

BLUEPRINTS FOR VIOLENCE PREVENTION: FROM RESEARCH TO REAL-WORLD SETTINGS— FACTORS INFLUENCING THE SUCCESSFUL REPLICATION OF MODEL PROGRAMS

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As science-based programs become more readily available to practitioners, the need for identifying and overcoming problems associated with the process of implementation becomes critical. A major goal of the Blueprints for Violence Prevention initiative has been to enhance the understanding of program implementation by studying the influence of human- and systems-level factors that challenge the successful implementation of programs. This article describes the results of a process evaluation focused on discovering common implementation obstacles faced by 42 sites implementing eight of the Blueprints programs. This evaluation revealed that most sites involved in the project faced many challenges when implementing in real-world settings. Using regression analyses to identify the most important of these factors, findings revealed that the quality of technical assistance, ideal program characteristics, consistent staffing, and community support were important influences on one or more measures of implementation success.

Keywords: implementation; replication; Blueprints; model programs

Many of us probably remember the age-old saying, “It is not what you do, but how well you do it that counts.” Usually expressed by the older and wiser members of our families or communities, this statement tended to be a gentle way of telling us that we have emphasized the *outcome* of our efforts over the *process*. The inherent wisdom was that process and product are intimately connected. One should not be emphasized over the other.

This lesson seems particularly poignant given the developments in criminal justice programs in the late 20th and early 21st centuries. Emerging from a pessimistic “nothing works” perspective in criminal justice (Martinson, 1974; Regnery, 1985; Sechrest, White, & Brown, 1979), the field of evaluation research flourished in the 1990s and early 2000s and seemed to give birth to a never-ending hunger to find programs demonstrating positive

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outcomes. The 1970s pessimism developed when few of the expensive criminal justice innovations at the time significantly reduced crime and delinquency (see Petersilia, 1990). By the late 1990s, however, several crime and delinquency prevention and treatment programs boasted that they produced significant results. Once evaluation results proclaimed that some programs worked (Botvin, 1990; Catalano, Arthur, Hawkins, Bergland, & Olson, 1998; Davis & Tolan, 1993; Dryfoos, 1990; Elliott, 1997; Gendreau & Ross, 1980; Greenberg, Domitrovich, & Bumbarger, 1999; Hawkins, Catalano, & Brewer, 1995; Hawkins, Farrington, & Catalano, 1998; Lipsey, 1992; Lipsey & Wilson, 1997; Mendel, 2000; Sherman et al., 1997; Tobler, 1992; Tolan & Guerra, 1994; Van Voorhis, 1987; Wasserman & Miller, 1998), federal, state, and private organizations supported the efforts to conduct outcome evaluations of a variety of criminal justice innovations and promoted the adoption of effective programs. By the late 1990s, the emphasis on program outcomes became so diffuse that many practitioners found they could not secure funding unless they conducted or submitted to outcome evaluation studies.

With the quest to ferret out what works from what does not in the treatment and prevention of crime and delinquency, the program evaluation field has tended to ignore the intimate relationship between process and product. Funders and evaluators have carefully focused on outcomes and, as a result, have produced numerous research findings outlining the programs that demonstrate significant positive results. What tends to be missing in this literature is a discussion of the process of implementing programs (Fagan, 1990; Greenberg, Domitrovich, Graczyk, & Zins, 2001). For example, in a review of over 1,200 published prevention studies, only 5% provided data on implementation (Durlak, 1997). Domitrovich and Greenberg's (2000) review of 34 rigorously evaluated mental health programs revealed that only 11 studies considered implementation factors in their analyses. Similarly, Dane and Schneider (1998) found that only 39 of the 162 preventive interventions they examined contained information on program integrity, and only 13 of those studies considered the impact of fidelity on outcomes.¹ Because of the emphasis on outcome over process, practitioners are left with a list of model or best-practices programs that produced favorable outcomes during research trials, but there is very little information available regarding how to implement these programs—what is often called *transporting* programs to real-world settings. In other words, we now know *what* to implement, but we know very little about *how*.

The importance of the process of implementation cannot be overstated. In fact, as the adage suggests, the process of implementation influences the product. For example, meta-analyses demonstrate that programs receiving implementation monitoring (DuBois, Holloway, Valentine, & Cooper, 2002) or that were implemented better produced more change (Gresham, Cohen, Rosenblum, Gansle, & Noell, 1993; Wilson & Lipsey, 2000). In his study of juvenile delinquency treatment programs, Lipsey (1999) found that the most outstanding programs reduced recidivism rates by 40%. Whether programs were thoroughly implemented and how long programs were implemented significantly affected recidivism rates. Moreover, process evaluation studies almost consistently show that programs implemented with fidelity to the original design demonstrate superior outcomes (Fors & Doster, 1985; Gray, Emshoff, Jakes, & Blakely, n.d.; Gresham et al., 1993; McGrew, Bond, Dietzen, & Salyers, 1994). Therefore, it becomes clear that reducing crime, delinquency, and other problem behaviors requires us to pay close attention to how programs are implemented.

In a response to the importance of implementation and the relative lack of information available, researchers have begun to outline the lessons learned from implementing

programs. Gleaned from case studies, field experiences, and, in a few cases, randomized studies, these findings outline some of the forces that seem to influence implementation success and note that characteristics of prevention and treatment programs, host organizations, staff, leaders, communities, and training and technical assistance (TA) seem to make a difference. However, these case studies and tales from the field are not able to identify those factors that are most significant. Furthermore, few studies have analyzed the replication of research-based programs in numerous settings. Those that have included large samples (Ellickson & Petersilia, 1983; Gottfredson & Gottfredson, 2002) tended to focus on the implementation of one type of program (i.e., law enforcement or school-based) in one type of setting (criminal justice systems or schools). What is missing is a systematic analysis of the factors that can make or break implementation efforts across a variety of contexts and programs.

This study fills this gap in our knowledge by looking at eight programs implemented in 42 sites across the United States. The eight programs represented a range of modalities including prenatal and postpartum, school-based, mentoring, family therapy, and foster care interventions. Each of the eight programs were considered model programs in that they demonstrated significant reductions in violence and other problem behaviors during research trials. In addition, the agencies responsible for implementing these programs included schools (elementary, middle, and high), state-supported health agencies, private treatment organizations, and nonprofit community agencies. Combining quantitative and qualitative data collection techniques, researchers conducted a process evaluation study with each site as they adopted one of eight model programs and implemented it for 2 years. During the 2 years of the study, researchers assessed how successfully the programs were implemented and began to identify the common factors contributing to or detracting from implementation success. At the end of the study, researchers tested their hypotheses gleaned during the qualitative portion of the study as well as those from the implementation literature to test the factors that seemed to significantly contribute to implementation success.

