

**The Study of Implementation in School-Based Preventive
Interventions:
Theory, Research, and Practice**

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The science and practice of prevention—whether related to physical disease or to behavioral health—have matured greatly. In the field of behavioral health today, a growing number of sophisticated models have been developed to describe how emotional and behavioral disorders develop over time. Preventive interventions based on these models have been tested empirically and shown to be effective in reducing behavioral disorders and promoting both emotional and physical health. The increased dissemination of these findings has encouraged communities to adopt and adapt preventive interventions that have been evaluated through high-quality research and found effective. Policies set by both State and Federal funding agencies requiring grantees to use empirically based approaches have added further impetus to this growing community awareness and interest in implementing proven interventions.

This report has been developed to help stimulate researchers and practitioners to place greater emphasis on how they conceptualize and measure implementation of evidence-based prevention programs. Without question, prevention practice will reach its full maturity only when known effective programs are implemented with integrity. Although the focus of this paper is on the implementation of school-based preventive interventions among children and youth, it has a broader application to other aspects of prevention research and practice by focusing squarely on the issue of how prevention models can be implemented with fidelity.

The Issue

Research on the prevention of mental disorders and problem behaviors in children and youth has risen dramatically during the past decade. As a result, a corpus of research findings increasingly suggests that prevention programs can both reduce mental disorders and problem behaviors and promote youth competence. The importance of prevention in behavioral health has been highlighted by the Reports of the Surgeon General on mental health and on youth violence (U.S. Department of Health and Human Services [DHHS], 1999, 2001). Both reports urged the mental health field to focus greater attention on the promotion of mental health and the prevention of mental illness. According to the Surgeon General, “Childhood is an important time to prevent mental disorders and to promote healthy development, because many mental disorders have antecedent problems in childhood. Thus, it is logical to try to intervene early in children’s lives before problems are established and become more refractory” (DHHS, 1999, p. 132). Promising research findings from the field of prevention also are influencing public policy. Federal, State, and local governments increasingly are calling for the use of empirically validated, effective models of preventive intervention for children and families.

The adoption and adaptation of known-effective prevention models, however, may present their unique set of challenges. Programs are not always implemented in the same way or with the same quality as when they were first evaluated. Aspects of the program may be left out, either deliberately or inadvertently. For example, scheduling or funding constraints may curtail the full scope of the program. Similarly, implementers may not be trained sufficiently to conduct the program effectively. Without the highest level of fidelity to the original research-based prevention program, the positive results are less likely to be replicated. Unfortunately, although the evidence base of prevention programs is quickly growing, the science regarding *how*

programs are implemented under real-world conditions is poorly developed. A very limited knowledge base currently exists on the measurement of implementation, on the factors that influence the quality of implementation, and on the relationship between the quality of implementation and the outcomes obtained for children and youth in school and community settings.

Goals of the Report

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The field of prevention (including mental health promotion) has reached an important stage. It is critical that researchers and practitioners share a common framework that enables them to exchange relevant information and communicate effectively regarding both the research and the practice of implementation in implementation programs. To that end, this report has been designed to:

- define implementation and assess its current status;
- introduce a broad conceptual model of implementation for school-based prevention programs that includes discussion of both the factors that affect implementation and the need for implementation quality monitoring;
- review barriers and suggest strategies that practitioners and researchers can use to improve implementation quality; and
- discuss the implications of implementation for program developers, researchers, trainers, practitioners, and policymakers.

Background

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Randomized and quasi-experimental research during the past two decades has demonstrated the effectiveness of a variety of programs to reduce symptoms of mental disorders, decrease aggression, and promote competence (Elliot, 1998; Greenberg et al., 1999; Institute of Medicine [IOM]; Mrazek & Haggerty, 1994). Schools have become one of the most important settings in which preventive and wellness promotion interventions are conducted.

Most of the evidence supporting the effectiveness of these programs has been generated through well-controlled investigations known as efficacy trials. However, careful monitoring is needed to meet the challenge of ensuring the same degree of program effectiveness in diverse school settings under naturally occurring conditions. A variety of contextual issues, such as leadership, the nature of a school's organization, and teacher training and support, may influence both the level and the quality of program implementation. Past research indicates that when communities replicate programs, the quality of delivery can vary widely and aspects of the program will be altered from the model to match community characteristics. Thus, research is needed to identify the specific elements of evidence-based programs that are essential to program success and those elements that may be modified while remaining true to the intended purpose or concept underlying the model—also known as maintaining fidelity. In addition, research studies also are needed to determine the dosage. Despite widespread endorsement of empirically based

interventions by Federal and State funding agencies, most programs and models are only beginning to enter this stage of research. It will take some time before scientists are able to provide communities with the information they need to adopt and adapt known effective programs without compromising fidelity and successful outcomes.

A Conceptual Model

The topic of program implementation has been examined in several different fields for more than 30 years. Nonetheless, no model to date has examined how best to implement prevention in the school setting, nor has one explored factors that influence implementation in the school context. A comprehensive theory that integrates multiple perspectives is greatly needed.

This report responds to that need by presenting a theory-driven model for studying the implementation of programs in school-based settings. The model differentiates the causative theory that explains program outcomes from the prescriptive theory that describes how the program should be implemented to reach intended outcomes. It also bases evaluation of implementation quality on both measures of program delivery itself and measures of the support system for training and consultation. In addition, the conceptual model identifies the influences external to the program that may have considerable impact on the quality of program implementation.

Strategies to Facilitate Effective Program Delivery

Guided by both the conceptual model and the contextual factors that can influence implementation in school-based programs, this report reviews strategies for practitioners and researchers to facilitate effective program delivery. The strategies may be enacted during the stage of program implementation at which they are most relevant.

Pre-Adoption Phase. Key stakeholders (i.e., administrators, teachers, parents, and students) should be involved early on, when schools are in the process of selecting a program and planning its implementation. During this selection and planning phase, it is essential to involve these stakeholders in the decision making process. Candidate programs should be evaluated for their fit to the existing needs of the school and its students; the available resources; and the goals, philosophy, and organizational capacity of the school. Because of the many tasks involved, it is important both to appoint a project coordinator who will ensure the successful implementation and evaluation of the program in the school setting and to allocate sufficient resources to sustain the program with fidelity. Before implementation, implementers must receive adequate training so that they are knowledgeable and confident in their skills. Finally, program implementation is greatly enhanced by a supportive, problem-solving atmosphere that allows for the discussion and facilitates the resolution of difficulties.

Delivery Phase. Once program implementation has begun, it is necessary to monitor program quality carefully on an ongoing basis. This monitoring requires assessing the implementers' skills and satisfaction and providing them with emotional and practical support. The intervention should be evaluated with measures based on a comprehensive, theoretically based

program model such as the one outlined in this report. Once the program is running effectively, information gathered in the early implementation phases should be used to make decisions about the program's ongoing viability and to identify and implement ways to improve its overall quality. In addition, maintaining a positive school atmosphere in which open communication, free exchange of ideas, and professional growth are endorsed will increase the probability of successful implementation.

Post-Delivery Phase. If the program is successful, steps should be taken to integrate the program more broadly into the existing structure of the school. It should be noted that it is important to have a realistic timeline for long-term implementation and for long-term outcomes to become evident. A broad range of dissemination strategies should be considered to inform the community about the program and its findings. Finally, it is quite useful to provide feedback to program developers regarding the intervention, the implementation system, and the factors that affected the implementation quality of the project.

Recommendations to Advance the Field

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The report concludes with a series of recommendations directed toward a broad range of audiences: researchers, program evaluators, program developers, funding agencies, policy makers, and journal editors. Each is a critical element in ongoing efforts to advance research and practice in the implementation of prevention programs.

Recommendations for Researchers and Program Evaluators

A great number of questions regarding the implementation of prevention programs are either underresearched or have yet to be researched. Two broad questions for the field to address are:

(a) what factors influence the quality of implementation for different types of programs, and
(b) what is the relationship between quality of implementation and both short- and long-term outcomes. The following more specific questions also warrant further inquiry:

- What are the best models for training school staff to deliver preventive interventions?
- What kind and over what time period should ongoing consultation occur between trainers and a school?
- What factors are necessary to develop an effective implementation support system?
- How do ecological characteristics of a school or community affect the quality of program implementation?
- How do underlying teacher and principal knowledge and attitudes affect program delivery?

These and other questions are critical for the next waves of both effectiveness studies and research on widespread diffusion of programs (i.e., going to scale). The report notes that for some factors in the model, few or no reliable and valid measures currently are available for researchers and program evaluators to use. Thus, measurement development also is needed to advance the field.

Broader recommendations for researchers and program evaluators include:

- Undertake routine assessment of implementation quality.
- Use the program’s theory to guide local changes in implementation.
- Use local replications of a program as an opportunity to confirm the program theory.
- Examine how variations in implementer characteristics and their support systems affect the quality of program delivery.
- Determine critical thresholds required for mediating factors to affect outcomes.
- Develop measures to assess implementation quality.

Recommendations for Program Developers

- Provide information about resources needed to implement an intervention.
- Communicate and share a common language with practitioners.
- Conduct research studies that inform the fidelity-adaptation debate.

Recommendations for Funding Agencies and Policymakers

- Employ initiatives to support higher quality work in implementation.
- Ensure that the quality of implementation of prevention programs is preserved when programs are replicated and “go to scale,” by ensuring that program quality is a driving force in the development of funding proposals and support for prevention.

Recommendations for Journal Editors

Develop implementation research standards for reporting efficacy trials and evaluations of prevention programs.

Significantly increase attention to research on implementation of prevention programs, including the development of special journal issues on this topic (see Zins, Elias, Greenberg, & Kline-Pruett, 2000a, 2000b).

During the past decade, the amount of research on the promotion of mental health and prevention of problem behaviors in children and youth has risen dramatically. As a result, a corpus of findings from randomized trials now indicates that prevention programs can promote mental health and reduce problem behaviors effectively, and can enhance youth competence. As a result, policymakers have been encouraging the use of empirically validated prevention programs in American schools and communities and are demanding greater accountability in program outcomes (e.g., No Child Left Behind, 2002).

Although the research evidence base is growing quickly, the science needed to promote successful implementation of evidence-based practices in real time, under naturally occurring conditions, is poorly developed. Only a very small scientific knowledge base currently exists on the measurement of implementation, on the factors that influence the quality of implementation, and on the relationship between the quality of implementation and the outcomes obtained for children and youth. The purpose of this report is to stimulate researchers and practitioners to place greater emphasis on how they conceptualize, incorporate, and measure implementation of evidence-based prevention programs. Prevention practice will reach its full maturity only when known effective programs are implemented with sufficient integrity. Although the focus of this paper is on the implementation of school-based preventive and promotion interventions among children and youth, it has application more broadly to other aspects of prevention research and practice by focusing squarely on the issue of how prevention models can be implemented with fidelity.

Child and Adolescent Risk

The health and social development risks facing today’s youth are greater than ever. Many children and adolescents are having difficulty managing the challenges of development and are exhibiting psychological problems. It is estimated that 20.9 percent of children and adolescents aged 9 to 17 have mental or addictive disorders (Shaffer et al., 1996) and between 12 percent and 22 percent of America’s youth under the age of 18 need mental health services (National Advisory Mental Health Council, 1990). Behavioral and emotional disturbances in adolescence, such as depression, substance abuse, and conduct disorder, are associated with a broad array of other serious social and behavioral problems, such as school failure and dropout, affiliation with deviant peers, and teen pregnancy (Centers for Disease Control and Prevention, 2000; Dryfoos, 1997). These disorders not only cause tremendous personal suffering but also impose a significant cost on society.

It is estimated that between 12 percent and 22 percent of America’s youth under the age of 18 need mental health services.

Success of Prevention and Wellness Promotion Efforts

In the past decade, advances in our knowledge of the risk and protective factors related to the development of behavioral or emotional problems, including substance abuse, have been

... empirically validated approaches... successfully reduce mental health and behavioral problems and promote mental health.

significant. Scientists have constructed sophisticated developmental models of the ways in which mental health and behavioral problems develop and the ways in which they are maintained by multiple systems and on multiple levels. This knowledge has been used to design preventive and promotion interventions. A number of empirically validated approaches now successfully reduce mental health and behavior problems and promote mental health and other positive youth outcomes. Most prevention scientists agree that to be successful, interventions must be empirically based, must begin early in childhood, must be sustained over time, and must be comprehensive (Dryfoos, 1994).

Schools have become one of the most important settings in which to conduct preventive and wellness-promotion interventions. In addition to their central role in fostering academic development, schools also play an important role in the health and social-emotional development of students (Elias et al., 1997). Many schools have recognized the importance of this role and have taken on the responsibility of providing competence-enhancement, character-building, and prevention programs to their students (Gottfredson & Gottfredson, 2001). The term “social and emotional learning,” or “SEL,” has emerged in the education field as an umbrella term to describe these types of programs. SEL is described as the process through which children acquire the competence to understand, manage, and express the social and emotional aspects of their lives in ways that enable the successful management of life tasks (Elias et al., 1997).

Fortunately, a growing array of research-based options in the fields of SEL and prevention are available for schools interested in implementing empirically based programs known to reduce risk factors and build protective skills and competencies in students. A solid literature also has developed regarding interventions that effectively promote young people’s emotional and social development and that reduce the adolescent health and social development risks mentioned above (Collaborative for Academic, Social, and Emotional Learning, 2003; Durlak & Wells, 1998; Mrazek & Haggerty, 1994).

A series of reports and reviews have summarized these programs and the evaluation research that has been conducted on them. For example, the Center for the Study and Prevention of Violence at the University of Colorado at Boulder developed a series, funded by the Federal Office of Juvenile Justice and Delinquency Prevention, entitled the *Blueprints for Violence Prevention* (Elliot, 1998). The Prevention Research Center at Penn State University published a review commissioned by the Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Mental Health Services (CMHS), which summarized the current state of knowledge on the effectiveness of preventive interventions for mental health disorders in school-aged children (Greenberg et al., 1999). This report identified a range of evidence-based prevention programs with differing population targets: universal (targeted to the general public), selected (targeted to individuals at higher than average risk), and indicated (targeted to high-risk individuals with detectable signs of a disorder) programs (Mrazek & Haggerty, 1994).

Other publications have assessed the state of the science in the fields of violence prevention and school safety (U.S. Department of Health and Human Services [DHHS], 2001; Drug Strategies, 1998; Thornton et al., 2000), positive youth development (Catalano et al., 1998), SEL (Zins et al., 2000), mental health (Greenberg et al., 1999; Olds et al., 1999),

substance use (Tobler et al., 2000; Drug Strategies, 1996), and related areas (Minke & Bear, 2000). Many school-based programs are included in these reviews.

Recognition of the critical importance of preventive efforts has grown significantly, as evidenced in the recent U.S. Surgeon General reports on both mental health and youth violence (DHHS, 1999, 2001). In these reports, the Surgeon General urged the mental health field to focus greater attention on the promotion of mental health and on the prevention of mental illness. According to the Surgeon General, “Childhood is an important time to prevent mental disorders and to promote healthy development, because many mental disorders have antecedent problems in childhood. Thus, it is logical to try to intervene early in children’s lives before problems are established and become more refractory” (DHHS, 1999, p. 132). The promising research findings from the field of prevention are influencing public policy. Federal, State, and local governments increasingly are calling for the utilization of empirically validated, effective models of intervention for children and families (Scattergood et al., 1998; National Institute on Drug Abuse, 1997; National Institute of Mental Health, 1998).

Recognition of the critical importance of preventive efforts has grown significantly...The Surgeon General urged the mental health field to focus greater attention on the promotion of mental health and the prevention of mental illness.

Some programs that have proven effective at reducing adolescents’ substance use and risky behavior are school based and others are family focused. However, a critically important gap remains between the implementation of well-designed interventions in controlled prevention trials and the typical implementation of prevention programs in schools and communities. Specifically, empirically supported interventions have not been adopted widely in school and community settings. Furthermore, of those intervention efforts that have been implemented by schools and communities, many lack systematic evaluation or evidence of effectiveness (e.g., Center for Substance Abuse Prevention, 1998; Ennett et al., 1994; Rohrbach et al., 1996; Spoth, 1999). Even when schools and communities implement empirically supported programs, it may be difficult for them to achieve the same levels of technical assistance, support, resources, and prevention expertise available in well-funded, controlled prevention research trials. A more systematic process is warranted to ensure program effectiveness in a variety of school settings under naturally occurring conditions. Such a process translates efficacy results into positive student outcomes, with special attention to factors that contribute to the quality of program implementation. This three-stage process is described briefly in the following section.

From Efficacy to Effectiveness to Going to Scale

The term “efficacy trial” is used to describe the first stage of the process and describes a formal evaluation of a preventive intervention in which the model is tested using a randomized clinical trial (Mrazek & Haggerty, 1994). This type of design is highly controlled and is the most appropriate one to determine whether an intervention is able to change targeted outcomes significantly for participants who receive it compared with those who do not. The efficacy trial is the gold standard of evaluation, and many of the “best practice” guidelines require it as a criterion for possible designation of a program as “evidenced based” or “exemplary.”

Effectiveness trials are critical in helping to understand how high-quality programs are likely to be implemented with real-world constraints and the factors in these settings that affect the quality of program implementation.

Now that significant research has accumulated establishing the efficacy of preventive interventions through randomized trials, the emphasis in the field has shifted toward determining how to achieve successful outcomes when there is local leadership and ownership of the intervention process (Mrazek & Haggerty, 1994). Two other research stages are essential to the process leading to widespread implementation of high-quality programs in community settings. The first stage is that of “effectiveness trials” (Mrazek & Haggerty, 1994), in which research on empirically supported programs is conducted

under the control of the community or school in real-world settings, rather than under the super-optimal (but often constraining) experimental conditions of an efficacy trial. Effectiveness trials are critical to help understand how high-quality programs are likely to be implemented within naturally occurring constraints and to determine what factors in these settings affect the quality of program implementation. Within the field of school-based prevention and, more broadly, within SEL programming, initial research has identified some factors that influence program implementation (e.g., Battistich et al., 2000; Durlak, 1998; Elias et al., 1997; Elias, Zins, Graczyk, & Weissberg, 2003; Gottfredson et al., 1997; Zins & Erchul, 2002). Excellent examples of such effectiveness trials include the current Blueprint Dissemination Trials (Elliot, 1998).

The final stage, often referred to as “going to scale,” occurs when proven programs are broadly disseminated. In both the second and third stages of this process, implementation must be assessed carefully to understand how contextual issues may influence both the level and the quality of implementation. In both stages, but especially when going to scale, the quality of delivery will vary widely and program changes often will be made to match community characteristics. Thus, before broad dissemination is possible, research should be undertaken specifically to understand the essential, or core, elements of the program. This research includes differentiating scripts, activities, or procedures that must be presented exactly as designed from those that can be modified so long as they still reflect the intended purpose or concept being presented in the material. In addition, research studies are needed to identify the dosage of implementation, or threshold, necessary to achieve the desired outcomes. Despite the widespread endorsement of empirically based interventions by Federal and State agencies, most programs and models are only beginning to enter these stages of research. Moreover, even the most widely acclaimed interventions are dependent on the delivery systems in which they are embedded (CASEL, 2003), as the conditions of implementation are the key variables related to success (Grager & Elias, 1997). Thus, it will take some time before scientists are able to provide communities with all the information that they need to know to adopt and adapt known effective programs without compromising fidelity and successful outcomes.

Goals of the Report

The field of prevention and mental health promotion has reached an important stage in its development. For the field to become even more robust, researchers and practitioners must adopt a shared framework that will enable them to exchange relevant information and communicate

effectively regarding both the research and the practice of implementation. This report was developed to that end. Specifically, it:

- defines implementation and assesses its current status;
- introduces a broad conceptual model of implementation for school-based prevention programs that identifies both factors that affect implementation and elements critical to implementation quality;
- reviews barriers and suggests strategies that practitioners and researchers can use to improve implementation quality; and
- discusses the implications of these issues for program developers, researchers, and policymakers.

Prevention researchers can use the model presented to conceptualize and study implementation within the context of specific programs. Program developers also can use this model to assess and improve the quality of their program and training system. Likewise, mental health practitioners, community leaders, consultants, and policymakers can use this framework to guide program decisions and evaluations to improve the quality of service delivery and outcomes.

Current Definitions and Use of Implementation Measures in School-Based Programs

Definition of Implementation Quality

Implementation quality also has been referred to as “treatment integrity” (Dane & Schneider, 1998; Gresham, 1989; Gresham et al., 1993), “fidelity” (Moncher & Prinz, 1991), and “adherence.” Despite the variation in terms, the quality of implementation is essentially the degree to which an intervention is conducted as it was originally intended (Durlak, 1995; Yeaton & Sechrest, 1981). This definition is based on the assumption that the evaluator and the community of implementers specify the intervention before beginning the program and then measure how the intervention actually is conducted in the field.

Dane and Schneider (1998) specify five aspects of implementation quality in their review of school-based preventive interventions: (1) adherence, or the degree to which program components were delivered as prescribed; (2) exposure, or the frequency and duration of the program delivered; (3) content and affective quality, or the qualitative aspects of the program delivery; (4) participant responsiveness; and (5) program differentiation. The authors include this last dimension because some studies they examined were highly controlled research evaluations in which an intervention group was compared to a control or comparison group that did not receive the test intervention but that unintentionally may have received another type of intervention. In this type of study, the design must be verified to ensure that the nonintervention group was not exposed to an unintended intervention.

Importance of Implementation

A central question is why scarce resources should be focused on studying and monitoring implementation. As detailed in Table 1, at least seven different functional reasons exist.

Table 1. Reasons for Studying and Monitoring Implementation

- ❖ *Effort Evaluation - To know what actually happened.*
- ❖ *Quality Improvement - To provide feedback for continuous quality improvement.*
- ❖ *Documentation - To document compliance with legal and ethical guidelines.*
- ❖ *Internal Validity - To strengthen the conclusions being made about program outcomes.*
- ❖ *Program Theory - To examine whether the change process occurred as expected.*
- ❖ *Process Evaluation - To understand the internal dynamics and operation of an intervention program.*
- ❖ *Diffusion - To advance knowledge regarding best practices for replicating, maintaining, and diffusing the program.*
- ❖ *Evaluation Quality - To strengthen the quality of program evaluations by reducing the error in the evaluation.*

First and most basic, in the absence of implementation information it is impossible to know precisely what took place during an intervention trial. This type of evaluation sometimes is referred to as an “effort evaluation” (Chen, 1998). It includes what actually occurred, the quality of the program delivered, and whether the target audience was reached. Second, implementation information provides a source of ongoing feedback that is useful for continuous quality improvement. If a program is being monitored, modifications can be made during the program period as problems are revealed and before they adversely affect outcomes. Third, assessment of the implementation process helps document compliance with important legal and ethical guidelines (Illback et al., 1999). For instance, if a school tragedy occurs, it may be important for a school to demonstrate that it had a suicide or violence prevention program in place.

A fourth rationale is that relating implementation quality to program outcomes is critical to establishing the internal validity of a program and to strengthening conclusions drawn about the program's role in producing change (Durlak, 1998). It also helps protect against the dangers of "Type III error" (Patton, 1997). This type of error occurs when one assumes the effects of an intervention to have been meaningful and conclusive, when, in reality, the intervention may have been delivered so poorly that it invalidates outcome analyses altogether (Dobson & Cook, 1980; Scanlon et al., 1977). For example, in the absence of implementation quality measures, one incorrectly may judge a program ineffective when, in fact, poor outcomes may be the result of service delivery shortcomings, not shortcomings of the program itself. In addition to clarifying group differences, implementation information can be used to explain variation in observed changes in outcomes (i.e., why some individuals improved after participation but others did not). Furthermore, assessing implementation helps explain both anticipated and unanticipated consequences of the intervention.

In controlled research designs, it is important to monitor implementation in both treatment and control groups to verify the study design. An intervention may appear ineffective when the control group receives a concurrent different form of intervention beyond the researcher's control. Today, this situation arises more frequently than ever before, particularly in schools or communities in which multiple prevention initiatives are conducted simultaneously without coordination of services (Cook et al., 2000). Indeed, Durlak (1998) referred to this issue as "the fantasy of untreated control groups," and he noted that many school-based prevention programs are hampered by poorly implemented interventions and no untreated comparison group. Ultimately, this combination leads to inaccuracies in measuring the program's true impact.

A fifth rationale for assessing implementation is to confirm the program's underlying theoretical basis. That theory specifies the essential components of an intervention, the conditions necessary to implement the program, and the ways in which these components produce change in the participants. When the ways in which these components were affected during program implementation are assessed, it becomes possible to examine whether the change process functioned as hypothesized when the program was designed (Cook et al., 2000; Harachi et al., 1999).

Sixth, assessment procedures used to understand the internal dynamics and operation of an intervention program traditionally have been categorized as components of "process evaluation" (Scheirer, 1994). This type of evaluation reveals how the pieces of the program fit together, how the users of the program (trainers, providers, and recipients) interact, and how they face and resolve obstacles (McCoy & Reynolds, 1998). All these are critical aspects of successful implementation, as will be discussed later in this document.

A seventh rationale for studying implementation is to advance knowledge regarding effective practices for replicating, maintaining, and disseminating research-based programs in complex and diverse real-world systems (Rogers, 1995; Scheirer, 1994). When a preventive intervention is transferred or adapted across settings (e.g., from the university to the community or from culture to culture), it is critical to document the changes in the implementation process.

Without implementation information, it is impossible to interpret the significance of specific program elements or to understand the effects of the changes made during the transfer. It is important to recognize that some preventive interventions may not be appropriate for broad dissemination. In fact, Weissberg and Greenberg (1998) note that an important outcome of prevention research may be the finding that a sufficient level of implementation for a given intervention program cannot be achieved in the field (e.g., because of cost, staff training, or community reception).

A final reason to assess implementation is to strengthen program evaluations. By incorporating measures of implementation into evaluation, program evaluators can decrease the amount of “noise,” or variance, unaccounted for in their experimental designs. Meta-analytic studies of the sources of variances in between-study effect size have estimated that between 11 percent and 28 percent of the variance in outcomes for intervention studies is residual (Lipsey, 1997; Wilson, 1995). By capturing the variance explained by implementation factors, program evaluators decrease the amount of unexplained variance. The program evaluation model also is strengthened because the more variation accounted for by the model, the better the model is able to clarify observed variations in program effects.

Current State of the Field

Despite the many reasons why implementation should be assessed in prevention program evaluation, the majority of prevention research studies still do not include implementation as a component of their evaluation. A recent meta-analysis of indicated prevention programs (i.e., programs for high-risk populations) found that 68.5 percent of the programs were described too broadly to be replicated. Further, very few included measurement of treatment fidelity (Durlak & Wells, 1998).

Most prevention programs provide inadequate data on program implementation.

Gresham and his colleagues (1993) conducted a review of school-based intervention studies published between 1980 and 1990. Using a basic definition of implementation (i.e., the study being reviewed noted that integrity was assessed and that it reported an index of treatment integrity), they found that only 35 percent of all the studies meeting these broad criteria provided an operational definition of their intervention either by description or by reference to a manual. Only 15 percent systematically measured and reported levels of treatment integrity. Although the authors did not mention whether any individual studies related implementation to outcomes, they were able to identify a significant relationship between effect size and treatment integrity by using meta-analytic techniques.

More recently, Dane and Schneider (1998) examined program integrity in studies of school-based behavioral interventions conducted between 1980 and 1994. The authors made a distinction between “promotion” and “verification” of integrity. The uses of a program manual, formal training, and ongoing consultation or support were considered steps that *promote* program integrity. In contrast, *verifying* program integrity required efforts to monitor the degree to which the program was

The promotion of program integrity (e.g., use of a program manual and ongoing support) should be distinguished from the verification of integrity, which requires ongoing monitoring of implementation quality.

being implemented as planned, also known as adherence. Each identified study was examined for specific features that promoted and verified fidelity of implementation. Those with specified procedures for verifying integrity were coded along five dimensions: adherence, exposure, quality of program delivery, participant responsiveness, and program differentiation.

Although 57 percent of the studies reviewed provided manuals and training, ongoing consultation was provided in fewer than half the studies (40 percent). Only 20 percent of the outcome evaluations used “comprehensive integrity promotion,” which included a program manual, formal training, and ongoing consultation. Of the total sample included in Dane and Schneider’s review, only 24 percent actually verified treatment integrity. This subgroup of studies was further examined by publication year and revealed that more recent studies (those conducted between 1988 and 1994) were more likely to verify integrity (31 percent) than those conducted between 1980 and 1987 (17 percent).

Dane and Schneider (1998) further examined prevention trials in which dimensions of program integrity and dosage were analyzed in relation to outcomes. The results confirmed the role program integrity, particularly adherence and exposure, played in explaining outcomes. In some studies, positive outcomes were evident only when a specific proportion of the program content was provided (e.g., Botvin, Baker, Filazzola, & Botvin, 1990; Mihalic, 2001). Intervention effects were found most often when trained observers, rather than service providers, were the source of information. The authors noted that the variability in the sources and aspects of integrity reported limited their ability to draw firm general conclusions about the effect of implementation on program outcomes (Dane & Schneider, 1998).

Penn State program review. As described earlier, SAMHSA/CMHS contracted with the Prevention Research Center at Penn State University to review programs that demonstrated effectiveness in promoting mental health and preventing problem behaviors predictive of mental disorders in school-aged children (Greenberg et al., 1999). The review included programs that produced improvements in specific psychological symptoms (e.g., aggressive behavior and anxiety) or in factors directly associated with increased risk for child mental disorders (e.g., poor parenting skills or a history of early child behavioral problems). Programs were included if they had been evaluated using either a randomized-trial design or a quasi-experimental design that included a comparison group. Studies were required to have both baseline and post-intervention findings and, ideally, follow-up data to examine the duration and stability of program effects. In addition, programs were required to have a written manual that specified the model and procedures used in the intervention. Only 34 programs met all of these criteria and were subsequently classified as effective and included in the review.

Greenberg et al. (1999) then classified the 34 programs using a system based on the work of Dane and Schneider (1998). All were examined for specific features related to program integrity. As in Dane and Schneider (1998), a distinction was made between strategies that promote integrity (e.g., manual and staff training), and procedures that verify integrity (e.g., monitoring adherence and dosage). All 34 programs promoted integrity to some degree. Because all the programs included the use of a manual or detailed program description, this finding was not particularly surprising. Some programs took additional steps to promote

Thirty-four effective programs were reviewed for quality of implementation...only 32 percent examined the influence of implementation on outcomes.

integrity by including either staff training or ongoing supervision and support. A little over half the programs (56 percent) reported using all three strategies (i.e., manual, training, and supervision). The type and number of integrity dimensions actually verified across programs varied considerably, however. Overall, 76 percent (26 of 34) of the effective programs verified program integrity in some way. Twenty programs (59 percent) included some rating of fidelity or adherence in their implementation data, which, for the majority, involved tracking the program's essential components with ratings made by independent observers or program implementers. In three of those 20 studies, fidelity was assessed indirectly. High fidelity was assumed when a significant difference was found between program participants and controls along a behavioral dimension targeted by the intervention (e.g., teacher practices or student perceptions). Although this method provides important information, it cannot verify that the behavioral changes were not due to one or more factors unrelated to the intervention. Regarding other dimensions of implementation, dosage (amount and duration of the intervention) was reported in 33 percent of the studies. Four programs (12 percent) assessed participant responsiveness, and two programs (6 percent) assessed program differentiation, i.e., the degree to which participants in each condition actually differed only with respect to whether or not they received the treatment intervention.

Interestingly, only 11 of the 34 studies (32 percent) used implementation information as a source of data for outcome analyses. In some cases, implementation information was presented as descriptive data, but the data, in turn, were not analyzed to determine their influence on program outcomes. Four studies examined dosage-response relationships. Results indicated that higher quantities of the intervention were related to better outcomes. Seven studies (21 percent) used fidelity or adherence ratings to examine whether quality of implementation was related to outcomes. When significant results were found, higher fidelity was related to stronger program outcomes (Greenberg et al., 1999).

A comprehensive theory of implementation is needed...

As this and earlier reviews suggest, the majority of published preventive intervention trials in the 1980s and 1990s were conducted with little or no reported implementation information (see Domitrovich & Greenberg, 2000, for exceptions to this trend in the field of school-based prevention).

However, more recently, a growing number of prevention programs, particularly in the substance abuse field, have monitored implementation extensively. The results of these studies have shown that variability in the quality of implementation can influence program outcomes (Basch, 1984; Blakely et al., 1987; Botvin et al., 1990; Botvin et al., 1995; Connell et al., 1985; Gottfredson et al., 1993; Hansen et al., 1989; Pentz et al., 1990; Rohrbach et al., 1993; Ross et al., 1991; Sobol et al., 1989; Taggart et al., 1990; Tricker & Davis, 1988). Limited attention to issues of implementation prevention trials is not due to a lack of research in the area. The topic has been examined in a host of different fields for more than 30 years. For the field of prevention to continue to grow, greater attention to and better understanding of the implementation process, and the factors that support it, is essential (Mihalic, 2001). One way to help achieve that end is through the development of a comprehensive theory that integrates multiple perspectives.

Historical Perspective on the Study of Implementation

Three separate but related fields provide a relevant historical perspective on the study of program implementation in school-based prevention research: education, school-based prevention, and program evaluation. A brief temporal summary of significant historical developments from each discipline follows.

Field of education. As early as the 1970s, educators stressed the importance of assessing the degree to which an educational approach or intervention was implemented as intended. For example, Charters and Jones (1974) cautioned the field to guard against the evaluation of “non-events.” Similar to a “Type III error,” evaluation of a non-event referred to evaluations of programs that were simply not implemented for whatever reasons.

In the 1980s, Maher and colleagues (Maher & Bennett, 1984; Maher et al., 1984; Maher & Kratochwill, 1980) described implementation issues in considerable detail. From their perspective, the basis for implementation is program design, which includes consideration of the physical, informational, technological, financial, and personnel resources necessary for a program to function appropriately. An implementation evaluation describes how a program is being delivered, and it identifies the conditions under which the program is operating (see Table 2).

Table 2. Components Necessary for Program Implementation

Preconditions for Operation

Human resources

Number, type, and qualifications of required staff

Informational resources

Policies and procedures

Criteria for selecting program clients

Evaluation plan

Technological resources

Materials

Equipment

Financial resources

Developmental budget

Operational budget

Physical resources

Facilities

Rooms

Buildings

Sites

Nature of methods and activities

Roles, responsibilities, and relationships of staff

Sequence and timing of activities

Amount of permissible variation across sites

According to Gersten and colleagues (2000), a number of factors contributed to the decline in efforts to study implementation in the education field in the 1980s. First, assessing implementation can be very costly, particularly when classroom observation is required. Second, the field was simply conducting fewer large-scale evaluations. Finally, many implementation studies that were conducted led to the same conclusion: the effects of high-quality teaching superseded the specific effects of any single educational intervention or approach. In other words, the non-specific features of competent teaching outweighed the unique effects of any specific intervention, such as the quality of teacher feedback, ongoing monitoring of student learning, and academic engagement (Gersten et al., 2000).

In the 1990s, the field of educational evaluation witnessed a resurgence of interest in the study of implementation that has led to the discussions of both theories of implementation as well as measurement of implementation. However, even now, educational researchers typically do not include measures of implementation, perhaps in part because cost-effective and psychometrically sound measures still need to be developed (Gersten et al., 2000). In addition, the education field as a whole appears to be struggling with these issues in the absence of a sound conceptual framework to guide efforts to understand and study implementation processes. One exception is a study conducted by the Rand Corporation that evaluated implementation of the New American Schools (Bodilly et al., 1998; Bodilly, 2001). As will be seen in the next section, the situation was not dissimilar in the fields of school-based prevention and positive youth development.

Fields of school-based prevention and positive youth development. Those in the fields of school-based prevention and positive youth development have paid considerable attention to research on implementation. Factors believed to influence program implementation have been identified and have been found to be related, not only to the program itself (e.g., program complexity, provision of technical assistance, and user-friendly materials) but also to the environment in which the program is being implemented (i.e., district, school, teacher, and participant characteristics). Several excellent references highlight and describe these factors (Durlak, 1998; Elias, 1997; Elias et al., in press; Gottfredson et al., 1997; Weissberg & Greenberg, 1998). However, to date, the field of school-based prevention also lacks a comprehensive program model that systematically clarifies the relationships between implementation factors and processes, and the causal factors and processes that contribute to a program's potential effectiveness.

Field of program evaluation. Until the mid-to-late 1980s, the primary concern of the program evaluation field was the accurate measurement of program outcomes. Research questions focused in a straightforward manner on the determination of whether or not programs worked. Thus, methods to undertake outcome evaluation, particularly those emphasizing internal validity, began to be developed and refined. Because the field of program evaluation was in a nascent stage of development at that time, the presence of rigorous methodological procedures to promote the validity of outcome evaluations also would help validate the field as a whole.

Until the mid-to-late 1980s, the primary concern of program evaluation research centered on whether or not programs worked (the black box model).

Consequently, the study of implementation was placed on the back burner until such validation issues were resolved.

By the late 1980s, a paradigm shift within the field began to gain momentum, fueled by the growing awareness of the need to identify factors that enhance or mitigate a program's effects on targeted outcomes (Gottfredson, 1984; Scheirer, 1987). An important subset of such factors includes those that affect successful program implementation. Evaluators realized that even high-quality programs would not yield positive outcomes for targeted participants unless they were implemented with integrity. Scheirer (1994) has described process evaluation that targets implementation issues as complementary to outcome evaluation. Although outcome evaluations assess program effectiveness, process evaluations measure two core aspects of program delivery: the scope of implementation (Did a sufficient number of targeted participants actually receive the intervention?) and the extent of implementation (Were the intended number of program components delivered as planned?). Process evaluations also consider whether other factors might have contributed to the degree of variation in the scope and extent of program implementation. Through such evaluations, implementation integrity can be determined.

In summary, neither the fields of education and prevention in general, nor the subfields of school-based prevention and youth development have a conceptual model of implementation or a solid understanding of the factors that affect implementation to guide work in these areas. Recent efforts in program evaluation offer guidance for developing such a model through the field's emphasis on program theory and theory-driven evaluations (Chen, 1990; Weiss, 1995). In particular, the approach to theory-driven evaluations outlined by Chen (1990, 1998) can be adapted to school-based prevention and competence-promotion efforts. This model will be presented after the following brief summary of theory-driven evaluation models.

Theory-Driven Evaluation

With the growing emphasis on process evaluations since the late 1980s, the field of evaluation research increasingly has moved away from traditional program evaluations (also known as method-driven evaluations) toward the development and application of theory-driven evaluation (Bickman, 1987, 1990; Chen, 1990, 1998; Chen & Rossi, 1992; Patton, 1997; Weiss, 1995, 1997). The primary objective of traditional program evaluations is to assess program outcomes through predetermined research steps (Chen & Rossi, 1992). Traditional or method-driven evaluations, sometimes referred to as "black box" evaluations, rarely focus on *why* a program was effective or how it can be improved (Chen, 1998). In contrast, the primary objectives of theory-driven evaluation are (a) to utilize the essential components of the theory that underlies a particular program to specify the design of the program evaluation itself, (b) to understand *how* and *why* a particular program resulted in certain outcomes, and (c) to use that information as a means to improve the effectiveness of a program (Chen, 1990, 1998; Weiss, 1995).

According to Chen (1990, 1998), to conduct a theory-driven evaluation, an evaluator first must construct a comprehensive program theory. To be comprehensive, the program theory must address two areas. The first is the *causative theory* that describes the "how and why" of the program: how the program is expected to achieve particular outcomes, the relationship between

Program failure may result from an inadequate theory of change or poor implementation.

the intervention and the outcomes, and the mediators or moderators of the intervention effect. The second major component of a program's theory is its *prescriptive theory*,¹ which describes how the program should be implemented or the manner in which daily activities of the program should proceed. This component includes the goals of the program, the guidelines for the type of intervention to be provided, and the context that is necessary for the successful implementation of the intervention. Program failure may result from weakness in either the causal or prescriptive aspects of the program theory. Thus, for example, program failure may be a function of inaccurate theory about the causal mechanisms (mediators and moderators) that link interventions with outcomes, or it may be due to a failure to implement the intervention properly.

In Chen's (1990, 1998) model, interventions are the change agents that are linked through causal mechanisms to specific (intended) outcomes. Interventions take place within an implementation system that provides the means and context for delivery of the intervention. The implementation system includes such elements as staff training or the infrastructure that coordinates intervention efforts. The implementation system is embedded within the broader general environment. Chen argues that the implementation system is as important to program effectiveness as is the intervention itself; implementation failure can occur when the implementation system does not support the intended delivery of the intervention. Consequently, the implementation system also must be monitored as part of the program evaluation.

Chen's (1990, 1998) work provides a broader perspective on program evaluation, in general, and on the evaluation of implementation quality, in particular. Traditional evaluations of implementation quality or treatment fidelity focus solely on the discrepancy between the program as planned and the program as delivered. The evaluation model proposed by Chen expands the definition of implementation quality to include the discrepancy between the *implementation system* as planned and the *implementation system* as delivered (see Figure 1).

Having a clear program theory is essential; it provides the conceptual basis for the design and operation of a program and it defines the instrumental components of implementation, both of which reduce the potential for program failure. This aspect is one of the most compelling reasons to use prevention programs that have a clearly specified theoretical base. Cook and colleagues (2000) provide an excellent example of how program theory can be used both to verify fidelity of the intervention model and to test the program theory of an intervention.

¹ In his model, Chen distinguishes between two theories and two corresponding sets of assumptions that should serve as the conceptual basis of every theory-driven evaluation. Prescriptive assumptions correspond to the normative theory of the model, and descriptive assumptions correspond to the causative theory of the model. For this model, the terms "prescriptive" and "causative," respectively, were chosen, to illustrate the two theoretical components of the model. We believe that these are more intuitive, easier to understand terms for readers who are not familiar with Chen's work.

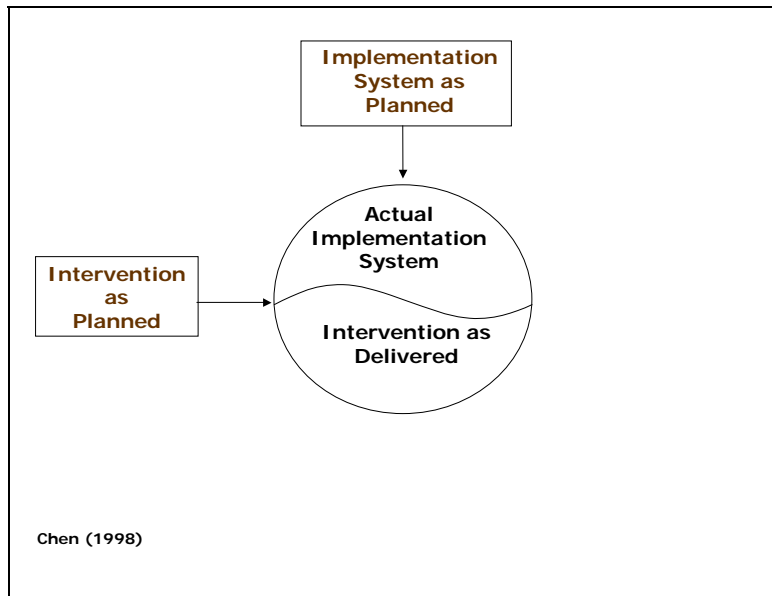


Figure 1. Implementation Discrepancy

A Conceptual Model of School-Based Implementation

This report proposes a new conceptual model for both the development of a program theory and the study of the implementation of school-based prevention and promotion programs. The model integrates research and theory from the fields of program evaluation (Chen, 1990, 1998; Scheirer, 1994; Weiss, 1995, 1997), prevention science (Watson et al., 1997; Dane & Schneider, 1998; Durlak, 1998; Elias, 1997; Elias et al., 1997; Gottfredson et al., 1997; Pentz et al., 1990; Weissberg, 1990; Zins & Erchul, 2002), and education (Gersten et al., 2000; Bodilly et al., 1998). A two-step process will be outlined and illustrated with two well-known, school-based prevention programs: The Promoting Alternative Thinking Strategies Curriculum (PATHS; Kusché & Greenberg, 1994) and Life Skills Training (LST; Botvin, 2000).

The following sections present steps to develop and evaluate a program theory and also to delineate the essential aspects of an intervention and implementation support system common to most school-based preventive and promotion interventions. By articulating causative and prescriptive assumptions, a program evaluator or practitioner can tailor measurement decisions directly to a specific program.

Step 1: Causative Theory

A successful preventive intervention begins long before a high-quality program is implemented. It begins with an assessment of needs and capabilities, and selection of an appropriate strategy to target the identified needs and utilize the available resources. This choice of strategies depends on an accurate needs assessment and an accurate underlying causative

theory of how the need develops and is maintained. One of the most important defining features of high-quality preventive interventions is that they are grounded in a theoretical model.

The preventive intervention research cycle described in the Institute of Medicine report (IOM, 1994) begins by prioritizing and then defining a target problem. The second phase of this cycle is the use of developmental, epidemiological, and longitudinal research to articulate both the overall etiological model of how the problem develops and the specific risk and protective factors involved in this process (Kellam & Van Horn, 1997). This phase is followed by identification and selection of known effective ways to address the identified problem. In the third phase of the prevention research cycle, a theoretical model is constructed based on the research conducted during the second phase (e.g., see Sandler et al., 1997). The risk and protective factors that can be modified (i.e., that are malleable) are identified as proximal targets for an intervention, and a program or strategy is designed to effect change in those proximal targets. Pilot studies are used to test and confirm the model. Then, clinical trials are conducted to evaluate the efficacy of the intervention.

In addition to measuring the long-term or distal program outcomes, every evaluation of a preventive intervention should include an assessment of the mediators, or proximal target outcomes.

To summarize, causative theory both explains how a targeted problem develops and informs the selection of appropriate strategies. It specifies how the program affects the targeted outcomes by identifying change as a function of the intervention (Harachi et al., 1999). These changes, in turn, influence intended outcomes. In addition to measuring the long-term or distal program outcomes, every evaluation of a preventive intervention should include an assessment of mediators or proximal target outcomes. This assessment permits the explanation of any treatment effects and the confirmation that the change process functioned the same way as it did when the program was developed. Figure 2 is a simple rendition of a causative model. Most causal models of real-world change are considerably more complex and contain multiple mediating mechanisms (e.g., cognition, behavior, and setting) and multiple levels of change (e.g., individual, family, classroom, and school district).

As an example, the overall goal of the PATHS program (Kusché & Greenberg, 1994) is to improve the social-emotional competence of children and the classroom climate of schools that implement the program. It is based on an ABCD (Affective-Behavioral-Cognitive-Dynamic) model of development (Greenberg & Kusché, 1993; Greenberg et al., 1991) that emphasizes the importance of the developmental integration of affect (and emotion language), behavior, and cognitive understanding within the dynamic structure of the individual personality. According to this model, a child's ability to cope (as reflected in the child's ability to regulate his or her feelings and behavior) is a function of emotional awareness, affective-cognitive control, and social-cognitive understanding. The relationships among the affective, cognitive, and behavioral domains are considered critical for socially competent behavior and positive peer relations (Weissberg & Elias, 1993). The PATHS Curriculum (Kusché & Greenberg, 1994) is designed to (1) teach children the skills necessary to develop effective coping and (2) improve classroom and school climate.

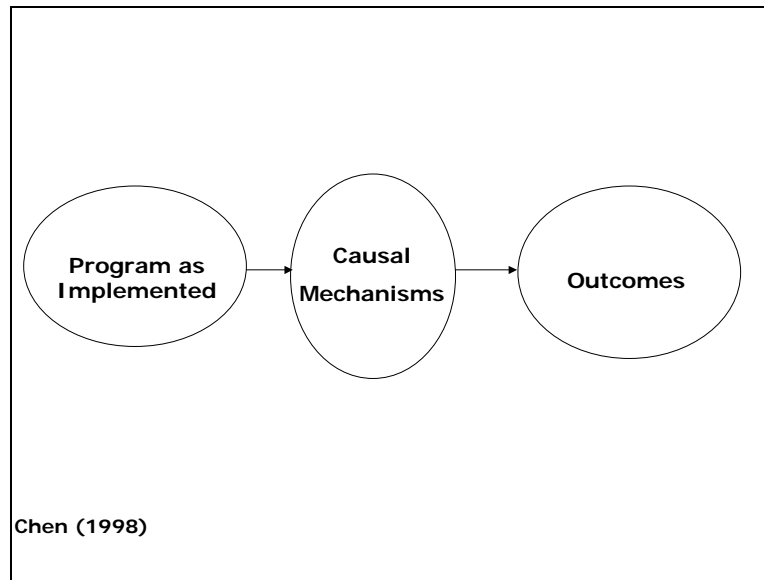


Figure 2. Causal Portion of Program Theory

For an individual child, affective awareness, communication, self-controls, and social problem-solving skills are the proximal outcomes of the PATHS program. At the classroom and school levels, the goals are to improve the classroom and school atmosphere as a result of adults who: (1) model these skills, (2) encourage students to practice and apply these skills, and (3) use a common language for problem solving and conflict resolution. Improvements in these domains are expected to improve the distal outcomes of child behavior and social adjustment.

The overarching goal of the LST program is to prevent substance abuse in middle school and junior high school students. Grounded in social learning theory (Bandura, 1977) and problem behavior theory (Jessor & Jessor, 1977), LST conceptualizes substance use as a socially learned behavior that serves one of several purposes, including attaining a specific goal, coping with anxiety or anticipated failure, or responding to the “social influence process” produced by the enticing appeals of peers and the media or modeling by high status individuals. On the basis of these two theoretical perspectives, LST takes a two-pronged approach to prevention that targets factors that motivate young people to use drugs (including normative beliefs) and provides participants with the skills to resist social pressures. Consequently, LST provides prevention-related information, promotes anti-drug norms, teaches drug refusal skills, and fosters the development of general social and self-management skills.

Step 2: Prescriptive Theory

The second step in the development of a comprehensive program theory is to outline the prescriptive theory, the “how to” of the intervention (Chen, 1998). This step involves specifying the essential elements of both the planned intervention and the planned implementation system (e.g., essential policies, structures, or setting characteristics), and then developing a measurement system to assess these elements. Figure 3 displays Chen’s (1998) model incorporating both the planned intervention and the planned implementation system. As the figure indicates, in most cases some discrepancy will exist between what is planned and what actually happens in both of these elements. The discrepancies in the intervention and in the implementation systems must be identified and understood because they may help explain variation in effects as a result of the way in which the program was implemented.

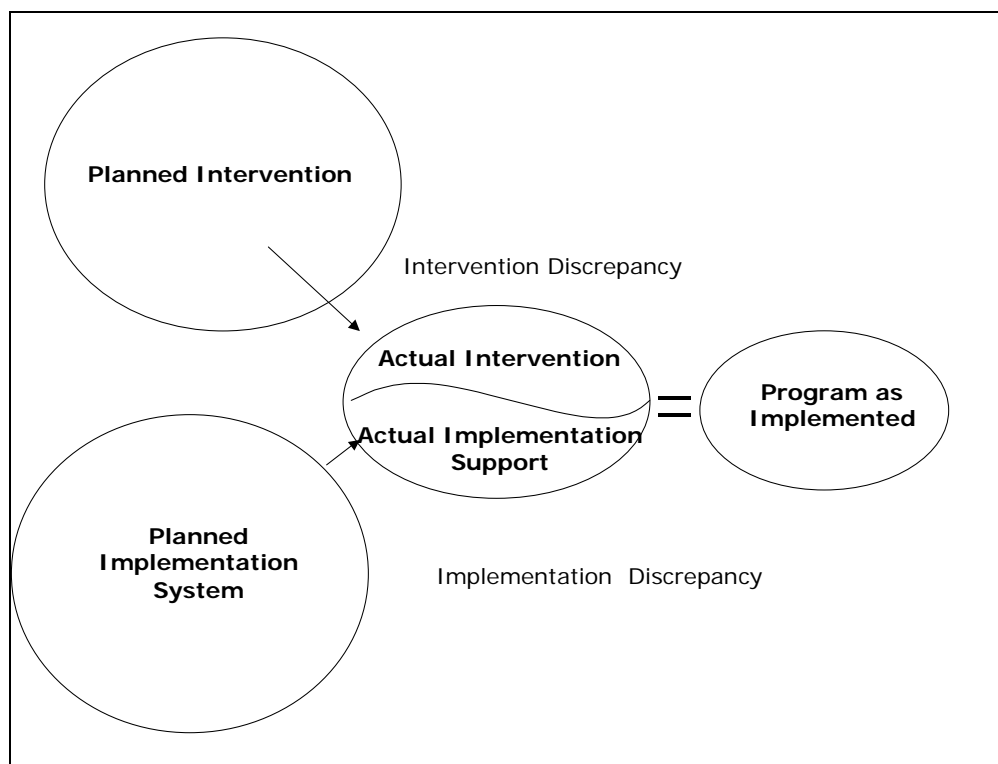


Figure 3. Prescriptive Portion of Program Theory (Chen, 1998)

Figure 4 depicts an adaptation of Chen’s prescriptive theory as it applies to school-based prevention programs. In the following sections, detailed information about each aspect of the prescriptive model for school-based prevention programs is presented.

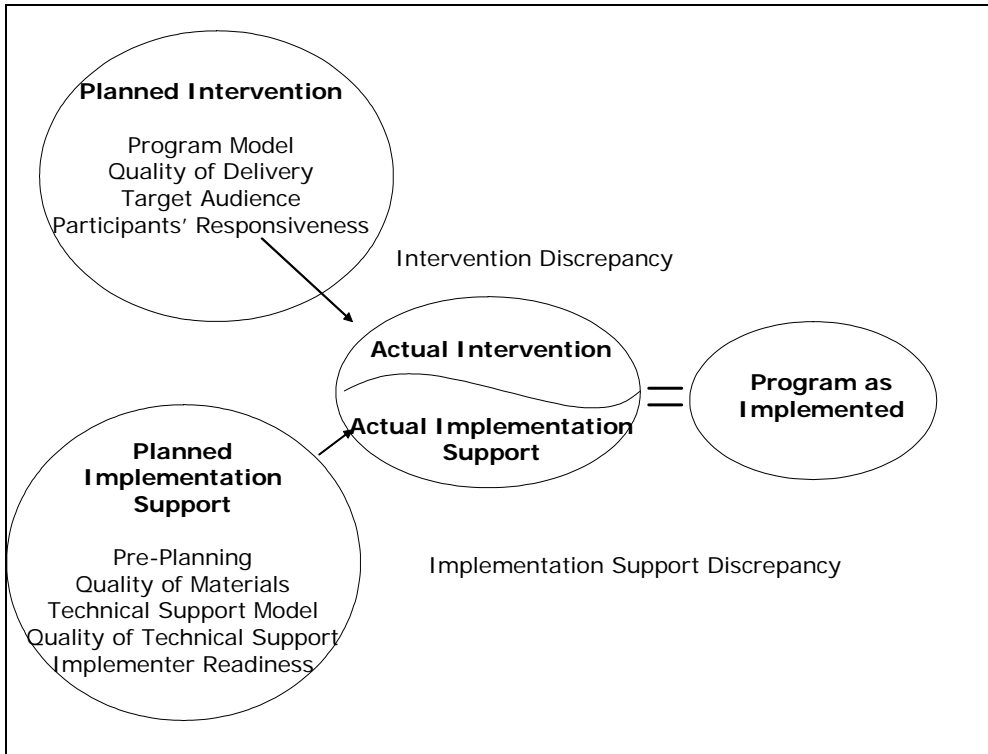


Figure 4. Prescriptive Portion of Program Theory for School-Based Programs

A. Planned Intervention. Evaluators should measure four dimensions of their planned intervention (see Table 3).

Table 3. Planned Intervention

- 1. Program Model**
 - Structure
 - Content
 - Timing
 - Dosage
 - Nature of intervention
- 2. Quality of Delivery**
 - Affective nature or degree of engagement
 - Effective use of implementation techniques
 - Generalization of skills
- 3. Target Audience**
 - Actual program recipients
- 4. Participants' Responsiveness**
 - Perceptions
 - Skills
 - Knowledge
 - Beliefs (e.g., efficacy)

1. Program model. The first dimension, the program model, includes the structure, content, timing, dosage, and nature of the intervention. The *program structure* includes who delivers the program and the format of the delivery (i.e., lessons or instruction alone or lessons or instruction plus generalization procedures). *Program content* is what some program developers refer to as the “essential components” or “essential elements” of the intervention. These may be broad components or processes, individual sessions within a component, or a specific sequence of activities within a lesson. The *timing of the program* is the pace at which the program should be administered (e.g., three times per week for 7 weeks or once per week for 21 weeks) and includes both the frequency and the duration of the intervention. *Dosage* is the prescribed level of exposure to the intervention and refers to how much of the intervention should be provided (e.g., number and length of sessions). Finally, the *nature of a given intervention* is likely to affect implementation quality. For instance, an intervention must be socially valid, capable of being delivered as intended, and within the range of expertise and resources available, if it is to be used widely (Elliott et al., 1991). Programs more acceptable to implementers also are more likely to be implemented. For example, teachers prefer positive interventions (e.g., modeling) rather than negative interventions (e.g., timeout), unless the problem is severe (Clark & Elliott, 1988). Programs that are more complex also tend to be delivered with less integrity (Elliott, 1988).

The PATHS Curriculum program model (Kusché & Greenberg, 1994) requires teachers to administer a set of core lessons at least two times per week for 15 to 20 minutes and to engage in a number of behaviors throughout the class day designed to generalize the curriculum concepts. The curriculum is divided into three major units: Readiness, Feelings, and Problem Solving. To assess the PATHS program model, the developers have teachers and PATHS coordinators monitor (1) whether the core content of each lesson and the curriculum as a whole are being covered, (2) how often lessons are conducted, and (3) the overall number of lessons administered. One aspect of implementation that is not well researched in PATHS is the core content presentation.

The LST program includes five core components. The “cognitive” component presents information about short- and long-term consequences of drug use and about drug dependency, use and abuse prevalence rates, and social acceptability. The “decision-making” component encourages responsible decision making and critical thinking skills. The “coping with anxiety” component provides students with techniques to cope effectively with anxiety and anxiety-provoking situations. The “social skills training” component encourages the development of social skills, in general, and assertiveness skills, in particular. Finally, the “self-improving” component provides students with techniques to change specific behaviors (e.g., self-monitoring, self-evaluation, goal setting, and self-reinforcement).

The LST program has several alternative delivery models. Implementers of LST may be classroom teachers, peer leaders, or outside health professionals. LST lessons may be taught at a rate of once per week or at a more intensive pace on consecutive class days. The elementary school version contains materials for 24 classes (8 classes per year) to be taught during third, fourth, and fifth grades

or fourth, fifth, and sixth grades. The middle school or junior high school version includes 25 required and 9 optional units to be taught during sixth, seventh, and eighth or seventh, eighth, and ninth grades, respectively. Fifteen units (12 required and 3 optional) are designed to be covered in year 1, 10 units (8 required and 2 optional) in year 2, and 9 units (5 required and 4 optional) in year 3. The units covered in years 2 and 3 are described as “booster” sessions.

2. Quality of delivery. The second important aspect of the planned intervention is the quality of program delivery, including the affective nature or degree of engagement of the implementers when delivering the program. This aspect may be reflected in implementers’ presentation style or in the variety of materials or methods they use to communicate the intervention concepts. Other aspects of delivery quality include the effective use of the intervention techniques (e.g., role-plays and problem-solving discussions) and the extent to which intervention concepts are generalized across the intervention context.

The developers of PATHS believe that students are more likely to be interested in PATHS and to internalize the curriculum when teachers present the lessons in an engaging manner and generalize the core concepts throughout the day. As such, program coordinators monitor the quality of program delivery and generalization throughout the day with classroom observations and teacher ratings (Conduct Problems Prevention Research Group, 1999). For the same reason, LST provides teachers with useful guidelines to help engage students. However, measures to monitor the quality of program delivery are not included in the basic set of LST program materials.

3. Target audience. The third dimension, target audience, refers to the population or populations intended to receive the intervention and whether they actually are reached. Although this dimension is related to dosage, it primarily is relevant for selected or indicated interventions that target a specific audience (e.g., at-risk students or students already displaying early signs of maladjustment). When an intervention is directed toward a specific group, it is important to monitor not only program dosage but also who was present when the intervention was delivered. Given the frequent absenteeism of high-risk children, it is very possible that even when school personnel deliver a program faithfully, targeted students will not receive an adequate amount of the intervention.

Because both PATHS and LST are universal programs delivered at the classroom level (i.e., intended for all students), keeping attendance when lessons are presented is not standard practice but is an option to be considered.

4. Participant responsiveness. The fourth dimension that warrants monitoring is participant responsiveness, or the way in which participants receive the program. Many program developers use positive participant ratings as a marker of high implementation quality. They assume that if participants like the program, are actively engaged in program activities, or acknowledge the benefits of the program, they are more accepting of the program and more likely to benefit from the intervention. In fact, the term “acceptability” has been used in the

school consultation and clinical literature to refer to students' judgments or beliefs that interventions are "appropriate, fair, and reasonable" (e.g., Kazdin, 1981).

Traditionally, PATHS consultants use classroom observations of student behavior during lessons as a means to monitor participant responsiveness rather than monitoring students' opinions of the program. During their research studies, the developers of LST monitored student responsiveness in two ways: with classroom monitoring forms to assess implementation fidelity (including items designed to assess student responsiveness to program activities), and with student feedback forms to assess student reaction to the overall LST and to specific activities or content, or both.

B. Planned Implementation Support System. In the school-based adaptation of Chen's (1998) model, the "implementation system" is replaced with the term "implementation support system." This replacement is done intentionally to remind school-based program implementers that even the strongest, most extensively evaluated program will fail without an adequate support system. The implementation support system can be divided into five dimensions (see Table 4) essential to most school-based prevention programs and, thus, should be included in every program theory and comprehensive evaluation.

Table 4. Planned Implementation Support

1. Pre-Planning

- Capacity
- Awareness
- Commitment/engagement
- Incentive for change
- History of prior program implementation

2. Quality of Materials

- Design of program materials
- Format of program materials

3. Technical Support Available

- Structure of training and supervision
- Content of training and supervision
- Timing of training and supervision
- Implementation monitoring system

4. Quality of Technical Support

- Quality of delivery
- Quality of the working relationship
- Trainer characteristics

5. Implementer Readiness

- Perceptions
- Skills
- Knowledge
- Beliefs (e.g., efficacy)

1. Pre-Planning. We define pre-planning as any preparation made by the school before the implementation of an identified intervention. Although case studies fill the file drawers of researchers and trainers, little quantitative research has been conducted on ways to assess or improve the readiness of a context for an intervention, or the ways in which readiness assessment may predict the quality of program implementation. The majority of prevention programs do not specify pre-planning steps, even though planning decisions made before program implementation can have a significant impact on the success of program adoption. At least seven system factors should be considered in the pre-planning of any school-based preventive or promotion intervention: (a) need for change; (b) readiness for change; (c) capacity to effect change; (d) awareness of the need for change; (e) commitment or engagement in the change process; (f) incentive for change; and (g) history of successful change. These factors strongly influence an organization's overall readiness for implementation (Oetting et al., 1995). Of interest is a Web site for prevention programs identified by the Substance Abuse and Mental Health Services Administration (www.samhsa.gov/centers/csap/modelprograms/programs.cfm). This site provides descriptions and pre-planning guidelines for each program.

Similarly, pre-planning includes what Stufflebeam and Shinkfield (1985) refer to as "context and input evaluations." Context evaluation includes an accurate assessment of the student population and its needs, coupled with a determination of the program's capability to address the needs of the targeted group of students. Without such information, it is difficult to assess the likely fit between what students need and what a program offers. Input evaluations encourage schools to analyze their infrastructure to determine whether it is sufficient to handle program needs. Analyses at this program stage consider such factors as availability of needed personnel and material resources, budgeting issues, and feasibility (Elias et al., 1997).

To identify and implement an appropriate preventive intervention, school personnel must begin with both an awareness of a need that affects the students in their community and an accurate assessment of the contexts in which the need exists. A need is a discrepancy between a desired state and an actual condition. Contexts in which the need exists may include the range of resources available to respond, previous change experiences, the likelihood of resistance to change, and the motivation for addressing the need in the first place (Illback et al., 1999). Without accurate problem identification, schools may misallocate resources, may spend funds inefficiently, or may cut personnel from necessary programs. Once a problem is targeted for change, all personnel should be aware of the problem in their school, should be informed about how the suggested program will address the problem (i.e., they must understand the program theory), and should be committed to carrying out the program.

High-quality preventive interventions are relatively costly and time consuming. They are more likely to be successful when most or all individuals in the setting are committed to the intervention and feel ownership for it. Even the strongest programs will fail if the individuals implementing them are not aware of the problems and needs or are not convinced that the programs are necessary (Elias et al., in press). Similarly, implementers will not engage in an intervention or conduct a program well if they do not feel it is within their job responsibilities. If a teacher is required to implement a violence prevention program but believes it is the responsibility of the parents, not the school, to educate children to be nonviolent, he or she may be less willing to teach the required number of lessons. In addition, the teacher may not engage

in generalization activities that extend beyond the time allotted for the lesson. Teachers are more likely to be committed to a program and to implement it well if they have played an active role in deciding what intervention to adopt and how it fits into the context of the educational program currently in place in their classrooms. At the school or district level, commitment is undermined when the goals of a preventive intervention are not congruent with school or district goals. As a result, the program will not be supported or seen as a priority when decisions are made regarding continuation or refunding. It should be recognized, however, that not all roles in the change process are equally rewarding, which has implications for program sustainability (Elias et al., in press).

Implementers benefit from training and incentives to do the extra work necessary to engage in high-quality intervention. The incentive may be as simple as knowing why the program is expected to be effective. At other times, monetary or professional benefits may be required. All too frequently, however, once new programs are started in schools, program delivery is not monitored and, as a result, implementers receive no feedback or consequences about the degree to which they implement the intervention with integrity, nor of the extent to which program outcomes were achieved. This lack of follow-up not only affects the quality of the program's delivery but also the sustainability of the program over time.

Very few schools institute new programs of any kind without encountering some problems with the process of implementation or with the outcomes achieved. A school's history of implementing prevention or other SEL programs may affect how school personnel perceive a new initiative. Teachers often view a new program as simply the latest in a long, never-ending series of initiatives introduced but then soon forgotten and replaced by the next fad an administrator learns about at a conference. School personnel falsely may have attributed either disappointing results or the failure of a program altogether to the program itself, when, in reality, flaws in how the program was implemented may have been the cause. In addition, programs often are not given sufficient time to strengthen and grow (Elias et al., in press). Implementers or school personnel may have unrealistic expectations about when outcomes should be realized, and they may form conclusions about the success of the program prematurely. Assessing and addressing these issues before the start of an intervention will greatly improve the likelihood of its success.

In the case of PATHS, the developers stressed that a committed school principal is essential for successful implementation (Elliot, 1998). In other words, the school principal's endorsement of both PATHS and attendance at the training is viewed as a critical prerequisite for program success. Recent evidence indicates that school principal support for PATHS directly affects reductions in student aggression (Kam & Greenberg, 2000). In addition, teachers should be made aware of the program, and at least the majority should agree to program implementation.

LST program developers have had similar experiences. They found that the commitment of the school principal or building supervisor is an important ingredient in successful implementation of the LST program. They have also found that it is important to include teachers in the decision to adopt the LST program, or at least to "sell" them on the idea of program implementation. Otherwise, many teachers will actively resist

school administration efforts to “mandate” implementation. School administrators should convey respect for teachers by asking them to participate rather than telling them to do so—before the initial training workshop. If teachers have not been informed about the program and asked to volunteer, the first half of the training workshop will need to be spent managing teacher resistance. A “top-down” communication style between the administration and teachers can undermine efforts to implement a new prevention program.

Despite this knowledge, LST developers have not formalized the process for engaging teachers as a specific pre-planning suggestion. Their only specific pre-planning recommendation is that all new LST instructors participate in a training workshop before program initiation. However, during recent large-scale dissemination efforts through the Federal Office of Juvenile Justice and Delinquency Prevention, LST staff found that pre-training technical assistance helped identify and solve potential implementation or scheduling problems. With proper pre-planning or pre-training, or both; technical assistance; high-quality training; and use of periodic monitoring, LST developers found that implementation fidelity rose to 81 percent, even within the context of a large-scale demonstration project—a level of fidelity that exceeds that of their randomized trials.

2. *Quality of materials.* Successful program implementation is more likely when the program materials are visually appealing, user friendly, age appropriate, and culturally sensitive. Instructor manuals probably are the single resource most widely used by teachers implementing positive youth development and other instructional prevention programs (Graczyk et al., 2000). Consequently, the design and format of instructor manuals may have a significant impact on the quality of program delivery. They are most helpful when they include a comprehensive scope and sequence chart, provide the theoretical rationale for the program, explain the theory’s connection to the lesson content and teaching strategies, clearly state the program objectives, and include detailed, well-organized, and easily understood lesson plans.

The PATHS program is presented in a series of manuals. Each lesson follows the same format and includes an overview of the objectives, reminders for teachers, a materials list, and specific procedures for conducting the lesson. This structure encourages fidelity to the lessons. Assessment of program materials should be an ongoing process, because teacher-friendly materials may be especially important in the later years of dissemination, when teacher incentives and support for implementing the prevention model may be reduced.

The LST program also is presented in a series of teacher manuals with accompanying student guides. The material is user friendly, well organized, visually appealing, and developmentally appropriate. Each lesson follows a similar format and includes unit goals and objectives, a list of needed materials, instructions for any special preparation required by the teacher, and key vocabulary words. Instructional strategies incorporate a combination of didactic instruction, demonstrations, in-class practice, feedback, social reinforcement (i.e., praise), and a homework assignment to foster practice and generalization outside the classroom.

3. Technical support available. One of the most important dimensions of the implementation support system is the technical support provided. This support includes the structure, content, and timing of pre-intervention training, and any ongoing support required to deliver the program successfully. It also includes the implementation monitoring system or additional technical assistance materials provided by the program.

The structure of the technical support determines who delivers program support and how it is delivered to program implementers (e.g., direct training, trainer of trainers model, or videotape). Training and supervision should be comprehensive and should prepare the implementers to conduct the program. Therefore, the content of the technical support should include the essential elements of the intervention. Program evaluators should verify that these elements are included and covered in the training. The timing of technical support refers to the frequency, duration, and pace at which the support and follow-up should be administered.

Little research exists on the effect of different technical support models on the quality of program delivery. Increased research attention is warranted regarding such factors as the timing of training (e.g., 2 days at once versus 1 day followed by partial implementation and then a 2nd day); the use of live, video, or Internet-based training; the importance of ongoing supervision versus pre-intervention training; the use of booster visits or telephone calls versus e-mail contact; and the role support personnel (e.g., school psychologists and school social workers) can have on program integrity.

The PATHS developers strongly recommend that teachers and school personnel (including the principal) who interact directly with students attend PATHS training. The PATHS training model involves a 2-day training session before school begins and a 1-day booster session halfway through the school year. Schools are encouraged to identify a PATHS coordinator to serve as a liaison between the developers and the school personnel. This individual provides weekly consultation and support to teachers and maintains monthly contact with program developers.

The LST program recommends that novice instructors attend a 2-day training workshop that presents (a) the theory, rationale, and background for the LST program; (b) skills to conduct the program; (c) time to practice teach selected components of the program; and (d) the opportunity to discuss practical implementation issues. Further technical assistance is available by e-mail or telephone contact with trainers. If needed, additional in-person technical support can be arranged.

4. Quality of technical support. The next dimension, the quality of technical support, includes (a) the quality of delivery during training and supervision, (b) the quality of the working relationship between the trainers and the implementers, and (c) the characteristics of the trainers who provide the assistance.

It is likely that teachers will be more interested in a program when their training is conducted in a collaborative, engaging manner. It is helpful for the teachers to perceive the trainer as one who respects their individual needs and interests and as one who is sensitive to their skill level and learning style. Adherence to program protocol can be improved and resistance decreased by creating a supportive, cooperative partnership between trainers and implementers. The technical support provided to program staff should establish and maintain open channels of communication and result in effective problem-solving between school personnel and program staff. Efforts should be made to clarify teacher beliefs and expectations about the implementation process and about intervention options and outcomes. When problems arise, any discrepancies between trainer and implementer assessment of the nature of the problem need to be addressed (Zins, 1985).

A poorly researched, but important factor is the experience of trainers. Some programs “train the trainers,” certifying as trainers individuals who vary widely in program experience. Other programs certify as trainers only individuals who have already had extensive program experience. Research on the effect of these different models on program quality is lacking. Clearly, trainers need to be adequately prepared and experienced to provide the technical support and basic encouragement that are required to implement an intervention successfully. Trainers also need to be aware of their own beliefs about their ability to improve implementers’ readiness, and trainers have the ability to monitor and adjust their behavior (e.g., presentation style and warmth) when interacting with various individuals in the school setting.

Experienced personnel hired directly by the program developers conduct the training activities for the PATHS Curriculum. The materials that PATHS trainers use are standardized to ensure a high level of quality and consistency of training delivery. The materials include guidelines about how to establish positive working relationships with attendees and strategies on how to manage common problems that may arise during the workshop.

National Health Promotion Associates, Inc., an affiliate of LST, certifies LST trainers. LST prefers to use trainers with previous LST teaching experience because they know firsthand the best way to achieve effective implementation.

5. Implementer readiness. Foremost, implementation support prepares implementers to conduct an intervention successfully. Indicators of implementer readiness include whether they have both adequate skills to carry out the intervention and sufficient knowledge about the theoretical basis of the intervention, feel positive about a program, value what it contributes to the educational setting, and are committed to its goals. If a teacher does not see the value of fostering a specific skill or conducting lessons about particular topics (e.g., sexuality), he or she may be more likely to skip those lessons, even though they may be core parts of the program.

Implementers also need to believe that both the intervention and their role in its delivery will be effective (R. Slaby, personal communication, October 1999). Teacher confidence in the effectiveness of an intervention and in their own knowledge and skills affects the ability to deliver a program successfully (Elliott, 1988). The more confident and comfortable they feel

when conducting lessons about a particular topic (e.g., suicide), the more likely they are to cover those lessons that are a necessary part of the program.

The PATHS training workshop always has included the opportunity for informal participant feedback. Recently, however, program developers created a questionnaire for participants to complete after the 2-day training. The measure assesses the participants' reaction to the training, their level of confidence and their feeling of being well prepared to teach the PATHS Curriculum, and their evaluation of the trainer's skill level.

The LST training workshop also assesses training workshop participants' skills and confidence in implementing the program. Workshop participants are required to prepare assigned activities from the LST program and to implement them within the context of the training workshop. LST trainers observe participants implementing these activities, provide feedback, and determine the confidence and skill level of each participant. Evaluation data also are collected at the conclusion of each training workshop, using a workshop evaluation form that assesses participants' reactions to the training and their confidence in their ability to implement the LST program. The form also asks workshop participants to assess the quality of the training workshop and the trainer, yielding "consumer satisfaction" information, as well as suggestions about ways in which the training model could be improved.

Contextual Factors That Affect Program Delivery and Effectiveness

The previous section presented an overview of the factors specific to school-based prevention and promotion programs and the implementation support system that may affect implementation quality. For any evaluation, the elements on which the planned intervention is built and that are contained within the implementation support system are critical. However, the adoption and effective use of any prevention program do not occur in a vacuum. Indeed, a broad array of factors *outside* the program theory may affect the quality of the intervention process or the program outcomes (see Figure 5), and it is essential to address the quality of the educational environment, as well as individual characteristics (Eccles & Appleton, 2002).

The external environment can be divided into different ecological systems relevant to school-based programs, among them the classroom, the school building, the school district, and the surrounding community. Sanction for a program usually must be obtained within each of these systems. Furthermore, entry into a system is not a single event or time, but rather a process (Zins & Curtis, 1981). If such systems also are intervention *targets*, they should be reflected in the program theory and assessed as part of the planned intervention as described in the previous section. For example, any school-based prevention program is likely to be more successful if it has administrative support; thus, the nature of this support should be evaluated because it may affect program effectiveness. However, if the support and action of the school principal are central components of the program model (i.e., the intervention includes a prescriptive role for the principal or specifically targets the principal with some type of program materials), then

measurement of the principal's behavior and support should become an essential aspect of the implementation support system model.

For PATHS, school principal support is a component of the program theory and specific program activities are directed toward principals, suggesting principal support is a factor to measure as part of the implementation model. However, for LST, school principal support is not part of the program's theory. Thus, it would be considered a contextual factor that does not need to be evaluated as part of the program's model.

Factors at the Classroom Level. Two major categories of classroom-level factors may affect implementation. For many school-based prevention programs, teachers are the primary program implementers. Therefore, the first category is teacher characteristics and behaviors. The second category includes factors that compose the classroom climate, including the peer group.

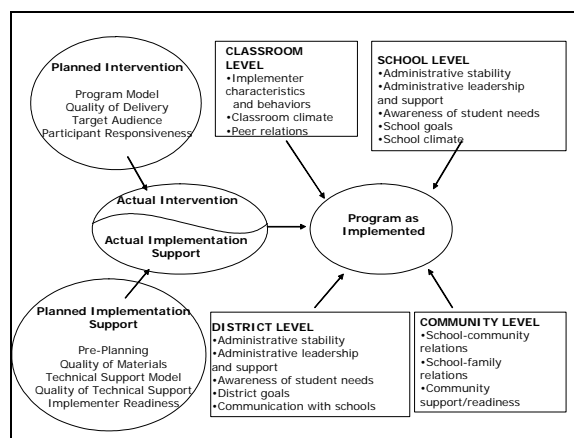


Figure 5. Contextual Factors That May Affect Intervention Process or Program Quality

Implementer characteristics and behaviors. Because general teaching and interpersonal competencies span areas of instruction, most teachers who are effective in teaching academic skills also will be effective implementers of prevention or promotion programs. However, teachers also must see the value of fostering their students' social and emotional development and must have the necessary background knowledge to do so (Adalbjarnardottir & Selman, 1997). Teachers need to be aware of the particular social and emotional needs of their students to choose and successfully apply the interactive types of teaching strategies called for in most prevention programs, such as role-plays, coaching, cooperative learning activities, peer mediation, perspective-taking exercises, and discussions of moral dilemmas.

A related, but often overlooked, factor is a teacher's personal awareness of his or her own emotional and social needs, and competencies. Psychological mindedness can vary considerably from one teacher to another, yet such self-awareness may be needed if teachers are expected to understand their own reactions to specific program activities or content (Kessler, 1999). Such awareness can be helpful in understanding both negative reactions (e.g., anxiety, reluctance, and anger) and positive reactions (e.g., enthusiasm and confidence). For example, a teacher who

recently has lost a significant person through suicide may find it particularly difficult to focus on that subject in the classroom. On the other hand, a teacher who personally has used anger management strategies from the curriculum may be more enthusiastic about helping students develop such competencies as well. However, to date, little research exists on how teacher characteristics, such as previous SEL training or psychological mindedness, affect program delivery or program outcomes.

Classroom climate. Classroom climate can be either a positive influence in the implementation of prevention or SEL programs or a significant barrier. No single factor defines a classroom's climate. Rather, classroom climate refers to the array of social and psychological aspects of the classroom environment, including shared goals, the level of cooperation and mutual respect among classroom members, and the relationships between and among teacher and students (Wang et al., 1997). To a great extent, teachers can promote a positive classroom climate by using effective classroom management techniques, by empowering students to participate in responsible decision making, and by serving as models of appropriate social and emotional competencies.

Peer relations. The influence of students' relationships with one another should not be underestimated. The peer group not only serves as a major context in which children need to demonstrate social and emotional competencies, but also it can serve as a contributing factor to both concurrent and future adjustment (Berndt & Keefe, 1995; Newcomb et al., 1993; Parker & Asher, 1987). Little research has been done on the effects of teacher-student relationships or peer-peer relationships on prevention program delivery or program outcomes.

As classrooms are nested within schools and schools within school districts, factors beyond teacher competencies and the composition of their classrooms also may influence the quality of program delivery.

Factors at the School Level. One school-level factor that affects implementation is the school's ability to provide logistical or administrative support for interventions. For example, the school administration must allocate sufficient time within the existing class schedule for a new program or curriculum to be presented. This aspect is a particular concern at present, given the current standards movement and the accompanying high-stake testing (Linn, 2000). If the time or the resources needed to conduct the program are not available, a program is less likely to be used by school personnel. School district administrators have the power to make schedule changes or even to modify the curriculum to make room for new programs. School policies may need to be modified to make the program successful. Support is needed across multiple levels of the academic hierarchy. Although the school superintendent or school board may support a new intervention or a school reform enthusiastically, the school principal also must support and lead the change. By providing support through organization, motivation, and direction, the principal can substantially affect program implementation. Of course, if a school does not have positive principal-teacher relationships, principal support may have less influence. And, disincentives often exist that do not encourage change (e.g., increased work load and lack of administrative support).

Positive interpersonal relationships within the school may have a profound effect on the quality of implementation because they build a sense of professional community crucial to promoting positive student outcomes (King & Newmann, 2000). It is believed that principals, teachers, and staff need a strong foundation of goodwill, respect, and collaboration to meet the challenges of implementing a new program, especially if the intervention includes multiple, integrated components. School personnel need to share common goals, to communicate openly, to exchange ideas, and to problem-solve actively with one another. All school personnel should be aware of the program and understand the implications of the changes for their position. A supportive school environment allows staff to take risks, to support one another, to learn from their mistakes, and to grow professionally.

Factors at the District Level. Although implementation usually occurs at the school site and classroom levels, district administrators as well as school board members can have substantial influence. Prevention programming is likely to receive stronger endorsement as well as greater resources if it targets an aspect of the district's mission statement or addresses a district objective or school board concern. Further, the support of influential school board members can have a direct positive effect on awareness and engagement at all levels, including in the area of funding allocation. For example, these types of programs can be funded in numerous ways, including Title I, Federal Safe and Drug-Free Schools funds, and State- and local-level funds. Little research exists on how decisions about the use of funds are made, but such decisions may have dramatic effects on program implementation.

Thus, implementation quality and the overall success of prevention initiatives are affected by the attitudes and beliefs of teachers, school administrators, support staff, and members of the broader community who make school-related decisions (e.g., parents and board members). For prevention efforts to be successful, these individuals first must be aware of a need in the community and must believe that creating change is a school-community goal. Next, they must see the problem as preventable and the intervention as effective. This viewpoint will increase the likelihood that the intervention becomes a priority accompanied by sufficient financial and human resources, as well as time for implementation during the school day. Finally, motivation to conduct the program and delivery of quality programming also will depend on the training provided by the implementation system.

Factors at the Community Level. Because schools function within larger systems at the local, county, State, and Federal levels, they may not have the power to make decisions regarding the adoption of a preventive intervention, even at the school-level, particularly if it requires the allocation of additional resources. Certain curricula or programs require collaboration between school personnel and mental health service providers who work outside of the school building. Others, such as alcohol and tobacco prevention, require cooperation with parents, police, and local merchants. Depending on the structure of the community's services or the history of the relationships between such agencies, this factor can present an added challenge to implementation. In addition, schools or districts differ widely; the characteristics of some support change more readily than others. For example, some school districts seem to be able to foster higher than average achievement and adjustment in students, which may be a function of organization, innovation, or creativity. School districts that are disorganized or that are

experiencing other internal problems are less likely to be able to implement new initiatives successfully.

The contextual factors described here may strongly influence the implementation quality of interventions conducted in school settings. Given the significant role of these factors, they may, in and of themselves, lead to improvements in both social and emotional outcomes for both students and teachers. In some cases, targeting changes in system alignment and linkages may be the first intervention.

Barriers That Reduce Implementation Quality

The foregoing section delineated key factors for successful implementation within the program and the implementation support system. The model described how they relate to one another, to program characteristics and, ultimately, to program outcomes. Contextual factors ranging from the classroom to the community that may affect program implementation also were reviewed. This information also can identify and address potential obstacles that schools may encounter in their efforts to provide the necessary infrastructure and climate to facilitate successful program implementation. Table 5 summarizes a number of these potential barriers to implementation. Additional examination of implementation failures, including unrecognized structural features, narrow perspectives, poor resource management, and too little attention to characteristics of implementers, can be found in Elias et al. (in press).

Summary* **DRAFT*

This section presented a theory-driven model for studying program implementation in school-based settings. The model differentiated the causative theory (i.e., does the program theory explain program effects) from the prescriptive theory (i.e., does the program theory describe the manner in which the program should be implemented). The study of program implementation quality was further differentiated into measures of aspects of the program delivery itself, as well as into the implementation support system. In addition, a conceptual model of the influences external to the actual program that may greatly affect the quality of program implementation was presented. Finally, the document briefly recognized the potential barriers to implementation.

As stated previously, many questions about the implementation of prevention programming are underresearched or remain unresearched altogether. Questions remain about factors that influence the quality of implementation for different types of programs, as well as about the relationship between quality of implementation and both short- and long-term outcomes. Such questions are ripe for investigation in the next waves of effectiveness research and research on widespread diffusion of programs (i.e., going to scale). Unfortunately, for some factors in the model (e.g., technical support, implementer readiness, and quality of the implementation environment), few or no reliable, valid measures currently are available for researchers and program evaluators to use.

Table 5. Examples of Barriers to Implementation

❖ **Pre-Planning**

- *Lack of awareness*
- *Lack of buy-in*
- *Absence of incentive to change*
- *History of implementation*

❖ **Implementation Support System**

- *Insufficient pre-planning*
- *Inadequate provision of training (i.e., implementers are unprepared)*
- *Insufficient ongoing support for implementers*
- *Poor communication between outside training system and implementers*
- *No system in place for addressing ongoing needs of implementers or problems encountered*

❖ **Implementation Environment**

- *Principal leadership is inadequate*
- *Program is not integrated with other aspects of schooling or curriculum*
- *Implementers are isolated or unsupported*
- *Program does not receive adequate attention because of competition with another curriculum*
- *Insufficient resources allocated (e.g., classroom time, physical space, and budget)*
- *Overall school climate is poor (e.g., low collegiality)*
- *Classroom climate impedes program implementation*
- *Low openness to change*

❖ **Implementer Factors**

- *Implementers do not feel prepared to deliver the intervention*
- *Implementers are overstressed and undersupported*
- *Implementer's educational philosophy or teaching style is not consistent with the intervention*
- *Implementer skills or knowledge insufficient*

❖ **Program Characteristics**

- *Poor quality of materials*
- *Inappropriate for audience*
- *Too narrow to address problem*
- *Incongruence between program and organizational needs*

Implications of the Conceptual Model: Recommendations and Conclusion

This document provides both a model and guidelines for the conceptual and empirical study of the implementation of school-based preventive and promotion interventions. In addition, it discusses typical supports that affect the quality of that implementation from the stage of pre-planning through program delivery. This information can provide a useful framework for understanding key factors and issues that contribute to the successful implementation of school-based prevention efforts, for demonstrating how implementation quality influences positive program outcomes among students, and for delineating the importance of monitoring and documenting the quality of the implementation of school-based prevention programs. The recommendations included in the next sections, derived from the previously presented framework, are organized according to their relevance to the advancement of effective practices, scientific thinking and research design, program development, and policy efforts in the field of school-based prevention and promotion.

Strategies to Facilitate Effective Program Delivery

DRAFT

Recommendations for Practitioners and School Personnel

Practitioners and school personnel can implement a range of strategies to improve program delivery in their schools at three different time points. The first is at the pre-adoption phase when a program is being considered. The second is at the delivery phase when a program is being conducted and implementation quality should be monitored. The final point is at the post-delivery phase when program outcomes should be evaluated and information obtained through the evaluation used for program improvement. Our recommendations to support effective practices are organized accordingly.

1. Pre-Adoption Phase

- Involve key stakeholders in the decision making process (e.g., school staff, parents, students, and members of the community). In addition, work collaboratively with program evaluators to plan and evaluate programs.
- Inform all individuals involved in program implementation, including those charged with decision-making authority, about the program. Ensure that key stakeholders have sufficient background knowledge about the program and the program theory to make informed decisions.
- Assess candidate programs for their fit to the existing need and readiness, available resources and skills, and organizational capacity within the school community.
- Examine the match between program goals and the schools' or districts' educational beliefs, values, policies, practices, and philosophy.
- Allocate sufficient resources to sustain the program with fidelity.

- Identify a project coordinator whose role is to ensure the successful implementation and evaluation of the program.
- Ensure that implementers receive training that enables them to be knowledgeable, skillful, and confident in their ability to implement the program effectively.
- Establish a supportive, problem-solving process and organizational climate that promote discussion and resolution of difficulties related to program implementation.
- Consult with program developers to identify the critical inviolable elements of a program as well as those components that are appropriate for adaptation to fit local needs and resources.
- Create a school atmosphere conducive to prevention and promotion efforts by integrating relevant training into staff development opportunities.

2. Delivery Phase

- Assess implementers' skills and satisfaction on an ongoing basis.
- Provide emotional and practical support to program implementers. Find ways to address factors that affect implementers' ability to conduct the program (e.g., physical space, time or scheduling constraints, competing programs or requirements, and resource materials). This approach may involve modifying the curriculum, changing funding allocation, hiring additional staff, or providing release time for implementers. Full administrative support is critical for the success of these activities.
- Maintain a positive school atmosphere that endorses open communication, exchange of ideas, and professional growth.
- Evaluate the intervention and the implementation system with measures based on a comprehensive, theoretically based program model, such as the one outlined in this report.
- Establish non-evaluative methods to monitor implementation quality (e.g., anonymous feedback). Implementers will be more open to feedback and more likely to engage in the intervention if ratings of implementation quality are not related to job performance determinations.
- Bring family members into the process of prevention programming. Inform parents of school-wide assessments and the goals of the preventive interventions. Involve them in decision making and program activities whenever possible. Provide parents with information, activities, or instructions to enable them to support the skills their children are learning in school.

3. Post-Delivery Phase

- Use implementation information to make decisions about the program and about ways to maintain and improve its overall quality.
- Integrate the program into the existing school structure (e.g., reflect the program in mission, value, and philosophy statements; incorporate program discussions into school meetings; link the preventive intervention with other school programs).
- Institutionalize the program. Carry out plans to make it a permanent part of the school's curriculum, including the requirement that program activities be reflected in teacher lesson plans.
- Use the program's SEL skills as part of staff development.
- Have a realistic timeline for long-term implementation; be equally realistic about when to expect to see long-term outcomes. Typically, new innovations require 18 months to 3 years (depending on the complexity of the program) for users to understand a program, adapt it to meet their own needs, and have it become a permanent part of the institution (Hord et al., 1987).
- Develop a broad range of dissemination strategies to inform the community about the program and its findings, such as one-page summaries, executive summaries for system leaders, or articles in the local newspaper.
- Provide feedback to program developers on the intervention, the implementation system, and the factors that affected implementation quality and contextual details regarding scaling-up efforts.

The foregoing recommendations provide ideas for practitioners to consider for improving program acceptance, delivery, and institutionalization. Some of these issues may be of greater or lesser importance, depending on both the type of intervention being considered and the local context and history of implementing effective programs. Along with gathering data on implementation itself, practitioners and school personnel should consider examining (either with quantitative or qualitative methods, or both) factors in the implementation support system or outside the program that they believe may substantially affect the quality of implementation in their setting. For example, in one setting, assessing implementer readiness may be seen as critical, whereas administrative leadership might be considered the most critical issue elsewhere.

Strategies to Advance the Science and Practice of School-Based Prevention

The following recommendations include ways researchers, program developers, and policymakers can help advance the field of school-based prevention by supporting and facilitating effective program implementation.

Recommendations for Researchers DRAFT

- Routinely assess implementation quality. Researchers should broaden their evaluation efforts to answer questions about how to optimize implementation quality in real-world settings. As described in this report, a complete evaluation of an intervention includes not only an assessment of the essential elements of an intervention but also identification and assessment of numerous factors outside the intervention that may affect implementation.
- Do not evaluate implementation quality alone. Researchers should work with local stakeholders (e.g., school leaders, community leaders, youth, and families) involved in projects to identify the potential barriers to implementing a program specific to that community and to develop effective strategies to address them.
- Use the program's theory to guide local changes in implementation. A significant challenge in the transfer of knowledge between researchers and service providers is that many preventive interventions were developed and evaluated under conditions different from the community settings in which the programs will be replicated and disseminated. Although the highly controlled design of an efficacy trial (e.g., random assignment) is critical for researchers to determine whether the program was effective in changing the targeted outcomes, it does not provide all the information that communities need to implement the program in the field. A dilemma facing communities is that they not only are advised to use research-based programs, but they also are encouraged to adapt them to meet the needs or characteristics of the individuals to be served. Unless these modifications are similarly research based or theoretically guided, implementers inadvertently may change critical aspects of an intervention and implement it in a less effective manner. For these reasons, evaluators should be clear about what changes are made and why, and evaluations should link the study of program changes and implementation to the program theory.
- Use local replication of a program as an opportunity to confirm the program theory. The primary goals of evaluation in community-level program replications are to assess whether the intervention is implemented as planned (i.e., the prescriptive model) and whether the mechanisms of change function as expected (i.e., the causal model). If the evaluation indicates relatively high implementation quality, subsequently, one also can examine how the program affects both mediating factors and short-term outcomes.
- Examine how variations in the implementation support system and implementer characteristics affect the quality of program delivery. An important research question will examine how variations in the implementation training system may affect the quality of implementation. For example, studies of different models of training and supervision (e.g., videotape versus live, 2 days in a row versus 2 days apart), delivery formats (after school versus in class), and types of implementers (school counselors versus teachers) would contribute to the field's understanding of how to enhance the effectiveness of the training and delivery systems per unit cost. In addition, new research is warranted to study how the attitudes and behaviors of implementers, as well as the nature of their

support systems (e.g., principal leadership and incentives), alter the quality of implementation and outcomes.

As discussed, many factors can affect implementation quality, and these can be organized in coherent conceptual models for a given intervention. The specific factors of greatest interest may depend on the nature of the intervention and the setting in which it is conducted. For school-based interventions conducted by teachers, certain personal characteristics or educational experiences may affect the ease with which some individuals learn and adopt a particular program. For example, does taking a pre-service class in SEL facilitate implementation of SEL programs in the classroom? Such research has implications for the nature of pre-service training in colleges of education, for the criteria governing teacher recruitment, and for the nature and extent of technical support provided for an intervention program.

- Determine critical dosage and quality thresholds required to have a significant effect on both mediating factors and outcomes. This information, with broad policy and cost implications, is extremely important when resources are limited.
- Develop measures to assess implementation quality. Although interest in both the practical issues of implementation and implementation research have grown dramatically in the past few years, a fundamental issue that warrants further understanding is the development of measures that are both valid and reliable to assess implementation quality. The combined input of researchers, program developers, and implementers can best accomplish this recommendation.

Although program developer suggestions can identify the best ways to monitor implementation for their specific interventions, broader cross-intervention measures also need to be developed because few standard measures exist for the different implementation dimensions and the factors that affect implementation quality outlined in this report. In particular, specific measures and procedures for assessing implementation quality are critically needed. By developing more refined conceptual models and assessments of implementation, it is hoped that all preventive interventions will include an outline of the steps for monitoring the implementation of that program and the necessary measurement tools for achieving that outcome.

Recommendations for Program Developers DRAFT

- Provide information about resources needed to implement an intervention. Program developers should provide information about the actual resources (e.g., money, time, and personnel) needed to implement an intervention in practical, familiar formats. This information not only will help communities make the best decision about which intervention to use but also will support the quality of the implementation when the program is conducted.
- Communicate and share a common language with practitioners. To facilitate these implementation studies and advance the field of prevention, program developers and

practitioners need to communicate with each other and share a common language. Practitioners from different settings who are implementing the same intervention could profit greatly from discussions among themselves and with the program developer to share both the problems they encounter and the solutions they develop. Practitioners have a wealth of knowledge about the challenges encountered, which could be used to inform future evaluations or to modify intervention materials.

- Conduct research studies that inform the fidelity-adaptation debate. It is important to understand as much as possible which intervention components must be delivered exactly as they were developed, which components can be modified, and ways to make these changes and still achieve significant outcomes.

Recommendations for Funding Agencies and Policymakers DRAFT

- Funding agencies should develop a set of initiatives to support higher quality work in implementation. Federal and private funding sources should initiate an integrated set of activities to further the science of implementation and, thus, improve community-based prevention programming. The range of activities supported should include: interdisciplinary working groups to develop the infrastructure of the field; the development of new resources and guidebooks that inform practitioners about recent research on implementation; communication between prevention researchers and other fields of study also interested in implementation and diffusion of innovations; the use of quality measures of implementation; and research that explores both new models of quantitative and qualitative assessments of the implementation process.
- Policymakers should ensure that the quality of implementation of prevention programs is preserved when programs are replicated and “brought to scale.” This recommendation requires that program quality be a driving force in the development of funding proposals and support for prevention.

Recommendations for Journal Editors DRAFT

Journal editors can dramatically increase attention to the study of implementation in research programs in the following ways:

- Journal editors should develop implementation research standards for the reporting of efficacy trials and program evaluations of prevention programs.
- Editors could focus attention on implementation by calling for special issues on this topic (see Zins et al., 2000).

Conclusion

The fields of prevention research and practice have reached an exciting stage, with many challenges ahead. More sophisticated models of how emotional and behavioral disorders develop over time have been developed. Interventions based on these models have been empirically tested and shown to be effective in reducing disorder and promoting health. By disseminating

information about these interventions, communities are now aware of the importance of using programs that have been evaluated with high-quality research designs. Increasingly, Federal and State policies requiring grantees to use empirically based approaches have had a major impact on community awareness and interest in implementation. Central to the focus of prevention research in the coming decade will be understanding the contextual factors that influence the quality of implementation. This document proposes that the study of the process of implementation and concentrated efforts to foster successful program implementation represent the next frontier in the field of school-based prevention.

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