Empirically Based School Interventions Targeted at Academic and Mental Health Functioning

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This review examines empirically based studies of school-based mental health interventions. The review identified 64 out of more than 2,000 articles published between 1990 and 2006 that met methodologically rigorous criteria for inclusion. Of these 64 articles, only 24 examined both mental health *and* educational outcomes. The majority of school-based mental health intervention studies failed to include even rudimentary measures of school-related outcomes. Analysis of the 24 studies yielded several key findings: The types of mental health outcomes most frequently assessed included self-, peer-, teacher-, or parent-reported measures of social competence, aggression, or problem behaviors. Academic scores and school attendance were the types of educational outcomes most frequently assessed. The majority of interventions focused on elementary students, had a preventive focus, and targeted prosocial, aggressive, and antisocial behaviors. Only 15 of the 24 studies demonstrated a positive impact on both educational and mental health outcomes, 11 of which included intensive interventions targeting both parents and teachers. The studies that had an impact only on mental health outcomes tended to be less intensive with more limited family involvement. This review discusses the implications of these findings for school-based mental health services and identifies directions for future research.

Despite school-based mental health services existing in virtually all elementary and secondary schools in the United States (Foster, Rollefson, Doksum, Noonan, & Robinson, 2005), the proportion of students in need of services continues to outpace available resources. From a policy and practice standpoint, the uneasy alliance between mental health services and academic programs remains polarized. Psychological, counseling, and support services continue to operate in a fiscally precarious position. From a scientific standpoint, the mental health program and educational achievement knowledge bases have arisen in significant isolation from each other. In fact, the majority of studies of school mental health interventions fail to include even rudimentary measures of school-related outcomes (Hoagwood & Johnson, 2003). As a consequence, the impact of school-based mental health interventions on both mental health and educationally relevant behaviors is poorly understood.

To better understand how mental health concerns could be supported by and integrated within the educational mission of schools, the impact of such interventions on educationally relevant outcomes needs to be better understood. Thus, the goal of this critical review is to examine school-based interventions targeting *both* mental health and academic outcomes. The aim is to document the types of assessments most commonly used to assess both domains of functioning, the types of interventions that yield positive outcomes, and the remaining gaps in the knowledge base so that directions for future research can be more clearly delineated.

Federal efforts to address student mental health needs within school reform initiatives have been supported through several initiatives. The two most prominent are funded by the Office of Adolescent Health within the Maternal and Child Health Bureau (Title V, Social Security Act) of the Health Resources and Services Administration, Department of Health and Human Services. These are two national school mental health centers: the Center for School Mental Health Analysis and Action at the University of Maryland (M. Weist, director) and the UCLA Center for Mental Health in Schools (H. Adelman & L. Taylor, directors). These federally funded programs were created to support innovation in integrating mental health services into schools and promote learning and broader instructional reforms. With the exception of these two centers, however, mental health and education have been categorically, fiscally, structurally, and scientifically separate.

A growing body of empirical literature that includes the results of controlled clinical trials and within-group studies has documented the impact of mental health treatments and other interventions on child and adolescent outcomes. These studies demonstrate that specific treatments are efficacious for most of the common clinical conditions in children (Burns & Hoagwood, 2002, 2004; Burns, Hoagwood, & Mrazek, 1999; Hoagwood & Burns, 2005; Jensen et al., 1999; Kazdin, 2005; Loeber & Farrington, 1998; U.S. Public Health Service, 1999, 2000, 2001a, 2001b; Weisz, 2004; Weisz & Jensen, 1999; Weisz, Weiss, Han, Granger, & Morton, 1995). This is especially encouraging given the high prevalence of psychiatric disorders among children and adolescents (Costello, Foley, & Angold, 2006). Despite the

growing body of knowledge on demonstrably effective services, little is known about the delivery of these interventions in settings where most children are able to receive services—school settings—nor about the impact that these services may have on children's academic functioning (Hansen, Litzelman, Marsh, & Milspaw, 2004). Although there has been some attention given to the importance of specifically assessing academic and social–emotional indicators in evidence-based intervention research (see Kratochwill & Shernoff, 2003; Kratochwill & Stoiber, 2000), the impacts of mental health interventions on academics and of academic interventions on mental health outcomes are understudied.

Researchers have examined the impact of academic interventions on mental health problems in children by studying contextual variables in schools that promote student engagement in learning or academic and social functioning (Christenson & Havsy, 2004). These contextual variables include the policies and practices of the school, relationships among students and family support, and involvement in the school. For example, some studies of school context have examined the nature and degree of family involvement with schooling and have found that positive family–school relationships predict academic competence and positive mental health outcomes (Christenson & Havsy, 2004; Christenson, Rounds, & Gorney, 1992).

The impact of context on intervention outcomes has also been examined in studies that document how interventions that are integrated into classroom curricula, as opposed to adjunctively offered, are associated with more positive child outcomes (Clarke, Hawkins, Murphy, & Sheeber, 1993) and long-term sustainability (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995; Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990; Botvin, Epstein, Schinke, & Diaz, 1994; Greenberg, Kusch, Cook, & Quamma, 1995; Hawkins, Catalano, & Kosterman 1999). Social and academic competence has also been linked in studies of social and emotional learning (SEL; see Zins, Bloodworth, Weissberg, & Walberg, 2004, for a review). The key features of this work, as outlined by Zins et al. (2004), involve several person-centered SEL competencies, including self-awareness, social awareness, responsible decision making, self-management, and relationship management. Because this work takes into account the conceptual framework of the reciprocal relationship between emotional and academic competencies, it provides an important template for measurement of mental health outcomes in schools. This relationship is often referred to as the "reciprocal relation model" and has been supported in a number of research studies. For example, Welsh, Parke, Widaman, and O'Neil (2001) demonstrated the link between social and academic competence through longitudinal research. Specifically, they found that academic achievement directly influences social competence from both first to second and second to third grade, and social competence was reciprocally related to academic achievement from second to third grade. Among the important implications of work in this area is the emphasis on targeting academic competency and social/emotional behavior interventions.

The instructional environment also represents an important school context variable in the link between academic and mental health functioning. Traditionally, school-based intervention programs for disruptive and problematic classroom behavior have focused primarily on social–emotional and behavioral problems. Yet there is increasing empirical support for strategies labeled "proactive classroom management" that focus on preventing problems by promoting positive instructional strategies and modifying various contextual variables for teachers in classroom intervention programs (Gettinger, 1988; Gettinger & Kohler, 2005). Research in this area has pointed to a number of school contextual variables (structural and organizational) that contribute to positive student outcomes, including classroom rules, smooth transitions between activities, beginning of the year management activities, efficient use of learning time, monitoring student performance, teacher communication of awareness of classroom behavior, as well as a variety of teacher instructional variables (Gettinger & Kohler, 2005).

Finally, studies of school climate have examined school ecology as a variable affecting a student's emotional, behavioral, or academic functioning. Although such studies have been rare, a few studies have documented that climate affects self-esteem (Hoge, Smit, & Hanson, 1990), students' motivation to learn (Beane & Lipka, 1984), and students' attitudes about aspects of school life. Rutter, Maughan, Mortimore, Ouston, and Smith (1979) in an observational study of school "ethos" involving approximately 1,500 children found that aspects of the internal organization of schools most directly affected four key outcomes: attendance, behavior, school attainment, and delinquency. A study by Esposito (1999), for example, found that school climate, as reported by parents, predicted children's school adjustment.

