Prevention Science, Vol. 4, No. 1, March 2003 (© 2003)

Examining the Role of Implementation Quality in School-Based Prevention Using the PATHS Curriculum

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In order for empirically validated school-based prevention programs to "go to scale," it is important to understand the processes underlying program dissemination. Data collected in effectiveness trials, especially those measuring the quality of program implementation and administrative support, are valuable in explicating important factors influencing implementation. This study describes findings regarding quality of implementation in a recent effectiveness trial conducted in a high-risk, American urban community. This delinquency prevention trial is a locally owned intervention, which used the Promoting Alternative THinking Skills Curriculum as its major program component. The intervention involved 350 first graders in 6 inner-city public schools. Three schools implemented the intervention and the other 3 were comparison schools from the same school district. Although intervention effects were not found for all the intervention schools, the intervention was effective in improving children's emotional competence and reducing their aggression in schools which effectively supported the intervention. This study, utilizing data from the 3 intervention schools (13 classrooms and 164 students), suggested that 2 factors contributed to the success of the intervention: (a) adequate support from school principals and (b) high degree of classroom implementation by teachers. These findings are discussed in light of the theory-driven models in program evaluation that emphasized the importance of the multiple factors influencing the implementation of school-based interventions.

KEY WORDS: school-based prevention; principal leadership; implementation quality; effectiveness trial; social–emotional learning.

INTRODUCTION

Thanks to the efforts of a growing community of prevention scientists, our knowledge base in prevention has been growing steadily in the past two decades. There is now a fair collection of empirically validated, school-based prevention programs that can reduce children's risks for substance use, mental disorders, and delinquency (Catalano *et al.*, 1998; Drug Strategies, 1996, 1998; Durlak & Wells, 1998; Greenberg *et al.*, 1999). The efficacy of these interventions has been established in carefully designed prevention trials that were evaluated under well-controlled conditions. These efficacy trials have high internal validity, but are relatively low in external validity, for example, actual utilization under "normal" community conditions. A next step in the understanding of preventive interventions is to carefully examine their use under typical conditions of community ownership, often termed "effectiveness" trials (Institute of Medicine, 1994). Such research is essential to understanding the optimal local conditions

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and training systems necessary for broad and effective program dissemination (Durlak, 1998; Rogers, 1995; Zins *et al.*, 2000).

In a report on implementation research, Greenberg *et al.* (2000) urged participants in prevention research to take action to advance our understanding of the program dissemination process. Durlak (1997) reported that less than 5% of over 1,200 published prevention studies provide data on program implementation. A second study of school-based intervention found that only 14.9% systematically measured and reported levels of treatment integrity (Gresham *et al.*, 1993). In a recent study of 34 effective prevention programs, only 21% examined whether quality of implementation was related to outcomes (Domitrovich & Greenberg, 2000).

As these reviews indicate, the majority of published preventive intervention trials have been conducted with little or no reported implementation information. However, a growing number of prevention programs, particularly in the substance abuse field, have monitored implementation. The results of these studies have shown that variability in the quality of implementation is related to program outcomes (Dane & Schneider, 1998). Prevention science has evolved to the point where understanding the implementation process and the factors that support it is essential to the field's continued growth (Mihalic, 2001).

Of central importance to school-based program implementation is the support and leadership of the school principal. There is a long line of research on the role of principals in improving their schools' climate and outcomes for children. Although, Cubberly's admonition 80 years ago "as is the principal, so is the school" (Cubberly, 1929) does not capture the complexity of current research, it is clear that principal instructional leadership influences both school climate and student outcomes (Hallinger & Heck, 1996). Despite the limitations of the current research on principal leadership, it appears that both principal stability and leadership qualities are especially important in impacting student outcomes in low-SES, urban, elementary schools (Andrews & Sober, 1987; Rowan & Denk, 1984). Fullan *et al.* (1980) found that principal leadership impacted all aspects of the implementation process from entry through maintenance of innovation. Despite these findings, there is still a lack of clarity regarding how to define instructional leadership. It is clear that the behaviors that constitute principal leadership are multidimensional (Deal, 1986) and their impact will vary depending on the school context and instructional model (Bossert *et al.*, 1982; Leithwood & Duke, 1999).

