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INTEGRATED MODELS OF SCHOOL-BASED PREVENTION: LOGIC AND THEORY

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Abstract

School-based prevention programs can positively impact a range of social, emotional, and behavioral outcomes. Yet the current climate of accountability pressures schools to restrict activities that are not perceived as part of the core curriculum. Building on models from public health and prevention science, we describe an integrated approach to school-based prevention. These models leverage the most effective structural and content components of social-emotional and behavioral health prevention interventions. Integrated interventions are expected to have additive and synergistic effects that result in greater impacts on multiple student outcomes. Integrated programs are also expected to be more efficient to deliver, easier to implement with high quality and integrity, and more sustainable. We provide a detailed example of the process through which the PAX-Good Behavior Game and the Promoting Alternative Thinking Strategies (PATHS) curriculum were integrated into the PATHS to PAX model. Implications for future research are proposed.

The past two decades have brought clear progress and a stronger empirical base to the field of school-based prevention (Greenberg, 2004). Recent reviews and meta-analyses indicate that there are now a considerable number of programs which have been shown to be effective at promoting positive youth development (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2002) and preventing sub-stance abuse (Blitz, Arthur, & Hawkins, 2002; Gottfredson & Wilson, 2003), aggressive and disruptive behavior problems (Hahn et al.,

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2007; Park-Higgerson, Perumean-Chaney, Bartolucci, Grimley, & Singh, 2008; Wilson & Lipsey, 2007), and mental health problems (Greenberg, Domitrovich, & Bumbarger, 2001; Hoagwood et al., 2007).

The delivery of preventive interventions through schools is logical given the amount of time that children and youth spend in these settings, the important socializing influence that the institution exerts, and the comorbidity of learning and mental disorders. Furthermore, there is increasing evidence that social-emotional skills have the potential to promote engagement in learning and long-term academic success and that behavioral risk factors undermine this process (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2008). With increasing demands on teachers to maximize instruction time and greater focus on preparation for standardized testing as a result of federal policies such as *No Child Left Behind*, however, there is a perception that class time to implement universal social-emotional and behavioral health interventions is limited, and such strategies are unrelated to academic success. As a result, there is a need for greater efficiency to deliver evidence-based prevention programs in schools without compromising implementation quality.

The current article proposes that integrated models of school-based prevention, which consist of multiple independent strategies or programs merged into a single intervention, have the potential to address some of the significant challenges facing school-based prevention in a way that does not compromise integrity. The concept of an integrated prevention approach is illustrated with a detailed example of the Promoting Alternative Thinking Strategies (PATHS) to PAX Program, which includes the PAX-Good Behavior Game (GBG; Embry, Staatemeier, Richardson, Lauger, & Mitich, 2003) and the PATHS curriculum (Kusché & Greenberg, 1994). We also highlight several other school-based models that combine interventions and support strategies across risk levels as a possible, theoretically integrated multisystemic approach. We conclude by outlining a research agenda related to integrated models of prevention, which we believe will illustrate the potential efficiency of integrated approaches for promoting a range of social, emotional, and behavioral outcomes among students.

Models of School-based Prevention

Prevention Science

The field of prevention science is rooted in epidemiological research regarding the factors that increase risk and the factors that buffer or protect against risk for developing problem behaviors or psychological disorders (Flay et al., 2005). It is also greatly informed by developmental models and ecological theory, which emphasize the dynamic influences of the environment on behavior (Brofenbrenner & Morris, 1998; Kelly, Ryan, & Altman, 2000). These environmental influences can be organized into specific contexts, ranging from the more proximal influences of the family, to more distal factors, such as the school or community. Thus, to adequately effect change, it is important to address risk factors at multiple ecological levels through developmentally appropriate programming (Brofenbrenner & Morris, 1998).

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A number of epidemiological studies have identified common individual and environmental factors that place children at increased risk for psychopathology (Coie et al., 1993). Due to the complex nature of human development, however, no disorder has a single cause or risk factor (Ialongo et al., 2006; Rutter, 1993). Longitudinal research also suggests that there are multiple pathways to most psychological disorders such that different combinations of risk factors may lead to the same outcome (Cicchetti & Rogosch, 1996). Findings in behavioral epidemiology indicate that mental health problems, social problems, and health-risk behaviors often co-occur as an organized pattern of adolescent risk behaviors (Donovan & Jessor, 1985). Because risk factors may predict multiple outcomes and problem behaviors overlap considerably, prevention efforts that seek to reduce multiple risk factors will likely affect several behavioral and social-emotional outcomes (Guerra & Bradshaw, 2008). Based on the notion of common and interrelated risk factors, prevention scientists have tested the strategy of targeting multiple factors simultaneously, predicting that multifactor programs will have a greater impact than narrow approaches that focus on a single risk factor (Hawkins, Catalano, Kosterman, Abbot, & Hill, 1999).