Conceptual Framework for the Study of Implementation

Diffusion theory provides a conceptual foundation for examining dissemination, adoption, implementation, and maintenance of innovations (Rogers, 1983, 1995). Diffusion is defined as the process by which an innovation is communicated through channels over time among members of a social system. An innovation is an idea, practice, service, or other object perceived as new by an individual or other unit of adoption. Diffusion of innovations occurs in four stages: (a) awareness is gained through the provision of information (dissemination); (b) adoption, when the innovation is selected for use; (c) implementation, when the innovation is used; and (d) maintenance, when the innovation is in place and becomes institutionalized (Rogers, 1983, 1995).

According to Rogers (1995), once knowledge of a new innovation has been acquired and motivation and support for it has developed, a decision may then be made to try the innovation. These mental processes are followed by the implementation stage, which involves putting the idea into practice. It is at this point in the diffusion process that overt behavior change is required and problems in how to use the innovation occur. If all goes well during implementation, there will be some recognition of the benefits of the innovation, and the integration of the innovation into the organization or ongoing routine will occur.

However, the decision to adopt a program does not always guarantee success in implementation. In reality, there are a host of obstacles that can undermine the implementation of effective programs, and these factors are only recently being addressed in the research literature through implementation studies (Domitrovich & Greenberg, 2000; Fagan & Mihalic, 2003; Greenberg et al., 2001; Mihalic, Fagan, Irwin, Ballard, & Elliott, 2002). Implementation research can provide an understanding of the organizational and human capacities and motivation necessary to successfully adopt, implement, and sustain programs.

Implementation Research

Although primarily anecdotal, the implementation literature notes that replicating programs is a complex process riddled with a number of challenges and barriers. Generalizing from the many case studies, there seems to be several key factors that play a role in how well a program can be implemented in a new setting. These include features of the organization adopting the new program, staff characteristics, strong leadership, adequate training and TA, and community support. There is also some evidence that aspects of the program being adopted and preplanning also play a role in implementation success.

Organizational features are understood as the characteristics of the organization implementing the program and are the most commonly documented factors determining implementation success. Such characteristics as the nature, structure, history, philosophical traditions, economic standing, and stability of organizations are thought to play a key role in how well new programs are implemented. Gendreau, Goggin, and Smith (1999) argued that organizations need to remain flexible, efficient, and nonconflicting when solving problems. In addition, the presence of strong administrative support for a program (Coolbaugh & Hansel, 2000; Dunworth, Mills, Cordner, & Greene, 1999; Ellickson & Petersilia, 1983; Gager & Elias, 1997; Gendreau, Goggin, & Smith, 1999; Mihalic, Fagan et al., 2002; Petersilia, 1990), open and clear communication channels within an organization (Harris & Smith, 1996; Kegler, Steckler, Malek, & McLeroy, 1998), and agency stability indicated by lack of staff turnover (Gendreau et al., 1999; Gottfredson & Gottfredson, 2002; Lynch, Geller, Hunt, Galano, & Dubas, 1998; Mears & Kelly, 2002; Petersilia, 1990) play important roles in successfully implementing a program. There is also some evidence that linkages between multiple agencies (i.e., collaboration) can bolster implementation quality (Ellickson & Petersilia, 1983; Freudenburg, 1998). Petersilia (1990) alluded to the importance of interagency linkages by arguing that implementation efforts fare better when larger systems are receptive to the program.

Although the nature and structure of organizations seem important to implementation success, staff members have also been cited as influential agents during program replication. Staff members who are motivated to implement and supportive of the program, generally, help successfully replicate programs (Elias & Clabby, 1992; Ellickson & Petersilia, 1983; Gendreau et al., 1999; Hunter, Elias, & Norris, 2001; McCormick, Steckler, & McLeroy, 1995; Mihalic, Fagan et al., 2002; Petersilia, 1990; Taggart, Bush, Zuckerman, & Theiss, 1990). It has been argued that staff need to “participate directly in designing the new program” (Gendreau et al., 1999, p. 184), whereas other researchers have noted that any mechanism to get staff involved in the program will be beneficial. Staff skills have also been cited as an important variable in success (Kegler et al. 1998; Lynch et al., 1998; Taggart et al., 1990). Often, staff skills are measured in terms of education, experience, or credentials.

There is also some evidence to suggest that adequate financial reimbursement provided to direct-line staff members makes a difference during implementation (Coolbaugh & Hansel, 2000). This is an especially relevant point for prevention programs, as many are implemented in schools and use teachers to implement programs in the classroom. Thus, these programs constitute add-ons to teachers' other duties, and, more often than not, teachers are not paid for their extra time. Although reimbursing instructors for teaching a prevention program may not be feasible for many schools and some may not want to initiate such a practice, there are many other small gestures that can be done to show support and appreciation (e.g., public acknowledgements, thank-you notes, providing extra classroom supplies). Another add-on barrier to implementation is time to implement a program. This is especially true in school settings. In their survey of 380 coordinators of Safe and Drug Free Schools programs, King, Wagner, and Hedrick (2001) discovered that time was one of the most consistently noted barriers to program implementation (see also, Kramer, Laumann, & Brunson, 2000).

School-based staff barriers, according to the literature, can be overcome by integrating programs into schools' daily operations (Fagan & Mihalic, 2003; Gager & Elias, 1997; Gendreau et al., 1999; Gottfredson & Gottfredson, 2002; Kramer et al., 2000). When teachers and administrators recognize that new programs serve a larger purpose for the school, they are not only more likely to adopt the initiatives but also feel ownership for them (Fullan, 1992).

According to the literature, successful implementation efforts need strong leadership and key personnel—often called program champions—to coordinate and conduct the program (Ellickson & Petersilia, 1983; Farrell, Meyer, Kung, & Sullivan, 2001; Gager & Elias, 1997; Gottfredson & Gottfredson, 2002; Kegler et al. 1998; Mihalic, Fagan et al., 2002; Petersilia, 1990). The program champion is the motivator behind the new innovation guiding its day-to-day operations, fostering communication, and serving as a base of support for program implementers. Projects that have highly committed champions have greater success (Ellickson & Petersilia, 1983; Fagan & Mihalic, 2003).