Interestingly, there has been little examination of the role of principal leadership in the implementation of prevention programs, in spite of its regular discussion in the practice literature (Elias *et al.*, 2000; Pentz & Trebow, 1985; Sarason, 1982; Weissberg & Elias, 1993). In the only quantitative study of specific programming, Rohrbach *et al.* examined the implementation and diffusion of a psychosocial-based substance abuse prevention program for fifth graders (Rohrbach *et al.*, 1993). They found that both teacher factors (years of experience, enthusiasm, and preparedness) and the degree of principal support influence maintenance and quality of implementation. Gottfredson *et al.* provides a rich case study of how principal leadership strongly impacted the quality of a comprehensive middle-school prevention program (Gottfredson *et al.*, 1997). In the National Study of Delinquency Prevention in Schools, Gottfredson and Gottfredson (2002) found that the level of principal support predicted both the quality of methods and the amount of programming of best practices in prevention.

Although there has been little examination of the effects of principal leadership on outcomes of preventive interventions, the quality of implementation by teachers and program staff has been examined in numerous trials. The findings generally indicate that the quality of implementation has significant impacts on individual differences in child outcomes (Blakely *et al.*, 1987; Botvin *et al.*, 1990, 1995; Connell *et al.*, 1985; Hansen *et al.*, 1989; Pentz *et al.*, 1990; Rohrbach *et al.*, 1993; Taggart *et al.*, 1990; Tricker & Davis, 1988).

The limited attention to issues of implementation in prevention trials is not due to a lack of research on the more general topic of implementation of change in education (Hall & Hord, 1987; Hall & Loucks, 1977). In this paper, we report the first-year results of a delinquency prevention project. The project's evaluation provides an opportunity to study how an empirically validated school-based prevention, the PATHS Curriculum, was implemented in a local community setting and how quality of implementation impacts child outcomes. The PATHS (Promoting Alternative THinking Strategies) Curriculum (Kusché & Greenberg, 1994) has been shown to be effective in reducing aggression and promoting social competence of elementary school-age children in both urban and rural contexts (Conduct Problems Prevention Research Group, 1999; Greenberg *et al.*, 1995; Greenberg & Kusché, 1998). It is one of the 10 *Blueprint for Violence Prevention Programs* (Elliot, 1998).

Given the importance of principal leadership, we hypothesized that it would impact the effectiveness of school-based intervention. Similarly we hypothesized that the quality of teacher implementation of intervention would also impact child outcomes. Finally, we examined whether the interactive impact of the combination of principals' support for the program and the quality of classroom implementation would add further explanatory power.

METHOD

Sample and Research Design

The program evaluation utilizes a quasi-experimental matched-group design. Random assignment of intervention was infeasible because the local funding source required that schools in neighborhoods that had the riskiest profile should receive the intervention. The sample in the overall intervention consisted of 350 first graders (47.14% males, 79.42% African American) in six elementary schools in Harrisburg, Pennsylvania. Three of the schools received the intervention and three other schools served as comparison. This implementation study focuses on the 13 intervention classrooms with 164 students.

All the participating schools serve neighborhoods with very high rates of poverty and crime. About 85% of the children from these schools came from low-income families (as indexed by participation in the free lunch program). More than 65% of the students in the participating schools performed below the 30th national percentile in reading and mathematics. Risk and needs assessment conducted by the Dauphin County Communities That Care (CTC) found that children living in the area were at high risk to delinquency. In addition, because of the high family mobility and school district reorganizations, student mobility averaged approximately 35–40% during the 1999 school year.

Project Initiation and Leadership

The local CTC secured program funding from the state government. They contracted with a local psychological consultation agency to coordinate the program implementation in targeted elementary schools in the Harrisburg school district. Teachers received training from the program developers in two 1-day workshops held on Saturdays approximately 6 weeks apart. Additional support for implementing the PATHS Curriculum was provided by an on-site PATHS coordinator employed by the local consultation agency. The support included a weekly visit by the coordinator to PATHS classrooms and continuous consultation with the teachers, and logistic/materials support. The PATHS coordinator met with the school building principals on a monthly basis; principals were also strongly encouraged to attend workshop training, but they attended only brief portions of the 2-day training. The PATHS coordinator received, as needed, ongoing consultation from the program developers. The first year intervention is briefer than a "standard" implementation of the PATHS Curriculum. Because of the timing of funding, the curriculum was taught for only 4 months, from January to April, as compared to a full school year.

While the PATHS Curriculum is the major component of the intervention, the Dauphin County project also had a second component of intervention provided by the Big Brothers and Big Sisters in the area (Tierney *et al.*, 1995). The latter provided mentoring to 14 students in the intervention schools who teachers identified to have special needs.