Both risk and protective factors can be organized into three general domains: individual factors (e.g., social cognitive skills, temperamental characteristics), quality of interactions with the environment (e.g., positive connections to others, parent-child relationship), and broader environment factors (e.g., poverty, home-school relationship, neighborhood characteristics). Although vulnerability to developing a disorder increases as a function of the number of risk factors, there are cases of resiliency where, despite exposure to multiple risks, an individual remains healthy (Rutter, 1993). Often this is because the risk occurs in the presence of protective factors that buffer the effect of and reduce the likelihood of maladaptive outcomes under risk conditions (Fergus & Zimmerman, 2005; Stouthamer-Loeber, Loeber, Wei, Rarrington, & Wikstroem, 2002). There is increasing empirical investigation into the individual and collective influences of protective factors at multiple ecological levels. The general consensus in the literature is that bolstering protective factors promotes adaptation, by decreasing the risk for dysfunction and/or interaction with other risk factors (Guerra & Bradshaw, 2008; Hawkins et al., 1999). Evolutionary theory and behavior analysis also help to explain how and why certain individual or group behaviors deemed risky can be adaptive and even protective in certain contexts (Biglan, 2003; Embry, 2002a).

Public Health Approach to Prevention

A hallmark of the public health approach to prevention is that it considers the full spectrum of interventions that are needed to address all levels of risk in a population. This approach was described in the Institute of Medicine's (IOM; Mrazek & Haggerty, 1994) summary of research on the prevention of mental disorders. The IOM report distinguished between prevention and treatment, and identified three levels of preventive intervention defined by the degree of risk in the participant population (also see O'Connell, Boat, & Warner, 2009). *Universal* preventive interventions target the general public or an entire population that has not been identified on the basis of individual risk. Because universal programs are positive, proactive, and are provided independent of individual risk status, their potential for stigmatizing participants is minimized. As a result, they may be more readily accepted and adopted. *Selected* interventions target individuals or subgroups (based on biological or social

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risk factors) whose risk of developing mental disorders is significantly higher than average. *Indicated* preventive interventions target individuals who are identified as having prodromal symptoms related to mental disorders but who do not yet meet diagnostic criteria.

Although there are effective school-based preventive interventions at all levels of the IOM model, much of the extant research has focused on universal programs implemented during the early elementary-school years (Greenberg, Domitrovich, & Bumbarger, 2001). Drawing on the prevention science and public health models, many of these evidence-based programs target risk and protective factors in an effort to reduce disruptive behavior problems in childhood and adolescence (Wilson & Lipsey, 2007). Fewer interventions focus on reducing internalizing problems, and rarely is there integration across levels or between prevention and treatment (see Greenberg, 2004; Weisz, Sandler, Durlak, & Anton, 2005).

Proponents of a public health approach to school-based mental health encourage school systems to develop comprehensive prevention models based on this structure so that the needs of all students are met (Adelman & Taylor, 2003; Strein, Hoagwood, & Cohn, 2003; Weist, 2001). To do this successfully, schools should develop an organizational structure within the building to manage and facilitate systematic implementation of proven strategies (Devaney, O'Brien, Resnik, Keister, & Weissberg, 2006; Sugai & Horner, 2006). A similar structure should be in place at the district and state levels to provide technical assistance and overall coordination of programs (Barrett, Bradshaw, & Lewis-Palmer, 2008). This in turn will likely reduce duplication of programs and staffing, iatrogenic combinations, competition for scarce resources, and burnout and/or turnover (Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005).

Theory-Driven Targets for Intervention Delivery

In addition to providing a continuum of preventive interventions that cover the needs of all students, theory and data should be used to identify the particular prevention models that could be integrated into more cost-effective and efficient strategies. Theory and data have the potential to guide the content, process, or structure of these types of interventions at each level of risk. In this way, developmental ecological models maximize the efficacy of a public health model by informing the selection of the core components for inclusion to affect multiple outcomes of prevention. This helps avoid the "program for every problem" phenomenon. For example, if a school district is attempting to reduce adolescent risk behaviors that undermine healthy development and academic success, the most effective generic risk factor to target is aggression in the elementary school years (Kellam & Rebok, 1992; Petras et al., 2008), because most cases of adolescent delinquency, substance abuse, and school dropout originate with an early onset of disruptive behavior problems (Moffitt, 2006; Patterson, DeBaryshe, & Ramsey, 1989). Individual, classroom, and building risk factors contribute to the onset and maintenance of aggressive behavior (Ozer, 2006). They also affect the development of competencies that could serve as protective factors against this process (Hawkins et al., 1999). Understanding these processes is critical for developing an effective intervention strategy. Taken together, the available research suggests that a range of risk and protective factors should be targeted through integrated school-based preventive interventions to maximize multiple child outcomes (Guerra & Bradshaw, 2008).

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Integrated Models of Prevention

Integrated prevention models result from the fusing of independent strategies or programs into one enhanced, coherent intervention or strategy. Integrating proven practices that target multiple risk and protective factors in a coordinated fashion could have a synergistic effect. Integration can be both *horizontal*, occurring within risk levels, and *vertical*, integrating programs across levels. Integrated programs and practices are needed in school-based prevention for a number of reasons. First, most school-based intervention effects are modest (Flay et al., 2005), possibly due in part to equifinality, such that different risk processes may lead to the same problem behavior (Cicchetti & Rogosch, 1996). Furthermore, the school population is heterogeneous in terms of the distribution of risk factors and the symptom trajectories among the individuals (Kellam & Rebok, 1992). Cohort-based assessments or surveys of risk and protective factors commonly used in prevention planning seriously underestimate the role of individual risk factors (Smolkowski, Biglan, Dent, & Seeley, 2006). As a result, single interventions may not adequately address the underlying mechanisms contributing to the problems (potential or manifest) within the entire population. Integrated models keep the unique strategies of each intervention model and merge those that overlap, resulting in a model that delivers a broader set of approaches simultaneously. This has the potential to improve intervention impact in an efficient manner and avoid the need for more costly, intensive interventions.

