children	
Demographic characteristic	Prevention (n = 23)	Control (n = 26)	Prevention (n = 47)	Control (n = 56)
Average age of child	11.5	11.19	10.93	10.95
Race/ethnicity				
Latino	100%	100%	0%	0%
African American	0%	0%	100%	100%
Sex of Child				
Male	42%	67%	51%	38%
Female	58%	33%	49%	62%
Grade of Child				
5th Grade	48%	46%	60%	53%
6th Grade	52%	54%	40%	47%
Parent's Marital Status				
Married	12%	22%	13%	21%
Separated	8%	11%	6%	10%
Divorced	19%	15%	6%	5%
Other	23%	29%	43%	22%
No Information	39%	22%	32%	41%
Mother's Education				
Some High School	43%	33%	11%	12%
High School Graduate	4%	15%	23%	22%
Some College	15%	7%	21%	14%
College Graduate	0%	0%	11%	9%

More than College	0%	4%	2%	0%
No Information	39%	41%	32%	43%
Father's Education				
Some High School	31%	26%	13%	9%
High School Graduate	12%	11%	30%	24%
Some College	4%	0%	2%	3%
College Graduate	0%	0%	0%	0%
More than College	0%	0%	2%	0%
No Information	54%	63%	47%	54%
Total Family Income:*				
$20,000 or less	58%	59%	36%	21%
$20,001-$40,000	4%	4%	28%	14%
More than $40,000	4%	4%	4%	17%
No Information	35%	33%	32%	48%

*Total Family Income in Study II: c2=10.40, $p<0.04$.

As such, Study I presents data from the Latino participants at School 1; Study II presents data from the African American participants at School 2, omitting from our analyses those of different racial–ethnic backgrounds at each school. This analytic strategy reduces our effective sample size somewhat, but it does not change any of the results.

Moreover, any interpretation of these results must acknowledge the potential School × Race–Ethnicity confound, in addition to recognizing any possible differences in the delivery of the intervention by the different intervention providers.

Procedure

The recruitment procedure at the two schools was identical: In the fall of 1996 and 1997, the parents of all the 5th and 6th grade children were contacted by mail and invited to participate in the program. In this letter, they were provided with information about a Coping Skills Program designed to help their children better handle difficult situations at school and at home. Parents were also told that the school was supportive of the program and that if they agreed to participate, their child would be randomly assigned to participate in either a Coping Skills Program or a no-treatment condition. No mention was made of depression prevention in this letter. Parents were informed that their child would receive a one-time payment of $5 for participating during the first year, a one-time payment of $10 for the second year, and a one-time payment of $15 for the third year, irrespective of the condition to which he or she was assigned. This payment was made directly to the child at the end of each academic year. We randomly assigned the 168 children in both schools who agreed to participate to either the prevention condition or the no-treatment control condition.

All children followed the same procedure. Immediately before the beginning of the PRP, all children completed a series of questionnaires that measured a variety of psychological states and traits (see below for detailed descriptions of the measures used). Members of the research staff supervised children in this task, assisting any children having difficulty with the instruments by reading selected portions to them. Upon completion of the PRP, all children again completed the same measures under the same supervised conditions, and then again at specific follow-up periods (3 and 6 months after the completion of the program).

Measures

All of the measures completed by the children, parents, and teachers are instruments that are standard in the field and have been shown to have good reliability and validity. Below is a brief description of the instruments.

The Children's Depression Inventory (CDI; Kovacs, 1985). The CDI is a standard 27-item symptom checklist that assesses depressive symptoms in children. The CDI has demonstrated acceptable levels of internal consistency (α = .84–.87) and test–retest reliability (r = .74–.77). A CDI score of 20 or greater was used to determine moderate to severe levels of depressive symptoms.

The Children's Attributional Style Questionnaire (CASQ; Kaslow, Tanenbaum, & Seligman, 1978). The CASQ is a 48-item forced-choice questionnaire that assesses the child's tendency to make internal, stable, and global explanations for negative and positive events. The CASQ has adequate internal consistency (α = .50–.73), and the test–retest reliability is also acceptable (a r = .71–.80; Seligman et al., 1984).

The Automatic Thoughts Questionnaire (ATQ; Kazdin, 1990). The ATQ is a 30-item questionnaire that assesses the occurrence and prevalence of negative thoughts and attributions on a 5-point Likert scale. For each statement the child indicates the extent to which the thought occurred during the previous week. The ATQ demonstrates good internal consistency (α = .96).

The Hopelessness Scale (H-Scale; Kazdin, Rodgers, & Colbus, 1986). The H-Scale is a 17-item true–false questionnaire that assesses the degree to which the child feels hopeless about the future. It demonstrates good internal consistency (α = .97) and adequate test–retest reliabilty (r = .52).

The Perceived Self Competence Scale/What I am Like (WIAL; Harter, 1982). The WIAL is a 36-item questionnaire that assesses the child's self-esteem in six domains on a 4-point Likert scale: scholastic, athletic, academic, appearance, behavior, and global. It has good internal consistency with its subscales (α = .71–.85) and good test–retest reliability.

PRP. The original PRP was developed and implemented in suburban middle schools outside of Philadelphia (Jaycox et al., 1994). The theoretical underpinning of the program is cognitive–behavioral: Children in this 12-week program learn about the links between thoughts and emotions, they learn how to generate a list of possible explanations for negative events in their lives, and they learn how to use evidence to choose the most plausible explanations for these events. The program also helps children consider appropriate ways to handle conflict, set goals, and problem-solve social situations. These skills are taught in a weekly group setting by a trained masters-level leader following a manual. Children also receive weekly homework assignments that they complete between sessions.

Reivich and Seligman (1992) and then Cardemil, Reivich, and Seligman (1997) revised the original version of the PRP manual in order to make it culturally appropriate for minority populations while keeping it true to its theoretical origins in cognitive theory. Careful consideration was given to every modification made to the program. It is possible that traditional cognitive–behavioral assumptions do not play the same role in low-income urban environments, although few studies have examined this issue. Thus, particular care was taken to prevent intervention providers from imposing suburban, middle-class values or perspectives on the participants. The group nature of the

PRP allowed the students to assist each other in searching for useful cognitive and behavioral solutions to problems, allowing the solutions to come from within the culture of the children as much as possible. In addition, given the fact that many of the children faced very difficult real problems, considerable time was spent helping students to develop and enhance their problem-solving skills, in addition to improving their thinking skills.

Specifically, the structure of the program was kept intact while much of the content was modified to make it more relevant to the life experiences of low-income African American and Latino children. For example, the race–ethnicity of many of the characters used as examples throughout the program was changed. In addition, many of the life problems that are targeted for discussion in the groups include a range of issues that are more salient to the children given their low-income, urban environment. For instance, many of the children in the program come from single-parent homes. As a consequence, more discussions focused on handling difficulties associated with growing up in a single-parent home. Moreover, because many of the children quickly turn to physical confrontation when they encounter peer conflict, more time was spent considering alternative ways of handling conflict. A cartoon character that resorts to physical confrontation was introduced earlier in the program and was repeatedly referred to throughout the 12 weeks.

In addition to changes in the content of the program, we made changes in the delivery of the program to make it more likely to keep attendance at a high level. For example, rather than deliver the program after school, the program was delivered during school hours. This decision was made after careful consultation with the principal and teachers of the two schools, who felt that afterschool programs would simply not be attended by their students. Other changes included weekly phone calls by the research staff to the children in the prevention program to remind them to complete their weekly homework assignments. Without these weekly reminders, the majority of the children did not tend to complete their homework.

Children participated in weekly 90-minute groups, composed of 10 children each. Each group was led by a masters-level graduate student (three were in clinical psychology, two in counseling, and one in education psychology) and was assisted by an undergraduate psychology major. In School 1 (with predominately Latino students), the first author, who is Latino, supervised four masters-level graduate students (three of whom were Caucasian and one of whom was African American) in the implementation of the program. In School 2 (with predominately African American students), the first author was the group leader for four groups and one other masters-level graduate student (who was African American) was the leader for one group. All group leaders received at least 20 hours of training prior to the leading of their group and then followed a flexible manual (Cardemil et al., 1997) that provided structure, guidelines, and suggestions to be used during each session. Bi-weekly supervision, which consisted of evaluation of audiotapes to ensure adherence to the manual and assist in problem solving, helped to ensure that the leaders were appropriately following the protocol.

Study I: Latino Children

As previously stated, the parents of all the 5th and 6th grade children at School 1 were contacted by mail and invited to participate in the program. Sixty-five children agreed to participate and were randomly assigned to either the PRP or the no-treatment control. We limited the size of the participating groups to 10 children each, and so 30 children were randomly assigned to the prevention condition and 35 to the control condition. In this article we restrict our analyses to the 49 Latino children who participated in the program. Of these children, 23 were in the prevention condition and 26 in the control condition. These children comprise Study I (see Table 1).

Data completed by the children's parents confirm that the participants were from low-income families. Approximately 57.1% of the participants (n = 28) indicated that their yearly total family income was less than $20,000. Only 4.1% ($n$ = 2) reported earning more than $40,000 per year. Education levels corresponded to income levels: Only one mother and no fathers reported completing college or receiving education beyond college.

Study II: African American Children

Similarly, the parents of all the 5th and 6th grade children at School 2 were contacted by mail and were invited to participate in the program. A total of 106 children agreed to participate, and we randomly assigned 50 children to the prevention condition and 56 to the control condition. Three children in the prevention condition changed schools in the middle of the program, and as a result we present data on the 47 who finished the course. These African American children comprise Study II (see Table 1).

As in Study I, the data completed by the children's parents in Study II also confirm that the participants were from low-income families. Approximately 28.2% of the participants (n = 29) indicated that their yearly total family income was less than $20,000. Only 12.0% ($n$ = 12) reported earning more than $40,000 per year. Education levels corresponded to income levels: only 9.7% of mothers (n = 10) and 1% of fathers (n = 1) reported completing college or receiving education beyond college.