Measures

Measure of Student Outcomes

Trained research staff interviewed teachers at both the pre- and post-intervention period regarding students' classroom behaviors using a 31-item Teacher Social Competence Rating Scale (Kam & Greenberg, 1998). Student behaviors in school were rated on a 6-point scale from 0 to 5 (0 = *Almost Never*; 5 = *Almost Always*). Factor analysis conducted on the scale indicated four factors. These four factors correspond to four types of children's behaviors and skills: aggression, dysregulated behaviors, attentional control, and social–emotional competence. A composite score for each subscale was used as the outcome measure of the intervention.

Measures of Quality of Implementation and Principal Support

Quality of Program Implementation in Classrooms. Observational ratings of the PATHS classrooms were made monthly by the local PATHS Coordinator. Two aspects of classroom environment and implementation quality were rated on a scale from 1 to 4 (from *low* to *high quality of implementation*). Two of these ratings were examined in this study: (1) *How well are PATHS concepts and skills taught by*

the teacher? (2) *How well is the teacher generalizing PATHS skills across the school day*? Because of their high intercorrelation, averaged ratings over 4-month implementation were used. Preliminary analysis indicated that the two measures were highly correlated ($r = 0.98$), and thus a single, combined score assessed the quality of classroom implementation.

Principal Support. The PATHS Coordinator and her supervisor were asked to independently rate principal support for the implementation of PATHS. Two measures were used in the study: (1) *Quality of principal support for PATHS*, and (2) *Quality of support for the PATHS technical assistance team (PATHS Coordinator and Supervisor)*. For both measures, a scale from 1 (*Not supportive at all*) to 4 (*Very supportive*) was used. The first rating measures the extent principals showed support in general for the intervention. It is the impression the PATHS coordinator and her supervisor got from their personal interactions with the principals and their observation of the support teachers got from their principals. A high rating would indicate that the principal sees PATHS as part of the central mission of the school, supports staff effectively, speaks positively about PATHS with staff, and has visible and uses PATHS materials in the office. The second measure is more specific and represents the relationship the PATHS coordinator and her team had with the principal. A low score would include not welcoming the coordinator or assisting the coordinator in becoming part of the school culture. A high score is given for a principal who develops a true collaboration with the technical assistance team and treats the PATHS coordinator as an essential component for building success.

As these two measures of principal support correlated highly with each other ($r = 0.99$). The two ratings were combined and treated as an ordinal variable with three levels that corresponded to the levels of principal support in the three intervention schools (High, Medium, and Low).

RESULTS

There was no significant main intervention effect for the teacher-reported outcome measures. Pairwise comparisons suggested that the impact of the intervention differs from school to school (see Table 1). As shown in the following results, the school differences can partly be attributable to the difference in the quality of implementation and principal support in the three schools.

Table 1. Comparisons Between Outcome Changes in Individual Intervention School and the Average Mean Outcome Changes of Comparison Schools ($n = 350$)

	Means	*SD*
Difference in adjusted mean change in aggression		
School 1 vs. avg. control	−0.27	0.102**
School 2 vs. avg. control	−0.16	0.132
School 3 vs. avg. control	−0.44	0.109***
Difference in adjusted mean change in dysregulated behaviors		
School 1 vs. avg. control	−0.19	0.115
School 2 vs. avg. control	−0.03	0.149
School 3 vs. avg. control	−0.24	0.123*
Difference in adjusted mean change in socio–emotional competence		
School 1 vs. avg. control	0.29	0.123*
School 2 vs. avg. control	0.00	0.159
School 3 vs. avg. control	0.67	0.132***
Difference in adjusted mean change in attentional control		
School 1 vs. avg. control	0.09	0.124
School 2 vs. avg. control	0.25	0.161
School 3 vs. avg. control	0.02	0.133

Note. All estimated mean differences were controlled for baseline aggression levels.
*$p < .05$. **$p < .01$. ***$p < .0005$.

Analyses of the Relation Between Implementation and Outcome

Model of Analyses

Analysis of covariance was used to analyze each outcome separately. Baseline measure of the outcome was entered into the regression as well as the two dummy variables representing principal support. The classroom implementation measure was included as a continuous variable, as well as interaction terms between principal support and implementation. Planned comparisons were made on the predicted changes in classrooms that have high and low degree of implementation (the 75th and 25th percentile), but had different levels of principal support.