Training has frequently been noted as a key resource for success (Connell, Turner, & Mason, 1985; Fagan & Mihalic, 2003; Fors & Doster, 1985; Gager & Elias, 1997; Gingiss, 1992; Gottfredson & Gottfredson, 2002; Hunter et al., 2001; Mihalic, Fagan et al., 2002; Parcel et al., 1991; Perry, Murray, & Griffin, 1990; Ross, Luepker, Nelson, Saavedra, & Hubbard, 1991; Taggart et al., 1990). Practitioners who receive thorough training are more prepared to implement, more likely to implement, complete a greater percentage of the program, adhere to the program more closely, and implement more effectively (Connell et al., 1985; Flay, 1999; Fors & Doster, 1985; McCormick et al., 1995; Parcel et al., 1991; Ross et al., 1991; Taggart et al., 1990). The most successful types of training tend to be those that include knowledgeable and enthusiastic trainers and site administrators (McCormick et al., 1995). Ongoing formal or informal training, sometimes called TA, can reinvigorate implementation efforts or provide necessary ongoing support (Durlak, 1998; Gager & Elias, 1997; Gingiss, 1992; Parcel et al., 1991).

There is some evidence to suggest that the community in which a program is implemented also influences success. Interagency cooperation and support from citizens have been characterized as community support. Regarding agency collaboration, "innovations that require but do not obtain cooperation across different organizations typically attain only low or moderate levels of effectiveness; those that achieve high levels of external support are much more likely to realize their full potential" (Ellickson & Petersilia, 1983, p 35). Barriers to community support are often turf conflicts between

agencies (Coolbaugh & Hansel, 2000; Stoil, Hill, Jansen, Sambrano, & Winn, 2000) and a lack of citizen understanding or support for programs (Freudenburg, 1998).

Community support is also important for school-based implementation of programs. Differing community philosophies regarding the mission of the school can easily undermine program efforts. In fact, in one survey, poor parental attitudes were listed by Safe and Drug Free School coordinators as one of the most strongly agreed upon barriers to improving programs (King et al., 2001; see also Wenter et al., 2002). Program integration in schools cannot occur unless the culture and attitude of the school and community are receptive to new programs and innovations (Gendreau et al., 1999; Kramer et al., 2000). Differences can be overcome when the community is made aware of the problems that exist and the need for intervention and are involved in the planning process (Fullan, 1992). Institutionalization can be enhanced when a program is given high visibility in the school (Gager & Elias, 1997), suggesting that all school staff, parents, and the surrounding community should be aware of and involved in school program efforts.

There is also some evidence to support the idea that the characteristics of the program, such as complexity and structure, are important (Blakely et al., 1987; Ellickson & Petersilia, 1983; Pankratz, Hallfors, & Cho, 2002; Petersilia, 1990). Freudenburg (1998) suggested that adolescent substance abuse programs that have the potential for successful implementation would be theoretically driven models that have proved to be effective. Additionally, they should be tailored to fit and assess specific needs of clients, link adolescents to larger resources, and use strengths-based models and aftercare. In school contexts, such aspects of programs as the standardization of materials (Gottfredson & Gottfredson, 2002) and materials that are tailored to fit students' needs (Lytle et al., 1994) are associated with success. Manuals or a set curriculum with designed activities that are viewed as relevant, attractive, and easy to use enhance program adoption in the classroom (Perry et al., 1990; Taggart et al., 1990). Also, programs that are flexible are said to be superior during implementation efforts (Colorado Healthy Communities Initiative, 1998).

Preplanning is believed to be beneficial to the implementation process (Mihalic, Fagan et al., 2002), but there is little information about this. The information that is available suggests that interventions that are adopted based on an empirically documented need (Gendreau et al., 1999; Petersilia, 1990), after a more exhaustive information search (Gottfredson & Gottfredson, 2002), and with activities that are initiated within the organization rather than by forces external to it (Ellickson & Petersilia, 1983) are implemented with higher quality. Adoption decisions are most successful when there is sincere motivation at initiation, early, top leadership support, and project director commitment (Ellickson & Petersilia, 1983). However, successful adoption does not always lead to successful implementation. Decisions made by community leaders are not always supported by front-line staff charged with delivering the services. When motivation and support are lacking, projects are sure to fail. Therefore, it is advisable that all stakeholders agree on the need for change and the relevance of the intervention for the school or agency (Fullan, 1992). The best method for ensuring consensus is to include all key players in planning for program adoption (Diebold, Miller, Gensheimer, Mondschein, & Ohmart, 2000).

Combining the findings in this growing body of implementation literature, we are left with the impression that there are many factors that influence implementation quality. In fact, almost everything seems to matter according to this literature. It is not easy to discern from these findings the most important of these factors. Taking the sheer frequency that particular factors have been mentioned, it would seem that organization and staff

characteristics, training, and community support are the most important features of implementation. Program characteristics and preplanning, conversely, have not received as much attention in the literature. Given that this literature mostly consists of case study approaches, it is important to acknowledge that the findings from random samples may provide a more reliable foundation for understanding the factors that are most important.

The factors contributing to implementation success emerging most frequently in the random sample or population studies that we examined are organization characteristics (Gottfredson & Gottfredson, 2002; Gager & Elias, 1997), staff characteristics (McCormick et al., 1995; Wenter et al. 2002), and training and/or TA (Gottfredson & Gottfredson, 2002; Gager & Elias, 1997; McCormick et al., 1995). Community support (Wenter et al., 2002) and program characteristics (Gottfredson & Gottfredson, 2002) also emerged as significant. Two multivariate regression studies (McCormick et al., 1995; Wenter et al., 2002) have been conducted to assess which among multiple factors have direct and significant effects. Wenter et al. (2002) found that the most significant factors influencing substance abuse prevention practice in schools are type of school (private vs. public, urban vs. rural), type of staff (primary prevention), adequate resources, and school board and parent support. McCormick et al. (1995) found training and awareness of curricula to be the most consistent correlates across multiple measures of implementation success. Organizational size and climate also had significant effects. Although, as noted, there were several correlates of implementation, these factors failed to predict implementation in regression analyses. Although providing more credible results than case studies or random sample studies that use only bivariate statistical analyses, these two studies do not test for the gamut of factors influencing replication efforts. Therefore, our understanding of the factors affecting implementation success among all those mentioned in the literature remains extremely limited to date.