Statistical Procedures

Analyses of covariance (ANCOVA) examined intervention effects for depressive symptoms (CDI), explanatory style (CASQ), negative automatic thoughts (ATQ), hopeless thoughts (H-Scale), and self-esteem (WIAL). In each ANCOVA, baseline levels of the dependent variable were statistically controlled and symptoms at postintervention were compared between the children assigned to the PRP and those assigned to the no-treatment control condition.

In order to investigate the prevention effects of the PRP, we used repeated-measures ANCOVAs for the CDI, the CASQ, the ATQ, the H-Scale, and the WIAL. Again, baseline levels of the dependent variable were first statistically controlled and then symptoms at the 3-month and 6-month follow-ups were simultaneously compared between the prevention children and the control children. Planned comparisons were conducted after the omnibus repeated-measures analyses in order to examine the prevention effects at each time point.

Because we had clear predictions that the PRP would decrease depressive symptoms, negative automatic thoughts, and hopeless thoughts, and improve explanatory style and self-esteem, we used one-tailed p values for all analyses. We used two-tailed t tests whenever there was not an unambiguous a priori prediction (e.g., analyses of preintervention differences; comparisons between Latino and African American children). Effect sizes for the dependent variables were calculated using residual scores. First, we calculated residualized change scores in a dependent variable from preintervention to a specified follow-up measurement point. The effect size is the absolute mean difference between prevention and control participants, divided by the pooled standard deviation of both groups (Cohen, 1988).

To determine whether a psychological variable mediated the program's effectiveness on depressive symptoms, we followed Baron and Kenny's (1986) recommendations for computing mediation

analyses. In brief, there are several regression equations that the authors recommend estimating: (a) regressing the mediator on the independent variable; (b) regressing the dependent variable on the independent variable; and (c) regressing the dependent variable on the independent variable and on the mediator, with one equation examining the effect of the mediator before adding the independent variable and with one equation examining the effect of the mediation after adding the independent variable. In order to establish mediation, the following conditions must be met: (a) the independent variable must affect the mediator in the expected direction in the first equation; (b) the independent variable must affect the dependent variable in the expected direction in the second equation; (c) the mediator must affect the dependent variable when it is added to the regression equation both before and after the independent variable; and (d) when the mediator is included before the independent variable, the effect of the independent variable on the dependent variable must be reduced.

Results

Study I: Latino Children

We hypothesized that the children who participated in the PRP would show fewer depressive symptoms, a more optimistic explanatory style, fewer hopeless thoughts, fewer negative automatic thoughts, and higher self-esteem than the control children. Overall, the results from the Latino children in School 1 are highly supportive of our hypotheses. Specifically, the children who went through the PRP showed fewer depressive symptoms, negative automatic thoughts, and hopeless thoughts at most of the assessment points than the children who were assigned to the control condition. Six months after the conclusion of the program, children who went through the program reported higher self-esteem. There did not appear to be an effect on explanatory style. We now present each of these analyses in turn.

Preintervention differences. There were no significant differences between the children in the PRP and those in the control group on any of the measures administered at the preintervention period (see Table 1). Moreover, there were no significant differences on any of the demographic variables. There was a slight trend for an unbalanced distribution of boys and girls into the two conditions, χ^2 (1, $N = 53$) = 3.17, $p < .10$, with slightly more girls in the prevention program (boys = 11, girls = 15) and more boys in the control condition (boys = 18, girls = 9). We ran analyses that covaried sex and included a Sex × Condition interaction term in order to determine whether any of the findings could be explained by this imbalance in sex distribution. None of the results reported below was changed by these analyses.

Attrition. A total of 88% of the children in the prevention program and 81% of the children in the control condition completed the 6-month questionnaire assessment. There were no significant differences on any of the preintervention measures between the children who left the study and those who stayed. Moreover, there were no significant differences between the prevention and control children who left the study.

Depressive symptoms: Overall effects. There is evidence for an intervention effect on depressive symptoms (see Figure 1).

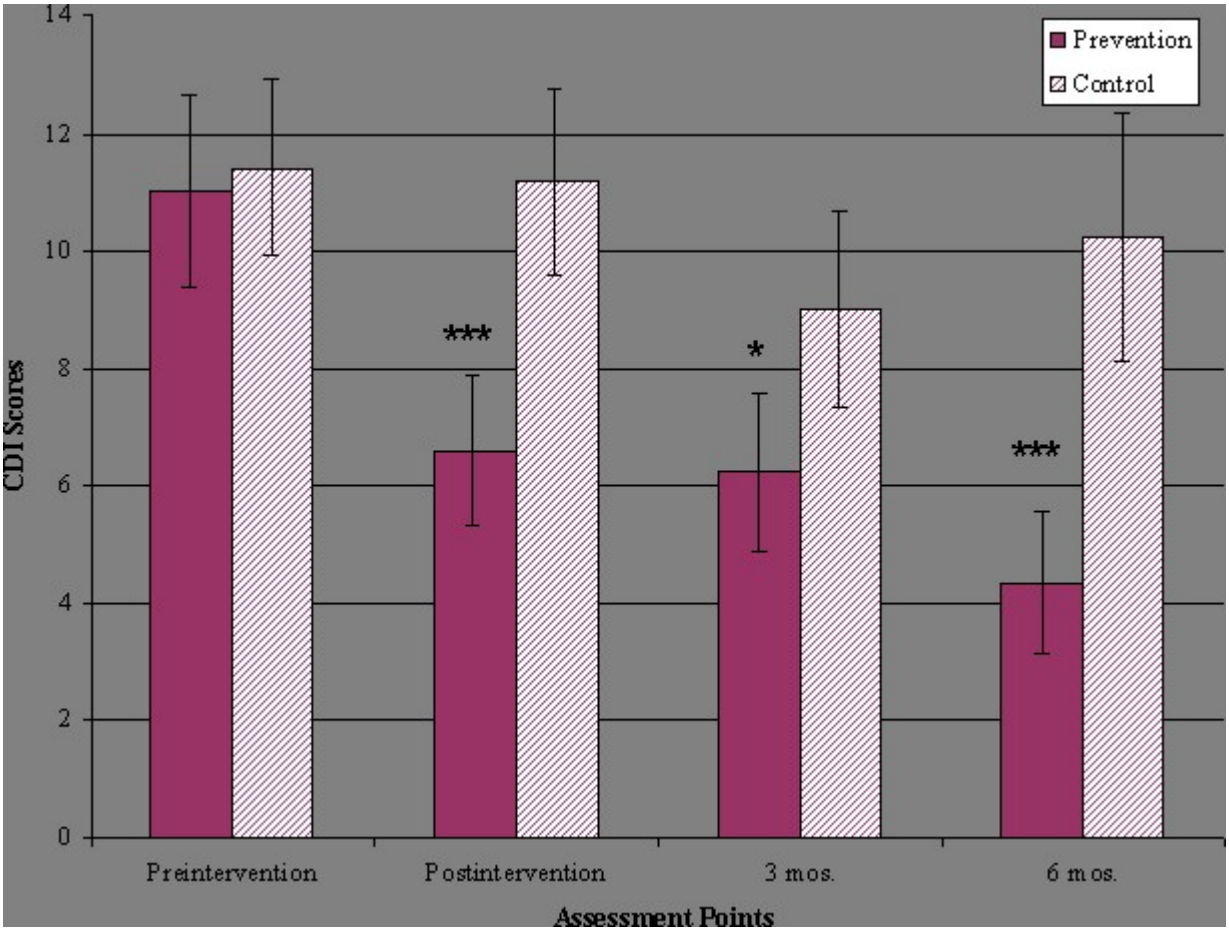

Figure 1. Mean CDI scores for Latino children. *one-tailed $p < 0.05$; ***one-tailed $p < 0.001$

An ANCOVA revealed that at the postintervention assessment, prevention children reported significantly fewer depressive symptoms than the control children, $F(1, 41) = 10.97$, one-tailed $p < .001$, $d = 1.01$. The overall effects of the PRP extended through the 6-month follow-up period (see Figure 1). Over the entire 6-month follow-up period, the prevention children reported fewer depressive symptoms than the control children, $F(1, 35) = 10.12$, $p < .01$. Separate planned comparisons at each follow-up period revealed that the differences between the two groups were significant at both the 3-month, $F(1, 35) = 5.07$, one-tailed $p < .05$, $d = 0.79$, and the 6-month, $F(1, 35) = 11.84$, one-tailed $p < .001$, $d = 1.05$, assessments.

With respect to moderate to severe levels of depressive symptoms, more control children than prevention children reported CDI scores greater than or equal to 20 at each of the follow-up periods, although none of these differences was statistically significant.

Depressive symptoms: Initially high-symptom children. To investigate our hypothesis that the PRP would produce enduring relief of depressive symptoms in those children who were initially symptomatic, we examined the PRP's effect on those children whose preintervention CDI scores were at or above the sample median (*Mdn* = 9.5). An ANCOVA showed that the initially symptomatic children in the prevention condition reported significantly fewer depressive symptoms than the control children at the postintervention assessment, $F(1, 18) = 7.39$, one-tailed $p < .01$, $d = 1.19$; see Table 2.

Table 2
Study I: Depressive Symptoms for Initially High- and Initially Low-Symptom Children

Assessment	Prevention Mean (*SD*) (*n*)	Control Mean (*SD*) (*n*)	Effect size: *d*
	Initially High-Symptom Children		
Preintervention	16.46 (5.83)	19.00 (5.08)	
	(13)	(11)	
Postintervention	9.67 (6.36)	17.48 (6.00)	
	(12)	(9)	1.19**
3 mos.	6.53 (5.31)	15.74 (8.22)	
	(12)	(9)	0.90*
6 mos.	4.82 (6.40)	16.89 (11.86)	
	(11)	(8)	0.90*
	Initially Low-Symptom Children		
Preintervention	3.93 (2.40)	5.86 (2.74)	
	(10)	(15)	
Postintervention	2.30 (3.89)	6.81 (4.82)	
	(10)	(13)	0.67+
3 mos.	2.25 (3.41)	5.24 (4.95)	
	(8)	(14)	0.34
6 mos.	2.13 (3.09)	6.13 (5.21)	
	(8)	(13)	0.79+

Note. The effect size is calculated using residualized scores to represent the change in symptoms from pre-intervention to each assessment point. See statistical procedures section for discussion of this computation.
+one-tailed $p<0.10$; *one-tailed $p<0.05$; **one-tailed $p<0.01$.