Despite studies of school context and its effect on both learning and mental health, the numerous reviews of evidence-based or empirically validated school-based mental health practices have largely ignored academic functioning as an outcome of interest. In fact, the evidence-based practice "movement" in mental health as applied to schools has operated in relative isolation from both educational research and from the key policy and practice issues that drive school ecology (Atkins, Graczyk, Frazier, & Adil, 2003; Frazier, Cappella, & Atkins, 2007). Perhaps this disconnect has some bearing on why the empirical knowledge on effective mental health interventions remains peripheral to school policy making or practice.

To begin to address this gap, we sought to review the scientific literature to identify empirically based interventions that targeted *both* academic/educational and mental health functioning in schools. The purpose of this review is to describe and critically synthesize the empirical base on school-based mental health interventions, paying particular attention to the subset of studies that focus on both mental health and academic/educational outcomes. In documenting the existing knowledge base, the aim is to identify research directions for future studies of school-based mental health services.

METHOD

Using the search engines of Medline, PsycINFO, and ERIC, both mental health and academic literature were thoroughly searched for peer-reviewed articles and other reports that examined the effectiveness of school-based mental health programs. Key words used in the searches were mental health, emotional/behavioral problems, academics, educational outcomes, achievement, school-based programs, school-based health, prevention, treatment, children, and adolescents. In addition, experts in the field were contacted to obtain information on any recent research. Experts were nominated by the National School Mental Health Alliance and were then contacted by the first author to determine if other studies meeting criteria existed. This was accomplished via e-mail correspondence.

To be included in the review, studies had to use a prospective, longitudinal design, with either random assignment or a quasi-experimental comparison. They also had to be published between 1990 and June 2006. In addition, the intervention being evaluated had to have taken place in a public school. School-based programs included a wide variety of services, and some involved both students and their families. Mental health outcomes were defined broadly to include behavioral issues, emotional problems, impaired functioning, or psychiatric diagnoses. Educational outcomes consisted of students' academic progress (e.g., grades, special education placement) as well as their functioning (e.g., attendance, suspensions) within the school.

RESULTS

Although more than 2,000 articles were identified from the initial search, only 64 studies met the previously mentioned criteria for inclusion in this review. Of the 64 studies, 24 (37.5%) tested the effects of a program on both academic and mental health outcomes and 40 (62.5%) examined mental health outcomes only. Figure 1 illustrates the results of applying the chosen criteria. Table 1 summarizes the 24 studies that targeted both mental health and academic outcomes, the focus of this article. The table outlines the study design, target population, length of intervention, the intervention components, and measures used to assess educational and mental health outcomes. Positive academic and mental health outcomes are highlighted. The 40 studies examining mental health outcomes are not discussed in this article (see Note). Fifteen of the 24 studies (62.5%) that examined both academic and mental health outcomes found a statistically significant effect on both; 8 (33.3%) found the program to improve mental health but not academic outcomes, and 1 (4.2%) found no significantly positive effect on either mental health or educational outcomes.

Mental Health and Academic Measures

Table 1 highlights the variety of self-, peer-, teacher-, or parent-reported measures that assess social competence, aggression, and antisocial or other problem behaviors. As is common in reviews of child mental health research (Jensen, Hoagwood, & Petti, 1996; Lahey, Hart, Pliszka, Applegate, & McBurnett, 1993), the use of multiple informants invariably yields incongruent results. For example, in two studies in which teachers reported changes in behavior, parents reported no significant change (Catalano, Mazza, & Harachi, 2003; Ialongo et al., 1999). With a few exceptions (e.g., Bloomquist, August, & Ostrander, 1991; Boyle et al., 1999; Conduct Problems Prevention Research Group [CPPRG], 1999; Hundert et al., 1999; Tremblay, Pagani-Kurtz, Masse, Vitaro, & Pihl, 1995; Walker et al., 1998), cost and time limitations prohibited the use of direct, independent observations. Yet, the importance of such independent direct observations is underlined in a couple of studies in which prosocial or disruptive behavior changes were found only from direct and independent observations by raters (Bloomquist et al., 1991; Hundert et al., 1999). Standardized instruments employed to measure significant changes in behaviors included the *Child Behavior Checklist* (Teacher and Parent versions; Achenbach, 1991a, 1991b; Achenbach & Edelbrock, 1983), the *Teacher Observation of Classroom Adaptation* (Werthamer-Larsson, Kellam, & Ovesen-McGregor, 1990), the *Teacher–Child Rating Scale* (Hightower et al., 1986), the *Behavior Assessment System for Children* (Reynolds & Kamphaus, 1992), and the *Behavioral and Emotional Rating Scale* (Epstein & Sharma, 1998). Computerized behavioral tracking systems or disciplinary records were also used to track behavioral outcomes.

Table 1 also highlights the variability of educational outcomes used. Educational outcomes that were most frequently assessed in these studies were grades, reading and math scores,

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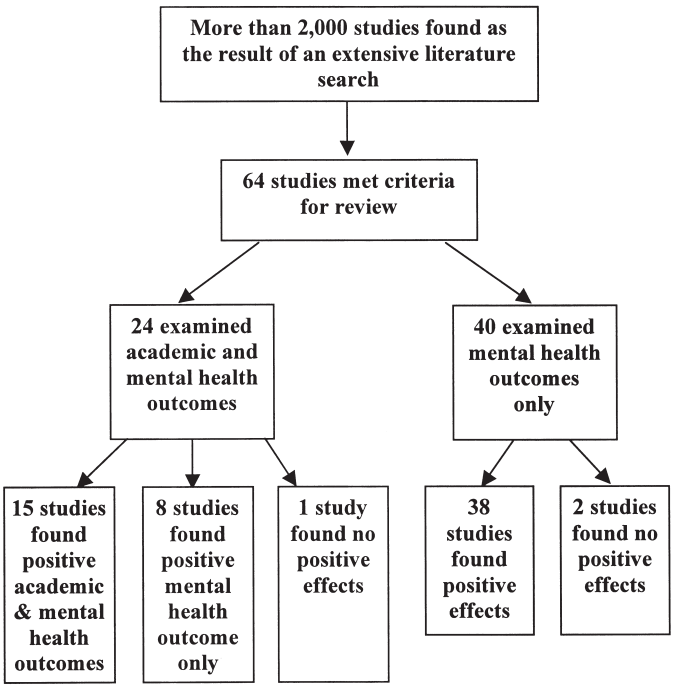

FIGURE 1: School-based mental health programs review flow chart.