Method

Study Design

These data come from the Center for the Study and Prevention of Violence (CSPV) Blueprints for Violence Prevention initiative. The project, initially beginning in Colorado and then expanding throughout the United States, was designed to reach two broad goals: identify effective, research-based violence prevention programs (see Table 1 for a list of these programs) and replicate these programs nationally (i.e., implement these programs in nonresearch settings). The findings presented in this article come from a replication project in which the Office of Juvenile Justice and Delinquency Prevention (OJJDP), through CSPV, funded 2 years of training and TA to 42 sites interested in implementing one of eight Blueprints for Violence Prevention model programs.² During the 2 years of the Blueprints training and TA funding, CSPV conducted a process evaluation of the replication. Process evaluations assessed the delivery of a program by describing and documenting how well the program was implemented or the integrity or fidelity of the implementation in comparison with the program's stated intent.

The primary goals in conducting the process evaluation were to discover (a) whether the program was reaching the intended target population (i.e., the appropriate population, the number of recipients reached, and their characteristics, e.g., age group, gender, socioeconomic status, etc.), (b) whether the program was being implemented as designed

TABLE 1
Blueprints Programs

Model Programs

Big Brothers Big Sisters
Bullying Prevention Program
Functional Family Therapy
Incredible Years
Life Skills Training
Midwestern Prevention Project
Multidimensional Treatment Foster Care
Multisystemic Therapy
Nurse-Family Partnership
Promoting Alternative Thinking Strategies (PATHS)
Quantum Opportunities

Promising Programs

Athletes Learning To Avoid Steroids (ATLAS)
Brief Strategic Family Therapy
Center for Addiction and Substance Abuse Striving Together To Achieve Rewarding Tomorrows (CASASTART)
Fast Track
Good Behavior Game
I Can Problem Solve
Intensive Protective Supervision Project (IPSP)
Iowa Strengthening Families Program
Linking the Interests of Families and Teachers (LIFT)
Parent-Child Development Center Programs (Houston, Birmingham, New Orleans PCD Centers)
Perry Preschool
Positive Action through Holistic Education (PATHE)
Preparing for the Drug-Free Years
Preventive Intervention
Preventive Treatment Program (from the Montreal Longitudinal Study)
Project Northland
School Transitional Environment Program (STEP)
Seattle Social Development Project
Student Training Through Urban Strategies (Project STATUS)
Syracuse University Family Development Research Program
Yale Child Welfare Project

(i.e., whether the program was delivering the services it intended to deliver in the way it was designed to deliver them in terms of number, frequency, and quality of program components), (c) what were the obstacles and barriers that prevented a complete implementation, and (d) whether the program was perceived by the implementers as worthwhile. By examining these aspects of implementation, we were able to assess, both qualitatively and quantitatively, some of the factors that contribute to implementation success.

Site Selection

The primary intent of the replication portion of the Blueprints initiative was not to study the process of implementing research programs in real-world settings, but to

encourage and assist a national dissemination of highly effective violence prevention programs. The chance to study and contribute to our knowledge of implementation was a secondary goal. Therefore, site selection decisions were made to ensure that sites would successfully implement the programs for at least 2 years and preferably longer. To meet this goal, CSPV conducted thorough site assessments before granting funds to each site. Site assessments, designed to determine sites' readiness to implement programs, included collecting information about the organizational capacity, funding stability, commitment, and resources available at each site (see Mihalic, Fagan et al., 2002). In addition, CSPV encouraged sites to demonstrate that the program fit the needs of the community or school by conducting a needs assessment. Priority was given to sites that could demonstrate that they were ready to implement.

Given this, the implementation study, in general, was conducted with a very select group of sites that may or may not represent real-world implementation contexts. In addition, CSPV closely monitored sites during the 2-year grant to help them progress toward full implementation, thus, further mitigating the representativeness of the study.

Data Collection

After selecting the 42 sites for inclusion in the Blueprints replication grant (i.e., the grant to fund training and TA for 2 years), CSPV conducted site visits three times a year for 2 years with each site (typically five visits were on-site and one was conducted by phone). Unless a site needed immediate guidance (i.e., they were experiencing problems that threatened the implementation effort), CSPV staff visited or telephoned the sites every 4 months thus allowing comparability of implementation progress across the sites. During visits, CSPV administered questionnaires and conducted informal interviews with staff members to assess how the implementation of these research-based programs was faring. The questionnaires combined quantitative questions and open-ended questions. In addition, CSPV staff summarized their observations after conducting a site visit.

For the quantitative portion of the questionnaires, CSPV staff met with staff members at the site to rate the progress of the implementation in terms of serving the appropriate population, administering all of the core program components, securing adequate funding and resources, hiring and training all staff, making necessary key contacts and interagency linkages, and achieving the proper treatment or *dose* (the frequency and intensity with which the program was being provided). We created these questions by examining the prescribed program delivery in the Blueprints books (written by the designers of each program and CSPV to describe each program in depth) and in efficacy trials of each program. Program designers were also consulted. If the sites implemented all of the components of the program at the dose that was prescribed, then the sites received an *achieved* rating for each of these measures. In addition, CSPV counted the number of components of each program that were achieved or not achieved thus allowing us to assess the percentage of core components achieved. Similarly, sites that complied with funding, target population, staffing, and training criteria also received achieved ratings for each measure.

Surveys administered during the course of the study also included questions regarding the challenges individuals confronted during implementation and sites' satisfaction with the program, training, and TA. We also contacted sites 6 months after the end of the grant to determine whether the program had been sustained.

The open-ended questions asked site members to discuss the problems that arose during implementation and how they were handled. Through the administration of these open-ended questions, informal conversations, and on-site observations, CSPV staff developed a more subjective understanding of the barriers and obstacles commonly confronted when research based programs are implemented in naturalistic settings.