This alleviation of symptoms continued over the 6 months of follow-up. A repeated-measures ANCOVA indicated that the initially symptomatic children in the prevention group reported fewer depressive symptoms than the control children across the 6-month follow-up period, $F(1, 15) = 4.25$, one-tailed $p < .05$. Planned comparisons indicated that these differences were significant at both the 3-month, $F(1, 15) = 7.13$, one-tailed $p < .01$, $d = 0.90$, and the 6-month, $F(1, 15) = 4.94$, one-tailed $p < .05$, $d = 0.90$, assessments (see Table 2).

With respect to moderate to severe levels of depressive symptoms, more initially symptomatic control children than prevention children reported CDI scores greater than or equal to 20 at each of the follow-up periods, although these differences were only significant at the 3-month follow-up period: 33.33% ($n = 3$) versus 0.00% ($n = 0$), $\chi^2(1, N = 21) = 4.67$, $p < .05$.

Depressive symptoms: Initially low-symptom children. In order to investigate our hypothesis that the PRP would prevent the development of depressive symptoms in children who were either nonsymptomatic or reporting low levels of depressive symptoms at preintervention, we examined the PRP's effect on those children whose preintervention CDI scores were below the sample median (*Mdn* = 9.5). An ANCOVA showed a trend for the prevention children to report fewer depressive symptoms than the control children at the postintervention assessment, $F(1, 20) = 2.77$,

one-tailed $p < .10$, $d = 0.67$ (see Table 2). This trend for the prevention of symptoms continued over the 6-month follow-up period, $F(1, 17) = 2.59$, one-tailed $p < .10$. Planned comparisons indicated that this difference was not significant at the 3-month assessment, $F(1, 17) = 0.42$, *ns*, $d = 0.34$, but was significant at the 6-month assessment, $F(1, 17) = 3.52$, one-tailed $p < .05$, $d = 0.79$ (see Table 2).

No differences emerged in the incidence of reporting moderate to severe levels of depressive symptoms (as defined by CDI scores of 20 or greater) between the initially nonsymptomatic prevention and control children, because none of these children ever reported depressive symptoms above 20.

Explanatory style. The results on explanatory style do not support our hypotheses (see Table 3).

Table 3
Study I: CASQ, ATQ, H-Scale, and WIAL Scores

	CASQ			ATQ		
Assessment	Prevention *M* (*SD*) (*n*)	Control *M* (*SD*) (*n*)	Effect size *d*	Prevention *M* (*SD*) (*n*)	Control *M* (*SD*) (*n*)	Effect size *d*
Pre	3.65 (4.18) (21)	3.30 (5.85) (23)		36.20 (24.30) (23)	31.85 (23.81) (24)	
Post	5.80 (5.52) (24)	5.53 (3.5) (21)	0.02	25.89 (20.78) (23)	36.34 (25.48) (21)	0.76**
3-month	5.15 (5.00) (21)	4.87 (5.16) (23)	0.03	21.09 (20.99) (22)	23.95 (23.32) (22)	0.70*
6-month	4.92 (4.81) (21)	4.89 (5.16) (21)	0.11	15.38 (20.59) (22)	20.31 (22.00) (21)	0.64*
	H-Scale			WIAL		
Pre	5.32 (3.55) (23)	5.57 (3.35) (24)		100.44 (16.50) (23)	99.85 (15.89) (25)	
Post	3.65 (2.51) (23)	4.72 (3.7) (22)	0.47+	104.87 (22.02) (23)	97.22 (17.53) (21)	0.34
3 mos.	3.83 (2.55) (23)	5.40 (3.23) (24)	0.94**	106.67 (21.38) (23)	104.60 (20.49) (24)	0.37
6 mos.	3.96 (2.80) (22)	4.90 (3.60) (22)	0.63*	106.18 (21.38) (19)	98.17 (14.14) (21)	0.86**

Note. The effect size is calculated using residualized scores to represent the change in symptoms from pre-intervention to each assessment point. See statistical procedures section for discussion of this computation.

+one-tailed p<0.10; *one-tailed p<0.05; **one-tailed p<0.01.

There were no significant differences between the prevention children and the control children at postintervention: ANCOVA, $F(1, 36) = 0.00$, *ns*, $d = 0.02$. Moreover, a repeated-measures ANCOVA showed no overall prevention effect, $F(1, 28) = 2.64$, *ns*.

Negative cognitions. In addition to the alleviation and prevention of depressive symptoms, the PRP also affected negative automatic thoughts (ATQ) and hopelessness (H-Scale), two of the cognitive measures that are associated with depression (see Table 3). At the postintervention assessment, an ANCOVA, covarying out initial ATQ scores, revealed that prevention children had significantly lower ATQ scores than control children, $F(1, 38) = 5.78$, one-tailed $p < .01$, $d = 0.76$. A similar ANCOVA, covarying out initial H-Scale scores, showed a trend for the prevention children to report lower H-Scale scores than the control children, $F(1, 38) = 2.22$, one-tailed $p < .10$, $d = 0.47$.

This effect continued across the 6-month follow-up period. Repeated-measures ANCOVAs indicated that the prevention children reported significantly lower ATQ scores, $F(1, 31) = 3.07$, one-tailed $p < .05$, and H-Scale scores, $F(1, 34) = 5.62$, one-tailed $p < .05$, across the entire 6-month follow-up period. Planned comparisons indicated that children in the prevention program had a trend towards lower ATQ scores at the 3-month follow-up, $F(1, 31) = 2.01$, one-tailed $p < .10$, $d = 0.70$, and significantly lower ATQ scores at 6-month follow-up, $F(1, 31) = 3.36$, one-tailed $p < .05$, $d = 0.64$, than the control children. Similarly, children in the prevention program reported significantly lower H-Scale scores than the control children at both the 3-month, $F(1, 34) = 5.34$, one-tailed $p < .05$, $d = 0.94$, and the 6-month, $F(1, 34) = 2.90$, one-tailed $p < .05$, $d = 0.63$, assessments.

In sum, the PRP appeared to reduce both negative automatic thoughts and hopelessness for the Latino children at School 1 at postintervention and at both the 3-month and 6-month follow-up periods.

Self-esteem. The results on the self-esteem measure (WIAL) partially supported our hypotheses (see Table 3). At the postintervention assessment, there was no difference in self-reported self-esteem between the children in the prevention program and those assigned to the control group, $F(1, 35) = 1.14$, *ns*, $d = 0.34$. A repeated-measures ANCOVA, however, showed that the prevention children reported significantly greater self-esteem than the control children over the 6-month follow-up period, $F(1, 35) = 4.67$, one-tailed $p < .05$. Planned comparisons at each follow-up period revealed that the differences between the two groups were not significant at the 3-month assessment, $F(1, 35) = 1.09$, *ns*, $d = 0.37$, but were significant at the 6-month assessment, $F(1, 35) = 6.97$, one-tailed $p < .01$, $d = 0.86$.

Given that there is some controversy in the field regarding the independence of self-esteem with regards to depressive symptoms, we decided to investigate whether the improvement in self-esteem could be wholly attributed to changes in depressive symptoms over the 6-month period. As such, we examined the extent to which prevention-control differences in self-esteem would exist at the 6-month assessment, after first controlling for baseline levels of self-esteem and then factoring out changes in depressive symptoms over the course of the 6-month follow-up (as calculated by residual change scores). This ANCOVA, which allows us to determine the extent to which the intervention produced changes in self-esteem above and beyond any changes produced in depressive symptoms, was significant, $F(1, 34) = 4.04$, one-tailed $p < .05$. This result suggests that the prevention children reported higher self-esteem than the control children, even after controlling for the fact that they reported fewer depressive symptoms.

In sum, it appears that there was no immediate intervention effect on children's self-esteem, but

that there was an overall prevention effect that was mostly driven by the longer term effects of the 6-month assessment. Furthermore, the change in self-esteem remained significant at the 6-month assessment even after controlling for changes in depressive symptoms, suggesting that the program had a direct effect on self-esteem above and beyond its effect on depression.

Mediation analyses. An unexpected finding was that explanatory style was not affected by the prevention program. Previous versions of the PRP have found that explanatory style was not only significantly improved by participation in the program, but that it also mediated change in depressive symptoms (Gillham et al., 1995). Given that the ATQ was the only measure in addition to depressive symptoms to yield significant effects at postintervention, we chose to examine the possible role of change in negative cognitions as a mediator of change in depressive symptoms. Specifically, we used residualized change scores in ATQ scores from preintervention to postintervention as the mediator.

Following Baron and Kenny's (1986) recommendations, we ran regressions using change in CDI scores as the dependent variable, the condition to which the child was assigned as the independent variable, and the residualized ATQ scores as the mediator. Results indicate that change in negative cognitions over the course of the prevention program was a significant mediator of the program's effect on depressive symptoms at post-treatment (see Table 4), 3-month follow-up (see Table 5), and 6-month follow-up (see Table 6).

Table 4
Change in ATQ Scores From Preintervention to Postintervention as a Mediator of Change in Depressive Symptoms From Preintervention to Postintervention

Requirement	Predictor variable	Dependent variable	B	*SE* B	β	R^2	F	*df*	p^*
1. Intervention condition predicts change in ATQ	CONDITION	ATQRES	14.87	6.11	0.36	0.13	5.92	1,39	0.0196
2. Intervention condition predicts change in depressive symptoms+	CONDITION	CDITOT2	4.77	1.44	0.33	0.59	10.97	1,41	0.0019
3. Change in ATQ predicts change in depressive symptoms+ when controlling for intervention condition	ATQRES	CDITOT2	0.08	0.03	0.26	0.64	5.98	1,37	0.0193
	CONDITION		3.26	1.40	0.25		5.45	1,37	0.0251

*Two-sided *p* values.