A second rationale for integrated models is that they maximize intervention exposure. Many interventions share common process elements such as building a sense of community, providing high levels of praise or positive feedback, holding interactive or reflective discussions, providing a technique for self-regulation, or following a sequence of cognitive steps to solve a problem (Guerra & Bradshaw, 2008). The content differs depending on the target of the intervention (e.g., violence vs. substance use) and the age of the students, but the process is similar. Integrated models maximize students' exposure to these processes by creating a shared conceptual framework and language that allows the application of these same processes in different contexts. The contexts may be different interventions (e.g., social skills training, drug prevention) or different settings across the school environment (e.g., cafeteria, hallways, or playground). Similarly, students in need of selected or indicated interventions who are exposed to language and techniques in the context of universal interventions are likely to benefit even more from the intense interventions if the concepts or techniques provided are repeated, reinforced, or extended through the universal intervention. This has the potential to increase generalization and encourage the application of skills and behaviors across settings.

A third rationale is that blending proven strategies may have additive or multiplicative effects, because complementary "active ingredients" interact synergistically. For example, one intervention might involve cognitive strategies, yet lack strong reinforcements or practice opportunities that could be provided through a complementary intervention. Another promising strategy might be robust at increasing the exhibition of competencies (e.g., behavioral activation), whereas another might more effective with behavior inhibition. When integrated, these combinations could be more powerful than the individual parts.

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A fourth rationale for integrated models is that they have the potential to reduce system overload and maximize sustainability (Fixsen et al., 2005). Recent research has documented that many schools are implementing a variety of prevention strategies or programs simultaneously but in an uncoordinated fashion (Adelman & Taylor, 2003; Gottfredson & Gottfredson, 2002; Ringwalt et al., 2002; Sugai & Horner, 2006). This may be a function of history in terms of how the programs were introduced to the setting, how they were funded, or what domain they targeted. When interventions operate in isolation they often lack sufficient buy-in, training, and fidelity and are more vulnerable to being dissolved over time (Greenberg, Domitrovich, Graczyk, & Zins, 2001). In an integrated model, intervention elements function as part of a coordinated whole, which build on and reinforce the importance of the individual components. Elements are also streamlined so that there is less repetition and duplication of efforts. This streamlining has the potential to reduce personnel and resource burden associated with implementing the model.

Finally, one of the factors that may contribute to the reduction of effect when interventions are replicated under typical community conditions, as compared to tightly controlled research projects, is poor implementation quality (Domitrovich, Bradshaw, et al., 2008; Flay et al., 2005; Gottfredson & Gottfredson, 2002). If integrated models are successful at improving intervention effectiveness, they also should result in greater implementation success because teachers are more likely to implement an intervention that they perceive is working (Han & Weiss, 2005).

Regardless of the rationale for integrating interventions, the process of development should follow a standard sequence to be conducted successfully. The first step is to articulate the theory underlying each intervention model, followed by the specification of how the program components and activities of each intervention are linked to theory. Once the models are sufficiently outlined, the two can be compared and the unique and shared program components identified. The final phase of the integration process is to develop an effective intervention support system (Domitrovich, Bradshaw, et al., 2008). This is not unique to integrated interventions, but it is critical to ensure high-quality implementation. In the section that follows, these steps are illustrated with an example of the integration of two universal evidence-based prevention models.

PATHS to PAX Integrated Prevention Model

The PATHS to PAX program is an example of an integrated intervention that was developed through a collaboration of the Johns Hopkins Center for Prevention and Early Intervention, the Pennsylvania State University Prevention Research Center, and the Paxis Institute. PATHS to PAX integrates the Promoting Alternative Thinking Strategies (PATHS) Curriculum (Kusché & Greenberg, 1994) and the PAX-GBG (Embry et al., 2003). The goal of the integration was to create a more efficacious preventive intervention that aims to impact a range of risk and protective factors for aggressive and disruptive behavior problems by targeting teachers' classroom management style, as well as children's social-emotional skills. The process of integration and the final model are described following a brief overview of the original models and their research base.

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GBG

The GBG is a classroom-based behavior management strategy based on social learning principles that is designed to improve academic instruction by reducing students' aggressive, disruptive, and off-task behavior. It was first developed in the 1960s by Muriel Sanders, an elementary teacher, as a strategy to manage her class, and has been evaluated through several teams of researchers (see Barrish, Saunders, & Wolf, 1969; Kellam et al., 2008). The GBG is a group-based token economy, where students are organized into "teams" that are reinforced for their collective success in inhibiting inappropriate behavior. This structure allows teachers to take advantage of positive peer pressure to manage student behavior at the individual and the classroom level.

The PAX version of the GBG (PAX-GBG) was recently developed to improve the effectiveness of the original GBG model and to make it ready for wide-scale dissemination in Grades K-5 (Embry, 2002b; Embry et al., 2003). At the beginning of the "game," the teacher and students collaborate to define their vision of the ideal classroom. They identify the behaviors that they feel are necessary for creating a focused, productive, and peaceful classroom. After jointly defining the behavioral expectations in the class, teachers assign students to one of several teams strategically so that all teams have an equal chance of winning the game. The teams work cooperatively to maintain appropriate behavior in the classroom, and points are given to the team when a member displays an inappropriate behavior. At the end of the game period, all teams with three or fewer points win the game and receive an award. The rewards are nonmaterial and include activities (e.g., pencil tapping, blowing bubbles) that are typically not allowed or not experienced in the classroom but are within the capacity of teachers to provide. The ideal implementation of the GBG is multiple times of the day both during instruction and transitions between activities and settings.