TABLE 1
School-based Mental Health Programs That Measured Both Educational & Mental Health Outcomes

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Programs w/ Positive Impact on Educational & Mental Health Outcomes (15 programs)							
Arbuthnot, 1992	Social Moral Reasoning Development Program	RCT: trmt. vs. waitlist control, postintervention & 1-yr. follow-up	48 students (Grades 7–10) from 4 school districts, teacher-nominated as seriously behavior disordered, matched on school adjustment index score, & randomly assigned to trmt. or control groups	***Intervention:*** 45-min. wkly groups lasting 16–20 wks; listening & communication skills, dilemma discussions & role plays that required participants to examine reasoning of others, anticipate consequences, & see dilemma from viewpoint of all characters & community at large	• ***Moral reasoning:*** global stage score & moral maturity score • ***Antisocial behavior:*** disciplinary referrals to school office (trips to principal's office, corporal punishment, in- & after-school detentions, expulsions), police/court contacts • ***School behavior:*** tardiness & absenteeism • ***Academic performance:*** school grades	• ***School behavior:*** trmt. group less tardy postintervention; at 1-yr. follow-up, tardiness & absenteeism rates lower in trmt. group than control group • ***Academic performance:*** trmt. group showed improvements in English & humanities class grades; control grades declined; grades continued to diverge between groups at 1-yr. follow-up	• ***Antisocial behavior:*** trmt. group had significant declines in disciplinary referrals & police/court contacts; control group had slight increases post-intervention. At 1-yr. follow-up, disciplinary referrals among control group more than doubled; trmt. group gains maintained
Catalano et al., 2003	Raising Healthy Children	RCT: exper. vs. trmt. as usual (4 data points spanning 18-mo intervention period)	10 schools: 5 exper., 5 controls (938 students in Grades 1 & 2)	Universal intervention targeting socialization in classrooms, families, & peers • ***Teachers:*** classroom management workshops, booster sessions, & coaching	• ***Academic performance***: teacher & parent reports on academic performance & school commitment (2 items: [1] Student wants to do well in school [2] Student tries hard in school)	Teachers & parents reported improved commitment to school; teachers reported improved academic performance	Teachers reported improved social competence & decreased antisocial behavior

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Catalano (cont.)				• ***Parents:*** workshops & in-home training • ***Students:*** summer camps & in-home services	• ***Behavior:*** Teacher & parent reports on social competency scale & antisocial behavioral scale (TOCA-R & CBCL); child self-report		
Conduct Problems Prevention Research Group, 1999, 2002, 2004	Fast Track	4-site RCT: longitudinal follow-up (at end of Grade 1, Grade 3, & Grades 4/5)	54 elementary schools (27 exper., 27 control); 891 (3 cohorts) children w/ behavioral disruptions (445 children in 191 exp. classrooms, 446 children in 210 control classrooms)	Universal & indicated intervention components addressing antisocial behavior, Grades 1–10, w/ heavier program concentration in first 2 yrs. elementary school & at transition to middle school • ***Teacher Intervention:*** curriculum-based lessons & behavioral consultation on emotion recognition & communication skills, friendship skills, self-control skills, & social problem-solving skills	• ***Social cognitive skills:*** *Emotion Recognition Questionnaire; Interview of Emotional Experience; Social Problem-Solving Measure; Home Inventory With Child* • ***Reading achievement:*** *Diagnostic Reading Scale, Woodcock-Johnson,* school records (special ed. services, retention, failure in reading/math) • ***Social competence & peer relations:*** *Social Competency Scale*; peer nomination • ***Parenting behavior & social cognition:*** *The Parent Questionnaire* (self-report); *Parent–Teacher*	• ***Achievement:*** improved language arts grades & word skills at end of Grade 1; effects disappeared by Grade 3; intervention children continued to use fewer special ed. services through Grade 3; effects disappeared by end of elementary school • ***Parental school involvement:*** increased at end of Grade 1; effect disappeared by Grade 3; no significant effects evident by end of elementary school	• ***Children's social cognitive skills & social competence:*** peers & observers reported improved coping & social problem-solving skills, increased positive peer relations, & higher peer social preference at end of Grade 1, which were evident (but diminished) through end of elementary school • ***Parenting behavior:*** more appropriate & consistent discipline (less physical), more positive involvement & change in parenting, increased satisfaction & ease of parenting at end of Grade 1; only self-reported improvements in parenting

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Conduct Problems (cont.)				• ***Parent training:*** parent groups, parent–child sharing time, & home visits • ***Child intervention:*** social skills training & child–peer pairing, academic tutoring	*Involvement Questionnaire*–Parent & Teacher versions; *Developmental History Interview* (used to derive *Physical Punishment Scale*); ratings of parent change (self-report); parent satisfaction questionnaire • ***Parent–child interactions:*** *Parent–Child Interaction Task* (Behavior Coding System); *Coder Impressions Inventory; Interaction Rating Scales* • ***Child behavior:*** CBCL–Parent & Teacher (Externalizing scale), PDR, parent ratings of child behavior change; TOCA-R (Authority Acceptance scale); teacher ratings of child behavior change; school observations (at end of Grade 1 only); DISC-2 (ODD/CD)–follow-up only		behavior & endorsement of less physical discipline at end of Grade 3 • ***Child behavior:*** fewer aggressive behaviors based on school observations only at end of Grade 1; teachers & parents reported fewer aggressive–disruptive behaviors by Grade 3 • ***Serious conduct dysfunction:*** 37% intervention vs. 27% control children free of diagnosis of serious dysfunction by Grade 3; by Grade 5, intervention children less likely to be involved w/ deviant peers, had lower rates of serious conduct problems in home/community; no effect on school behavior

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Dolan et al., 1993; & Kellam et al., 1994 (follow-up to middle school)	Good Behavior Game (GBG) & Mastery Learning (ML)	RCT: GBG vs. ML (active control) vs. no intervention; postintervention & 6-yr. follow-up	864 students in Grade 1 from 19 Baltimore schools (8 GBG vs. 6 internal control (same school) classrooms; 9 ML vs. 7 internal control classrooms; 12 external control classrooms)	2-yr. classroom-based universal preventive interventions: GBG– aimed at reducing aggressive & shy behaviors through behavior management in classrooms; ML– aimed at increasing reading achievement to reduce depressive symptoms	• ***Child behavior:*** teacher ratings of aggressive & shy behaviors based on TOCA-R, peer nominations of aggressive & shy behaviors based on PAI • ***Achievement:*** CAT (Reading)	• ***Reading achievement:*** ML benefited boys at lower end of achievement continuum & girls at higher end of achievement continuum. (Overall specificity of interventions on proximal targets in short term; ML improved shy behavior in girls only as rated by teachers; otherwise, GBG did not directly affect achievement & ML did not directly affect aggression)	• ***Aggressive behaviors:*** teachers reported decline in aggressive behavior in boys & girls, w/ greater impact for students who started w/higher teacher ratings of aggressive behavior; peers reported decreased aggression in boys who started w/ higher peer nominations of aggressive behavior. 6 yrs. later, effects of GBG held only for boys w/ higher levels of aggression in Grade 1; GBG exposure in 1st grade did not protect boys who were not aggressive from becoming aggressive later • ***Shy behaviors:*** teacher reported decrease in shy behaviors for both boys & girls; peers reported decrease in shy behavior (specifically has few friends) for girls only