Findings Regarding Implementation

There was no significant main effect for implementation quality in predicting any of the four outcomes. On the other hand, significant main effects were found for principal support. In addition, significant interaction effects were found between the effects of principal support and

implementation in the changes in all four domains: Aggression ($F[3, 157] = 3.69, p = .01$); behavior dysregulation ($F[3, 157] = 4.62, p < .005$); social–emotional competence ($F[3, 157] = 2.52, p < .06$); on-task behaviors ($F[3, 157] = 3.44, p = .01$). Such results indicated that the effects of implementation work differently in schools with different degrees of principal support. Simple effects tests were conducted to compare the predicted change in student behaviors in the three schools under different conditions of implementation quality. The results indicated that when both the quality of implementation was high and principal support was high, students showed significantly greater reductions in aggression and behavioral dysregulation, and significant increases in emotional competence, when compared to students in the school with the lowest principal support. No difference was found in the change in students' on-task behaviors. Similarly significant, but weaker differences on the same student outcomes were also shown when the school with the lowest principal support was compared to the average of the two schools that had higher principal support. When the implementation quality was low, no significant difference was found to exist among the three schools (see Fig. 1 and Table 2).

Table 2. Differences in the Outcome Changes Between the School With Highest Principal Support and the School With Lowest Principal Support[a,b] ($n = 164$)

	Quality of implementation			
	High		Low	
	Mean	*SD*	Mean	*SD*
Decrease in Aggression[c]	0.35**	0.175	0.17	0.525
Decrease in Behavior Dysregulation[c]	0.37**	0.175	−0.40	0.532
Increase in Socioemotional Competence[d]	0.41**	0.174	−0.75	0.545
Increase in Attentional Control[d]	0.01	0.195	−0.45	0.591

[a] All estimated means were controlled for the baseline of corresponding outcome variables.
[b] Outcome changes in school with highest support minus outcome changes in school with lowest support.
[c] Positive values indicate that students in school with higher support had larger decrease in aggression and behavior dysregulation. The opposite is true for negative values.
[d] Positive values indicate that students in school with higher support had larger increase in socioemotional competence and attentional control. The opposite is true for negative values.
** $p < .05$.

DISCUSSION

This study of a local dissemination of the PATHS Curriculum to a group of inner-city public schools demonstrated the importance and complex nature of implementation quality in school-based prevention. Both the supports from the principals and the quality of teacher implementation at the classroom level were critical factors in determining the success of the program dissemination on child outcomes. In our study, significant intervention effects were *only* found in those settings where both principal support and implementation quality was high; that is, neither high implementation quality nor high principal support by itself predicted intervention effectiveness.

These results point to the need to study multiple facets of the implementation process, including dosage, quality of delivery, and the quality of institutional leadership and support. Previous implementation studies have usually examined single facets of implementation and have failed to look at the interrelationship among multiple facets of implementation (Greenberg *et al.*, 2000).

The literature on leadership in educational research suggests that principal support can be an important factor in the success of curricular innovation (Hallinger & Heck, 1996; Leithwood & Duke, 1999). It is not surprising that we found that the effects of the program partly depended on whether school principals were supportive of the implementation of the program. What is informative is that we found that the intervention is only effective in school with both high principal support *and* high quality of implementation. When principal support is low, high quality of implementation in the classroom did not guarantee that the intervention would work.

Further research is needed to elucidate why that is the case, as our measure of principal support was ratings made by the PATHS coordinator and we did not have direct measures on school context in this study. There are numerous, possibly interactive possibilities that might explain this "black box" finding. One factor may be whether principals allocated sufficient resources and/or rewards to teachers to bring the full impact of the program to their students. A second reason could be that principals may be crucial in providing an environment for the generalization of skills learned in PATHS outside the classroom. If the school, as a whole, does not provide the environment for practising the socioemotional skills students learned in their classroom, the effect of the intervention will be diminished. It is well known that principals