In addition to refining the game, the PAX-GBG incorporates a number of experimentally validated instructional and interpersonal evidence-based kernels or strategies that engage students in the learning process, make more time for instruction, and create a positive classroom environment (Embry & Biglan, 2008). These strategies include behavioral cues and practices that reduce disruptions and transition time between activities and increase student attention. In addition, the PAX-GBG includes the exchange of written compliments among all members of the school community.

Research on the Efficacy of GBG

Approximately 40 interrupted time-series studies exist on the GBG (Tingstrom, Sterling-Turner, & Wilczynski, 2006), which show nearly immediate reduction in disruptive, aggressive, or inattentive behaviors. A series of large-scale randomized controlled trials of the original GBG, tested alone and in combination with other intervention components, has been led by Kellam and colleagues, first at Johns Hopkins University and more recently at the American Institutes for Research. Studies of GBG, tested alone and delivered in first and second grade, have reported a reduction in off-task behavior as rated by independent observers (Brown, 1993), a reduction in aggressive/disruptive behavior as rated by teachers and peers (Dolan et al., 1993), and a reduction in diagnoses of conduct disorder in fourth

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grade (Brown et al., 2008). Significant effects were also observed on aggressive/disruptive behavior through middle school (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; Kellam, Rebok, Ialongo, & Mayer, 1994). Long-term benefits by young adulthood (ages 19-21) include a reduction in the rates of antisocial personality disorder, drug and alcohol abuse and dependence, and tobacco use (Kellam et al., 2008), the use of school-based mental health services (Poduska et al., 2008), and the perpetration of violent behavior (Petras et al., 2008). For the most part, the impact of GBG has been greatest for males who entered first grade exhibiting aggressive/disruptive behavior. When GBG was combined with instructional components and delivered in first grade, short-term results showed an impact on aggressive/disruptive behavior as well as achievement (Ialongo et al., 1999). At sixth-grade follow-up, these children were rated by teachers as having fewer conduct problems and were significantly less likely to have a diagnosis of conduct disorder, relative to controls. Moreover, they were less likely to have been suspended from school and/or need mental health services (Ialongo, Poduska, Werthamer, & Kellam, 2001). By the end of high school, children exposed to the GBG in first grade were less likely to require special education services and performed better on standardized tests, were more likely to graduate from high school, and were more likely to attend college (Bradshaw, Zmuda, Kellam, & Ialongo, in press).

PATHS

PATHS is a universal, teacher-taught social-emotional curriculum for students in Grades preK-5. The program is based on the Affective-Behavioral-Cognitive-Dynamic model of development (Greenberg & Kusché, 2006), which places primary importance on the developmental integration of emotion, language, behavior, and cognitive understanding as they relate to social and emotional competence. PATHS is designed to improve student social-emotional skills in four domains: (1) emotional understanding and emotional expression skills, (2) prosocial friendship skills, (3) self-control/emotion regulation, and (4) problem-solving skills, including interpersonal negotiation and conflict resolution skills.

At each grade level, the curriculum includes a set of lessons that are delivered twice a week for 20-30 minutes, depending on the age of the students. Emotion lessons focus on teaching specific feeling words and skills related to emotional understanding including emotion recognition, emotion regulation, and communication regarding emotions. Friendship lessons focus on skills related to the increase of positive social behavior (e.g., social participation, prosocial behavior, communication skills) and the skills needed to make and sustain friendships (e.g., good manners, negotiation, effective communication). Development of self-control, affective awareness and communication, and beginning problem-solving skills are integrated with the use of the “Turtle Technique” (Robin, Schneider, & Dolnick, 1976) in the preschool version and the Control Signals Poster in the elementary version.

In addition to formal lessons, PATHS includes strategies that can be used throughout the day by teachers and other school staff to generalize the core concepts and promote a climate that fosters social-emotional learning. These strategies include the use of a daily special helper who receives compliments from adults and peers, classroom-wide problem-solving

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discussions, and teacher-student dialoguing to facilitate self-control and social problem solving in real situations.

Research on the Efficacy of PATHS—Previous trials of the PATHS curriculum with regular and special education children have shown that the use of PATHS is associated with significantly improved social cognitions and more socially competent behaviors (Greenberg, Kusché, Cook, & Quamma, 1995; Kam, Greenberg, & Kusché, 2004; Riggs, Greenberg, Kusché, & Pentz, 2006). In both populations, findings indicated significant reductions in both internalizing and externalizing behavior at 1 year postintervention (Kam et al., 2004; Riggs et al., 2006). Further evidence of the efficacy of PATHS comes from a large, multisite trial, which included 198 intervention and 180 comparison classrooms from schools within high-risk neighborhoods (Conduct Problems Prevention Research Group [CPPRG], 1999a). In the intervention schools, first grade teachers delivered a 57-lesson version of PATHS, which focused on improving self-control, emotional awareness, peer relations, and problem solving. At the end of Grade 1, PATHS classrooms had lower aggressive behavior scores than did the control classrooms. A significant intervention effect was also observed on hyperactive/disruptive behavior. Longitudinal analyses comparing students who had received 3 years of the PATHS curriculum with students in control schools demonstrated significantly lower rates of aggressive behavior, inattention, and poor academic behavior and higher rates of prosocial behavior. In addition, peer sociometric reports indicated significantly lower rates of peer-rated aggression and hyperactive/disruptive behaviors for boys and higher rates of prosocial behavior for both boys and girls (CPPRG, 2009).