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Elias et al., 1991	Improving Social Awareness–Social Problem Solving Project	Quasi-exper.: high-fidelity exper. group (E1) vs. moderate fidelity intervention group (E2) vs. control group; 4- to 6-yr. follow-up	2 E1 vs. 2 E2 schools: students in Grades 4 & 5 w/ social problem solving in last 2 yrs. of elementary school	Prevention program: 2 yr. teacher-implemented social competence curriculum (decision-making, self-control, group participation, & social awareness)	• ***Antisocial & delinquent behavior:*** NYS (35 items: Elliot et al., 1983), CBCL-Youth Self Report • ***Self-efficacy:*** PCS-C • ***Academic:*** CTBS	Improvement in overall achievement, but language & math only in group that received high level of training, compared to no intervention; differences did not last over time when districts' remedial procedures instituted	No effect of intervention fidelity; pattern of results differentiated 2 exp. groups from controls • ***Boys:*** increased prosocial behavior, decreased antisocial, self-destructive, & socially disordered behaviors; decreased vandalism, self-destructive/ identity problems & alcohol-related problems • ***Girls:*** increased social competence & self-efficacy & decreased tobacco use
Flay et al., 2001	Positive Action (PA) Program	Quasi-exper.: PA schools vs. matched controls vs. all non-PA schools in district	Nevada (NE; 13 schools) & Hawaii (HI; 8 schools) D13	Integrated comprehensive, holistic approach to school reorganization, teacher–student relationship, parent involvement, instructional practices, & development of self-concept. Classroom (K–Grade 6) curriculum; school climate program to	Data based on school archival data • ***Achievement:*** CTBS (NE), SAT (HI) • ***Disciplinary data:*** student-to-student violence, student-to-staff violence, possession of weapons (NE), felonies, misdemeanors, department & school rules (HI)	Improvement in math, reading language; absenteeism marginally decreased in 1 district	Fewer behavioral incidents requiring disciplinary referral or suspensions; 1 district: fewer violent acts & marginal decrease in weapon use

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Flay (cont.)				reinforce curriculum learning; parent- & community-involvement activities			
Gottfredson et al., 1993		Quasi-exper.: nonequivalent control group (6 exper. & 2 comparison schools, which were exposed to the computerized behavior tracking system only)	8 public middle schools	2-yr. comprehensive intervention involving school, classroom, & individual interventions aimed at reducing misbehavior; included [1] school discipline policy review & revision, [2] computerized behavior-tracking system (BTS), [3] classroom management, & [4] positive reinforcement, w/ special assistance targeted at high-risk students.	• ***Student behavior:*** ESB, student questionnaire, teacher ratings, CEA for students & teachers. • ***School climate:*** ESB (clarity of rules, fairness of rules, respect for students) • ***Classroom climate:*** Student CEA. • ***Student experiences:*** ESB • ***School discipline records:*** suspensions & disciplinary referrals (not included in final analysis, when reports from BTS revealed dramatic shifts in rates associated w/ changes in administration)	• ***School climate:*** High-implementation schools showed changes in 3 indicators (respect, clarity, fairness); report of rewards increase in all schools; students reported declines in levels of punishment in high implementation schools. • ***Classroom climate:*** Treatment schools improved on student-reported classroom order, organization, & rule clarity; order & organization mostly carried by trmt. schools	• ***Student behavior:*** Teacher-rated increase in attentiveness (high-implementation schools only) & decrease in disruptive behavior (high- & medium-implementation schools); student report of rebellious behavior increased in medium-implementation schools & comparison schools

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Gottfredson et al., 2002	Social problem-solving curriculum	Quasi-exper.: trmt. vs. WL control (trmt. in 2 phases—fall & spring—w/ some of fall control receiving trmt. in spring)	Students in Grades 7 & 8 in disorganized inner-city middle school (97 trmt. vs. 158 controls)	Social skill classes taught by graduate students in psychology, 2 days/wk in fall (1st iteration) & spring (2nd iteration) w/ different students: 27 lessons focused on social competency skills, involved role-playing & skill practice	• ***Student behavior:*** *Walker-McConnell, What About You* self-report questionnaire on drug use & risk & protective factors • ***Academic/school outcomes:*** social skills class attendance & school attendance	• S***chool attendance:*** fall trmt. group more tardy & more likely to be absent but more likely to remain in school; similar finding for spring trmt. vs. control group	• ***Student behavior:*** Compared to control, fall trmt. group self-reported significantly less rebellious behavior, less victimization, & increased positive peer association; no differences found in spring iteration due to poorer implementation
Hawkins et al., 1999	Seattle Social Development Project	Quasi-exper.: 6-yr. follow-up of children who got full intervention (Grades 1–4 & 5–6) vs. late intervention (Grades 5–6 only) vs. control (no intervention)	598 students in Grade 5 in 18 Seattle public schools	Universal intervention in selected schools in high-crime neighborhoods to increase school bonding & academic success & prevent range of health-risk behaviors. • ***Teacher intervention:*** yrly in-service training on proactive classroom management, interactive teaching, & cooperative learning	• ***School bonding, success/failure, misbehaviors:*** group-administered questionnaire, children; individually administered interview; school disciplinary action reports • ***Delinquency, substance use, & sexual behavior:*** juvenile court record; group-administered questionnaire, children; & individually administered interview • ***Achievement:*** CAT, GPA	• ***Dose effects:*** full intervention (but not late intervention) group showed significant positive effects on school bonding, achievement, & behavior; full intervention more effective for poor than middle class for school attachment & grade repetition; greater effect on grade repetition for boys than girls; no sig. effect on test scores or dropout rates	• ***Dose effects:*** full intervention group showed decrease in self-reported violent delinquent acts, heavy drinking, sexual intercourse, multiple sex partners; no sig. effects for nonviolent delinquency, self-reported arrests, juvenile delinquency, drug use, marijuana use, cigarette use, pregnancy; but more effective at reducing pregnancy & parenthood among middle class than poor, more effective in reducing sexual activity among boys than girls

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Hawkins (cont.)				• ***Parent intervention:*** Developmentally appropriate child management classes • ***Child intervention:*** Cognitive & social skills training, interpersonal cognitive problem solving			
Ialongo et al., 1999	Classroom-Centered (CC) & Family–School Partnership (FSP)	RCT: CC vs. control & FSP vs. control	678 students in Grade 1 & families in 9 Baltimore public schools	Universal interventions on risks for substance abuse, affective & conduct disorders • ***CC:*** enhancements; teacher behavior management & skills; backup strategies • ***FSP:*** training teachers in parent–teacher communication & partnership; parent workshops on strategies	• ***Child behavior:*** PAI, POCA, TOCA-R • ***Achievement:*** CTBS	CC boys had higher reading & math scores than control group; CC girls had higher math achievement; FSP boys had improved reading but not math (*Note:* downward trend in achievement from Grade 1 to 2, suggesting lack of maintenance of gains)	• ***CC & FSP:*** Fewer teacher-rated problem behaviors, benefit greatest for CC children w/moderate problems at baseline; fewer peer ratings of aggression among boys (*Note:* behavior gains maintained from Grades 1 to 2 for CC group)

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Klein, 2004	Reaching New Heights	RCT (of classrooms): immediate intervention vs. delayed intervention control group. Pre–post + 6-mo follow-up	62 middle school gifted children (Grades 6 & 7) in 3 Midwestern schools (2 classrooms from each)	13 sessions of 50-min. prevention program (once/wk), led by researcher & an undergraduate student, targeted at increasing stress management skills & decreasing perfectionism, levels of academic anxiety & social anxiety; improve children's self-efficacy to implement successful solution to stressful situations; increase students' effectiveness in coping w/ academic & social stressors	• ***Social anxiety:*** self-rating of social anxiety, SASC-R • ***Academic anxiety:*** self-rating of test anxiety, TASC • ***Perfectionism:*** self-ratings on MPS • ***Social & academic stressors:*** checklist of stressors rated on 5-point scale • ***Perceived coping effectiveness:*** self-rating for each stressor listed • ***Self-efficacy for coping:*** Self-rated scale developed for the study • ***Problem solving skills:*** measured by researcher-designed vignettes • ***Teachers' ratings:*** using TCRS (including Problems subscales: Anxious–Shy & Learning Problems, & 3 competency subscales:	No effects on teachers' adjustment ratings postintervention; at follow-up: continuous improvement on total school-problem & school-competencies teacher-rated scores; students displayed fewer difficulties in school (on the anxious-shy & learning problems scales)	• ***Problem solving:*** improved problem solving skills for the immediate intervention group was found at post but was not maintained at follow-up • ***Social & academic stressors:*** Children in the delayed intervention group improved after receiving the intervention; delayed continuous improvement found for immediate intervention group • ***Teachers' competency scores:*** immediate intervention group improved significantly more & displayed greater competency in school-related tasks, including frustration tolerance, assertiveness, & task orientation.