+Change in depressive symptoms calculated by covarying out baseline scores.

Table 5
Change in ATQ Scores From Preintervention to Postintervention as a Mediator of Change in Depressive Symptoms From Preintervention to 3-Month Follow-Up

Requirement	Predictor Variable	Dependent Variable	B	*SE* B	β	R^2	*F*	*df*	p^*
1. Intervention condition predicts change in ATQ	CONDITION	ATQRES	14.87	6.11	0.36	0.13	5.92	1,39	0.0196
2. Intervention condition predicts change in									

depressive symptoms[+]	CONDITION	CDITOT3	4.27	1.68	0.30	0.44	6.45	1,40	0.0151
3. Change in ATQ predicts change in depressive symptoms[+] when controlling for intervention condition	ATQRES	CDITOT3	0.13	0.04	0.36	0.59	7.98	1,33	0.008
	CONDITION		2.98	1.69	0.22		3.11	1,33	0.087

[*]Two-sided *p* values.

[+]Change in depressive symptoms calculated by covarying out baseline scores.

Table 6
Change in ATQ Scores From Preintervention to Postintervention as a Mediator of Change in Depressive Symptoms From Preintervention to 6-Month Follow-Up

Requirement	Predictor variable	Dependent variable	B	*SE* B	β	R^2	*F*	*df*	p^*
1. Intervention condition predicts change in ATQ	CONDITION	ATQRES	14.87	6.11	0.36	0.13	5.92	1,39	0.0196
2. Intervention condition predicts change in depressive symptoms[+]	CONDITION	CDITOT4	6.65	2.06	0.40	0.45	10.46	1,37	0.0026
3. Change in ATQ predicts change in depressive symptoms[+] when controlling for intervention condition	ATQRES	CDITOT4	0.10	0.06	0.25	0.48	3.43	1,31	0.073
	CONDITION		5.85	2.02	0.38		8.35	1,31	0.007

[*]Two-sided *p* values.

[+]change in depressive symptoms calculated by covarying out baseline scores

Summary of Study I: Latino children. We hypothesized that the PRP would have a beneficial effect on its participants, as evidenced by fewer depressive symptoms, improved explanatory style, fewer hopeless thoughts, fewer negative automatic thoughts, and higher self-esteem. The results from Study I supported most of our hypotheses. Specifically, the PRP appears to have produced both an immediate and a longer term effect on depressive symptoms for the Latino children who went through it. The program was effective for the initially symptomatic children in providing enduring alleviation of depressive symptoms. There was also a trend for the PRP to prevent the development of depressive symptoms in those children who were initially nonsymptomatic.

With respect to two correlates of depression, negative automatic thoughts and hopeless thoughts, the PRP also was effective for the Latino children. The prevention children showed fewer negative automatic thoughts and hopeless thoughts than the control children at post-intervention, 3-month, and 6-month follow-up. And finally, whereas there was no effect on explanatory style and no short-term effect on the self-esteem, there was a longer-term effect on self-esteem such that at the 6-month assessment the prevention children reported higher self-esteem than the control children.

Study II: African American Children

In contrast with the positive results reported by the Latino children at School 1, the results from the African American children at School 2 did not support our hypotheses. There were no differences at any of the measurement periods between the children who went through the PRP and those who were assigned to the no-treatment control condition. We now present these analyses in turn.

Preintervention differences. There were no significant differences between the children in the prevention group and those in the control group on any of the measures administered at the preintervention period (see Table 1). In addition, there was only one demographic variable that revealed a significant difference between the prevention and control groups: Control families had higher levels of income than prevention families, $\chi^2(4, N = 105) = 10.40$, $p < .05$. Analyses run with income level as a covariate did not affect any of the results.

Attrition. Several children changed schools during the course of the 6-month follow-up period. Because we had obtained their home addresses at the start of the project, we attempted to have them continue to participate in the program by mailing the measures to their homes. Nevertheless, we were unable to contact several children by the 6-month follow-up point. A total of 87% of the children in the prevention program and 74% of the children in the control condition completed the 6-month questionnaire assessment. There were no significant differences on any of the preintervention measures between the children who left the study and those who stayed. In addition, there were no significant differences between the prevention and control children who left the study.

Depressive symptoms: Overall effects. There was no support for an intervention effect on depressive symptoms with the African American children at School 2 (see Figure 2).

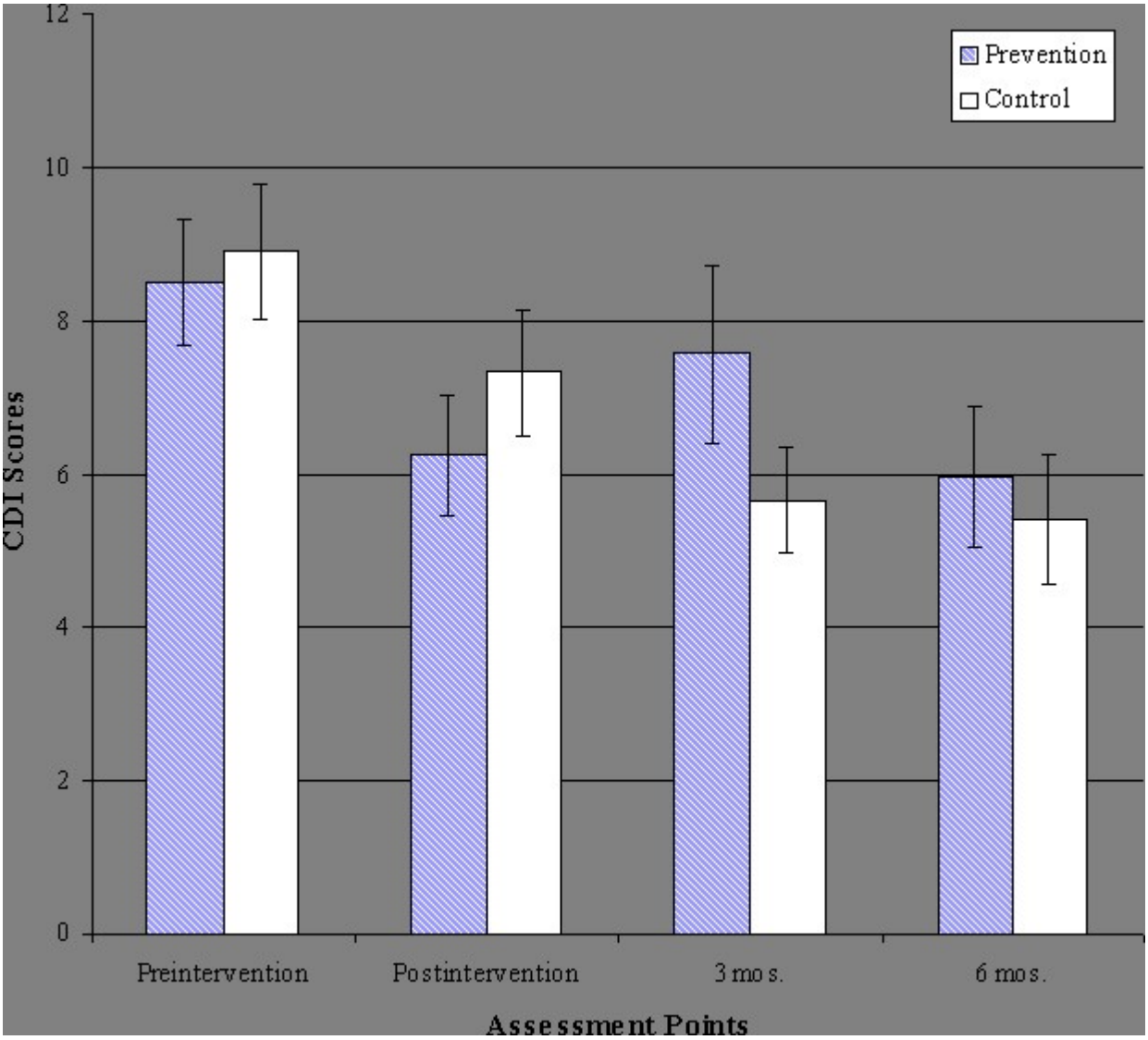

Figure 2. Mean CDI scores for African-American children.

Although prevention children reported fewer depressive symptoms than control children at the postintervention assessment, this difference was not statistically significant, $F(1, 99) = 0.67$, *ns*, $d = 0.16$. The lack of an effect on depressive symptoms continued across the 6-month follow-up (see Figure 2). In fact, a repeated-measures ANCOVA showed a paradoxical result: In addition to there being no overall prevention effect, control children tended to report fewer depressive symptoms than the prevention children, although this difference was not statistically significant, $F(1, 77) = 2.54$, *ns*.

Careful examination of these data reveal that over the course of the program and follow-up, the prevention children did report significantly fewer depressive symptoms than at the outset: preintervention to postintervention, $t(46) = 2.99$, two-tailed $p < .01$; preintervention to 6-month follow-up, $t(39) = 2.99$, two-tailed $p < .01$. However, the control children reported similarly significant reductions in depressive symptoms: preintervention to postintervention, $t(54) = 2.27$, two-tailed $p < .05$; preintervention to 6-month follow-up, $t(40) = 3.39$, $p < .01$, two-tailed. This parallel improvement in the control children resulted in there being no differential effectiveness for the prevention children.

With respect to moderate to severe depressive symptoms, there was a trend for more control children than prevention children to report CDI scores greater than or equal to 20 at postintervention, 7.27% ($n = 4$) vs. 0.00% ($n = 0$), $\chi^2(1, N = 102) = 3.56$, $p < .10$. However, at the 3-month assessment, the difference had reversed itself: A greater number of prevention children than control reported CDI scores greater than 20, 2.13% ($n = 1$) vs. 13.04% ($n = 6$), $\chi^2(1, N = 93) = 3.98$, $p < .05$. This paradoxical reversal did not continue at the 6-month assessment, however: 2.38% ($n = 1$) vs. 2.50% ($n = 1$), $\chi^2(1, N = 82) = 0.001$, *ns*.

Depressive symptoms: Initially high-symptom children. In order to investigate our hypothesis that the PRP would produce enduring relief of depressive symptoms in those children who were initially symptomatic, we examined the PRP's effect on those children whose preintervention CDI scores were at or above the sample median (*Mdn* = 7). Again, an ANCOVA revealed no difference in the reporting of depressive symptoms between the prevention children and the control children at the postintervention assessment, $F(1, 52) = 0.37$, *ns*. A repeated-measures ANCOVA across the 6-month follow-up period yielded similar results to that of the overall sample: Prevention children reported higher levels of depressive symptoms than the control children, $F(1, 39) = 4.56$, two-tailed $p < .05$. Planned comparisons revealed that this difference was significant at the 3-month assessment, $F(1, 39) = 4.46$, two-tailed $p < .05$, but not at the 6-month assessment, $F(1, 39) = 2.17$, *ns*.

Examination of moderate to severe CDI scores in these initially symptomatic children found a pattern similar to that of the overall sample. Immediately after the conclusion of the program, there was a trend for more control children than prevention children to report CDI scores greater than 20, 13.33% ($n = 4$) vs. 0.00% ($n = 0$), $\chi^2(1, N = 55) = 3.60$, $p < .10$. However, once again at the 3-month assessment a greater number of prevention children than control children reported CDI scores greater than 20, 4.00% ($n = 1$) vs. 25.00% ($n = 6$), $\chi^2(1, N = 49) = 4.41$, $p < .05$. This reversal did not continue at the 6-month assessment, 4.35% ($n = 1$) vs. 5.00% ($n = 1$), $\chi^2(1, N = 43) = 0.01$, *ns*.

Depressive symptoms: Initially low-symptom children. In order to investigate our hypothesis that the PRP would prevent the development of depressive symptoms in children who were either nonsymptomatic or reporting low levels of depressive symptoms at preintervention, we examined the PRP's effect on those children whose preintervention CDI scores were below the sample median (*Mdn* = 7). An ANCOVA found no differences between the prevention and control children at the postintervention assessment, $F(1, 46) = 0.64$, *ns*, and a repeated-measures ANCOVA across the 6-month follow-up also revealed no significant differences, $F(1, 35) = 0.34$, *ns*.

No differences emerged in the incidence of reporting moderate to severe levels of depressive symptoms (as defined by CDI scores of 20 or greater) between the initially nonsymptomatic prevention and control children, because none of these children ever reported CDI scores above 20.

Explanatory style, negative cognitions, and self-esteem. None of the other measures (CASQ, ATQ, H-Scale, and WIAL) revealed any significant differences between the prevention children and the no-treatment control children (see Table 7).

Table 7
Study II: CASQ, ATQ, H-Scale, and WIAL Scores

	CASQ	ATQ

	Prevention	Control		Prevention	Control	
Assessment	*M* (*SD*) (*n*)	*M* (*SD*) (*n*)	Effect size *d*	*M* (*SD*) (*n*)	*M* (*SD*) (*n*)	Effect size *d*
Pre	4.88 (4.02) (43)	5.42 (4.98) (51)		27.59 (21.70) (46)	23.29 (20.23) (54)	
Post	5.17 (4.00) (47)	6.38 (4.69) (52)	0.15	21.16 (19.39) (47)	17.55 (21.94) (54)	0.06
3-month	5.39 (4.09) (46)	6.98 (4.74) (44)	0.32	19.60 (18.11) (45)	14.03 (14.97) (44)	0.31
6-month	4.74 (4.09)	5.98 (5.04)	0.23	14.32 (16.62)	11.36 (14.35)	0.21
	H-Scale			WIAL		
Pre	4.11 (2.81) (47)	4.12 (3.23) (56)		101.3 (16.1) (46)	104.75 (14.05) (52)	
Post	3.93 (3.03) (47)	3.76 (2.99) (55)	0.07	89.21 (17.20) (46)	92.45 (16.68) (55)	0.11
3 mos.	4.18 (3.03) (46)	3.18 (2.31) (46)	0.34	88.05 (15.56) (46)	90.59 (24.08) (47)	0.02
6 mos.	4.09 (3.14) (40)	3.24 (2.93) (42)	0.25	105.64 (16.05) (40)	109.57 (17.73) (41)	0.11

Note. The effect size is calculated using residualized scores to represent the change in symptoms from pre-intervention to each assessment point. See statistical procedures section for discussion of this computation.

Thus, the prevention program was not differentially effective in reducing or preventing any of the measured psychological variables in the African American children at School 2.

Summary of Study II: African American children. The results from the African American children at School 2 did not support our hypotheses. There were no differences in depressive symptoms or any of the other outcome measures at any of the measurement periods between the children who went through the depression prevention program and those who were assigned to the no-treatment control condition. Although the prevention children showed significant improvement over the course of the follow-up period, this difference was no greater (and at times less) than the improvement shown by the control children. The one consistent difference that did emerge was a paradoxical one: At the 3-month follow-up period, the prevention children reported higher levels of depressive symptoms than the control children. At 6 months, however, this difference disappeared.

Comparisons Between Studies I and II

Given the strikingly different results provided by these two studies, a closer examination that directly compares the Latino children from Study I and the African American children from Study II seems warranted. It is possible that the Latino prevention children are benefiting more from the program than the African American prevention children. It is also possible that the African American control children are reporting fewer symptoms than the Latino control children. Either of

these two scenarios would contribute to the results found.

Repeated-measures ANCOVAs across the follow-up period, controlling for initial levels of symptoms, revealed that the Latino prevention children reported significantly fewer depressive symptoms than the African American prevention children, $F(1, 55) = 7.67$, $p < .01$ (see Figure 3).

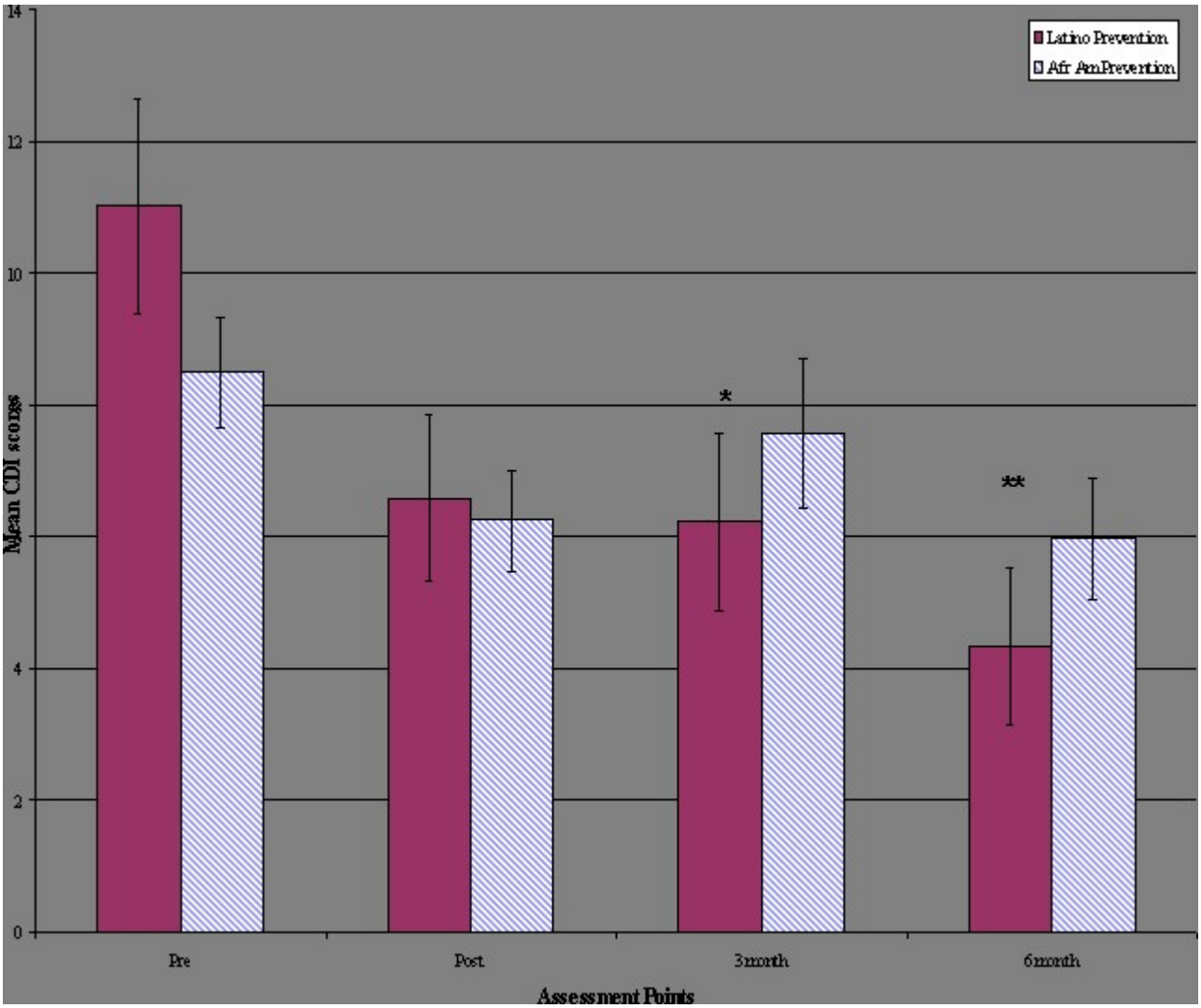

Figure 3. Prevention children: Latino and African American. *two-tailed $p < 0.05$; **two-tailed $p < 0.01$

In addition, the Latino prevention children reported significantly fewer hopeless thoughts, $F(1, 54) = 6.25$, $p < .05$, and significantly higher self-esteem, $F(1, 53) = 15.61$, $p < .001$, than the African American prevention children. There was also a nonsignificant trend toward the Latino prevention children reporting fewer negative automatic cognitions, $F(1, 50) = 2.70$, *ns*. These differences support the hypothesis that the Latino prevention children benefited more from the program than did the African American prevention children.

Comparison of the control children shows fewer depressive symptoms in the African American children than in the Latino children across the follow-up period, $F(1, 55) = 5.64$, $p < .05$ (see Figure 4),

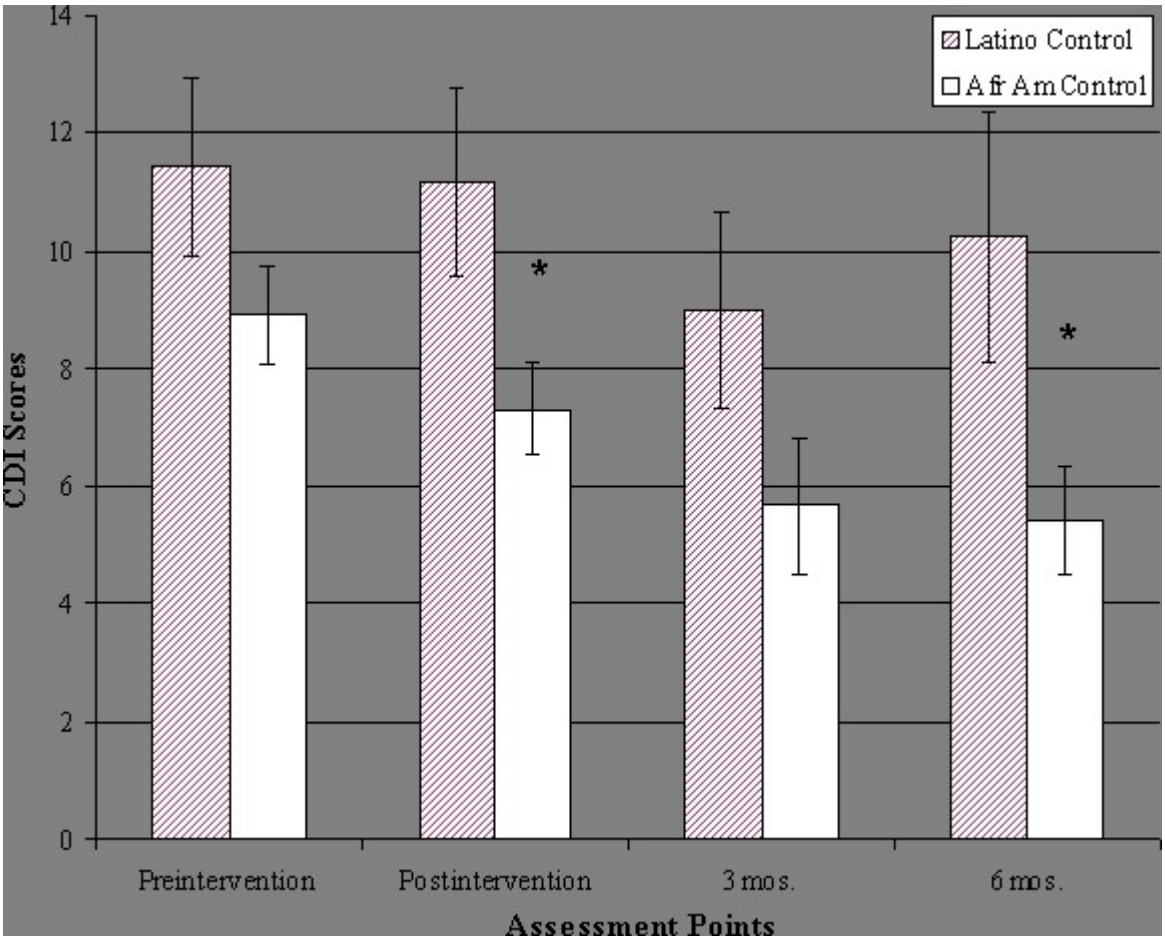

Figure 4. Control children: Latino and African American. *two-tailed $p < 0.05$

and a trend toward fewer negative automatic cognitions, $F(1, 47) = 3.20$, $p < .10$. These results provide some support for the hypothesis that the African American control children were reporting fewer symptoms than the Latino control children.

In sum, the Latino prevention children appeared to benefit more from the PRP than the African American prevention children. Also, the African American control children reported significantly fewer depressive symptoms than the Latino control children. As previously stated, comparisons between the African American children in Studies I and II were limited because of low numbers of African American participants in Study I ($n = 10$). Comparisons between the Latino children in Studies I and II were not possible because of low numbers of Latino children in Study II ($n = 1$).

Discussion

The primary goal of this project was to investigate whether a school-based depression prevention program could prevent depression in low-income minority children. We now summarize the major findings and present potential explanations for the pattern of results we report.

Did the Program Prevent Depression?

There were three major findings. First, the prevention program produced clear positive long-term

results with the Latino children. Up to 6 months after the conclusion of the program, the Latino prevention children reported fewer depressive symptoms, fewer negative cognitions, fewer hopeless thoughts, and higher self-esteem than the randomly assigned controls. Moreover, the program appeared to work for both those children reporting initially high levels of symptoms and those reporting low levels or no symptoms. That is, it produced enduring relief for those children who were initially symptomatic, and showed a trend toward preventing the development of depressive symptoms in those children who were initially nonsymptomatic. Finally, changes in negative cognitions over the course of the prevention program appeared to mediate the program's effect on depressive symptoms.

The second major finding was that the success of the program did not extend to the African American children. Overall, the control group and the prevention group did not differ in follow-up on any depression measures. It is important to note that the prevention children did in fact show improvement in their depressive symptoms over the course of the program, but this improvement was not different from that reported by the control children. Subanalyses indicated that this lack of an effect also extended to the initially high-symptom children and the initially nonsymptomatic children. In fact, at the 3-month assessment more initially high-symptom prevention children than control children reported high levels of depressive symptoms, although this finding was not present at posttreatment and had completely disappeared by the 6-month assessment.

The third major finding came from the comparisons across the two studies. The Latino children seemed to benefit more from the program than the African American children. Moreover, they appeared to need the program more, because the Latino control children reported more depressive symptoms across the follow-up period than the African American control children.

What Led to the Differential Effectiveness of the Program?

Why did the program not work with the African American children when it worked so well with the Latino children? Any explanation that attempts to account for the differential effectiveness that we found would need to take into account both of the following factors: (a) a less robust response in the African American participants and (b) a significant "natural improvement" in depressive symptoms reported by the control children. We now consider six potential explanations for these findings.

The prevention program was effectively delivered only to the Latino children. It is possible that the program instructors for the African American children simply delivered a poorer version of the program, as compared to the program instructors for the Latino children. We discount this possibility, given that the primary program instructor for the African American children trained the program instructors for the Latino children. It seems unlikely that the program instructor could deliver a poor version of the program and then be able to train other instructors in the effective delivery of the program. Moreover, this explanation does not account for the improvement in depressive symptoms reported by the African American control children.

The delivery of the program was affected by unmeasured interactions between the race/ethnicity of the children and that of the program instructors. The two program instructors for the African American children were Latino and African American, whereas the three program instructors for the Latino children were Caucasian. It is possible that the African American children did not respond well to the two minority instructors, whereas the Latino children responded well to the three Caucasian instructors. We doubt this explanation, particularly given the informal feedback from the children participants, their teachers, and their parents, but we have insufficient data to

directly examine any racial–ethnic interactions between the participant and the intervention providers. However, once again, this explanation does not account for the improvement in depressive symptoms reported by the African-American control children.

The results are an example of regression to the mean. We take this explanation seriously and wonder whether it is possible that the children who presented to our research program were somehow more depressed than the average child at the respective schools and, once enrolled, simply improved over time. Although this possibility would explain the reduction in depressive symptoms reported by the African American prevention and children, it does not explain why the Latino control children did not similarly improve over time.

The African American and the Latino children expressed their depressive symptoms differently. Differential reporting of depressive symptoms could occur in several ways. It is possible that the African American children underreported depressive symptoms or the Latino children overreported depressive symptoms as they grew older, a pattern that would yield the results found in our work. It is not clear to us, however, why there might be differential reporting of depressive symptoms between these two groups.

Another possibility is that the two groups of children expressed their symptoms differently. Some researchers have explored the possibility that culture can lead to differential manifestation of psychiatric symptoms (e.g., Kleinman & Good, 1985). If the African American and Latino children manifest depression differently from one another and thus report these symptoms differently, it is possible that the instruments used to detect depressive symptoms may have been insensitive to this characteristic. While intriguing, emerging research comparing different racial–ethnic groups in the United States has tended to find more similarities than differences (e.g., Roberts, 1992; Roberts et al., 1995). More research is needed to evaluate the merits of this possibility.

The Latino children and the African American children responded to different ingredients in the program. Given that this study did not include a placebo control or alternative treatment condition, we are limited in our speculations of the active ingredients of change in the PRP. Nevertheless it is possible, for example, that the Latino children responded to the cognitive-behavioral content of the program whereas the African American children responded to the attention provided to them by the intervention providers.

Such a difference in active ingredients might explain some of the differences in our results. It might, for instance, explain why at the 3-month assessment more initially symptomatic African American prevention children than control children reported high levels of depressive symptoms. The 3-month assessment occurred at the beginning of the subsequent school year following the usual summer break, and these prevention children may have been particularly disappointed that the PRP was not continuing throughout the academic year. By the 6-month follow-up period, these children would have become acclimated to the idea of not having the PRP available and thus would no longer be reporting high levels of depressive symptoms. If the Latino prevention children were responding more to the cognitive-behavioral content of the program, then they would be less affected by the absence of the attention components of the PRP in the subsequent year.

While intriguing, this possible explanation is limited for several reasons. First, as explained earlier, we do not have any data that directly address this possibility. The mediation analyses supporting the role of the ATQ in producing changes in depressive symptoms with the Latino children lend some support to the possibility that the Latinos are responding to the content of the program, but our inability to conduct mediation analyses with the null results of the African Americans limits this interpretation. Second, we are currently unable to explain why this racial–ethnic difference

would exist. It is possible that school differences in the amount of attention provided to the children would create differences in the children's need for attention, but we did not formally assess this variable. And third, this explanation does not account for the improvement in depressive symptoms reported by the African American control children. As such, this explanation can only partially explain the differential effectiveness of the PRP.

The African American children became less depressed as they grew older. As such, a depression prevention program would not produce significant results should the dependent variables be limited to depressive symptoms. Because we were limited to statistical analyses of the results from the African Americans at one school, we cannot address the intriguing possibility that actual differences in depressive symptoms are culturewide or school-specific. In other words, it is possible that the particular school in which we worked was especially helpful in promoting and teaching coping skills to all its children in a way that produced a reduction in depressive symptoms in all of its children. And yet, our exploratory examination of mean depression scores yielded similar patterns of symptoms among the African American control children at both schools.

We know of no research that directly addresses these six different possibilities, and unfortunately, our current data cannot directly distinguish among these possibilities. However, the reduction in depressive symptoms in the African American control children at both schools is consistent with the data from both the ECA study and the National Comorbidity Survey, which found that African Americans were significantly less likely to report a major depressive episode than were Caucasians (Blazer et al., 1994; Regier et al., 1993). Moreover, the large benefit derived by the Latino children would also be consistent with the high rates of depression found among Latinos in the National Comorbidity Survey (Blazer et al., 1994) and the Hispanic Health and Nutrition Examination Survey (Potter et al., 1995). In fact, analyses of the survey that specifically examined Puerto Ricans living in New York City (a city relatively close in proximity to Philadelphia) showed 6-month prevalence rates of major depression of 7.19% (Potter et al., 1995), considerably higher than the 2.2 to 3.5% reported by the participants in the ECA study (Myers et al., 1984). Given that the majority of the Latino children in this study were of Puerto Rican origin, it is possible that Puerto Ricans living in the Northeast United States represent a particularly at-risk subset of Latinos that would benefit from depression prevention programs.

Conversations with teachers, parents, and school administrators lead us to doubt the possibility that the African American children were somehow experiencing fewer depressive symptoms because their mental health spontaneously improved over the course of the 9 months. If the African American children were not in fact experiencing improved mental health, then perhaps alternative measures of mental health would reveal difficulties. And yet, data from the ECA study and the National Comorbidity generally do not support this hypothesis, given the overall low prevalence of psychiatric disorders reported by African Americans (Blazer et al., 1994; Regier et al., 1993). Attar, Guerra, and Tolan (1994), in a study of life stress, depression, and aggression among urban African American and Latino children, found no relationship between life stress and teacher's report of depression or anxiety. Interestingly, however, they did note a positive relationship between life stress and teacher reports of aggression. The authors suggested that low-income minority children in urban environments may choose to respond to their life stressors aggressively rather than with depressive or anxious symptoms, perhaps as a means to reduce perceived vulnerability.

Although the Attar et al. (1994) data are intriguing, we remain unable to explain why the African American children in our study would respond in such a manner and the Latino children would not. Nevertheless, we have collected parent and teacher data that focuses on the conduct of the children in our program. Given our informal conversations with teachers and parents, it is possible that examination of these data will produce indices of effectiveness in the program that the self-report

measures did not.

What Mediated Prevention?

Because the program was only effective with the Latino children, we limited our mediation analyses to Study I. An unexpected finding was that explanatory style was not affected by the prevention program, because previous versions of this prevention program have found that explanatory style is not only significantly improved by participation in the program, but that it also mediates change in depressive symptoms (Gillham et al., 1995). Explanatory style is defined as the habitual manner in which individuals explain the events that occur in their lives, and a large body of research has established a negative explanatory style as a risk factor for depressive symptoms (e.g., Nolen-Hoeksema, Girgus, & Seligman, 1986; Peterson & Seligman, 1984). And yet, the Latino prevention children in our program showed improvements in depressive symptoms without a concomitant change in explanatory style.

Moreover, the results from Study I revealed that the change scores in negative cognitions over the course of the prevention program were a significant mediator of the program's effect on depressive symptoms. This change in negative cognitions suggests that the Latino children who reported fewer depressive symptoms as a result of the prevention program did so, at least in part, through changes in their reporting of negative cognitions from the beginning to the end of the program. It is unclear why explanatory style did not play its expected role in either of the two studies, or why negative cognitions would play such an important role with these children when they did not in our previous work with suburban children (e.g., Gillham et al., 1995).

One possibility is that the instrument that assesses the presence of negative cognitions (ATQ) is more relevant to the low-income minority children who comprised this urban sample than the instrument that assessed explanatory style (CASQ). The ATQ asks children to report the frequency of negative cognitions, whereas the CASQ asks children to consider possible hypothetical life situations that occur in children's lives. Perhaps the hypothetical situations described in the CASQ did not represent typical life situations that low-income children encounter in urban environments. If this were the case, the CASQ would be less relevant as a predictor of depressive symptoms for these children. Very few data exist that examine psychometric properties of the CASQ with either African American or Latino children, although one study found that a revised version of the CASQ showed less internal reliability with African American children than with Caucasian children (Thompson, Kaslow, Weiss, & Nolen-Hoeksema, 1998). More research examining the validity and reliability of these instruments with minority children is clearly warranted as a first step toward exploring possible racial or ethnic differences in the role of cognitions in the development and maintenance of depressive symptoms.

Limitations of the Study

There were several limitations to this study that we believe should be taken seriously. One of the major limitations of the study was the lack of a placebo control. As such, it is plausible that factors other than the cognitive–behavioral elements we deem important contribute to the effects we found. Studies that use no-treatment controls with samples from low-income, urban areas may be particularly vulnerable to this criticism given that there are probably many areas in which these children have needs. For example, the attention provided by a caring, nonjudgmental adult may be an experience that contrasts sharply with the child's everyday experience in the classroom or even at home. The experience of discussing problems in a supportive environment may also be a novel experience. In short, it is plausible that the children who benefited from the program did so through

mechanisms other than the cognitive–behavioral elements we hypothesize to be important. And as we discussed in the previous section, it is even conceivable that the two cohorts of participants responded to different ingredients. The fact that changes in negative cognitions at least partially mediated changes in the Latino children's depressive symptoms supports our belief that the cognitive–behavioral content of the program was an important factor for them, but the possibility remains that it was less important than attention for the African American children. Mediation analyses, although useful, are limited in their ability to answer these questions definitively; an experiment that includes a placebo condition that controls for the active ingredients would be more appropriate.

A second limitation is our reliance on self-report measures. We have not yet analyzed the parent and teacher data, but future studies should incorporate the use of clinical interviews. Muñoz and Ying (1993) pointed out that prevention science should aim to reduce the incidence of disorders and without clinical interviews that accurately assess the presence of disorders, we are forced to rely on clinical cutoffs of the self-report measures. We believe that these cutoffs are adequate first-pass estimates of disorder prevalence; however, future studies should more accurately assess incidence of disorders. Another limitation of our reliance on self-report measures is the absence of data that examines their psychometric properties with minority children. As such, we chose to use instruments that have been well-established with Caucasians in the field. Clearly, all the results we presented should be interpreted in light of this decision.

A third limitation focuses on our ability to make comparisons between the Latino and African American children. We did not make an a priori decision to investigate racial–ethnic differences in the effectiveness of our prevention program. Rather, we were interested in examining the extent to which the program would be effective with low-income minority children. As we were able to recruit sufficient numbers of participants from two different racial–ethnic groups, we decided to examine the extent to which the program was differentially effective. We proposed several possible hypotheses that might account for the differential effectiveness, but given the quasi-experimental nature of this study (we recruited the Latino children from one school and the African American children from the second school), we cannot discriminate among these possibilities. Nor can we rule out the possibility that the differential effectiveness we found is due to a third variable. For example, in our analyses of the demographic data, the families of the Latino children reported less income and parental education than that of the African American families. Although it would be surprising to us to discover that the program worked effectively with extremely poor children and less well with less poor children, we cannot rule out the possibility that these differences, or some other unmeasured variables, are responsible for the differential effectiveness. The best way to evaluate the extent to which our differences represent true racial–ethnic differences in the effectiveness of our program is to replicate it with another set of children. We are currently considering developing this study.

A fourth limitation is the lack of generalizability of our findings. We do not know the extent to which our results are limited to local environmental factors or indicative of larger cultural issues. For example, we do not know if the improvement in the African American control children is due to something about their experiences in their middle school, the West Philadelphia neighborhood, or the larger African American community. We are following these children as they make the transition to high school in order to help us to make this determination, but we recommend that future studies make the effort to recruit participants from more racially or ethnically diverse schools, or from more than two schools, so as to better distinguish among these different possibilities. Moreover, we do not have any data comparing the students who agreed to participate in our study with those who did not. This self-selection, inherent in most research programs, also limits the generalizability of our findings.

Future Directions

We are encouraged by the results from this study. To date, no depression prevention work has been conducted with low-income minority children. We believe that the results from this work show that depression prevention is feasible and potentially valuable to its participants. In addition to encouraging us to pursue larger, more comprehensive prevention research with minority children, this work also raises several research directions that we believe merit some attention. For example, to what extent is the reduction of depressive symptoms in the African American children a real phenomenon that extends beyond the one school in which we worked? We are currently following as many children as we can as they transition to high school to see if they continue to exhibit low levels of depressive symptoms beyond their stay in the middle school. What is the role, if any, of racial–ethnic matching between children and delivery provider? Future depression prevention programs that work with minority populations should make every effort to take this issue into consideration. What role does explanatory style play in minority populations? Our research suggests that it does not respond to a prevention intervention that nevertheless produced positive results. Might explanatory style be less relevant for low-income minority children? Or might an improved program that highlights explanatory style yield even larger effects?

We believe that the answers to these questions that have been raised by our findings are answerable in a prevention research framework. Given the data showing that minority individuals tend to underutilize mental health services (Cheung & Snowden, 1990; Dworkin & Adams, 1987), we believe that properly designed, researched, and implemented prevention programs may be the best mechanism by which to improve the mental health inhabitants of low-income urban communities.

References

Attar, B., Guerra, N. G., & Tolan, P. H. (1994). Neighborhood disadvantage, stressful life events, and adjustment in urban elementary-school children. *Journal of Clinical Child Psychology*, *23*, 391–400.

Baron, R. M., & Kenny, D. A. (1986). The mediator–moderator distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.

Barreto, S., & McManus, M. (1997). Casting the net for “depression” among ethnic minority children from the high-risk urban communities. *Clinical Psychology Review*, *8*, 823–845.

Biafora, F. (1995). Cross-cultural perspectives on illness and wellness: Implications for depression. Conference on multicultural perspectives on mental illness. *Journal of Social Distress and the Homeless*, *4*, 105–129.

Blazer, D. G., Kessler, R. C., McGonagle, K. A., & Swartz, M. S. (1994). The prevalence and distribution of major depression in a national community sample: The National Comorbidity Survey. *American Journal of Psychiatry*, *151*, 979–986.

Brown, D. R., Ahmed, F., Gary, L. E., & Milburn, N. G. (1995). Major depression in a community sample of African Americans. *American Journal of Psychiatry*, *152*, 373–378.

Bruce, M. L., Takeuchi, D. T., & Leaf, P. J. (1991). Poverty and psychiatric status: Longitudinal

evidence from the New Haven epidemiologic catchment area study. *Archives of General Psychiatry*, *48*, 470–474.

Cardemil, E. V., Reivich, K. J., & Seligman, M. E. P. (1997). *Penn Resiliency Program for Low-Income Minority Students*. Unpublished manuscript.

Cheung, F. K., & Snowden, L. R. (1990). Community mental health and ethnic minority populations. *Community Mental Health Journal*, *26*, 277–291.

Clarke, G. N., Hawkins, W., Murphy, M., Sheeber, L. B., Lewinsohn, P. M., & Seeley, J. R. (1995). Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: A randomized trial of a group cognitive intervention. *Journal of the American Academy of Child and Adolescent Psychiatry*, *34*, 312–331.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Danziger, S. H., Sandefur, G. D., & Weinberg, D. H. (1994). *Confronting poverty: Prescriptions for change*. Cambridge, MA: Harvard University Press.

Dworkin, R. J., & Adams, G. L. (1987). Retention of Hispanics in public sector mental health services. *Community Mental Health Journal*, *23*, 204–216.

Freeman, L. N., Mokros, H., & Poznanski, E. O. (1993). Violent events reported by normal urban school-aged children: Characteristics and depression correlates. *Journal of the American Academy of Child and Adolescent Psychiatry*, *32*, 419–423.

Garrison, C. Z., Schluchter, M. D., Schoenbach, V. J., & Kaplan, B. K. (1989). Epidemiology of depressive symptoms in young adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *28*, 343–351.

Gillham, J., Reivich, K., Jaycox, L., & Seligman, M. E. P. (1995). Prevention of depressive symptoms in schoolchildren: Two-year follow-up. *Psychological Science*, *6*, 343–351.

Goldston, S. (1977). Defining primary prevention. In G. W. Albee & J. Joffe (Eds.), *Primary prevention of psychopathology* (pp. 18–23). Hanover, NH: University Press of New England.

Harter, S. (1982). The Perceived Competence Scale for Children. *Child Development*, *53*, 87–97.

Hoagwood, K., & Rupp, A. (1994). Mental health service needs, use, and costs for children and adolescents with mental disorders and their families: Preliminary evidence. In R. Manderscheid & M. Sonnenschein (Eds.), *Mental health, United States, 1994* (pp. 52–64). Washington, DC: Center for Mental Health Services.

Jaycox, L. H., Reivich, K. J., Gillham, J., & Seligman, M. E. P. (1994). Preventing depressive symptoms in school children. *Behavior Research and Therapy*, *32*, 801–816.

Kaslow, N. J., Tanenbaum, R. L., & Seligman, M. E. P. (1978). *The KASTAN: A Children's Attributional Style Questionnaire*. Unpublished manuscript, University of Pennsylvania.

Kazdin, A. E. (1990). Evaluation of the Automatic Thoughts Questionnaire: Negative cognitive processes and depression among children. *Psychological Assessment*, *2*, 73–79.

Kazdin, A. E., Rodgers, A., & Colbus, D. (1986). The hopelessness scale for children: Psychometric characteristics and concurrent validity. *Journal of Consulting and Clinical Psychology*, *54*, 241–245.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshelman, S., Wittchen, H., & Kendler, D. S. (1994). Lifetime and 12-month prevalence of DSM–III–R psychiatric disorders in the United States: Results from the National Comorbidity Survery. *Archives of General Psychiatry*, *51*, 8–19.

Kessler, R. C., Zhao, S., Blazer, D. G., & Swartz, M. (1997). Prevalence, correlates, and course of minor depression and major depression in the national comorbidity survey. *Journal of Affective Disorders*, *45*, 19–30.

Kleinman, A., & Good, B. (1985). Culture and depression: Introduction to the problem. In A. Kleinman & B. Good (Eds.), *Culture and depression: Studies in anthropology and cross-cultural psychiatry of affect and disorder* (pp. 1–33). Berkeley: University of California Press.

Kovacs, M. (1985). The Children's Depression Inventory (CDI). *Psychopharmacology Bulletin*, *21*, 995–1124.

Lewinsohn, P. M., Rohde, P., Klein, D. N., & Seeley, J. R. (1999). Natural course of adolescent major depressive disorder: I. Continuity into young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 56–63.

Muñoz, R. F., & Ying, Y. (1993). *The prevention of depression: Research and practice*. Baltimore: The Johns Hopkins University Press.

Muñoz, R. F., Ying, Y., Bernal, G., Pérez-Stable, E. J., Sorensen, J. L., Hargreaves, W. A., Miranda, J., & Miller, L. S. (1995). Prevention of depression with primary care patients: A randomized control trial. *American Journal of Community Psychology, 23*, 199–222.

Myers, J. K., Weissman, M. M., Tischler, G. L., Holzer, C. E., Leaf, P. J., Orvaschel, H., Anthony, J. C., Boyd, J. H., Burke, J. D., Kramer, M., & Stoltzman, R. (1984). Six-month prevalence of psychiatric disorders in three communities. *Archives of General Psychiatry, 41*, 959–967.

Nolen-Hoeksema, S., Girgus, J., & Seligman, M. (1986). Learned helplessness in children: A longitudinal study of depression, achievement, and explanatory style. *Journal of Personality and Social Psychology*, *51*, 435–442.

Peterson, C., & Seligman, M. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review, 91*, 347–374.

Potter, L. B., Rogler, L. H., & Moscicki, E. K. (1995). Depression among Puerto Ricans in New York City: The Hispanic Health and Nutrition Examination Survey. *Social Psychiatry and Psychiatric Epidemiology, 30*, 185–193.

Regier, D. A., Narrow, W. E., Rae, D. S., Manderscheid, R. W., Locke, B. Z., & Goodwin, F. K.

(1993). The de facto US mental and addictive disorders service system: Epidemiologic Catchment Area prospective 1-year prevalence rates of disorders and services. *Archives of General Psychiatry, 50*, 85–94.

Reivich, K. J., & Seligman, M. E. P. (1992). *Penn Resiliency Program for Inner-city Students*. Unpublished manuscript.

Roberts, R. E. (1992). Manifestation of depressive symptoms among adolescents: A comparison of Mexican Americans with the majority and other minority populations. The *Journal of Nervous and Mental Disease, 180*, 627–633.

Roberts, R. E., Attkisson, C. C., & Rosenblatt, A. (1998). Prevalence of psychopathology among children and adolescents. *American Journal of Psychiatry, 155*, 715–725.

Roberts, R. E., & Chen, Y. W. (1995). Depressive symptoms and suicidal ideation among Mexican-origin and Anglo adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 81–90.

Roberts, R. E., Chen, Y. W., & Solovitz, B. L. (1995). Symptoms of DSM–III–R major depression among Anglo, African, and Mexican American adolescents. *Journal of Affective Disorders, 36*, 1–9.

Robins, L., Helzer, J., Weissman, M., Orvaschel, H., Gruenberg, E., Burke, J., & Regier, D. (1984). Lifetime prevalence of specific psychiatric disorders in three sites. *Archives of General Psychiatry, 41,* 949–958.

Seligman, M. E. P., Peterson, C., Kaslow, N. J., Tanenbaum, R. L., Alloy, L.B., & Abramson, L. Y. (1984). Attributional style and depressive symptoms among children. *Journal of Abnormal Psychology*, *93*, 235–238.

School District of Philadelphia. (1996). School district of Philadelphia on-line directory of administrative offices and schools [On-line]. *School District of Philadelphia*. Available: http://www.phila.k12.pa.us/Directory/

Snowden, L. R. (1999). African-American service use for mental health problems. *Journal of Community Psychology, 27*, 303–313.

Somervell, P. D., Leaf, P. J., Weissman, M. M., Blazer, D. G., & Bruce, M. L. (1989). The prevalence of major depression in black and white adults in five United States communities. *American Journal of Epidemiology, 130*, 725–735.

Thompson, M., Kaslow, N., Weiss, B., & Nolen-Hoeksema, S. (1998). Children's Attributional Style Questionnaire—Revised: Psychometric examination. *Psychological Assessment, 10*, 166–170.

Vega, W. A., Kolody, B., Aguilar-Gaxiola, S., & Catalano, R. (1999). Gaps in service utilization by Mexican Americans with mental health problems. *American Journal of Psychiatry, 156*, 928–934.

Vega, W. A., Valle, R., Kolody, B., & Hough, R. (1987). The Hispanic network preventive intervention study. In R. F. Muñoz (Ed.), The prevention of depression: Research foundations (pp.

217–234). Washington, DC: Hemisphere.

Footnote

[1]Specific comparisons between the African American children in School 1 who were omitted from the analyses with those African American children at School 2 who were included in the analyses revealed no striking differences between the two groups, although the low numbers of African Americans at School 2 (n = 10) prevented us from statistically analyzing these data. We did not make any comparisons between the Latino children at the two schools, because there was only one Latino student at School 2 who participated in our program.