Integration of PATHS and PAX-GBG

The primary goal when creating PATHS to PAX was to develop a model that was theoretically sound and involved conceptual and pragmatic integration of the two programs. This development began by taking each intervention, specifying its theory and how the intervention components were linked to that theory. This was essential because neither intervention had been subjected to an empirically based component analysis even though several of the individual components were tested experimentally (e.g., Embry & Biglan, 2008; Robin et al., 1976). Interventions that are being considered for integration have components that, from a theoretical or data standpoint, overlap and those that are unique. As stated previously, an integrated model is not simply the sum of two interventions; rather, it is the blending of overlapping components and the combination of unique elements to maximize the mechanisms of change that underlie each model. The relative role of the unique elements in the intervention logic model must be weighed relative to the other components in the model so that decisions can be made about what to retain and what to drop.

Rationale for Integration—There are a number of reasons why additive and synergistic effects were expected as a result of integration of PATHS and PAX-GBG. Self-control is a core competency in both PATHS and PAX-GBG. Whereas PATHS seeks to accomplish reductions in aggressive/disruptive behavior via teacher-led, formal instruction (i.e., lessons) aimed at facilitating emotion regulation, self-control, social problem solving, and conflict resolution skills (Greenberg & Kusché, 2006), the PAX-GBG uses contingency management

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involving both the teacher and peers to shape student behavior. The PATHS curriculum has always emphasized the importance of teacher generalization through the use of daily practices such as classroom problem-solving meetings, visual aides to promote self-control, and dialoguing around problem solving to extend learning beyond the lessons. This relies, however, on teachers to be aware of "teachable moments" to encourage students to apply and practice the new skills that they are learning and to take advantage of them. The PAX-GBG provides a regular, predictable "practice" opportunity that complements the explicit instruction provided by the PATHS lessons. In addition, PATHS lessons promote cooperation and provide problem-solving language and strategies needed for resolving conflicts that have the potential to arise in the context of the PAX-GBG.

Second, the ability of teachers to effectively conduct PATHS lessons is undermined by disruptive student behavior. The PAX-GBG is based on social learning and behavioral principles and provides teachers with an efficient means of managing student behavior via reinforcement of the inhibition of aggressive and off-task behaviors. By increasing attention to task and reducing disruptive behavior in the classroom, PAX-GBG may facilitate the acquisition of the emotion regulation, self-control, social problem solving, and conflict resolution skills taught during PATHS lessons. The social learning-based PAX-GBG may increase the likelihood that students' newly acquired skills would also be appropriately prompted and reinforced by teachers. Consequently, the PATHS skills would be better learned and more frequently employed. Third, the PAX-GBG provided a context and method for children to participate as groups and not just as individuals to change both the group behavior and group incentives for cooperative goals demonstrated to restrain aggression (Sherif, Hogg, & Abrams, 2001). Fourth, the increased teacher and child success as a result of combining PATHS and PAX-GBG should minimize teacher and child discouragement and subsequent failure to participate or comply fully with the intervention regimens.

Developing the Integrated Model—An additional goal when creating PATHS to PAX was to develop a model that was ready to be tested in a randomized controlled efficacy trial. Although it was clear that the final model would include both lessons and the game, there were many details that had to be considered to create the final integrated PATHS to PAX model. For example, both PATHS and PAX-GBG promote the exchange of compliments to foster a positive classroom environment. In PATHS this is achieved through the Kid of the Day technique, whereas in PAX-GBG it is encouraged more generally through the use of "tootle" notes (Skinner, Cashwell, & Skinner, 2000). These overlapping elements were simple to integrate. In PATHS to PAX, the PAX-GBG terminology for a compliment (i.e., tootle) was integrated with the Kid of the Day "compliment list" so that this individual process was consistent with what adults were encouraging the students to exchange at any time. Similarly, both interventions send materials home to parents to describe the key concepts that students are learning in school, to extend use to that setting, and to encourage family members to reinforce the students for positive behavior and use of skills. There was a significant amount of overlap between PATHS and PAX-GBG in these materials, so the content was reviewed and an integrated version was created for the final PATHS to PAX program.

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Both PATHS and PAX-GBG also use visual cues to remind students of appropriate behavior. In PATHS, the Turtle Technique or control signal encourages calming down, and the problem-solving poster outlines a series of steps for working out solutions to problems. PAX-GBG uses a picture of a “thumbs up” and “thumbs down” to remind children to make good choices about their behavior. In PATHS to PAX all of these visual cues were integrated so that during a PAX-GBG game, teachers could use the PATHS cues to help children stop and calm down (which is an important first step that makes it more likely that they will make a positive behavior choice) and when dialoguing around problem solving, teachers could refer to the PAX-GBG cues for good choices.

Developing the Integrated Intervention Support System—Once the integration was articulated conceptually and the content for PATHS to PAX was determined, the next phase of program development involved streamlining the intervention so that it was feasible for teachers to use in the classroom and creating a system of training and support that fostered high-quality implementation. This was achieved by translating the conceptual integration into a rationale for three components (lessons, activities, and practices) of the intervention, giving the integrated model a new name (i.e., PATHS to PAX) and explaining how that name reflected the structure of the model in a way that would be understood by teachers. Presenting the PAX-GBG as a practice within the PATHS to PAX model (i.e., an important “path to PAX”) allowed it to be seen as parallel to the other PATHS generalization techniques and not as an “add on” to the primary component of PATHS, which are the lessons. This was critical because integrated interventions need to appear as single models to their users. The original program materials were revised so that they reflected the new intervention name, were consistent in appearance, and could be executed simultaneously without additional burden on teachers. A standardized curriculum manual and set of materials (e.g., puppets, books, posters) were created that could be duplicated each year as the program expanded.

The next step was to create an effective training model that prepared teachers to use the combined intervention. The developers spent a significant amount of time integrating their existing presentation and training materials into a single set of training materials, which carefully outlined the rationale for the integrated intervention. Large- and small-group exercises were created to supplement the didactic training sessions. This initial version of the training model was then piloted with teachers in several high-risk K-5 urban elementary schools in Baltimore City.

Following this initial implementation and with feedback from teachers in the form of focus groups, individual interviews, and anonymous questionnaires, the next generation of the training model was developed. Videotaped footage of teachers successfully using the various PATHS to PAX lessons, activities, and practices was incorporated into the next iteration of the training model. Videotaped teacher testimonials of the effectiveness of the GBG and PATHS lessons and practices were incorporated into the final version of the training. During the trainings, teachers also heard from their colleagues who successfully implemented PATHS to PAX in previous years. In addition to sharing experiences, the teachers took questions from the audience regarding implementation and the intervention’s effectiveness. The videotaped examples of PAX-GBG and PATHS practices being successfully

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implemented, the testimonials of their effectiveness, and the teacher panels were all designed to increase teacher self-efficacy consistent with the Han and Weiss model (2005) of the factors influencing teacher implementation of evidenced-based practices. In addition to the integration of the videotaped footage into the training model, the PATHS to PAX curriculum materials were reorganized based on teacher feedback. All of these materials were then made available on the district Web site so that participating teachers could access them following the training for further study at their convenience. In general, all these efforts were aimed at developing a high-quality training model and a set of materials that teachers would find appealing and easy to use and access.

The final step of the integration process was to design a system to monitor the implementation of PATHS to PAX that could be linked to the ongoing professional development support provided by intervention coaches. Several tools were developed to promote high-quality implementation including handouts for teachers regarding essential elements of the intervention, a coach observation rating form to assess quality of implementation, and a written feedback form for coaches to use to communicate with teachers. The written feedback was based on the quality ratings made by the coaches. A technical support model was developed that formalized the use of these monitoring and feedback forms and set benchmarks for implementation quality that could be used to determine the frequency of support provided.

Research on the PATHS to PAX Model—The final step in the integration process was to pilot test the combined intervention and gather feedback from teachers regarding the feasibility and acceptability of the PATHS to PAX model. The success of integrated interventions is not only a matter of improved effectiveness but also depends on avoiding additional burden on implementers. In the pilot study, teachers in Grades K-5 in six schools were trained to use the program and implement it over the course of one school year. Students in the schools were predominantly African American (84% or higher) and economically disadvantaged (90% or higher free lunch eligibility). These institutions were also at risk for reconstitution due to chronic poor academic achievement and/or high suspension rates.

Data regarding satisfaction with the training model and the materials and teacher perceptions of intervention effectiveness were gathered from 73 teachers, in addition to coaches' ratings of teachers' intervention implementation during classroom observations. Nearly 80% of teachers reported that the PAX-GBG was "somewhat easy" or "very easy" to fit into their schedules (Domitrovich, Ialongo, Embry, & Greenberg, 2008). More than 75% of the teachers reported using the GBG at least 2-3 times per week, and about a quarter reported daily use of the PAX-GBG (2-3 times per day, every day of the week). Just over two thirds of teachers reported implementing PATHS lessons (1-2 lessons per week) and practices on a daily basis. Approximately 90% of teachers reported that the PAX-GBG had "a lot" to "a great deal" of impact on student behavior in terms of self-control and attention, and more than 80% of teachers perceived the PATHS lessons to have at least "some" to "a great deal" of impact on student behavior. In terms of coaches' ratings of teachers' skills in implementing the PAX-GBG and PATHS lessons and practices, slightly more than 73% of the teachers were rated by coaches as average to highly skilled in implementing the PAX-

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GBG basics, with only approximately 11% rated as poor. Nearly 75% of the teachers were rated as skilled to highly skilled in terms of teaching the PATHS lessons and practices.

A randomized controlled trial is currently underway that is testing the PATHS to PAX model in contrast to the PAX version of the GBG, and a classroom setting following standard teaching practice. The trial is being conducted in 27 urban elementary schools, which have high rates of student poverty and discipline problems. Both the effects of the combined intervention on students, as well as contextual factors which may influence implementation quality of the models and teacher factors and attitudes (e.g., burden, efficacy, burnout) are being monitored. The effects of the PATHS to PAX model are expected to be greater than those of the PAX-GBG alone because the integrated model targets a broader range of risk and protective factors for children's behavior problems. Both the integrated and the PAX-GBG-only conditions will be compared to those of a set of control classrooms conducting instruction as usual. We are also interested in assessing teachers' attitudes regarding the implementation of the integrated model as compared to the PAX-GBG program.

Distinguishing Integrated Models from Other Innovative Models of Prevention and Early Intervention

It is important to clarify how integrated prevention models differ from other innovative program delivery models, such as tiered approaches (Mrazek & Haggerty, 1994; Prochaska, Velicer, Fava, Rossi, & Tsoh, 2001) or adaptive preventive interventions (Collins, Murphy, Nair, & Strecher, 2005). A critical feature of the integrated model is that commonalities and connections are made between the original programs, such that the resulting model(s) not only uses a similar language and process for implementation but also shares an interwoven theoretical framework. This is different than simply implementing two models using more of an additive or sequential approach. Delivering multiple, uncoordinated interventions likely contributes to the program fatigue and washout noted in several large-scale studies of the programs commonly implemented in schools (e.g., Fixsen et al., 2005; Gottfredson & Gottfredson, 2002).

As mentioned previously, there are both horizontal and vertical forms of integration. Horizontal approaches, such as PATHS to PAX, operate at one risk level within an intervention continuum and attempt to maximize the intervention impact for a particular risk group. A similar and increasingly popular model of program delivery is an adaptive model or dynamic treatment design (Collins, Murphy, & Bierman, 2004). Originating in the prevention or treatment of substance abuse (Breslin et al., 1999; Prochaska et al., 2001; Sobel & Sobel, 2000), these models have more recently been applied to the prevention of disruptive behavior problems in children (CPPRG, 1999a, 1999b; Connell & Dishion, 2006; Dishion & Kavanagh, 2000). Following an adaptive approach, a set of pretreatment individual- and family-level "tailoring variables" are identified and matched with the various components of the intervention to meet the child's specific pattern of needs. Identification of the tailoring variables typically occurs through secondary analysis of intervention trial data and review of the theorized program targets and empirical literature on risk and protective factors. By identifying, *a priori*, which interventions are likely to be most efficacious for

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which individuals under certain contexts, the adaptive or dynamic treatment is hypothesized to optimize program effectiveness and result in higher quality dynamic preventive interventions (Collins et al., 2004, 2005; Murphy, 2006).

Vertical approaches, in contrast, operate at multiple risk levels and attempt to maximize the intervention impact for various risk groups. An added benefit for the most at-risk students is that there is the potential for them to have repeated exposure to the intervention content. The majority of students who are not at risk are exposed to the intervention only at the universal level, but those at high risk whose educational programs are inclusive will receive universal components in addition to the components that are specifically designed for their more intensive needs.

Many adaptive prevention programs are sequential, meaning that discrete programs are administered one after the other in an independent fashion without explicitly forming connections between the programs or their core elements. With the growing interest in schoolwide organizational models, such as Positive Behavioral Interventions and Supports (PBIS; Sugai & Horner, 2006), however, there is an opportunity for integrating the continuum of increasingly intensive prevention programs and services as well as greater horizontal integration across programs. For example, in both the Response to Intervention (RTI) approach (Fuchs, Mock, Morgan, & Young, 2003; Hawken, Vincent, & Schumann, 2008) and PBIS, students who do not respond adequately to a universal prevention program (e.g., PATHS, PAX-GBG, universal system of positive behavior support) would require targeted and/or individually tailored preventive interventions based on systematic assessment of their needs (Sugai & Horner, 2006). Like other adaptive or tiered prevention models, both RTI and PBIS emphasize data-based decision making, continuous progress monitoring, continuum of evidence-based interventions, and monitoring of implementation fidelity. Through review of data at the child, classroom, or school level, other more intensive evidence-based practices or socialemotional learning curricula can be selected to meet the needs of the entire student body or targeted populations.

Within the PBIS framework, there also is an opportunity for vertical integration of programs to meet a range of student social and emotional learning needs. By using a common language, logic, and structure, as well as the existing systems established through the schoolwide PBIS model to implement the other complementary evidence-based practices, the vertically integrated model may result in more sustainable changes in the school environment and optimize outcomes for the student (Osher et al., 2007; Sugai & Horner, 2006). It is important to note, however, that simply implementing discrete, sequential, or parallel programs independent of each other is not considered integrative. Rather, the programs should be integrated with a schoolwide model of support and other programs by using a common language, logic, and structure, as outlined earlier in this article.

One of the earliest examples of a vertically integrated, multicomponent preventive intervention is the FAST Track program (CPPRG, 1999a, 1999b). FAST Track was developed to meet the needs of high-risk children who exhibited elevated rates of problem behavior at home and school during Kindergarten. The students and their families received a combination of five partially integrated interventions that were delivered simultaneously

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during first grade that addressed the majority of the risk factors specified in developmental models of conduct problems. Specifically, FAST Track included a universal, classroom-based social-emotional curriculum and two indicated interventions (one-on-one academic tutoring and small-group social skill training). The families of the children received home visits and participated in parent-training groups. FAST Track not only integrated content across contexts but also vertically integrated intervention strategies across risk levels. Another example of vertical and horizontal integration of evidence-based practices is the Triple P parenting program. Through a multitiered system of support, Triple P has demonstrated population-level benefits (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009).

Similarly, Dishion and Kavanagh (2000) have demonstrated success with the Adolescent Transitions Program school-based model, which provides family-focused services and supports for youth at varying levels of risk for disruptive behavior problems, as indicated by administering the Family Check-up. Through a process of screening and motivational interviewing, family members' mental health and behavioral needs and goals are met through a series of individually tailored programs and services. There also are some large-scale community-level models of adaptive interventions (e.g., Communities that Care; Hawkins & Catalano, 1992) that have demonstrated positive effects on youth outcomes when implemented through a coordinated approach. Taken together, the available research on these innovative delivery models (e.g., integrated, tiered, adaptive) shows promise for the effective prevention of behavioral and other untoward outcomes.

Conclusions and Future Directions

Prevention science is at a crossroads, as the evidence base for the field has reached a point where there are a number of interventions available to address the behavioral and social issues that undermine learning and place students at risk for poor personal and educational outcomes. However, these strategies tend to be delivered in isolation—both in terms of the outcomes they target and the level of risk in participants. Without improved efficiency in the delivery of the extant evidence-based programs, there is little hope that they will be implemented with integrity or disseminated broadly. Furthermore, most prevention programs have only a modest impact on student outcomes (Park-Higgerson et al., 2008). Using integrated models is a potentially efficient strategy to deliver comprehensive interventions that maximize impact.

There are some potential challenges in developing integrated models. For example, program developers must be willing to let go of the original program model, be flexible, and work collaboratively to make the accommodations needed to marry the interventions. Even when developers are open to the process, publication agreements may limit the extent to which the developer is able to act independently and engage in the process. Another potential challenge is creating a combined model that does not compromise integrity or efficacy of the original programs. Given the paucity of component analysis studies, which identify the most efficacious and critical components of interventions (Chorpita, Becker, & Daleiden, 2007), researchers must be guided by theory in selecting which components to retain in isolation or blend between programs, and which to drop.

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Integrated models do, however, provide a potential strategy for leveraging the theory underlying preventive interventions in a way that maximizes intervention effectiveness without overburdening users. Research is needed to confirm this hypothesis, to identify the characteristics of successful integrated models, and to determine whether these models are more likely to be sustained over time. It is equally possible, depending on the nature of the integrated approach, that integrated models may overburden teachers or have iatrogenic effects on students. There is a significant amount of research documenting the complexities and challenges associated with delivering single-intervention models in real-world settings (Domitrovich, Bradshaw, et al., 2008; Flay et al., 2005; Gottfredson & Gottfredson, 2002). These problems could be compounded when multiple interventions are integrated. Through additional research we will be able to isolate challenges unique to the implementation of integrated models from those challenges associated with the implementation of standard school-based prevention programs. Further research is also needed to develop and test effective professional development models of training and support which enhance implementation quality (e.g., coaching); these models will be especially important to test in the context of integrated models of prevention.

Although this article highlighted the PATHS to PAX model as an example of a horizontal integration at the universal level, an important future direction for this approach is the integration of horizontal and vertical strategies. We plan to explore this in our work over the next five years as a part of the work conducted at the Johns Hopkins Center for Prevention and Early Intervention. For example, the PBIS framework described provides an organizational structure for the vertical integration of complementary prevention strategies and programs. Our research team also has been working with the developers of indicated prevention programs, like Coping Power (Lochman & Wells, 2004) and the Incredible Years Program (Webster-Stratton, 1992) to integrate these models with PATHS to PAX in schools that are implementing schoolwide PBIS. We believe that the organizational features of schools implementing schoolwide PBIS with quality (e.g., improved organizational health, communication among staff, and principal leadership; Bradshaw, Koth, Thornton, & Leaf, 2009) will enhance the schoolwide implementation of universal interventions such as PATHS to PAX. The more intensive PATHS to PAX program will likely meet some of the social-emotional skills deficits displayed by children not responding adequately to the universal, schoolwide PBIS model. In addition, the integration of indicated interventions with the universal PATHS to PAX approach will ensure that the more intensive services provided to at-risk students will reinforce the strategies to which they are exposed at the universal level in their classrooms. We hypothesize that the more integrated interventions are across levels, the more likely participants are able to benefit from the more resource intensive universal and indicated preventive interventions.

Although there has been an increase in the identification of evidence-based programs on the elementary-school level, school districts are now also searching for models with a clear scope and sequence from pre-K through Grade 12 (Collaborative for Academic, Social, and Emotional Learning, 2003). At present, the field of prevention science has primarily implemented and assessed specific programs that focus on a relatively narrow age span. There has been comparatively less attention to comprehensive, evidence-based models that span multiple developmental levels. Creating integrated programs that span elementary and

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middle school is another direction for future research. We also plan to spend the next several years developing middle-school versions of PATHS to PAX to extend the elementary model into the middle-school grades, where the risk for engaging in aggressive and delinquent behavior is increased (Moffitt, 2006).

As evidence for the effectiveness of preventive interventions accumulates, so does the research regarding the importance of the proximal targets (e.g., social-emotional learning) in many of these models for academic achievement (Durlak et al., 2008). This has significant implications for urban school reform because achieving the goal of *No Child Left Behind* is impossible unless the mental health needs of all students are addressed. With only so much time in the school day and school year, the effectiveness of these efforts has to be maximized. This maximization requires horizontal, vertical, and developmental integration of prevention efforts, as well as increased collaboration among program developers and greater sustained collaboration between researchers and practitioners to develop, implement, and evaluate these efforts (Greenberg, 2004).

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