Measures

The measures of implementation factors (independent variables) and success outcomes (dependent variables) were derived from the literature as well as from the hypotheses emerging during the qualitative portion of the study. When compiling the independent variables for analyses, we reviewed all of the possible factors that have been said to influence or seemed to play a role in implementation success including the characteristics of programs, communities, training and TA, agencies, staff, and leaders.

To assess the role of program, community, staff, leadership, and agency, we developed a set of scales designed to include many of the features of each concept that seemed to affect implementation success. For example, when assessing program characteristics, we asked site coordinators at the end of the 2-year period to rate on a five-point scale how much of an *asset* (score of 5) or *barrier* (score of 1) the quality of the materials, the flexibility, the time required, complexity, and cost of the program were during implementation. This Ideal Program Characteristics scale had a reliability of .69 based on Cronbach's alpha. The Ideal Agency Characteristics scale (reliability of .84) included staff participation, administrative support, communication, fit between program and agency, cohesion and collaboration, clarity of goals, clear lines of authority, structural stability, champion, facilities, financial support, resources for program, and political climate. We also asked sites to rank the function of program champions (Ideal Champion characteristics scale, reliability of .81) in regard to the program champions' support of the program, motivation, skill and knowledge, and time to devote to the project. The Ideal Staff Characteristics scale (reliability of .88) included staff members' buy-in/support for a program, motivation, skill and knowledge, prioritization of program, communication with others, as well as the hiring pool of available staff. The Community Support scale (reliability of .79) included the agency's communication with and support for partnering agencies, support of community leaders, and support of parents.

Training and TA were measured in two ways. First, for number of TA visits, we created a ratio of the number of training sessions and TA visits received by sites by the number of months of implementation. This allowed us to keep the failed sites in our analysis. Four sites had stopped implementing the program before the end of the 2-year study. Second, we also assessed the quality of TA visits by asking sites to rank the overall quality of the training and TA that they received. We assessed this at the end of the 2 years. For the failed sites, this score was taken during their last site visit.

We assessed the failure of sites to hire and retain staff (inconsistent staffing) and secure funding (inconsistent funding) similarly. These variables are comprised of ratios of the number of times sites had fallen out of compliance during each 4-month interval with hiring staff and securing funding by the number of months the program had been implemented thus, again, allowing us to include the four failed sites in our analysis.

Time to implement the program emerged as a consistent theme in our qualitative findings. Therefore, we felt that it was necessary to determine how powerful time as an independent variable was to success. Although it was originally part of the staff composite

measure in which sites were asked how much of a barrier or an asset time was to implement the program, we excluded it from the composite staff variable and analyzed it separately.

Measures of the dependent variables—implementation success—demanded careful consideration. For example, every site considered success differently. Some were happy to have introduced a new modality to their community, whereas others were eager to implement every aspect of the program at the appropriate dose. To assess the range of definitions of success,^{3,4} we used four dependent variables including adherence to core components, percentage of core program components achieved, dosage, and sustainability. Adherence is a dichotomous variable indicating whether the site was able to implement every core component of the program that was prescribed during research trials. Percentage of core program components achieved is a continuous variable measuring the percentage of the core components that were implemented per number of components that should have been implemented for each program. Thus, it is a ratio representing percentage of adherence across all sites. The variables that comprise adherence and percentage of core program components achieved are the same; they are merely calculated as a dichotomous or continuous variable.

We also wanted to examine whether sites were able to implement the intervention as frequently as it was prescribed during research trials. This is generally called the dosage of the treatment and, depending on the type of program, included everything from the number of meetings between therapists and clients to the number of lessons taught during the school year. Like adherence, dosage is a dichotomous variable indicating whether the site was able to implement all the dosage elements prescribed. For example, there were five dosage elements for the Promoting Alternative Thinking Strategies (PATHS) program: (a) lessons taught three times per week for a minimum of 20 minutes, (b) biweekly phone consultation with program designers, (c) weekly or biweekly classroom observations by the consultant, (d) biweekly individual or team meetings led by the consultant, and (e) quarterly, whole-school, staff discussions. Sustainability was also a dichotomous variable representing whether sites were still implementing their program 6 months after the end of the 2-year grant (i.e., 30 months after startup).

Analysis

We used bivariate correlations to look at the significance and strength of the relationships between each of the independent and dependent variables. To be conservative in our bivariate analyses, we used two-tailed tests of significance. We then conducted multiple regression analyses for each of the dependent variables (adherence, percentage of core program components achieved, dose, and sustainability). For the dichotomous variables, we conducted stepwise logistic regression, and, for the continuous measure of percentage of core components achieved, linear regression was used.⁵ This allowed us to examine those factors that emerged as most significant when all the independent variables were taken into account. Because these analyses were exploratory and we did not want to omit variables that might be important, we indicated significant relationships equal to or lower than the .10 level for our regression analyses, and we included in the models relationships between .11 and .20. This allowed us to include variables that might have been significant if we had a larger sample size and a more representative study population. Also, this allowed us to identify the variables that might be important for future studies.

Given the general lack of multivariate analyses in implementation studies (for exception, see McCormick et al., 1995; Wenter et al., 2002), it seemed necessary to compile

a preliminary sketch of the factors that might be significant had our research design conformed to experimental criteria. From these analyses, we can at least assume that the significant relationships identified merit further analysis at a future date. In addition, these regression analyses provide more support than case studies or correlation analyses alone.

Univariate and Bivariate Analyses

Overall, the 42 replication sites demonstrated high adherence to the programs. In fact, 74% of the sites had implemented *all* core components of their program (adherence). Among the 11 sites that failed to implement all core components, 4 were the failed sites that ended implementation prematurely thus receiving implementation scores of zero. One site was slow in the start-up and had not implemented any of the core components, and another site chose to implement only a few of the core components. The other 5 sites implemented from 75 to 92% of the core components of their chosen programs (percentage of core program components achieved). Taken as a whole, the 42 sites achieved an average of 85% of the core program components.

Dosage was more difficult to achieve with only 57% of the sites implementing all dosage elements in the prescribed amounts. Most sites continued to implement the program throughout the 2 years ($n = 38$). Six months beyond the termination of the grant, an additional 4 sites, for a total of 8, had stopped implementing their program. Thus, all of the effort that went into choosing sites carefully, providing training and TA, and monitoring the process paid off in high rates of sustainability.

Table 2 shows the results of the correlation analysis in which several bivariate relationships appeared as significant. This was surprising given the fact that our number of sites was relatively small and that most sites seemed to perform similarly on a couple of the dependent variables. Ideal Program and Ideal Staff Characteristics were significantly related to all four dependent variables demonstrating their consistency in these analyses. Significant on three of the dependent measures were Community Support, time, Ideal Champion Characteristics, Ideal Agency Characteristics, and number of TA visits (the only variable for which effects were opposite to what had been predicted). The number of TA visits had a significantly negative relationship with the adherence measures suggesting that, the more TA visits that a site received, the less likely they were to implement with high quality. This was due to the fact that the failed and floundering sites needed and received more TA visits. TA quality, however, was significantly and positively associated with both adherence and percentage of core program components achieved.

Although most of the sites worried about funding and suggested that lack of resources was a major barrier to success, inconsistent funding did not appear to be significantly related to any of our outcome measures. Inconsistent staffing was significant on only one of the measures indicating that more inconsistent staffing patterns resulted in lower implementation of core components.

To summarize, nine of the ten independent variables were significantly associated with either one or both of the adherence measures (adherence and/or percentage of core program components achieved). Factors associated with dosage included Ideal Program Characteristics, Community Support, time to implement, and Ideal Staff Characteristics. Factors associated with sustainability included those same four variables plus Ideal Champion Characteristics, Ideal Agency Characteristics, and number of TA visits with those sites receiving more TA visits more likely to fail.

TABLE 2
Implementation Success Correlations

		<i>Adherence</i>	<i>Percentage of Core Program</i>	<i>Components Achieved</i>	<i>Dosage</i>	<i>Sustainability</i>
Program	Ideal Program Characteristics	.352*	.390*	.466**	.548**	
Community	Support	.257	.337*	.424**	.333*	
Technical	Number of TA visits	-.360*	-.343*	.046	-.358*	
assistance (TA)	TA quality	.353*	.339*	-.112	.127	
Organization	Time to implement	.190	.391*	.383**	.315*	
	Ideal Staff Characteristics	.360*	.399*	.432**	.470**	
	Ideal Champion Characteristics	.393*	.423**	.214	.488**	
	Ideal Agency Characteristics	.462**	.445**	.180	.337*	
	Inconsistent staffing	-.274+	-.461**	-.104	-.029	
	Inconsistent funding	-.249	-.242	-.050	.003	

NOTE: Kendall's tau-b coefficients were used for correlations involving an ordinal and a dichotomous variable. Pearson coefficients were used for correlations involving either a dichotomous and an interval/ratio scaled variable or two interval/ratio variables.

+Significant at .10. *Significant at .05. **Significant at .01.

Regression

We created four multiple regression models to identify the independent effects of all of our independent variables on adherence, percentage of core program components achieved, dosage, and sustainability. For adherence, our dichotomous variable—only two variables, Ideal Agency Characteristics and TA quality—had a significant direct effect (Table 3). Ideal Agency Characteristics were only significant at the .10 level. The likelihood ratio R^2 of .35 indicates that the three variables in the model had a moderate effect. Once all of the other independent variables were taken into account, the variables that were significant in the correlation analysis (number of TA visits; the Characteristics of Staff, Champions, and Program; and inconsistent staffing) had no direct effect on adherence.

For the continuous adherence variable—percentage of core program components achieved—regression analysis revealed that three of the ten independent variables had a significant and independent effect: Community Support, inconsistent staffing, and TA quality (Table 4). TA quality had a marginal effect at the .10 level. With an R^2 of .48, these variables were moderate predictors of adherence. Interestingly, Ideal Program, Staff, Champion, and Agency Characteristics, number of TA visits, and time to implement—which were significantly related at the bivariate level—did not have a direct effect once all independent variables were taken into account.

The regression model for dosage had the greatest number of significant, direct predictors (Table 5). Ideal Program Characteristics and TA quality had significance levels of .05, whereas number of TA visits and inconsistent staffing had only marginally significant relationships at the .10 level. Interestingly, TA quality had a negative effect, suggesting that as sites' evaluations of TA quality decreased, dose increased. This relationship at the bivariate level, although not significant, was also negative. Combined, the six variables in the model had a likelihood ratio R^2 of .42, which suggests that this model had a moderate predictive power. Once other variables were taken into account, time and Community Support failed to demonstrate any direct effects. Ideal staff Characteristics

TABLE 3
Backward Stepwise Logistic Regression of Adherence on Independent Variables ($n = 37$)

<i>Independent Variables</i>	<i>Unstandardized B</i>	<i>SE</i>
Technical assistance quality	1.212*	.524
Ideal Agency Characteristics	.143+	.079
Number of technical assistance visits	-8.637	6.319

NOTE: $R^2_L = .35$. Model $\chi^2 = 13.415$, $df = 3$, $p = .004$.

+Significant at .10. *Significant at .05. **Significant at .01.

TABLE 4
Backward Stepwise Linear Regression of Percentage of Core
Program Components Achieved on Independent Variables ($n = 37$)

<i>Independent Variables</i>	β	<i>Unstandardized β</i>	<i>SE</i>
Inconsistent staffing	-.468***	-58.479	16.813
Community Support	.339*	3.431	1.274
Technical assistance quality	.235+	6.464	3.714

NOTE: $R^2 = .48$.

+Significant at .10. *Significant at .05. **Significant at .01.

TABLE 5
Backward Stepwise Logistic Regression of Dosage on Independent Variables ($n = 37$)

<i>Independent Variables</i>	<i>Unstandardized β</i>	<i>SE</i>
Ideal Program Characteristics	.515*	.256
Technical assistance quality	-1.181*	.565
Number of technical assistance visits	11.653+	6.863
Inconsistent staffing	-6.129+	3.655
Ideal Staff Characteristics	.223	.155
Ideal Champion Characteristics	-.286	.229

NOTE: $R^2_L = .42$. Model $\chi^2 = 21.14$, $df = 6$, $p = .002$.

+Significant at .10. *Significant at .05. **Significant at .01.

entered the model but not at the traditional level of significance. Interestingly, number of TA visits and TA quality, which had no significant relationships at the bivariate level, appeared as significant at the multivariate level.

Sustainability—the last model—was significantly influenced only by Ideal Program Characteristics (Table 6). As with other measures of success, many bivariate relationships disappeared at the multivariate level for sustainability. More precisely, Community Support, number of TA visits, time, and Ideal Staff, Champion, and Agency Characteristics proved to have no significant direct relationships with the ability of programs to sustain for 30 months (6 months after the grant ended). Also interesting is the fact that TA quality, which played a role in the other success models, did not seem to emerge as a significant predictor in the bivariate or the multivariate analyses. The likelihood ratio R^2 of .56 suggests that this variable had a moderate to high predictive power for sustainability.

TABLE 6
Forward Stepwise Logistic Regression of
Independent Variables on Sustainability ($n = 37$)

<i>Independent Variables</i>	<i>Unstandardized B</i>	<i>SE</i>
Ideal Program Characteristics	1.234*	.589
Ideal Agency Characteristics	.171	.118
Number of technical assistance visits	-13.829	10.594

NOTE: $R^2_L = .56$. Model $\chi^2 = 18.313$, $df = 3$, $p = .0001$.

+Significant at .10. *Significant at .05. **Significant at .01.

Table 7 summarizes the significance of these factors across the four regression models. Four of the factors were predictive in the various models at the traditional level of significance (.05 or lower); these factors are signified by *A* in the table. These factors were TA quality, Ideal Program Characteristics, inconsistent staffing, and Community Support. All but one (TA quality on dosage) was in the expected direction. This variable was significant in two models and marginally significant (signified by a *B* in the table) in another model. Two other factors were significant at levels between .06 and .10 in one model each. These two factors, number of TA visits and Ideal Agency Characteristics, also emerged in a couple of other models at levels of significance between .11 and .20 (signified by a *C* in the table) as did Ideal Staffing Characteristics and Ideal Champion Characteristics. Interestingly, time and inconsistent funding had no effects in any of the models.

Discussion

One of the common assumptions in the literature is that everything matters to implementation success. Based largely on case studies, this literature fails to identify what factors are most important. This is an especially relevant point to practitioners who face numerous financial and time constraints but who are interested in doing the best that they can in the face of limited resources. For them, it becomes important to identify the most efficient pathways to implementation success. The findings presented here hint at what these pathways might be.

The purpose of these analyses was to identify the factors that played a role in implementation success. Throughout the last 20 years, researchers and practitioners have begun to identify, often in a tales-from-the-field format, some of the factors that help or hurt the implementation of programs in both research and real-world settings. In a recent effort to disseminate research-based violence prevention programs for 2 years in a variety of sites throughout the United States, we examined how the factors identified in the literature affected our sites.

The findings from this study corroborate the overarching arguments in the literature. At a bivariate level, the characteristics of staff implementing programs, the quantity and quality of training and TA, community support, having time to implement programs, possessing strong leadership (i.e., program champions), and the characteristics of the agency in which a program is implemented influenced whether a program was successfully implemented in a new environment. Although not mentioned frequently in the literature, the characteristics of the program being implemented also contributed to success in our study.

TABLE 7
Summary of Regression Models

<i>Independent Variables</i>	<i>Adherence</i>	<i>% of Core</i>	<i>Dosage</i>	<i>Sustainability</i>
Technical assistance quality	A	B	A ^a	
Ideal Program Characteristics			A	A
Inconsistent staffing		A	B	
Community Support		A		
Number of technical assistance visits	C ^a		B	C ^a
Ideal Agency Characteristics	B			C
Ideal Champion Characteristics			C	
Ideal Staff Characteristics			C	
Time				
Inconsistent funding				

NOTE: a. Direction is opposite of that predicted.

A = $p \leq .05$. B = $p > .05$ and $> .11$. C = $p < .10$ and $> .21$.

Our findings at a multivariate level, however, suggest that some of these relationships may be spurious or work through other variables.

Just as there are different ways of defining and measuring implementation success, there are also different factors that lead to the various types of success. Dose seemed to be directly influenced by program characteristics, TA quality (although negatively), number of TA visits, and the ability of sites to hire and retain all staff. Adherence was influenced by TA quality and agency characteristics. The percentage of core program components achieved was directly influenced by community support, TA quality, and inconsistent staffing. Sustainability was significantly influenced by program characteristics. Thus, successfully implementing a program will, in large part, depend on what practitioners are hoping to achieve and how they define success for themselves. One of the most common measures of success, at least among the programs analyzed in this study, has been achieving successful behavioral outcomes in youth, in other words, reducing or preventing delinquent, violent, or substance-using behavior. If individuals are interested in reproducing the program effects that were achieved during research trials, then they should pay attention to the factors that influence all of the success measures identified in this study.

Because TA quality emerged in three of the four regression models, the quality of TA seems to be the most consistent, direct factor across multiple success measures. In fact, TA quality seemed to be a more consistent predictor than the number of TA visits, although number of TA visits had a marginally significant and positive relationship with dosage. The number of TA visits negatively predicted adherence and sustainability. These relationships were not significant at the standard level; however, we had allowed variables to enter or remain in these models through the .20 level of significance so as not to overlook variables of importance that may not have entered the models at the traditional level. This initially suggests that more is not always better, at least in terms of adherence and sustainability, and that the content and quality of TA packages remains extremely important. It is also important to note throwing TA at floundering and failing sites does not always help. Many of our sites failed despite the extra effort and TA that was utilized on them. Interestingly, although high TA quality helped sites to achieve adherence to all core components, it had a negative effect on achieving all the dosage elements of a program. This is somewhat confusing. School programs had the greatest difficulty achieving the dosage elements

(analyses not provided in this article), and the most commonly given reason for this, in open-ended format, was lack of time (Mihalic, Ballard et al., 2002). It is possible that many TA packages do not address the problems, such as lack of time, that prohibit implementing at the appropriate dosage. Additionally, the rating of TA quality was assessed by the coordinator of each project. Ultimately, the success of a program is dependent on the implementers, and it is possible that implementers of the program might have had a different rating of the TA quality. It is also possible that since little information has been gleaned scientifically about the dosage thresholds necessary to achieve program results, some TA providers may have been hesitant to require that their programs be implemented at some required frequency fearing disillusionment among the implementers.

Because of its exploratory nature, this study was not able to discern the precise components of TA quality that influenced the different types of success. For example, is TA quality a measure of whether TA providers were likable, easy to reach, informative, experienced, good listeners, or helpful in overcoming problems? This study does, however, imply that providing ongoing TA to agencies and schools throughout the nation requires as much coordination, care, and scientific rigor as was required during the research trials to prove that programs are successful. Given the consistently powerful, direct relationship between TA and implementation success, future studies should carefully assess the exact characteristics of TA quality that play a role in implementation success. For example, how long of a training period is appropriate, what are the best methods for presenting the program in training, is ongoing TA assistance as important as the initial training and for how long, can TA be accomplished over the phone or are on-site visits necessary, how often is TA required for maximum program benefits, and so forth?

In addition to the importance of TA and the need for more careful and systematic analyses of TA quality, these data also suggest that characteristics of various programs influence success—at least in terms of dosage and sustainability. Based on our findings, practitioners may want to pay close attention to selecting the appropriate program. It is most important to select programs that match the local needs and that are consistent with the stated goals or mission of the school, agency, or community. Adopting agencies should take into account program flexibility, availability of materials and manuals, time necessary to implement and complexity of a particular program, and costs. If any of these program characteristics do not match well with the funding, resources, and mission of the implementing agency, they might be better off finding alternatives.

We also found that inconsistent staffing directly influenced dosage and percentage of core components achieved thereby suggesting that failing to hire and/or retain a full staff may influence the extent to which the program will be fully implemented. During CSPV site visits, we found implementation to be set back on various occasions as sites struggled with maintaining a full staff. Particularly relevant to implementation was the time needed to hire and train new staff members as well as the overload on other staff during these periods that sometimes prevented them from carrying out many of their own duties. Having the support of the community was also important in achieving a higher percentage of core program components. Considering that many of the Blueprints programs are complex and require extensive community and interagency linkages to obtain client referrals (all treatment programs) and volunteers (Big Brothers Big Sisters and Treatment Foster Care), the importance of this variable is not surprising. Others have also suggested that programs seem to fare better when the larger community is involved and supportive of the efforts.

Ideal Agency Characteristics appeared as a relatively important factor in adherence to *all* program components and sustainability, although neither attained the traditional level of

significance. It is interesting to note that, although other factors may influence implementation of a larger percentage of core program components, it may require an exceptional agency with ideal characteristics (e.g., administrative support, open lines of communication, clear lines of authority, structural stability, financial support, etc.) to succeed in implementing all elements of a program as designed and to prolong program life.

Another interesting finding emerging from this study is the failure to find significant effects for the staffing scale (i.e., Ideal Staffing Characteristics), leadership scale (i.e., Ideal Champion Characteristics), time, and funding variables in our regression analyses. This is particularly interesting given that the literature is liberally peppered with tales about how each of these factors has been a consistent problem during past implementation efforts. In fact, a qualitative analysis of these data (Mihalic, Ballard et al., 2002) concurred with the literature and suggested that these were important factors. The emergence of significant relationships between these variables and the different success measures in the bivariate analysis provided further proof of the importance of these factors. These variables, however, disappeared in our multiple regression analyses indicating that, when everything is taken into account, they do not have independent, significant effects and do not play a direct role in any type of success identified here. These variables may indirectly influence success (i.e., they may influence other variables, which then influence success). In addition, they may have a spurious relationship to success—meaning that they have no relationships within the model and that the bivariate relationships observed completely disappear once other variables are taken into consideration (i.e., the relationship observed is dependent on a third variable so that the association disappears when the third variable is controlled).

Future studies are needed to assess the direct and indirect effects of all factors identified here. In fact, given the nonrandom and largely exploratory design of this study, the findings presented here are best interpreted as a road map for other, more systematic analyses. We have suggested that there are several models of success and that TA quality, program characteristics, and inconsistent staffing are the three most consistent predictors across varying success measures. The Blueprints data was cross-sectional thereby limiting causal inferences that can be attributed to these implementation characteristics. Additionally, although Blueprints staff met with and gathered data from various people during site visits, many of the measures used for this article were created from a single respondent (usually the program coordinator) from each site who characterized the overall climate of the agency and staff. The insights gathered from this person may not reflect those of other staff members. Thus, more research is needed to support these findings.

Studies examining the implementation of a variety of programs implemented in diverse contexts and using random-sample techniques and multiple respondents are needed to definitively state what are the most or least important ingredients for the successful adoption of new programs. In addition, future research would do well to identify alternate measures of success and the variables that directly and indirectly influence all models of successful implementation.

NOTES

1. The lack of attention to implementation is interesting given that when program evaluations are conducted, findings indicate that prevention and intervention initiatives are often inadequately implemented (Silvia & Thorne, 1997). In their study of the implementation of school-based prevention programs, Gottfredson, Gottfredson, and Czeh (2000) found that the average prevention

initiative managed to implement only 57% of the criteria necessary to create behavior change. This led them to conclude that the quality of prevention activities in the nation's schools is too poor to produce desired outcomes (i.e., prevention of juvenile delinquency among students). Similarly, a study to test the effectiveness of the Life Skills Training Program in 56 New York State schools (Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990) showed that only 27% to 97% (mean of 68%) of the program material was covered. Only 75% of the students in the study were exposed to 60% or more of the prevention program.

2. At the time, ten Blueprints programs had been identified, but only eight were included in this grant. One of the programs was being implemented more widely by the Center for the Study and Prevention of Violence under a different Office of Juvenile Justice and Delinquency Prevention grant, and the other program was not ready for widespread dissemination.

3. To diversify our categories of success, we also initially considered the inclusion of staff satisfaction with the program as a dependent measure. Because this variable could also be operationalized as an independent measure of staff buy-in, and because there were no significant bivariate relationships with the other independent variables, we did not include this in the final study.

4. We would argue that the outcome of primary importance is achieving reductions in the antisocial behaviors targeted. To accomplish this, attention must be paid to both adherence to program components and dose. Sustainability of programs is important; however, program life can be achieved absent of effectiveness on behavioral outcomes. For instance, Drug Abuse Resistance Education (DARE) has been demonstrated to be quite sustainable but has also shown to have little effect in reducing drug use.

5. For dosage, adherence, and percentage of the core, backwards elimination procedures were used. For sustainability, forward inclusion was used after backward elimination procedures failed. With only 6 sites in the analysis failing to sustain implementation 6 months after the grant's end, the backwards elimination procedure may have failed because some combination of independent variables resulted in the condition described as *complete separation* in which case the maximum likelihood logistic regression model cannot be estimated.

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