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Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Klein (cont.)					Frustration, Tolerance, & Assertive Social Skills; Task Orientation; & Peer Social Skills; teachers provided global ratings of social & academic adjustment		
Nelson et al., 2002	Comprehensive School-Based Program	Quasi-experi.: 7 participating (exper.) vs. other nonparticipating schools	35 elementary schools (including cohort of target vs. criterion children in the 7 participating schools)	2-yr. universal, selected, & indicated interventions for disruptive behaviors consisting of 5 elements: [1] School-wide Program; [2] ecological arrangements in school; [3] behavioral expectations, discipline policies, & procedures; [4] one-on-one tutoring in reading, family management, conflict resolution; [5] individualized function-based behavioral interventions & support	• ***School climate:*** administrative disciplinary actions (suspensions, emergency removals, office referrals), *Student Safety Survey* (26-item self-report measure on safety, relationships, & social competence) • ***Academic achievement:*** CTBS, WJ-R, WASL • ***Social competence:*** BERS • ***Consumer satisfaction:*** Teacher satisfaction w/ project	• ***School climate:*** consistent declines in suspensions, emergency removals, office referrals • ***Academic achievement:*** improved reading, language, arts, spelling, science, social studies (CTBS), improved reading & math (WASL), & improved scores on broad reading, dictation, & calculation (WJ-R) • ***Consumer satisfaction:*** teachers reported that techniques & strategies were easy to use, addressed educational needs, & would recommend project to other teachers	• ***Social competence:*** Significant improvement on BERS

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(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Pedro-Carroll et al., 1999	Children of Divorce Intervention program	Quasi-exper.: 2-yr. follow-up: program participants vs. divorce controls vs. non-divorce controls	102 students in kindergarten & Grade 1 from 5 schools; 77 analyzed at 2-yr. follow-up due to attrition	12-session group-based prevention program including support & coping skills w/ 5 objectives: [1] foster supportive group environment, [2] facilitate identification & appropriate expression of divorce-related feelings, [3] promote understanding of divorce-related concepts, [4] encourage exploration & clarification of divorce-related misconceptions, [5] teach competencies & enhance perceptions	• ***Child behavior & emotions:*** TCRS (Part 1–acting out, shy/anxious, learning problems; Part 2–frustration tolerance, adaptive assertiveness, peer social skills, & task orientation); *Parent Evaluation Form* (parent rating of child's general adjustment); Children's *Family Adjustment Scale* (child's perception); STAIC; structured parent interview focused on child adjustment & coping • ***School records:*** days absent, times tardy, visits to school nurse or health office for somatic complaints	No differences found on school attendance across groups, but divorce intervention group had fewer frequent nurse visits than divorce controls; divorce controls had more tardiness than intact family children	At postintervention & follow-up, teacher reported gains in school-related competencies (frustration tolerance, social assertiveness, peer sociability) & decrease in problem behaviors among intervention group compared to divorce control group; parent & child reported improved child adjustment (e.g., increase in children's problem-solving & coping skills & ability to handle divorce-related concerns; decreased anxiety, self-blame, somatic symptoms; increased self-confidence); divorced control children reported higher anxiety levels
Tremblay et al., 1995	Montreal Longitudinal-Exper. Study	RCT: mid-adolescent follow-up: intervention vs. attention-control vs. no intervention control	243 disruptive kindergarten boys from disadvantaged urban families screened from 53 schools	• ***2-yr. prevention program:*** home-based parent-training & school-based social skills development for children (trmt. started at age 7, ended at age 9)	• ***School adjustment:*** placed out of gen. ed. class for age • ***Disruptive & delinquent behavior:*** teacher ratings of disruptive behaviors, self-reported juvenile delinquency, juvenile court records	• ***School adjustment:*** treated boys more likely to be in age-appropriate class during elementary school yr.; effect disappeared by age 15	Treated boys reported fewer delinquency incidents at ages 10–15 yrs., but court records showed no difference in extreme delinquent behavior

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Tremblay (cont.)					• ***Parenting behavior:*** child perceptions of parenting behavior		
Walker et al., 1998	First Step to Success	RCT: exper. vs. wait-list control; 1- to 2-yr. follow-up	46 kindergartners who were antisocial & their families	• ***Prevention of antisocial behavior:*** 3-mo. school-based intervention (Contingencies for Learning Academic & Social Skills Program) using curriculum for children w/ conduct disorder; • ***Home (home-Base) components:*** 6 lessons designed to enable parents to build child competencies & skills	• ***Child behavior:*** teacher ratings of adaptive & maladaptive behaviors, CBCL (teacher report on Aggression & Withdrawn subscales) • ***Academic engagement:*** AET observations	Improvement on AET	• ***Child behavior:*** decreased aggression on CBCL, increased teacher-rated adaptive behavior & decreased maladaptive behavior
Programs w/ Positive Impact on Mental Health Outcomes Only (8 programs)							
Bloomquist et al., 1991	School-based CBT for children w/ ADHD	Quasi-exper.: multicomponent CBT; teacher-only intervention vs. control; 6-wk follow-up	52 children w/ ADHD from 3 elementary schools (2 exper. & 1 control)	Multicomponent CBT • ***Child component:*** 20-session group CBT w/training in	• ***Child behavior:*** Structured behavioral observations, CTRS, SCRS, PHCSCS, *Walker-McConnell*	No effect on school adjustment	Reduction of disruptive behavior postintervention based on classroom observation only; effect disappeared on follow-up

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Bloomquist (cont.)				recognizing problems, generating alternative solutions, thinking of consequences, anticipating obstacles, executing behaviors • ***Teacher component:*** one 2-hr. inservice & six 45- to 60-min. consultations over 10 wks • ***Parent component:*** seven 90-min. sessions to provide education on ADHD, establish trust & support, intensive training on cognitive-behavioral & behavioral principles			
Hains & Ellmann, 1994	Stress Inoculation Training	RCT: exper. vs. wait-list control groups; 2-mo follow-up	21 high school students	Prevention intervention to reduce negative emotional arousal in response to stress:	• ***Psychological states:*** STAI, STAXI, RADS, APES, physical health, negative stress events	No improvement in GPA or school attendance	Reductions on Anxiety, Depression, & Anger self-report scales, especially in youth who were in high emotional arousal;

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Hains & Ellmann (cont.)				13 sessions of 50 min (3-phase model): conceptualization, skill acquisition (cognitive restructuring, problem solving, & anxiety management training), skill application	• ***School reports:*** school absences, GPA		no improvements in physical health problems, self-reports of total, daily, & major negative stress events
Hundert et al., 1999/ Boyle et al., 1999	Social Skills Training (SS) vs. Partner Reading (RE) vs. SS + RE	RCT–SS vs. RE vs. SS + RE vs. comparison schools; 1.5- to 3.5-yr. follow-up	60 schools (schools randomly assigned to one of the intervention conditions; K–Grade 3; 1,423 exper. vs. 1,016 control children)	Universal intervention: Classwide SS program, RE program: a 12-wk & an 8-wk session of partner reading at school & home	• ***Child behavior:*** observations of playground (partial interval procedure, behavior codes by Ollendick et al.) & classroom behavior, (CISSAR), parent- & teacher-rated externalizing problems (35-item questionnaire to assess *DSM–III–R* ADHD, ODD, & CD) • ***Social skills:*** SSRS • ***Achievement:*** WRAT-R	No effect on reading	Improved prosocial behavior on playground (diff btwn program schools & no intervention schools, no difference by program type); decrease in teacher-rated externalizing problems in SS + RE schools; decrease in parent-rated externalizing problems in SS schools
King & Kirschenbaum, 1990	Wisconsin Early Intervention	RCT: Parent/ teacher consultation vs. + social skills (SS) vs. parent–teacher consultation only	2 rural elementary schools, intervention conditions nested within schools (135 students in Grades K–4)	Intensive 4-mo program for children at risk for social adjustment problems	• ***Child behavior/social skills:*** Teacher–Child Rating Scale, CBCL–Parent; Aide Child Rating Scale	No effect on learning skills	Only full intervention students had less depressed mood. SS group leader rated these children as having greater

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
King & Kirschen-baum (cont.)				• ***School A:*** consultation to parent/teacher + SS groups; parent/teacher consultation only • ***School B:*** parent–teacher consultation only, no services	• ***Depression:*** CDRS-R • ***Learning skills:*** TCRS learning skills & task orientation		initiative/participation & self-confidence
Kiselica et al., 1994	Stress Inoc-ulation Training	RCT: Exper. vs. attention con-trol; 4-wk follow-up	48 Grade 9 White stu-dents from a public high school in a rural community	Prevention inter-vention, including eight 60-min train-ing sessions on stress inoculation & assertiveness (to cope w/ external stressors, such as peer pressure); control condition: guidance classes	• ***Adolescent anxiety & psychosocial adjustment:*** STAI A-TRAIT, *Symptoms of Stress Inventory* • ***School achievement:*** GPA	No effect on GPA	Exper. group had lower anxiety & stress symptoms
Lochman et al., 1993	Social rela-tions train-ing program	RCT: Aggressive, rejected inter-vention (ARI) group vs. re-jected only in-tervention (RI) group vs. 2 con-trol groups; 1 yr. follow-up	52 African American inner-city Grade 4 chil-dren who were socially rejected	Combination of in-dividual (26 ses-sions) & group social relations training (8 ses-sions), including so-cial problem solv-ing, positive play training, group-entry skill training,	• ***Child behavior & self-concept: PCS-C:*** (General Self-Worth scale), peer nomina-tion & rating variables (social preference, aggression, prosocial behavior, social accept-ance), *Teacher Behavior Checklist* (aggressive	No effects on academic difficulties	Decreased aggression & social rejection; increased social acceptance among aggressive & rejected children postintervention & at 1-yr. follow-up; no differences between rejected-only inter-vention & control chil-dren; teacher ratings

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Lochman (cont.)				& dealing with strong negative feelings	behavior, prosocial behavior, academic difficulties & rejection by peers)		similar to peer ratings (*Note:* unexpectedly, intervention group children reported lower self-worth scores postintervention; interventions showed specific direct effects rather than nonspecific effects [i.e., on ARI but not RI group]); at follow-up, intervention more effective in children w/ fewer academic problems, suggesting higher cognitive capacity may be necessary for cognitive aspects of intervention program & for long-term gains
Stein et al., 2003	Cognitive behavioral intervention for trauma in schools	RCT: early intervention vs. wait-list delayed intervention group, compared at 3 & 6 mos	2 middle schools: 126 students w/ exposure to violence, PTSD symptoms were not disruptive	10-session group cognitive–behavioral therapy to address symptoms of PTSD, anxiety, & depression related to violence exposure	• ***Child symptoms/ behavior:*** *Child PTSD Symptom Scale,* CDI, PSC, TCRS	No change in teacher-rated learning problems	Decreased PTSD scores, depression, parent-rated psychological dysfunction; no change in teacher-rated classroom behavior
Weiss et al., 2003	RECAP	RCT: trmt. vs. no trmt. control; 1-yr. follow-up	93 children with externalizing & internalizing problems from 3 elementary/middle schools	RECAP intervention program (9-mo academic yr.)	• ***Child behavior & symptoms:*** CBCL (Parent, Teacher & Self-Report), TBQ, peer-report measure	No effects on grades or attendance found	Teacher, Self, & Parent Report: improvement in internalizing behavior; Teacher, Peer, & Self Report: improvement in

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Weiss (cont.)				• ***Child component:*** includes social skills training, reattribution training, communication skills, self-monitoring & self-control improvement, affect recognition, & expression & relaxation • ***Teacher & parent components:*** include using appropriate praise & punishment, improving adult–child communication, strengthening adult–child relationship, supporting children in their use of RECAP skills	of internalizing & externalizing, STAIC, *Vanderbilt Depression Inventory,* child school behavior questionnaire (adapted from TBQ) • ***Parent symptoms:*** BSI, *General Severity Index* • ***Academic/school outcome:*** GPA, school attendance records • ***Consumer satisfaction:*** parents in trmt. group completed measure of satisfaction & global perceptions of child's improvement in academic & mental health domains		externalizing behavior; reduction in peers' negative attitudes toward trmt. children (*Note:* although very high, parent satisfaction not correlated to parent ratings of child psychopathology)
Program w/ No Significant Impact (1 program)							
Braswell et al., 1997	Multi-component competence enhancement	RCT: MCEI vs. information/ attention control (IAC); 1- & 2-yr. follow-up	6 elementary school districts (3 MCEI vs. 3 IAC) with 309 children who were disruptive & 144 nondisruptive	• ***MCEI:*** children participated in 18 school-based training group sessions of	• ***Child behavior:*** BASC Teacher & Parent Rating scales, self-report of personality; CTRS; *Problem Solving*	No difference in school problems	No significant differences were found in mental health outcomes

(table continues)

(Table 1 continued)

Author	Name	Design	Units of allocation/ population	Intervention components (length of intervention)	Outcome measures	Educational outcomes	Mental health outcomes
Braswell (cont.)	intervention (MCEI)		children as normative comparison	45–60 min—taught social skills & problem solving, anger management; parents had 15 group sessions of 2 hrs; teachers had 3 in-service sessions of 2 hrs & 14 training sessions of 45 min on information on ADHD, behavioral contingencies, & problem-solving methods • ***IAC:*** information & expectancy control for parents & teacher, but children had no direct intervention	*Rating Scale;* structured behavioral observations in classrooms (*Behavior Coding System* modified by Abikoff et al. & Horn et al.) • ***Family/parent factors:*** BASC Parent Personality Profile, Parent Locus of Control, Behavioral Management Self-Assessment • ***Adjunctive treatment:*** Health survey questionnaire to document other trmt. & traumatic life events		

Note. AET = academic engaged time; *DSM-III-R* = *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* (American Psychiatric Association, 1987); exper. = experimental; PTSD = posttraumatic stress disorder; RCT = randomized controlled trial; trmt. = treatment; ***Test abbreviations:*** APES = *Adolescent Perceived Events Scale*; BASC = *Behavioral Assessment System for Children*; BERS = *Behavioral & Emotional Rating Scale*; BSI = *Brief Symptom Inventory*; CAT = *California Achievement Test*; CBCL = *Child Behavior Checklist*; CDI = *Child Depression Inventory*; CDRS-R = *Children's Depression Rating Scale–Revised*; CEA = *Classroom Environment Assessment*; CISSAR = *Code for Instructional Structure and Student Academic Response*; CTBS = *Comprehensive Test of Basic Skills*; CTRS = *Conners Teacher Rating Scale*; DISC = *The Diagnostic Interview Schedule for Children*; ESB = *Effective School Battery*; MPS = *Multidimensional Perfectionism Scale*; NYS = *National Youth Survey*; PAI = *Peer Assessment Inventory*; PCS-C = *Harter Perceived Competence Scale for Children*; PDR = *Parent Daily Report*; PHCSCS = *Piers-Harris Self Concept Scale*; POCA = *Observation of Child Adaptation*; PSC = *Pediatric Symptom Checklist*; RADS = *Reynolds Adolescent Depression Scale*; SASC-R = *Social Anxiety Scale for Children–Revised*; SAT = *Stanford Achievement Test*; SCRS = *Self-Control Rating Scale*; SHP = *Social Health Profile*; SSRS = *Social Skills Rating System*; STAI = *State-Trait Anxiety Inventory*; STAI A-TRAIT = *State-Trait Anxiety Inventory–Trait Anxiety Scale*; STAIC = *State-Trait Anxiety Inventory for Children*; STAXI = *State Trait Anger Expression Inventory*; TASC = *Test Anxiety Scale for Children*; TBQ = *Teacher Behavior Questionnaire*; TCRS = *Teacher–Child Rating Scale*; TOCA-R = *Teacher Observation of Classroom Adaptation–Revised*; Walker-McConnell = *Walker-McConnell Scale of Social Competence & School Adjustment*; WASL = *Washington Assessment of Student Learning*; WJ-R = *Woodcock-Johnson–Revised Tests of Achievement*; WL = Waitlist; WRAT-R = *Wide Range Achievement Test–Revised.*

school attendance (dropout or absenteeism rates), and special education placement. Only one study directly assessed students' academically engaged time (Walker et al., 1998). A handful of studies examined parents' school involvement, school bonding or attitudes toward school, classroom or school climate, disciplinary actions, and students' sense of safety (e.g., Catalano et al., 2003; CPPRG, 1999; Flay, Allred, & Ordway, 2001; Gottfredson, Gottfredson, & Hybl, 1993; Hawkins et al., 1999; Nelson, Martella, & Marchand-Martella, 2002). These constructs are often used in the education literature to describe school climate and have been linked to academic success (see Wilson, 2004). However, although such measures of school climate have been used less frequently in studies of school mental health, they appeared to be robust in this review. Standardized school or classroom climate measures that were used consisted of the *Effective School Battery* (Gottfredson, 1984) and *Classroom Environment Assessment* (Gottfredson, Gottfredson, & Hybl, 1990). Standardized academic measures included the *Woodcock-Johnson Revised Tests of Achievement* (Woodcock & Johnson, 1989), the *Comprehensive Test of Basic Skills* (CTB/McGraw-Hill, 1992b), *Diagnostic Reading Scales* (Spache, 1982), *California Achievement Test* (CTB/McGraw-Hill, 1992a), and the *Washington Assessment of Learning Outcomes* (Office of the Superintendent of Instruction, 1996). Four of the studies that found significant changes in academic or school-related outcomes, however, indicated that these effects (primarily achievement) did not last over time (CPPRG, 2004; Elias, Gara, Schuyler, Branden-Muller, & Sayette, 1991; Ialongo et al., 1999; Tremblay et al., 1995).

Target Population

Seventeen of the 24 studies (and 11 out of 15 of the dually effective programs) focused on kindergarten and elementary students. The majority had a preventive focus and targeted prosocial, disruptive, aggressive, and antisocial behaviors. The interventions were primarily universal in nature, with the inclusion of indicated interventions for children with more severe behavioral difficulties. As seen in Table 1, the impact of these universal preventive interventions tended to be quite modest given the intensity (i.e., program length) and complexity (i.e., multicomponent) of the interventions. For example, in the *Fast Track Study* (Table 1; CPPRG, 1999, 2002, 2004), only 37% of intervention versus 27% of control children were free of a diagnosis of serious dysfunction by third grade. By fifth grade, intervention children were less likely to be involved with deviant peers and had lower rates of serious conduct problems in the home and community. However, the educational gains disappeared by the end of elementary school.

Of the seven studies that targeted middle- to high-school populations, three focused on conduct problems (Arbuthnot, 1992; Gottfredson et al., 1993; Gottfredson, Jones, & Gore, 2002), three on stress inoculation (Hains & Ellmann, 1994; Kiselica, Baker, Thomas, & Reedy, 1994; Klein, 2004), and one on posttraumatic stress disorder (Stein et al., 2003).

Interventions

Among the 15 dually effective studies, all but 4 included highly intensive and complex programs. Those 4 studies were shorter term (a semester or less) and primarily researcher implemented (i.e., delivered in the school setting with school staff providing limited involvement in intervention delivery; Arbuthnot, 1992; Gottfredson et al., 2002; Klein, 2004; Pedro-Carroll, Sutton, & Wyman, 1999). The other 11 dually effective studies targeted children at risk for antisocial behaviors and were complex and highly intensive programs involving interventions at multiple levels across multiple contexts (i.e., home, classroom, and/or school) and overextended periods of time (at least 1 year). For example, the *Fast Track Program* exemplifies a multimodal prevention approach to intervening with high-risk students and their families at multiple levels (e.g., academics, behavioral problems, and family support). This program spanned Grades 1 through 10, but the other programs typically lasted 1 to 2 years. These programs typically involved both school- and home-based interventions, requiring both the teachers (or school staff) and the parents to participate in various aspects of the interventions. Three programs included schoolwide interventions that involved school-level reorganization of discipline policies and procedures in addition to changes in classroom management practices and individual-level behavior management techniques (Flay et al., 2001; Gottfredson et al., 1993; Nelson et al., 2002).

In contrast, the eight programs that found positive mental health but not significant educational outcomes tended to be less intensive (a year or less), and only three of them involved school staff and families in the intervention program (Bloomquist et al., 1991; King & Kirschenbaum, 1990; Weiss, Harris, Catron, & Han, 2003). Four of these eight programs targeted individual students and were researcher-implemented programs where the school setting served as a location for the intervention (Hains & Ellmann, 1994; Kiselica et al., 1994; Lochman, Coie, Underwood, & Terry, 1993; Stein et al., 2003). It is unclear if the lack of effectiveness of these programs on educational outcomes is due to the intensity of the programs, the type of educational outcomes assessed, the severity of students' problems, or other factors. Some of these studies involved older children (middle and high school) or children who presented with other types of emotional difficulties (e.g., anxiety). The only study in this group of 24 that did not find a significant impact on either educational or mental health outcomes (Braswell et al., 1997) had elements of other successful programs (e.g., the involvement of school staff and families in intervention). However, this study used an information/attention control group that provided a substantial amount of information to the parents and teachers, likely contributing to the lack of significant difference between experimental and control groups in the study.

Discussion

This literature review highlights the paucity of empirically validated studies targeting both academic and mental health functioning. Of the research that does exist, only a fraction examined

outcomes of interest to school policymakers or practitioners. Only 64 of more than 2,000 studies (i.e., less than 1%) met minimal scientific criteria for inclusion in this review. Of these, approximately one third of the studies (24/64) examined the impact of the intervention on both mental health and educational outcomes. It is surprising that the majority of these studies do not even include educationally relevant outcomes given that schools are increasingly held accountable for achieving academic outcomes. The limited scientific attention paid to interventions that target these dual domains means that the impact of school-based mental health interventions on educationally relevant behaviors is poorly understood. Furthermore, insofar as school-based interventions are able to effect change in both educational and mental health domains, it is increasingly important to document these impacts. When resources are limited and the pressure to increase test scores mounts, school mental health programs are likely targets for cuts, particularly in the face of limited evidence showing their impact on academic achievement.

What Has Been Studied?

The majority of the 24 studies that examined outcomes in both mental health and educational domains were geared toward kindergarten and elementary students with a predominant focus on the prevention of antisocial behaviors. The focus on young children in these studies is consistent with the literature suggesting that children at high risk for conduct problems can often be identified by the time they enter school (CPPRG, 1999). The programs among those studies that found positive impact in both domains were highly intensive and involved multiple components and targets (i.e., teachers, parents, and students). Yet, as noted above, the positive effects of some of these programs on educational and mental health outcomes were overall quite modest. The modest impact of the universal programs described in this article is consistent with other universal prevention studies to date. Such results have raised questions about the cost-effectiveness of these programs. One reason cited for the modest impact of such programs is that the interventions are targeted at such a broad population that they may not be tailored sufficiently to meet the needs of subpopulations of students who might benefit from more intensive or continued support beyond the study intervention. This is true particularly during times of transition (Greenberg, Domitrovich, & Bumbarger, 2001).

Findings from the few studies (e.g., Bierman, Greenberg, & CPPRG, 1996; Gottfredson et al., 1993; Hawkins et al., 1999; Ialongo et al., 1999) that attempt to understand the dose–outcome relationships suggest the importance of support that can be accessed over time, especially as levels of risk wax and wane. Overall, these studies suggest the need for a multitiered intervention approach in schools, where varying levels of service intensity are available over time and in different grades for students, especially during transitional periods.

On the other hand, not all children who are at risk develop later problems. It could be argued that when left without intervention, a significant proportion of high-risk children make adequate compensation so that they are not distinguishable from other high-risk children who have not been exposed to prevention programs. In fact, larger gains have been demonstrated for children who are at higher risk (e.g., CPPRG, 1999; Dolan et al., 1993; Hawkins et al., 1999; Ialongo et al., 1999; Kellam, Rebok, Ialongo, & Mayer, 1994). In the climate of limited resources, the question of who might benefit most from different types of intervention is important. Further, understanding the mechanisms by which various intervention components operate to produce positive outcomes is critical for streamlining or adapting effective interventions for dissemination on a larger scale.

Another related and critical issue in demonstrating program effects is that of implementation fidelity. Only two studies examined this issue directly. Those two studies (Gottfredson et al., 1993, 2002) highlighted how the level of program implementation significantly impacted student outcomes. The issue of implementation fidelity was otherwise rarely discussed in these studies of school-based programs, but it could potentially have significant influence on the strength of findings in other studies.

Impact of Mental Health Interventions on Academic Functioning

Recent developments in education literature on SEL have pointed to the reciprocal relations between children's academic functioning and socioemotional health (see Zins et al., 2004, for review). This body of literature points to the need for including academic skills and competencies and other educationally relevant outcomes as dependent variables in mental health intervention research. Unfortunately, the studies reviewed here suggest that the effects of mental health interventions on academic outcomes are modest and often do not hold over time. This finding may not be too surprising because the majority of these studies did not directly address academic difficulties as part of the intervention. While mental health interventions are designed to remove learning barriers, the likelihood of academic gains also depends on the presence of effective instructional techniques. Further, the academic environments (e.g., teachers, classrooms) often change from year to year such that teacher-implemented interventions that might be effective during the study period are usually not extended beyond the academic year. As demonstrated by a couple of the studies (e.g., Dolan et al., 1993; Ialongo et al., 1999), program effects tend to be larger when measures of outcome overlap with the content of the intervention. Clearly there is a need to better understand the processes by which mental health interventions affect academic and other educational outcomes.

Part of the difficulty in demonstrating the educational impact of mental health interventions could also be related to the limited variety and quality of the academic measures used in these studies. Current thinking about what determines academic success calls into question the adequacy of measures (e.g., grades, attendance, test scores) that are the typical focus in these studies. Academic outcomes such as grades and school dropouts are distal outcomes and hence less likely to change immediately.

More proximal variables that mediate academic outcomes—such as academic engagement, disciplinary actions associated with conduct problems, classroom and school climate—are likely to be more sensitive to change in the short run. The implications from this review suggest that such educationally relevant variables are robust and sensitive to change. Indeed, several of the universal prevention programs in this review were designed to target socialization processes at the classroom-wide and/or schoolwide level. Yet, the primary focus of their outcome measures tended to be on individual-level outcomes (e.g., aggression, grades), with limited or no attention paid to the possible impact of their effects on school climate or context variables. Given the broad reach of some of these interventions, one might expect that the effects at the individual level are likely to be diluted. Broader school context/climate variables that might have been more specific and hence sensitive to change were not measured in many of these programs, even among those purportedly targeting school climate (e.g., Flannery et al., 2003). The infrequent assessment of school climate/context variables in these studies highlights missed opportunities to demonstrate the impact of mental health interventions on such educationally relevant variables. The peripheral role of mental health services in schools makes measuring their impact on school context variables particularly important for their sustainability.

Conclusion

This review highlights the potential for school-based mental health services to impact both educational and mental health outcomes for children. Robust constructs to assess outcomes in both the mental health and academic domains exist; yet, the majority of school-based mental health interventions that have been examined have largely failed to include these dual domains in their outcome measurement. Even among the studies that examined academic outcomes, the range of educationally relevant outcomes that were examined was quite limited. From a measurement standpoint, the evidence showing modest impact of mental health interventions on academic success suggests a need to more carefully consider the adequacy of academic outcomes that have thus far been the focus of school-based mental health interventions. Efforts to more fully delineate educationally relevant outcomes and to clarify the construct of academic success would aid future research efforts.

The studies that did target the dual domains of academics and mental health focused mainly on younger children and on those with externalizing behavior problems. The developmental spectrum of these studies was limited in that few examined children in middle or high school settings, nor did they include children with internalizing behavior problems (e.g., anxiety and depression). As the long-term impact of trauma, anxiety, and depression have been well documented (Breslau, Davis, