The APA Division 16 Working Group on Translating Science to Practice contends that implementation science is essential to the process of translating evidence-based interventions (EBIs) into the unique context of the schools, and that increasing attention to implementation will lead to the improvement of school psychological services and school learning environments. Key elements of implementation and implementation science are described. Four critical issues for implementation science in school psychology are presented: barriers to implementation, improving intervention fidelity and identifying core intervention components, implementation with diverse client populations, and implementation in diverse settings. What is known and what researchers need to investigate for each set of issues is addressed. A discussion of implementation science methods and measures is included. Finally, implications for research, training and practice are presented.

Keywords: implementation science, evidence-based intervention, school psychology

The American Psychological Association Division 16 (School Psychology) established a Working Group on Translating Science to Practice in schools. The charge to the group was: (a) to facilitate the translation of research to practice and practice to research in the specialty of school psychology; (b) to enhance research-based psychological practices in the context of schools; and (c) to promote Division 16 as a resource for translating research to practice for school psychologists. The Working Group views the concept of implementation and the methods of implementation science as critical to the translation process and to improving schools.
This article was developed to provide an introduction to implementation science as a vehicle for addressing important professional practice issues in school psychology.

This article has three objectives. First, the article describes implementation and implementation science. Second, it describes how implementation science can serve as an important framework for enhancing the use of evidence-based interventions (EBIs) in schools and in school psychology practice. Third, recommendations for research, training, and enhancing collaboration between researchers and practitioners are outlined. This article is not designed to provide a comprehensive review and citation of the large and rapidly growing body of publications in implementation science; the current size of this body of literature precludes a comprehensive review within the space parameters of a single journal article. Rather, this article addresses how implementation and implementation science intersect with important issues in school psychology practice and research, and emphasizes seminal works and research syntheses to support positions presented.

What Is Implementation?

Over the past few decades, there have been substantial advances in school psychologists' understanding of interventions that can yield positive emotional, behavioral, social, and academic outcomes for students. Interventions that can be used in school settings have the potential to address child and adolescent problems such as anxiety (Kendall & Hedtke, 2006), depression (Stark, 1990), anger and aggression (Lochman, Wells, & Lenhart, 2008), disruptive behavior in the classroom (Kellam, Mayer, Rebok, & Hawkins, 1998), substance use (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995), and low achievement in reading (McCardle & Miller, 2009), and mathematics (Swanson, 2009). These interventions, typically referred to as EBIs, have been defined as research-based prevention and intervention programs that have a strong empirical basis and have demonstrated positive outcomes in multiple well-designed studies (Stoiber & DeSmet, 2010). Although definitions of the term evidence-based have varied, criteria commonly used include two or more studies with: careful specification of the client population; random assignment of participants to conditions; use of intervention manuals that document the procedures; multiple outcome measures, including measurement of the target problem; statistically significant differences between the intervention and a comparison group after treatment; and replication of outcomes, ideally by an additional investigator or research team (Kazdin & Weisz, 2010).

Unfortunately, use of EBIs in schools is relatively low (Ennett et al., 2003). The efforts of researchers will fail to yield benefits for individuals and society unless the interventions resulting from their efforts are used in practice and service settings; efficacious and effective school-based interventions will not produce positive outcomes for students unless they are used, and used appropriately. The gap between research and practice, development and deployment, and discovery and delivery impedes prevention and intervention efforts and progress (Noonan, Sleet, & Stevens, 2011; Rosenfield, 2000). Implementation represents a set of activities that has been viewed as the “to” in science to practice (Fixsen, Blasé, Duda, Naoom, & Van Dyke, 2010).

Stressing the importance of implementation in measuring the success of interventions in practice settings such as schools, Glasgow, Lichtenstein, and Marcus (2003) proposed the RE-AIM framework. RE-AIM identifies five elements: reach—the number of students served; efficacy—changes in behavior that can be attributed to the intervention; adoption—the decision to use an intervention; implementation—whether the decision to use an intervention is translated into action; and maintenance—the degree to which the intervention continues to be used over time. This framework emphasizes the fact that adoption decisions will not necessarily lead to implementation, and that initial implementation will not necessarily lead to maintenance without specific planning and action.

Definition of Implementation

Several key terms related to implementation science provide a foundation for understanding this area (see Table 1). Implementation refers to the process of putting a practice or program in place in the functioning of an organization, such as a school, and can be viewed as the set of activities designed to accomplish this. Imple-
mentation has also been defined as the process of transferring a treatment to a clinical setting (McHugh & Barlow, 2010) and as the use of strategies to adopt and integrate EBIs and change practice patterns within specific settings (Fogarty International Center, 2010). Fixsen, Naoom, Blasé, Friedman, and Wallace (2005) have pointed to the importance of distinguishing between intervention activity and implementation activity, as well as between intervention outcomes and implementation outcomes. Intervention activity refers to provision of a treatment or prevention program to clients, while implementation activity refers to actions taken in the organizational setting and in related systems to ensure that the intervention is delivered to clients completely and appropriately.

Implementation activity refers to actions taken to ensure program is delivered completely, appropriately. Implementation outcomes are indicators of adequacy of program delivery.

Implementation components include:
- An innovation; a communication process between those who know about it and those who do not; a social system context
- Individual working to bring an innovation into a social system
- Dissemination; adoption; initial implementation; sustainability
- Study of the uptake of research findings and evidence-based practices

Both are essential.

### Table 1

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation</td>
<td>Putting a practice/program in place</td>
</tr>
<tr>
<td>Implementation activity</td>
<td>Actions taken to ensure program is delivered completely, appropriately</td>
</tr>
<tr>
<td>Implementation outcomes</td>
<td>Indicators of adequacy of program delivery</td>
</tr>
<tr>
<td>Implementation components</td>
<td>An innovation; a communication process between those who know about it and those who do not; a social system context</td>
</tr>
<tr>
<td>Change agent</td>
<td>Individual working to bring an innovation into a social system</td>
</tr>
<tr>
<td>Implementation stages</td>
<td>Dissemination; adoption; initial implementation; sustainability</td>
</tr>
<tr>
<td>Implementation science</td>
<td>Study of the uptake of research findings and evidence-based practices</td>
</tr>
</tbody>
</table>

Implementation has been defined in terms of its elements or components by several authors. For example, Rogers (2003) identified those elements as: an innovation (something perceived of as new), communication (through communication channels), time (during which an individual proceeds through an innovation decision process), and a social system (within which the innovation decision process occurs). Fixsen et al. (2005) identified: a source (where an innovation was developed), a destination (an individual or organization that may use the innovation), a communication link (purveyors who work to have a program implemented at a destination), a feedback mechanism (a flow of information about the performance of the innovation), and a sphere of influence (the systems and external factors that impact individuals and the organization involved in implementation).

Although variations occur in various descriptions of the elements or components of implementation, commonalities exist among these conceptualizations. Common elements of implementation include: (a) an innovation—a practice or program that is perceived as new,
such as an EBI; (b) a communication process—information-sharing between those who know about the innovation and those who do not know about it, including information about what the innovation is and how it works, as well as information about outcomes of attempts to implement the innovation; (c) a social system—the context within which the implementation process occurs, such as a school; and (d) an individual (or group) actively working to bring an innovation into a social system, sometimes referred to as a change agent. School psychologists have been viewed as potential change agents working within the social system of the school, and have been encouraged to assume this role for many years (Magary, 1967; Merrell, Ervin, & Gimpel, 2006; Sarason, 1971). Through the role of change agent, school psychologist practitioners have the potential to increase and improve the implementation of EBIs in schools, given knowledge and skill related to effective means of communicating about EBIs within the school organizational and social system context. School psychology researchers have the potential to add to the development of information about evidence-based implementation strategies to support practitioners in their implementation efforts.

Implementation stages. Implementation has also been described in terms of its stages. Again, there has been variation among the ways in which the stages of implementation have been conceptualized, although commonalities exist. The various stage models include: an initial stage, in which information about the innovation is dispersed by change agents and acquired by potential implementers and stakeholders (dissemination); a stage during which a decision is made to try the innovation, based on a matching of implementer and/or organizational needs and innovation characteristics (adoption); a stage in which the innovation is first tried (initial implementation); and a stage during which the innovation is maintained over time (sustainability) (Durlak & DuPre, 2008). Understanding the stages of implementation is viewed as important because it is thought that different implementation stages require different actions from change agents and implementers in order to support successful implementation. For example, provision of information about the intervention and matching of intervention resource requirements and organizational resources are seen as important in the early stages of implementation, and peer opinion is seen as important in middle stages, while feedback about outcomes and the ability to adapt the intervention become important in the later stages (Fixsen et al., 2005; Hall & Hord, 2001; Rogers, 2003).

What Is Implementation Science?

Implementation science has been defined as the scientific study of methods to promote the systemic uptake of research findings and evidence-based practices into professional practice and public policy (Eccles & Mittman, 2006). Other definitions have emphasized addressing major “bottlenecks” that impede effective implementation, and understanding the behavior of professionals and other stakeholders as a key variable in implementation (Fogarty International Center, 2010). Implementation science focuses on understanding the processes and factors related to successful integration of EBIs in a specific type of setting, such as a school. This includes investigation of how to successfully transport core components of the intervention to the professional practice setting, how to adapt the intervention to the local context, and how to enhance readiness for successful implementation by addressing the culture and climate of an organization or community (Rabin & Brownson, 2012).

Historical Roots

Implementation science is a multidisciplinary field, with beginnings in medicine, public health, business, communication, sociology, anthropology, psychology, and education (Rogers, 2003). The historical roots of implementation science can be seen in Everett Rogers’s (1962) first edition of the seminal work Diffusion of Innovations, which was an effort to bring together the separate disciplines working in this area. The targets of early studies were use of new practices among farmers, use of new medical procedures by physicians, the spread of “news” through mass media versus interpersonal communication, and adoption by consumers of new products; later studies focused on the areas of health promotion, evidence-based medicine, organizational innovativeness, and teaching and learning innovations (Greenhalgh,
Robert, Mcfarlane, Bate, & Kyriakidou, 2004; Rogers, 2003).

Early studies related to implementation science used terms such as knowledge utilization, diffusion, dissemination, and implementation, sometimes interchangeably. Currently, the term *diffusion* usually refers to the spread of ideas; the term *dissemination* refers to efforts to distribute information about new programs and practices to practitioners; while the term *implementation* refers to an active approach to providing the necessary supports and organizational or systems conditions for those using new programs and/or practices. Fixsen et al. (2010) described the differences among diffusion, dissemination, and implementation in terms of “letting it happen” (researchers publish their findings and hope practitioners find and use the information), “helping it happen” (research findings are provided directly to practitioners via manuals, toolkits, training sessions), and “making it happen” (practitioners are provided with support to learn how to use EBIs and with a hospitable environment in which to implement EBIs).

**Theoretical Foundations and Models**

The study of implementation has theoretical roots in systems theory, social learning theory, and behaviorism. In addition, theories, models, and frameworks related to process of implementation have been proposed. They provide a way of understanding how the implementation process proceeds and works, and the conditions that support successful implementation.

Systems theory is a broad theory of nature that describes relationships and assumes that everything is interrelated and interdependent (Berrin, 1968). Systems theory set forth the notion that society can be viewed as a set of social systems, which consist of people in patterned relationships attempting to produce a desired outcome. As it relates to the study of implementation, systems theory emphasizes the influences of multiple social systems on potential implementers and stakeholders, as well as the importance of feedback mechanisms and adaptation (modifications made in a system over time to ensure success). The concept of nested social ecology (Glisson, 2002) builds on general systems theory by explaining how individuals working in human service organizations, such as schools, function in a social system in which they are members of one or more subsystems nested within broader systems. Thus, a teacher may be part of a grade-level group of teachers, as well as a curriculum area group, and also part of the school and school district, which are influenced by the local community and the state and federal departments of education. Each of these systems may influence the teacher’s attitudes and behaviors, and thus, her willingness to engage in implementation of a new practice.

Social learning theory (Bandura, 1977) also emphasizes the notion that learning and behavior change are influenced by factors outside of the individual, such as observing another person’s behavior, stressing the importance of the implementer’s observation of and communication with other individuals, and of the social nature of the implementation process. Behaviorism’s (Skinner, 1969) emphasis on the influence of the environment and reinforcement in behavior change also provide significant anchors for the study of implementation.

Theoretical models and frameworks specific to implementation have been developed that use and build on systems theory, social learning theory, and behaviorism. These implementation models and frameworks, described in the paragraphs that follow, hypothesize the relationships of a variety of factors to implementation success. Some seek to explain how implementation works in a social or organizational setting. Others have special significance for school psychology practice as it relates to implementation issues because they focus on the school setting, or on a type of program that a school psychologist might implement, such as a mental health prevention program.

Diffusion theory (Rogers, 2003), one of the most influential models related to implementation, describes how innovations or new ideas and/or practices are spread among members of a social system. Diffusion theory defines how attributes of the innovation, attitudes, beliefs, and relationships of social system members, and the nature of and structure of the social system influence the diffusion process and the adoption, implementation, and sustainability of new programs. The social nature of the diffusion process and the importance of the social system in facilitating or hindering diffusion are emphasized.
Focusing on the context of the work organization, Klein and Sorra (1996) offered a two-factor model of implementation. The first factor is the organization’s climate for implementation of an innovation. This refers to staff members’ perceptions of the extent to which the innovation is rewarded, supported, and expected. The second factor is organizational members’ perceptions of the fit of the innovation to their values. Again, as with diffusion theory, stakeholder perceptions and beliefs, and organizational context play major roles in implementation effectiveness, and, in addition, this model emphasizes the importance of the organizational reward structure in facilitating implementing.

Also focusing on work organizations, including education and human services settings, Fixsen et al. (2010) has offered a theoretical framework. They proposed that successful intervention implementation is related to a set of components that include: (a) purveyor organizations composed of individuals expert in the intervention and in implementation methods; (b) a clear operational definition of the intervention; (c) methods for developing competent use of the intervention, including staff selection, training, coaching, and performance evaluation; (d) organizational supports for implementers, including data systems and other administrative supports; and (e) facilitative leadership recognizing the need for different leadership activities in different implementation stages. The authors contend that in successful implementation these components are integrated and focused on use of an innovation in efforts to influence staff behavior, organizational supports, and system functioning.

Focusing on mental health prevention, Wandersman et al. (2008) have also presented an implementation model, named the interactive systems framework for dissemination and implementation, to bridge the gap between prevention research and practice. This model describes elements of the movement of research-based knowledge into practice through three systems: a synthesis and translation system, which translates information about innovations into user-friendly formats; a support system, which provides training, technical assistance, and other organizational support to users; and a delivery system, which implements prevention programs in the practice setting and develops and maintains the capacity to do so (e.g., sufficient staffing, organizational leadership). Each of the three systems is seen as crucial, and as in Fixsen et al.’s (2010) model, these systems must work together for successful implementation of prevention innovations.

Also addressing implementation of prevention programs, Berkel, Mauricio, Schoenfelder, and Sandler (2011) have proposed a model of the relationships between dimensions of implementation and outcomes of prevention. They focus on four dimensions of implementation, which they conceptualize as behaviors of program facilitators (i.e., fidelity, quality of delivery, adaptation) and behaviors of participants (i.e., responsiveness), as predictors of program outcomes. Their model suggests that the effects of facilitator implementation on program outcomes are mediated or moderated by participant responsiveness (e.g., attendance, active participation, homework completion). Thus, they contend that a critical question for implementation science and practice is how to promote high levels of participant responsiveness, and they hypothesize that program adaptation affects participant outcomes through responsiveness. They indicate that a major issue for implementation science is determining whether program adaptations enhance program outcomes or result in loss of program effectiveness, and that the effectiveness of adaptations may differ with differing cultural contexts.

Building on social learning theory, Han and Weiss (2005) have focused on how sustainability in teachers’ program implementation can be enhanced through provision of teacher training and performance feedback from a consultant, and have proposed a model in which naturally occurring implementation processes create a self-sustaining feedback loop that can result in sustainable teachers’ program implementation. They contend that high quality teacher implementation of an efficacious program will result in positive changes in student behavior, which will in turn generate teachers’ experience of success. Resulting efficacy beliefs and attribution of improved student functioning to the program will lead to increased motivation to implement the program and increased skill in implementing the program as teachers learn what is effective and ineffective in their classroom. Teacher motivation and skill will lead to continued correct program implementation.
All of these theories and models emphasize the importance of understanding the context for implementation, including the organization and related social systems in which implementation occur. Other themes that occur in multiple models include the importance of methods of developing competent implementers, of rewarding implementation, and of feedback about the implementation process and its outcomes. In general, they emphasize the importance of going beyond the problems of an individual child or adolescent client, and beyond the specific content of an EBI, to a broader consideration of clients, implementers, other stakeholders, and the context and systems in which they function, in efforts to implement EBIs successfully.

Goals of Implementation Science

The goals of implementation science have been to understand barriers to and facilitators of implementation, to develop new approaches to improving implementation, and to examine relationships between an intervention and its impact. Implementation science has investigated a number of issues, including: influences on the professional behavior of practitioners; influences on the functioning of health and mental health care practice organizations; the process of change; strategies for improving implementation, including how organizations can support the implementation efforts of staff members; appropriate adaptation of interventions according to population and setting; identification of approaches to scaling-up effective interventions; implementation measurement methods; and implementation research design (Deering & Kee, 2012; Eccles & Mittman, 2006; Eccles et al., 2009; Klimes-Dougan, August, & Lee, 2009; Fogarty International Center, 2010; Payne & Eckert, 2010; Rabin & Browson, 2012).

Implementation research can also be contrasted with effectiveness studies that focus on the generalizability of an intervention to a practice setting. In addressing the issue of establishing the effectiveness of interventions, Chorpita (2003) defined four types of research that form an evidence base: (a) efficacy research, which establishes the connection between practice elements and positive outcomes; (b) transportability research, which is the study of interventions in laboratory conditions without exclusionary criteria for client participation; (c) dissemination research, which involves use of practice setting staff as interventionists; and (d) systems evaluation, which occurs when the practice setting and the investigator team are fully independent. Dissemination research and systems evaluation, as described by Chorpita, could be considered within the scope of implementation science; however, Chorpita’s intervention research model maintains a focus on the intervention in a series of expanded contexts with lessening control from the investigators who established efficacy, while implementation science tends to have a systems focus in an attempt to answer the questions: “What contextual supports are needed to support implementation success?” and “What adaptations can be made to the intervention when used with specific types of clients in specific types of contexts, while maintaining positive client outcomes found in efficacy studies?” To date, the primary focus of implementation science has been on improving health care services, although the application of implementation science to other settings, including school settings, is gaining momentum.

Implementation Science in School Psychology

As indicated above, implementation science has been used to investigate a number of issues related to increasing use of research-based programs and practices. This model of investigation has special significance for school psychology because of the context for the delivery of school psychology services, including the importance of increasing the effective use of EBIs in schools (Kratochwill, 2007); the diverse populations with which school psychologists work (Ortiz, Flanagan, & Dynda, 2008); and the significance of organizational characteristics, cul-
ture, and climate in school functioning and the ability of the school psychologist to function effectively (Forman & Selman, 2011). The diversity of populations with which and contexts in which school psychologists function makes the systems focus in implementation science especially relevant for school psychological service delivery.

The following is a discussion of important school psychology practice questions that implementation science can address, along with summaries of what we know and what we need to know from future implementation research about these questions. The intent here is not to provide a complete review of the literature, but to highlight significant multidisciplinary literature and literature especially relevant to the practice of school psychology. The purpose is to provide a framework for viewing implementation science as a means of understanding how the practice of implementing EBIs in schools can be improved, and what needs to be done to move our knowledge base forward in this area.

**Barriers to Implementation**

**Why it is important to school psychology.**

Several studies have found that the level of implementation of EBIs in schools is low (Atkins, Frazier, Adil, & Talbott, 2003; Ennett et al., 2003; Gottfredson & Gottfredson, 2002), and this provides a compelling rationale for the importance of implementation and of advancing implementation science in school psychology. As Fixsen et al. (2005) have stated, “Only when effective practices and programs are fully implemented should we expect positive outcomes” (p. 4). In school psychology, a primary goal is provision of services that will support the development of students; therefore, implementation of procedures and programs with evidence of the potential to accomplish this goal should be of primary importance. The significant efforts of school psychology researchers and researchers in other social sciences, as well as the financial resources expended by government agencies and foundations to support research on interventions that can produce positive outcomes for children and adolescents, will be wasted unless these interventions are implemented, and implemented well, in schools. Implementation science can help answer the following questions for school psychologists and other professionals working in school settings: “Why don’t we do what has been shown to work?” and “What individual and organizational interventions can we use to overcome barriers to implementation of EBIs?”

**What we know and need to know.** A large number of studies in existing implementation literature from a variety of disciplines have investigated barriers to and facilitators of implementation in attempts to identify the conditions that can hinder and help implementation efforts. These studies indicate that implementation can be affected by personal implementer factors, including implementer skill and attitudes and beliefs about the intervention; factors related to the organizational context for the intervention, including the attitudes, beliefs, and behaviors of administrators, managers, and other stakeholders, as well as organizational policies and procedures related to the intervention; and the external environment of the implementing organization (Fixsen et al., 2005; Greenhalgh et al., 2004; Klein & Sorra, 1996; Rogers, 2003).

Durlak and DuPre (2008) conducted a comprehensive review of the literature on factors that influence implementation of mental health and health promotion and prevention programs (some of which were school-based); the review was based on 81 studies containing quantitative or qualitative data on factors affecting the implementation process, as well as three systematic narrative reviews of factors affecting implementation. They concluded that implementation is affected by: community- (systems-) level factors, including politics, funding, and policy; provider (implementer) characteristics, including implementer perceptions of the need for and potential benefits of the intervention, as well as self-efficacy and skill proficiency; characteristics of the prevention or intervention program, including adaptability, flexibility, and compatibility (contextual fit); organizational capacity (see the section below on implementation in diverse settings for a discussion of this area); and training and technical assistance.

Literature related to barriers and facilitators for school-based programs are of special interest to school psychology professionals because the unique organizational structure of the school may influence implementation. In a qualitative study of developers of school-based EBIs, Forman, Olin, Hoagwood, Crowe, and Saka (2009)
found that teacher support, principal and other administrator support, good training, good technical assistance, integrating the intervention with other school programs or the curriculum, and engaging the school in planning for implementation were seen as important facilitators, while finances, lack of time in the school day, school staff negative beliefs about the intervention, competing priorities in the school, and federal law and/or policy, such as the No Child Left Behind Act of 2001, were seen as barriers to implementation. Principal support and support from other administrators; teacher support; financial resources; high-quality training and technical assistance; alignment of the intervention with school philosophy, goals, policies, and other programs; visibility of the impact of the intervention to key stakeholders; and development of methods to deal with turnover in school staff and administrators were viewed as key in supporting successful implementation of EBIs.

Forman and Barakat (2011) conducted a narrative review of studies that specifically addressed factors affecting implementation of cognitive—behavioral interventions in schools. Consistent with the Forman et al. (2009) findings, five factors were most frequently found to influence implementation success: (a) school organizational structures—use of a school-wide committee to oversee implementation and use of regular staff members as implementers; (b) program characteristics—use of standardized intervention materials, such as manuals, handouts, and videos that were clear and easily understood; (c) fit with school goals, policies, and other programs; (d) training and technical assistance; and (e) administrator support, especially principal support.

A recent study of factors that influence school psychologists’ own willingness to implement EBIs (Forman, Fagley, Chu, & Walkup, 2012) found that barriers to implementation might be somewhat different for school psychologists than for other potential implementers. Beliefs about the acceptability and efficacy of the intervention and organizational resources for it were found to be most important in school psychologists’ commitment to implement an EBI, while administrator support was less important. Although studies of barriers and facilitators with other types of potential implementers have downplayed the importance of the implementer’s knowledge of research findings related to an intervention, this study indicated that this might be important in shaping school psychologists’ willingness to implement.

For many EBIs, especially those targeting academics and universal interventions for mental health, the teacher is the primary implementer; therefore, understanding the factors that hinder and facilitate teacher implementation is especially important in increasing the use of EBIs in schools. In investigating this area, Reinke, Stormont, Herman, Puri, and Goel (2011) found that teachers reported a lack of skills, training, and coaching related to selecting and implementing interventions, and lack of funding as barriers to dealing with children’s mental health needs.

Thus, although a number of studies have identified barriers to and facilitators of implementation, the methodology used in many of these studies limited the conclusions that can be drawn about how to deal with these barriers and how to develop conditions that facilitate implementation success. The studies described above have typically used survey, interview, or focus group methodology to yield information about attitudes toward implementation and characteristics associated with implementation success. However, information is lacking about what typically goes wrong when attempts at implementation of EBIs have resulted in failure, partially because of reluctance to publish negative results of studies involving interventions that have been shown to be efficacious. A major issue for implementation science in school psychology is determination of conditions and processes that have led to negative results using experimental design methodology. When such results occur, it is important for school psychology researchers and practitioners to engage in backward tracking, a process that can help determine when undesirable implementation and intervention outcomes were manifested, and what implementation conditions were present at that time. This information can help practitioners understand what conditions and processes to avoid in their implementation of specific interventions in specified contexts. Studies of this type can also provide the basis for developing individual and organizational interventions that have the potential to address these barriers and for investigating the outcomes of these interventions. When the facilitative conditions described above do not exist in a school setting,
alternative responses are needed to the practice of turning away from schools that are not “ready for change.” Implementation science can assist in efforts to find ways to support the development of those facilitative conditions.

Improving Intervention Fidelity; Identifying Core Intervention Components

Why it is important to school psychology. In a review of over 500 individual studies and meta-analyses, Durlak and DuPre (2008) concluded that level and quality of implementation affects the outcomes obtained in mental health and health promotion and prevention programs, with higher levels of implementation leading to better outcomes. EBIs need to be delivered with accuracy and with skill in order to yield benefits for clients. Yet, the implementation literature also tells us that innovations that are adapted locally have a greater likelihood of being sustained (Berkel et al., 2011; Rogers, 2003). In general, we do not know if all or only some of the components of EBIs are necessary to yield positive outcomes (Berkel et al., 2011), and we do not know how EBIs can be adapted and still yield positive outcomes for clients. Implementation science can help answer the questions: “What methods are effective for promoting intervention fidelity in the diverse and complex organizational contexts of schools?” and “What components of EBIs are essential for positive school-based program effects?”

What we know and need to know. Researchers across disciplines have long been interested in measuring the process of intervention fidelity as a way of drawing conclusions regarding intervention outcomes (Sanetti & Kratochwill, 2009). Intervention fidelity data provides information about whether an intervention is being implemented as planned or as it should be. Intervention fidelity (also referred to in the literature as treatment integrity or program fidelity) has been defined in several ways, with the dimensions of adherence, exposure and dosage, quality, participant responsive, and program differentiation (program uniqueness), proposed by Dane and Schneider (1998), used most often. Another conceptualization proposed by Noell (2008), which differentiates consultation procedural integrity from treatment plan integrity, is of special interest to school psychologists because of the indirect nature of the delivery of many school psychological services. Noell’s conceptualization recognizes that both consultation with teachers (or other program implementers, such as paraprofessionals or parents) and interventions delivered to students need to be conducted accurately, comprehensively, and consistently to yield positive student outcomes.

High intervention fidelity is associated with significant positive outcomes and higher effect sizes (Durlak & DuPre, 2008; Webster-Stratton, Reinke, Herman, & Newcomer, 2011); thus, the level or quality of implementation increases the chances of intervention success and benefits for clients. Research on a range of educational and mental health programs shows that researchers often fail to monitor fidelity or do so in a cursory manner (Power et al., 2005), and that practitioners also typically fail to assess intervention fidelity, despite practitioners’ perceptions that it is important (Cochrane & Laux, 2008). In a special issue of School Psychology Review, devoted to developing a science of treatment integrity, school psychology researchers indicated that treatment integrity has been largely assumed or, worse, overlooked in educational research, as evidenced by a relative paucity of empirical attention to this construct (Sanetti & Kratochwill, 2009). In addition, cross-disciplinary research has demonstrated that, when EBIs are implemented in local settings, end users often change, modify, or eliminate key intervention components to suit local conditions (Rohrbach, Grana, Sussman, & Valente, 2006); thus, it may be unclear whether unfavorable results are due to an ineffective intervention model or to failure to implement the model fully or as intended.

Effective training and technical assistance can be instrumental in developing the capacity of implementers to implement EBIs with fidelity. Meta-analysis results have suggested that effective training includes: (a) presenting information about the intervention; (b) providing opportunities for demonstration of intervention implementation; (c) practicing intervention implementation in the natural setting; and (d) ongoing implementation support (Joyce & Showers, 2002). Ongoing implementation support, in the form of performance feedback, has been found to promote high levels of intervention fidelity in educational settings (Coddling, Livansis, Pace, & Vaca, 2008; Noell et al., 2005).
This type of support has typically consisted of providing implementers with graphed intervention fidelity data and recommendations for improving the accuracy of their implementation.

Most, if not all, implementers require at least some level of implementation support after initial training related to an EBI, and developing, evaluating, and disseminating highly effective, efficient, and feasible competency development supports will be vital to reaping the benefits of EBIs. A continuum of competency development supports (e.g., school-wide professional development to individualized supports) will be needed. Within school psychology literature and practice, it will be important to identify the specific types of initial training and ongoing implementation support likely to facilitate intervention implementation fidelity. Direct examination of the impact of support strategies, such as providing effectiveness data, coaching, consultation, and combination of these, or others, within the context of large-scale implementation projects conducted in varying school contexts is needed.

Research has suggested that practitioners are likely to adapt treatments for a variety of reasons, such as efficiency, simplicity, experience, intuition, and availability of resources (Lilienfield, Ammirati, & David, 2012), or to facilitate ownership and responsiveness of participants (Berkel et al., 2011). Traditional models of treatment integrity might evaluate all such changes as deviations from the treatment protocol that translate into inaccurate or incomplete implementation. Consequently, these changes may result in core intervention elements that are provided at inappropriate levels, omitted, or varied across recipients, potentially rendering effective interventions ineffective (Fixsen et al., 2005). Alternatively, adaptations to treatment protocols have corresponded positively with outcomes (Durlak & DuPre, 2008) as well as generated knowledge about core treatment components (Fixsen et al., 2005). The realities of implementing contextually relevant treatments along with evidence suggesting that deviations from the standard protocol can both hinder and facilitate successful outcomes suggest that: (a) critical components of evidence-based treatments be identified and (b) local adaptations and modifications to standard treatment protocols be documented, evaluated, and tested.

Critical components might be considered the minimum number of treatment elements necessary to achieve effectiveness while also resulting in sufficient levels of fidelity that can be sustained when applied within various contexts (Barnett, Daly, Jones, & Lentz, 2004). An initial step in this process is to define treatment components and their underlying principles within intervention research (Damschroder & Hagedorn, 2011). This task can be accomplished by: (a) identifying and defining core components in widely used, efficacious EBIs and/or (b) delineating core elements after repeated applications of EBIs in various contexts (Fixsen et al., 2005).

Within the school psychology literature, detailed descriptions of intervention components are prevalent, demonstrated by 70% of reviewed studies (Sanetti, Gritter, & Dobey, 2011). However, identifying core components shared across EBIs may result in greater flexibility, transportability, and utility (Fixsen et al., 2005; Kazdin, 2007). For example, Chorpita and Daleiden (2009) examined 322 randomized clinical trials for child mental health treatments and found that practice elements (a discrete clinical technique or strategy, such as relaxation or social skills training) corresponded to child problem areas, indicating that interventions can be selected for particular problem areas or can be designed by selecting practice elements relevant to a particular problem of youth. Generation of taxonomies that elucidate common behavior change elements across treatments could provide standardized language and collective conceptual understanding (Damschroder & Hagedorn, 2011) as a basis for determining how EBIs can be delivered efficiently, as well as efficient methods of training current and future practitioners to implement EBIs. Research that focuses on identifying core components can provide direction for practitioners regarding which intervention components must be implemented with fidelity to the original intervention and which can be adapted to fit the local context.

**Implementation With Diverse Client Populations**

*Why it is important for school psychology.* Child and adolescent populations with which school psychologists work are culturally diverse on a variety of dimensions, such as race, ethnicity, national origin or immigrant status, so-
community contexts. Berkel et al.'s (2011) model of program implementation, described above, underscores the importance of participant responsiveness in determining program outcomes and of adapting programs to increase effectiveness with diverse populations. Implementation science can help answer the questions: “What interventions work with what student populations?” and “How can EBIs be adapted so that they are effective with diverse student populations?”

What we know and what we need to know. EBIs have encountered skepticism and opposition related to the potential lack of applicability to a diverse range of populations (La Roche & Christopher, 2008; Muñoz & Mendelson, 2005). The participants in studies that established the efficacy, and in some cases the effectiveness, of EBIs, do not represent the diversity of youth in the United States, much less in international settings. The majority of work that has investigated use of EBIs with diverse populations has targeted African American and Hispanic/Latino minority youth (Mak, Law, Alvidrez, & Perez-Stable, 2007).

In a meta-analysis, Huey and Polo (2008) reviewed published randomized trials of efficacious treatments for outcomes with ethnic minority youth. Studies that met the following conditions were classified as an ethnic minority evidence-based treatment: at least 75% of participants were ethnic minorities; separate analyses with ethnic minority youth showed that treatment was superior to control conditions; and analyses showed that ethnicity did not moderate treatment effects or that treatment was effective with ethnic minority youth despite moderating effects. Thirteen treatments were found to be probably efficacious (one placebo-controlled trial or two trials comparing treatment and no treatment) and 17 were found to be possibly efficacious (one study showing that a treatment is more efficacious than control) for youth with a variety of problems, including attention-deficit/hyperactivity disorder, conduct problems, trauma, depression, substance use, anxiety, suicidal behavior, and mixed or comorbid problems (e.g., Fantuzzo, Manz, Atkins, & Meyers, 2005; Ginsburg & Drake, 2002; Lochman & Wells, 2003; Rosello & Bernal, 1999). In addition, the ethnic minority youth were found to benefit as much as European American youth, although no treatments met the highest level of empirical support; well established (two randomized controlled trials [RCTs] by independent research teams). The treatments were mostly group- or family-based, and most used cognitive—behavioral approaches.

A number of issues regarding implementing EBIs with diverse populations remain to be addressed. First, although several EBIs have been found to work well for African American and Hispanic/Latino youth, other ethnic minority groups and recent immigrant groups are mostly absent from the literature. In addition, we do not know if other dimensions of diversity, such as sexual orientation or socioeconomic status, influence how youth will respond to EBIs.

In Huey and Polo’s (2008) review, most of the studies were tightly controlled by research groups, and how minority youth respond to these interventions in the “real world” of the school has not been established. Thus, more work examining the outcomes of EBIs with diverse populations is called for, and a major issue for implementation science in school psychology may be examination of specific adaptations that are made in the process of using efficacious interventions with populations and settings that differ from those documented in the efficacy studies supporting the intervention. Several aspects of intervention have been cited as relevant for cultural adaptation, including language, cultural content, the extent to which intervention concepts are consonant with the client’s culture, and treatment goals (Bernal, Bonilla, & Bellido, 1995), as well as integrating stakeholders into the process of adaptation (Domenech-Rodriguez, Baumann, & Schwartz, 2011). A few studies have compared EBIs and culturally modified versions of the same EBI (e.g., Botvin, Schinke, Diaz, & Botvin, 1995; McCabe & Yeh, 2009). However, it is not clear how much EBIs can be adapted before outcomes will begin to erode. Studies that seek to examine this issue should use a process of forward-tracking in which intervention adaptations and implementation activities are documented,
and each intervention adaptation and implementation activity is scrutinized for its impact on implementation and intervention outcomes. This work should be conducted with recognition of the possibility that adaptation of existing EBIs may not be sufficient to yield positive outcomes for some student populations and that new interventions may be needed.

Implementation in Diverse Settings: The Importance of Context and Systems

Why it is important to school psychology. Implementation science recognizes the importance of context and systems in supporting successful implementation (Eccles et al., 2009). Schools provide a unique systems context (Sarason, 1971) that has a major impact on the way goals are set and tasks, such as implementing EBIs, are accomplished; and organizational and systems characteristics of schools are significantly different from those environments in which many EBIs were developed (e.g., using university-based research teams, using clients in mental health clinics or agencies). The systems context of schools can be viewed through the functioning of the school organizational setting and the school’s suprasystems, such as state and federal education agencies.

As indicated above, existing literature on implementation has indicated that organizational and systems factors affect implementation success (Durlak & DuPre, 2008). Unfortunately, the various systems within which school psychologists function frequently do not work individually or in concert to support implementation of efficacious interventions. Implementation science can help answer the question: “How can those in school organizations and relevant social systems work to reduce barriers to implementation and to support provision of EBIs and their intended benefits to children and adolescents?”

What we know and need to know. When viewed in terms of systems theory, a school-based implementation effort occurs within a school organization. The school organization is in turn influenced by external systems, such as the local community, the state department of education, and the federal government. Thus, all of these systems should be considered in attempts to understand how implementation of an EBI will proceed and how it may be improved.

In their review of studies related to factors that influence implementation, Durlak and DuPre (2008) found organizational capacity to be of major importance. Several aspects of organizational functioning that have an impact on implementation success were specified in their findings, including: (a) positive work climate (staff views about morale, trust, collegiality and methods of resolving disagreements); (b) organizational openness to change and incorporation of new programming; (c) shared organizational vision (the extent to which organizational members are united about the value and purpose of the new intervention); (d) shared decision-making; (e) effective (frequent and open) communication mechanisms; (f) effective procedures and structures to accomplish work tasks; (g) coordination with other local agencies who may be able to contribute resources to the implementation effort; (h) effective leadership and administrative support; and (i) the existence of a program champion. Other reviews of the implementation literature have indicated that a monitoring and feedback system is important (Fixsen et al., 2005; Greenhalgh et al., 2004), as is linking the organizational reward system to intervention implementation (Fixsen et al., 2005; Klein & Sorra, 1996).

With regard to community stakeholders, research results have suggested that the contextual fit of an intervention can be maximized when parents and community members are engaged and when the intervention is adapted, increasing the probability of high-quality implementation (Gullan, Feinberg, Freedman, Jawad, & Leff, 2009; Power et al., 2005). Some data have suggested that an intervention is more likely to be implemented, regardless of effectiveness, if the intervention has a high level of external stakeholder support or political utility. For example, the Drug Abuse Resistance Education (D.A.R.E.) program’s popularity was more due to its symbolism as an action against the “drug crisis” and the benefits reaped by associated stakeholder groups than empirical evidence of effectiveness (Aniskiewicz & Wysong, 1990). The broad adoption of D.A.R.E. in schools highlights the importance of data-based decision-making that incorporates evaluation of student outcome and intervention implementation data. Compelling data indicating a lack of positive student outcomes may have the potential to shift external stakeholder opinion away from pro-
grams without evidence of positive outcomes and move stakeholders toward implementing an EBI.

Intervention selection, adoption, and implementation can be significantly influenced by policy and legislation at the federal, state, and local levels. For example, federal education legislation (e.g., Individuals with Disabilities Education Improvement Act, 2004) outlined the use of a response-to-intervention model of service delivery to identify students with a specific learning disability who are in need of special education. Such multilayered models are being rapidly adopted in schools throughout the United States. In these models, decisions about the level of intervention needed by a student are based on student response to an EBI implemented with a high level of fidelity. Thus, assessing and evaluating student outcomes in light of intervention implementation is now a necessary aspect of the implementing the entitlement process and is a due process protection for students (Noell & Gansle, 2006).

Several issues related to optimizing the organizational and systems context for implementation of EBIs are in need of further investigation. First, what is the relative influence of the many organizational and systems factors that have been found to influence implementation? Are they the same in the different types of schools (e.g., rural vs. urban, large vs. small, high poverty vs. high socioeconomic status) within which school psychologists practice? And if some factors are more important, can they offset other factors? It will also be important to determine if different factors are more important for some types of EBIs than for others. For example, is shared decision-making and shared vision more important for a school-wide intervention, such as School-Wide Positive Behavior Support, than for a group intervention, such as the Coping Power Program?

Although stakeholder support within the organizational setting and its community is widely regarded as important in implementation attempts (Gullan et al., 2009; Klein & Sorra, 1996), we do not have research-based information about how to develop stakeholder support. In addition, research on the ways in which policy and law can be shaped to maximize their effectiveness in driving implementation could provide much needed information on increasing EBI use. Finally, we lack information on the actions that purveyors of EBIs and school-based change agents, such as school psychologists, can take when organizational and systems conditions are not supportive of implementation.

**Implementation Science Methods and Measures**

The methods of implementation science are best conceptualized within the methodological frameworks that result in EBIs and practices. Efforts to isolate the impact of independent variables on outcomes remain the key focus of treatment efficacy research. Similarly, identifying cause-and-effect relationships that can best explain the observed outcomes is the key objective of methods of implementation science. Implementing the intervention with high fidelity and multiple replications of the impact of the intervention is critical to establishing the intervention as indeed empirically supported. Failure to replicate outcomes at this stage of the intervention development process initiates a need to carefully consider whether the interventions were implemented with fidelity or if variations in method implementation were the culprit in interpreting the outcomes.

Researchers developing EBIs show strong concern about both the internal and the external validity of their interventions. In the process of developing and validating an EBI, researchers almost always move their research from an emphasis on internal to external validity as an essential element in evaluating the generalizability of their developed intervention. Likewise, researchers use theory-driven concepts to determine which aspects of external validity will be most important in their efforts to examine generalizability of the EBI. However, a key difference from intervention development is that implementation science is more interested in the natural variations in independent variables that occur as a function of the setting in which the intervention is placed. In other words, at the level of the development of the EBI, we want to know if the interventions work under ideal and controlled conditions, and how those interventions generalize across less controlled settings and populations. At the level of implementation science, we want to know what the outcomes are when a known EBI is put into place in a practice setting, whether the nature of natural variations introduced by users altered...
the outcomes of the intervention to be stronger or weaker than found in the research examining external validity of the EBI, and how quality of EBI delivery can be improved.

Although there is a tendency to view these natural changes made to EBIs as likely to produce poorer outcomes than those achieved under the controlled intervention, it is also very possible that such changes actually produce stronger effects than were seen in the efficacy study of the EBI. It is this contextual effect that implementation science attempts to capture. For example, teachers implementing a repeated reading intervention with known strong effects (i.e., Therrien, 2004) may begin to notice declines over time in the overall outcomes of students. Teachers may add increased strategies to enhance motivation to respond to their intervention, such as a Mystery Motivator (Jenson, Rhode, & Reavis, 1994), and/or may alter the nature of the task by asking students to do a retell as part of the technique to improve comprehension, and such changes show increased student outcomes. In this example, changes made to the EBI as a function of the natural variation of implementation would be found to enhance the overall impact of the intervention.

Conceptually, a dichotomy between intervention and implementation science can be made. However, there are actually both reciprocal and coordinated efforts between these methodologies. Competent intervention developers, after establishing the internal validity of their intervention, typically begin to examine systematically the outcomes of the intervention across settings and populations. That is, they begin to examine the external validity of their intervention, as well as the presence of mediators and moderators to the intervention. As the changes in interventions are verified, researchers again venture to examine the external validity of their findings.

Methodologies for the science of implementation follow a path illustrated in Figure 1, and are useful after the internal and external validity of intervention development has been established. When an EBI is put in place within a school setting, without the benefit of oversight and support from the team who developed and established the efficacy of the EBI, the science of implementation begins with conducting careful observations of the processes surrounding implementation. In particular, an examination of the fidelity of implementation is crucial. However, unlike concerns raised in the development of EBIs, the interest and attention here is to variations and adaptations in the fidelity of implementation made by users of the intervention in the setting in which the EBI is implemented. Observations need to be carefully constructed so that they capture the particular changes made (subtle and not so subtle) to the intervention itself. These observations, usually obtained through a variety of methods consistent with quantitative and qualitative observational and self-report methods, including interviewing, completion of fidelity checklists, focus groups, systematic direct observation using event and/or interval recording, and sequential (antecedent–behavior–consequence) recording, are designed to identify key elements within the setting that changed the specified way in which the intervention was to have been implemented.

From the observational data collection process, the researcher identifies potential hypotheses that may be related to the altered implementation process. For example, although an intervention was designed to be implemented by a trained teacher, changes were made within the setting in which the intervention was put in place. Was the key implementer of the intervention a paraprofessional? If the intervention called for specific types of language in feedback based on student responses, was the exact nature of the language used in feedback changed.

Figure 1. Path of methodologies for implementation science. EBI = evidence-based intervention; RCT = randomized controlled trial; SSD = single-subject design.
in the implementation? Did the teacher alter or differentiate the feedback processes depending on student responsiveness? Was the amount of time for implementation (dosage level) altered due to factors within the classroom context? There are a very large number of potential variables that could be changed from the prescribed EBI, and the observational process is designed to capture these potential components.

Each of these hypotheses, or the combination of these hypotheses, is tested in subsequent research studies, using known designs aimed at determining cause-and-effect. These designs would include some of the same scientific methods that established EBIs, including RCTs, replicated single-subject designs, and quasi-experimental methods. Based on the studies, alterations are made in EBIs, and the cycle continues. However, as implementation science emerges, new methodologies and designs will likely evolve that will provide clear indications on the impacts of interventions when placed into real-world implementation. For example, Lei, Nahum-Shani, Lynch, Oslin, and Murphy (2012) described a methodology using a set of empirically developed decision rules that alter the intensity and type of treatment needed in fighting drug abuse. The process essentially operationalizes adaptive clinical decision-making, and is an excellent example of extending intervention science to implementation science (see https://methodology.psu.edu/ra/adap-treat-strat, for more details on the process).

In the science of implementation, one also wants a strong cause-and-effect linkage between the intervention and its impact; however, the outcomes are considered in the context of the implementation. Adaptation in fidelity of implementation becomes an essential element of these designs, along with elements known as intervention clusters (i.e., the presence of multiple interventions that co-occur and have strong interrelationships to outcomes), and aspects of context that may require modification of the original EBI.

What occurs in the science of implementation is a systematic variation of the fidelity of implementation as it was described in the EBI used as the starting point for the implementation. Variations in aspects of the intervention are made carefully and with a systematic study process to isolate the nature of the varied implementation and its potential effects. Key questions in this process are: “Will the planned changes in fidelity of implementation result in better, same, or poorer outcomes than the EBI predicts?” “What conditions are predictive of the same, better, or poorer outcomes than the EBI?” Asking these questions in a systematic, planned, and scientific way allows the advancement of EBI’s toward sustainable change. A serious concern with the current state of implementation science is the length of time it typically takes for an intervention to move from an EBI to a fully understood intervention within the context of implementation. As new methodologies emerge for implementation science, a key element will be to find methods that more quickly bring the EBI to scale.

An example of the implementation science process was described by Odom (2009) related to a particular early childhood education curriculum that he and his team developed and evaluated. Odom noted that there have been significant advances in research findings that have produced positive outcomes for infants and young children with disabilities and their families. Practices, such as inclusion and family-centered intervention, now have strong empirical support. However, Odom pointed out that few of these interventions have often crossed into programs for early childhood and/or early childhood special education.

The intervention begins as an idea brought to a setting by his team, but user adaptation of the intervention is inevitable. Such adaptations almost always occur, and they are based on practitioner values, community values, administrative support, and undoubtedly other variables (Backer, 2002). Documenting both structure and process in the adaptation is critical, and its impact on various outcomes of the curriculum implementation is measured.

As illustrated in Figure 2, tension often exists between researcher/developers and user practitioners, because developers want implementation to be identical to the EBI, but users feel a need to adapt it to their setting and context. In Odom’s project, teachers were introduced to the curriculum in a set of workshops, and then site coordinators visited teachers each week to observe, coach, and plan activities. Many teachers made efforts to implement all components in their classes, whereas others selected parts of the curriculum to employ and, in some cases, employed very little of the curriculum at all.
His team documented the process of adaptation and noted that the key to successful adaptation occurs when teachers implement the “core” or essential components of the practice, which impacts subsequent implementations of the curriculum.

In general, the current methodologies and outcome measures used in implementation science are identical to those methods used in all scientific investigations. They represent typical efforts to isolate variables or groups of variables that provide cause-and-effect explanations. The use of RCTs, replicated single-subject designs, and other quasi-experimental designs and analysis procedures can all work together to support the design of studies within implementation science, although there is a lack of consensus in this field about the methodological approaches that can best be used to investigate implementation strategies. For example, some researchers have criticized RCT designs because, in practice settings, randomization may not be feasible or acceptable, while others contend that the RCT design best addresses common threats to interpretation of findings (Landsverk et al., 2012). As a result of this debate, new methodologies are likely to emerge that will be distinct to implementation science. The emphasis is on the iterative and reciprocal process used to carefully identify aspects of context that impact the outcomes and to subsequently manipulate these outcomes in studies to better understand the impact of context on outcomes. In a sense, when EBIs are developed based on the framework from “research-to-practice,” implementation science starts where intervention science ends and works from the framework of “practice-to-research-to-practice.” From this framework, what happens to EBIs (both enhanced and diminished outcomes) when the interventions are placed within the school context is examined.

**Discussion**

Implementation science has much to offer school psychology, and can provide a framework for substantially advancing the knowledge base and professional practice in our field. Although we have distinguished between intervention activity and research, and implementation activity and research, as a means of defining and differentiating the practice and study of implementation from other areas, intervention research and practice and implementation research and practice need not be distinct and separate endeavors. In fact, sound intervention research should include the study of intervention implementation and sound intervention practice should consider and address methods of ensuring effective implementation in the practice setting. We contend that high-quality intervention research cannot be conducted without consideration of issues of implementation in “real-world” practice settings.
In the past, the field of school psychology has had a consistent focus on the development and validation of EBIs. The field has also devoted considerable attention to identifying EBIs and disseminating articles, books, and manuals that describe them. However, limited attention has been devoted to the process of effectively delivering EBIs in the context of schools (Rosenfield, 2000). For school psychology researchers in the intervention area, it is time to expand the goal from only establishing efficacy, along with some diffusion and dissemination activities, to include an emphasis on increasing our knowledge base related to how existing and new EBIs can be implemented successfully in school psychology practice settings. For school psychology practitioners, it is time to expand the focus of intervention-related activity from learning about how to select new EBIs and use their methods with clients, to include a focus on understanding and actively working to develop facilitative implementation conditions and monitoring implementation as well as student outcomes. In the words of Fixsen et al. (2010), the time for “letting it happen” and “helping it happen” has passed; school psychology researchers and practitioners who are concerned with EBIs must focus on “making it happen.” We contend that researchers, trainers, and practitioners must be equipped with both declarative knowledge (what EBIs to use), as well as procedural knowledge (how to implement EBIs) in school contexts.

The school environment, which is the setting for delivery of EBIs in school psychology practice, is complex, diverse, and at times changing and chaotic. School contexts are uniquely different from those of clinics in medical settings, mental health organizations, or universities, and even from those school settings in which much of the research on psychological and educational interventions has been conducted. Implementation science has emerged as a critical element in the shift from examining intervention effectiveness in controlled experimental settings to routine educational practice. We believe that implementation science offers a critically important means of enhancing the knowledge and utilization of EBIs in schools.

In general, intervention research and development has proceeded through a process in which university-based researchers develop interventions based on theory and prior research and then test their programs in supported and tightly controlled trials. Once efficacy has been established for an intervention in a clinical laboratory, mental health setting, or school context, school psychology practitioners may then begin to try to use it in the natural organizational setting of the school and encounter a variety of implementation problems. Implementation science can help answer the questions: “How can researchers develop interventions with consideration of implementation issues likely to be encountered in school settings?” and “How can school psychology practitioners plan for successful implementation of EBIs?”

Core Components of Successful Implementation

The implementation process as described in current literature is complex, consisting of multiple strategies and components. Given the time, staff, and financial constraints of school settings, and the multiple demands and time constraints inherent in current school psychology practitioner positions (Weir, 2012), the identification of effective and parsimonious implementation practices assumes importance. In addition to adding to our knowledge base on core components of EBIs, it will be important for implementation science to identify the implementation strategies and components that are essential for effective implementation.

Some of the theoretical frameworks described above propose such components. However, existing frameworks, such as that proposed by Fixsen et al. (2010; which identifies: a purveyor organization; methods for operationalizing the EBI; methods for developing competent implementers, including staff selection, training, ongoing coaching, and performance evaluation; organizational supports, e.g., data systems for use in decision-making, facilitative administrative supports; and facilitative leadership as essential to successful implementation), are problematic in terms of providing direction for action on implementation issues from the perspectives of the school psychology researcher and the school psychology practitioner. Although university-based researchers who have developed EBIs used in schools are highly skilled in research methods, they typically lack understanding of how to develop or partner with a purveyor organization (Forman et al., 2009) in order to facilitate widespread implementation of their EBI. From the perspective of the school
psychology practitioner wanting to bring an EBI to practice in his/her professional setting, purveyor organizations for EBIs are not widely available, and the typical staff school psychologist has little input on staff selection, or control over the selection and actions of school leaders, such as principals and superintendents. The model described by Fixsen et al. (2010) is useful for meta-planning purposes, such as those in which state and federal agencies support the development of purveyor organizations. However, implementation planning “roadmaps,” which focus on actions those in researcher and practitioner roles can reasonably take, recognizing their positions in an organizational context, are also needed.

A Research Agenda

To enhance the use of EBIs in schools, a national research agenda on implementation science in school settings is urgently needed. Knowledge resulting from engaging in implementation science in school settings has the potential to improve student outcomes, school staff and school system functioning, and educational and mental health policy. Implementation science can provide a conceptual map and empirical process for accomplishing this goal.

We have described some of the critical knowledge gaps in the sections above and we recommend that the following issues be addressed in future research on implementation in the school psychology context: (a) determination of core components of existing EBIs; (b) for interventions with established efficacy, examining effectiveness with diverse populations and diverse contexts, using forward-tracking to document the outcomes of adaptations; (c) when EBIs do not work in practice settings, examining the conditions and processes that led to negative results in order to identify key variables in failure situations, so that these can potentially become prerequisite conditions to address in future implementation efforts; (d) determination of client and context variables that may interact with each other to yield success or failure in EBI implementation; (e) examination of the relationship between specific implementation practices and intervention fidelity; (f) determination of organizational, community interventions, and actions that are effective in developing stakeholder support; (g) development and examination of effective methods of technical assistance and coaching; (h) examination of methods of dealing with staff turnover; and (i) examination of conditions that support sustainability and the capacity to scale-up.

Training Issues

Training for school psychology faculty, graduate students, and practitioners in how to conduct implementation research and use implementation research findings is needed. Training trainers in implementation science is important for enhancing effective teaching and supervision of the next generation of school psychologists. School practitioners and graduate students will benefit from training and mentorship in implementation science as the basis for improving the practice of innovation implementation in schools. School psychology trainers have reported that students have difficulty bridging the “university-practice setting gap” when attempting to implement EBIs in schools, often meeting resistance from school personnel when introducing new interventions, even those that are evidence-based, and failing to secure stakeholder buy-in of new practices (Rosenfield & Forman, 2011).

Such training could include courses on implementation that address the theory, research, and practice of adult and organizational learning and change, and should include skill development in areas, such as building stakeholder support, planning training and technical assistance programs, financing innovation in schools, and evaluating the implementation process. In addition, practicum experiences that expose students to the process of implementing new programs from varying systems perspectives, such as a school district pupil services director’s office or a state department of education, can provide useful vehicles for graduate student observing and modeling in “real-world” implementation efforts (Forman, 2009).

Initiating education and training of this type may be difficult, because it appears that few current faculty members have extensive knowledge in this area. To assess and begin to address this issue, this Working Group is in the process of conducting a survey of school psychology program directors and trainers to gain information on current teaching and training practices related to EBIs and their implementation in schools (Forman, 2012). The survey is also designed to gain a better understanding of faculty attitudes and barriers to education and training in this area, as well as potential feasible, useful activities that could be undertaken.
by professional associations to facilitate development of education and training in the implementation of EBIs.

Collaboration to Enhance Research-to-Practice and Practice-to-Research

Implementation science in school psychology will require enhanced communication and partnerships between researchers and practitioners. Researchers who are developers of EBIs need early and continuing feedback from practitioners about the feasibility of their interventions, how contextual variables influence them, and the success and failure of various implementation strategies. The development of “practice-based evidence” (Kratochwill et al., 2012), through which practitioners, while providing interventions in practice settings, collaborate and share information with researchers, will be important. The creation of formal mechanisms to accomplish this type of partnership between researchers and practitioners, such as funding from federal agencies, private foundations, and professional associations, as well as journal policies that support publication of the results of such endeavors, will be essential to support activities of this type.

Through this article, we hope to encourage scholars, trainers, and practitioners to consider current approaches to facilitating research to practice and future actions needed to enhance the use of evidence-based practices in schools. We have set forth a series of next steps in the research agenda delineated above, suggestions for initiating or increasing training in implementation practice and science in school psychology training programs, and the development of formal mechanisms to facilitate the growth of practice-based evidence. With an increased emphasis on implementation science in school psychology, we can look forward to an enhanced capacity to use research for the benefit of students, school staff, and schools.

References


McCardle, P., & Miller, B. (2009). Why we need evidence-based practice in reading and where to find that evidence. In S. Rosenfield & V. Berninger (Eds.), *Implementing evidence-based academic in-


Members of Underrepresented Groups: Reviewers for Journal Manuscripts Wanted

If you are interested in reviewing manuscripts for APA journals, the APA Publications and Communications Board would like to invite your participation. Manuscript reviewers are vital to the publications process. As a reviewer, you would gain valuable experience in publishing. The P&C Board is particularly interested in encouraging members of underrepresented groups to participate more in this process.

If you are interested in reviewing manuscripts, please write APA Journals at Reviewers@apa.org. Please note the following important points:

- To be selected as a reviewer, you must have published articles in peer-reviewed journals. The experience of publishing provides a reviewer with the basis for preparing a thorough, objective review.
- To be selected, it is critical to be a regular reader of the five to six empirical journals that are most central to the area or journal for which you would like to review. Current knowledge of recently published research provides a reviewer with the knowledge base to evaluate a new submission within the context of existing research.
- To select the appropriate reviewers for each manuscript, the editor needs detailed information. Please include with your letter your vita. In the letter, please identify which APA journal(s) you are interested in, and describe your area of expertise. Be as specific as possible. For example, “social psychology” is not sufficient—you would need to specify “social cognition” or “attitude change” as well.
- Reviewing a manuscript takes time (1–4 hours per manuscript reviewed). If you are selected to review a manuscript, be prepared to invest the necessary time to evaluate the manuscript thoroughly.

APA now has an online video course that provides guidance in reviewing manuscripts. To learn more about the course and to access the video, visit http://www.apa.org/pubs/authors/review-manuscript-ce-video.aspx.