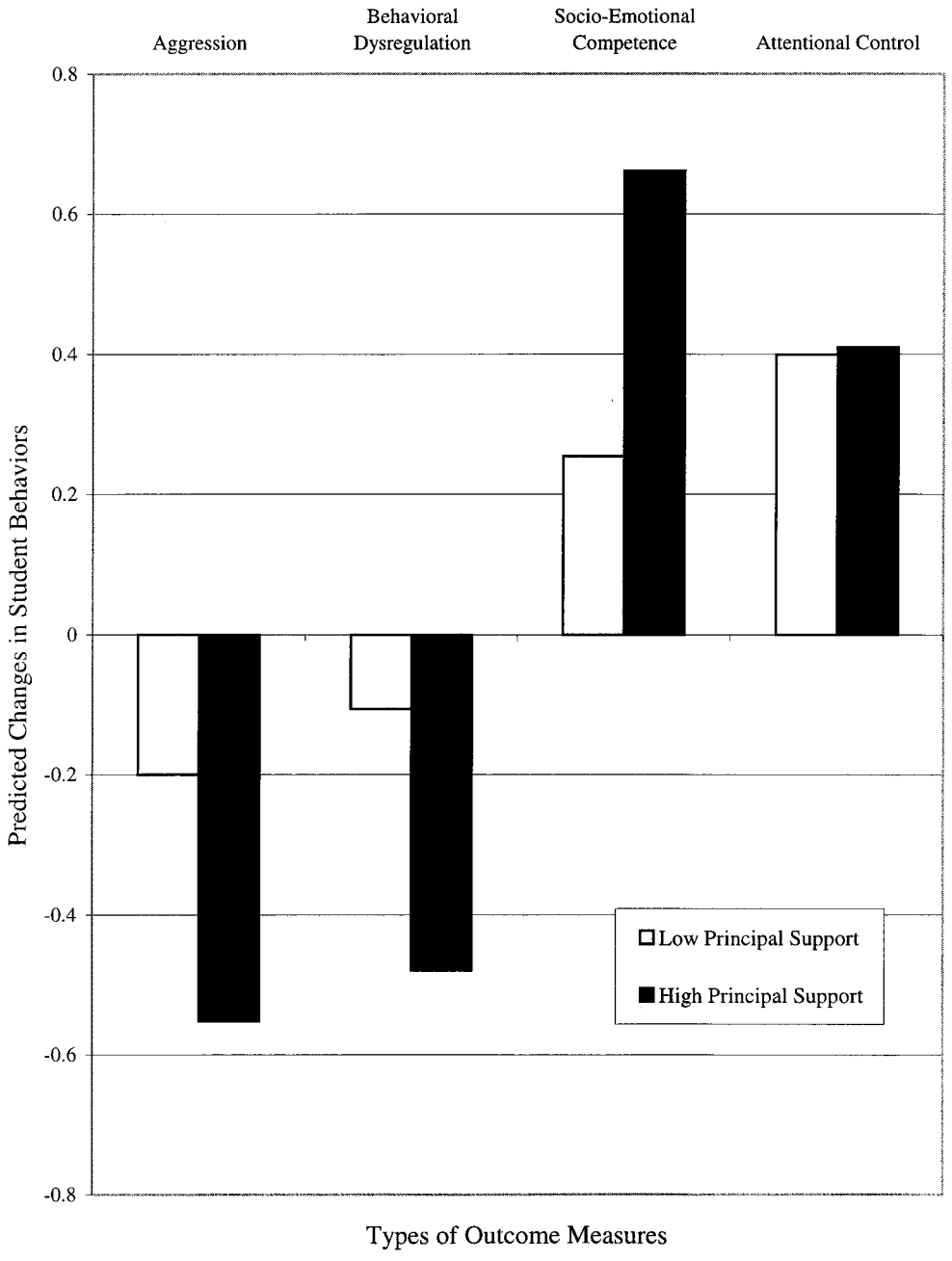

Fig. 1. Predicted changes of student behaviors when implementation quality was high.

who are effective leaders promote positive social climates that reinforce norms for behavior throughout the building. In addition, there is a need for further exploration of the ways in which principal's vision and action influence implementation and sustainability. There are numerous models for the assessment of the components of principal leadership (Deal, 1986; Greenfield, 1986; Heck *et al.*, 1990) and numerous measures of organizational climate as assessed by staff regarding principal behavior (Hoy *et al.*, 1991). Such models should be applied in future projects to better understand the process by which principal activity supports prevention programming.

We agree with other researchers that mental health and substance abuse prevention programs are unlikely to be effectively implemented and

maintained without forward planning on a school and/or district-wide basis (Weissberg & Elias, 1993). Principals can be very helpful in providing teachers with positive incentives for using a prevention program (e.g., verbal encouragement, clock or credit hours for meetings, and time for curriculum replication, etc.) and are important liaisons in promoting a positive attitude towards the program among parents and the larger community (e.g., with parent orientation meetings, contacts with public officials, etc.). In addition, coordination between classroom teachers and other personnel can be facilitated by an active, pro-intervention administration (e.g., encouraging discussions during staff meetings, coordinating with parent educators and school psychologists, etc.). Changes in students' behaviors can also be noted and positively reinforced by administrators, both privately (e.g., during chance observations) and publicly (e.g., at school assemblies).

It is unclear why teacher quality of implementation, alone, did not predict changes in student behavior as it had in a previous study (Conduct Problems Prevention Research Group, 1999). It is likely that the poor climate of these schools as observed by our staff might account for the fact that principal behavior was also necessary to impact student change. This observed poor, albeit chaotic climate was due to a number of changes including rapid turnover in superintendents, principal instability, and extremely low student achievement that led the state to take over the school district in the next school year. There may be other, more proximal unmeasured factors that might predict quality of teacher implementation including teacher personality, self-efficacy, and attitudes toward change (Hopkins, 1990; McKibbin & Joyce, 1980), teacher experience, and adaptation to curriculum innovation (Hall & Hord, 1987; Horsley & Horsley-Loucks, 1998). In addition, teachers who believe in the importance and effectiveness of prevention would be more likely to implement the program.

The quantitative findings in this study support our clinical experience that there are several important dimensions in the implementation, and implementation support system that can affect the probability of effective program implementation (Chen, 1990, 1998; Greenberg *et al.*, 2000). First, the readiness of the schools to implement the intervention is important. Our study indicates that obtaining principal support for the program is essential because principal leadership partially determines whether teachers' efforts in program implementation were supported. Second, the provision of ongoing technical support and mentoring to principals and teachers dramatically changes the nature of implementation. By providing high-quality and continuous technical support, projects can better maintain quality control over how the program is implemented in schools and deal with implementation challenges in a timely manner. In this effectiveness trial, weekly technical support was provided by a PATHS coordinator to teachers and principals. Although this provides additional costs for program implementation and requires additional pre-implementation planning, without such support, it is unlikely that fidelity would have been maintained. The third important factor that could influence the success of implementation is the long-term institutional commitment from the schools and the school district. This project is planned to implement PATHS for four continuous grades. However, a complete change of principals, a complete change in district administrators, and a state takeover of the school district create major challenges in the provision of ongoing support and institutional commitment. Later reports will examine how these factors influence long-term outcomes for students.

ACKNOWLEDGMENTS

This work was supported by The Pennsylvania Commission on Crime and Delinquency. We thank the administration, principals, and teachers of the Harrisburg School District as well as Vladimir Beaufils and Linda Figueroa of the Community Action Commission. We are especially grateful to Irith Harpster and Dr Howard Rosen of Hempfield Counseling Associates for their exemplary work in supporting teachers in the use of the PATHS.

REFERENCES

Andrews, R., & Sober, R. (1987). Principal instructional leadership and school achievement. *Educational Leadership*, *44,* 9–11.

Blakely, C. H., Mayer, J. P., Gottschalk, R. G., Schmitt, N., Davidson, W. S., Roitman, D. B., & Emshoff, J. G. (1987). The fidelity-adaptation debate: Implications for the implementation of public sector social programs. *American Journal of Community Psychology*, *15,* 253–268.

Bossert, S., Dwyer, D., Rowan, B., & Lee, G. (1982). The instructional management role of the principal. *Educational Administration Quarterly*, *18,* 34–64.

Botvin, G. J., Baker, E., Dusenbury, L., & Botvin, E. M., & Diaz, T. (1995). Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *JAMA*, *273,* 1106–1112.

Botvin, G. J., Baker, E., Dusenbury, L., Tortu, S., & Botvin, E. M. (1990). Preventing adolescent drug abuse through a multimodal cognitive–behavioral approach: Results of a 3-year

study. *Journal of Consulting and Clinical Psychology*, *58,* 437–446.

Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. C., & Hawkins, J. D. (1998). *Positive youth development in the United States: Research findings on evaluations of positive youth development programs* (NICHD Publication). Washington, DC: U.S. Department of Health and Human Services.

Chen, H. T. (1990). *Theory-driven evaluations* . Newbury Park, CA: Sage.

Chen, H. T. (1998). Theory-driven evaluations. *Advances in Educational Productivity*, *7,* 15–34.

Conduct Problems Prevention Research Group. (1999). Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. *Journal of Consulting and Clinical Psychology*, *67,* 648–657.

Connell, D. B., Turner, R. R., & Mason, E. F. (1985). Summary of the findings of the School Health Education Evaluation: Health promotion effectiveness, implementation, and costs. *Journal of School Health*, *55,* 316–323.

Cubberley, E. P. (1929). *Public school administration*. New York: Houghton Mifflin.

Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control. *Clinical Psychology Review*, *18,* 23–45.

Deal, T. (1986). Effective school principals: Counselors, engineers, pawnbrokers, poets . . . . or instructional leaders? In W. Greenfield (Ed.), *Instructional leadership: Concepts, issues and controversies* (pp. 230–245). Lexington, MA: Allyn & Bacon.

Domitrovich, C. E., & Greenberg, M. T. (2000). The study of implementation: Current findings from effective programs that prevent mental disorders in school-aged children. *Journal of Educational and Psychological Consultation*, *11*(2), 193–221.

Drug Strategies. (1996). *Making the grade: A guide to school drug prevention programs*. Washington, DC: Drug Strategies.

Drug Strategies. (1998). *Safe schools, safe students: A guide to violence prevention strategies*. Washington, DC: Drug Strategies.

Durlak, J. A. (1997). *Successful prevention programs for children and adolescents*. New York: Plenum.

Durlak, J. A. (1998). Why program implementation is important. *Journal of Prevention and Intervention in the Community*, *17,* 5–18.

Durlak, J. A., & Wells, A. M. (1998). Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *American Journal of Community Psychology*, *26,* 775–802.

Elias, M. J., Bruene-Butler, L., Blum, L., & Schuyler, T. (2000). Voices from the field: Identifying and overcoming roadblocks to carrying out programs in social and emotional learning/emotional intelligence. *Journal of Educational and Psychological Consultation*, *11*(2), 253–272.

Elliot, D. S. (1998). *Blueprints for violence prevention.* Center for the Study and Prevention of Violence, University of Colorado at Boulder.

Fullan, M., Miles, M. B., & Taylor, G. (1980). Organizational development in schools: The state of the art. *Review of Educational Research*, *50,* 121–183.

Gottfredson, D. C., Fink, C. M., Skroban, S., & Gottfredson, G. D. (1997). Making prevention work. In R. P. Weissberg, T. P. Gullotta, R. L. Hampton, B. A. Ryan, & G. R. Adams (Vol. Eds.), *Issues in children's and families' lives, Vol. 9*: *Healthy children 2010: Establishing preventive services* (pp. 219–252). Thousand Oaks, CA: Sage.

Gottfredson, D. C., & Gottfredson, G. D. (2002). Quality of school-based prevention programs: Results from a national survey. *Journal of Research on Crime and Delinquency*, *39*(1), 3–35.

Greenberg, M. T., Domitrovich, C., & Bumbarger, B. (2001). The Prevention of Mental Disorders in School-Aged Children: Current State of the Field. *Prevention and Treatment.*, Volume 4, Article 1. Available on the World Wide Web: *<http://journals.apa.org/prevention/volume4/pre004001a.html>*.

Greenberg, M. T., Domitrovich, C., Graczyk, P. A., & Zins, J. E. (2000). *The study of implementation in school-based prevention research: Theory, research, and practice*. Report to the Center for Mental Health Services (SAMHSA). Available on the World Wide Web: *<http://www.prevention.psu.edu/>*.

Greenberg, M. T., & Kusché, C. A. (1998). *Blueprints for violence prevention: The PATHS Project* (Vol. 10). Boulder, CO: Institute of Behavioral Science, Regents of the University of Colorado.

Greenberg, M. T., Kusché, C. A., Cook, E. T., & Quamma, J. P. (1995). Promoting emotional competence in school-aged children: The effects of the PATHS curriculum. *Development and Psychopathology*, *7,* 117–136.

Greenfield, W. (1986). Moral imagination and interpersonal competence: Antecedents to instructional leadership. In W. Greenfield (Ed.), *Instructional leadership: Concepts, issues and controversies* (pp. 56–76). Lexington, MA: Allyn & Bacon.

Gresham, F. M., Gansle, K. A., Noell, G. H., & Cohen, S. (1993). Treatment integrity of school-based behavioral intervention studies: 1980–1990. *School Psychology Review*, *22,* 254–272.

Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. Albany, NY: State University of New York Press.

Hall, G. E., & Loucks, S. F. (1977). A developmental model for determining whether the treatment is actually implemented. *American Education Research Journal*, *14,* 236–276.

Hallinger, P., & Heck, R. H. (1996). Reassessing the principal's role in school effectiveness: A review of empirical research, 1980–1995. *Educational Administration Quarterly*, *32,* 5–44.

Hansen, W. B., Graham, J. W., Wolkenstein, B. H., & Lundy, B. Z. (1989). Differential impact of three alcohol prevention curricula on hypothesized mediating variables. *Journal of Drug Education*, *18,* 143–153.

Heck, R. H., Larsen, T. J., & Marcoulides, G. A. (1990). Instructional leadership and school achievement: Validation of a causal model. *Educational Administration Quarterly*, *26,* 94–125.

Hopkins, D. (1990). Integrating staff development and school improvement: A study of teacher personality and school climate. In B. Joyce (Ed.), *Changing school culture through staff development*. Alexandria, VA: Association for Supervision and Curriculum Development.

Horsley, D. L., & Horsley-Loucks, S. (1998). CBAM Brings Order to the Tornado of Change. *Journal of Staff Development*, *19,* 17–20.

Hoy, W. K., Tarter. C. J., & Kottkamp, R. B. (1991). *Open schools/healthy students: Measuring organizational climate*. Newbury Park, CA: Sage.

Institute of Medicine. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research.* Washington, DC: National Academy Press.

Kam, C., & Greenberg, M. T. (1998). *Technical Measurement Report on the Teacher Social Competence Rating Scale.* Unpublished technical report, Prevention Research Center for the Promotion of Human Development, The Pennsylvania State University.

Kusché, C. A., & Greenberg, M. T. (1994). *The PATHS curriculum*. Seattle, WA: Developmental Research and Programs.

Leithwood, K. A., & Duke. (1999). A century's quest to understand school leadership. In J. Murphy & K. S. Louis (Eds.), *Handbook of research on educational administration* (2nd ed., pp. 45–72). San Francisco, CA: Jossey-Bass.

McKibbin, M., & Joyce, B. (1980). Psychological states and staff development. *Theory Into Practice*, *19,* 248–255.

Mihalic, S. (2001). The importance of implementation fidelity. *Blueprints News*, *2*(1), 1–2.

Pentz, M. A., & Trebow, E. (1985). Implementation issues in drug abuse prevention research. In C. Leukfeld & J. Ludford (Eds.), *Adolescent drug abuse: Analyses of treatment research* (DHHS Pub No. [89–125488],pp. 123–139). *National Institute of Drug Abuse Monograph 56*. Washington, DC: Supt. of Docs., U.S. Govt. Print. Off.

Pentz, M. A., Trebow, E. A., Hansen, W. B., MacKinnon, D. P., Dwyer, J. H., Flay, B. R., Daniels, S., Cormack, C., & Johnson, C. A. (1990). Effects of program implementation on adolescent drug use behavior: The Midwestern Prevention Project. *Evaluation Review*, *14,* 264–289.

Rogers, E. M. (1995). *Diffusions of innovations*. New York: Free Press.

Rohrbach, L. A., Graham, J. W., & Hansen, W. B. (1993). Diffusion of a school-based substance abuse prevention program: Predictors of program implementation. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, *22,* 237–260.

Rowan, B., & Denk, C. E. (1984). Management succession, school socioeconomic context and basic skills achievement. *American Education Research Journal*, *21,* 517–537.

Sarason, S. B. (1982). *The culture of the school and the problem of change* (2nd ed.). Boston: Allyn & Bacon.

Taggart, V. S., Bush, P. J., Zuckerman, A. E., & Theiss, P. K. (1990). A process evaluation of the District of Columbia "know your body" project. *Journal of School Health*, *60,* 60–66.

Tierney, J. P., Grossman, J. B., & Resch, N. L. (1995). *Making a difference: An impact study of big brothers big sisters.* Philadelphia, PA: Public/Private Ventures.

Tricker, R., & Davis, L. G. (1988). Implementing drug education in schools: An analysis of the costs and teacher perceptions. *Journal of School Health*, *58,* 181–185.

Weissberg, R. P., & Elias, M. J. (1993). Enhancing young people's social competence and health behavior: An important challenge for educators, scientists, policy makers, and funders. *Applied and preventive psychology: Current scientific perspectives*, *3,* 179–190.

Zins, J. E., Elias, M. J., Greenberg, M. T., & Pruett, M. K. (2000). Special Issue: Implementation of Prevention Programs. *Journal of Educational and Psychological Consultation*, *11*(1), 1–172.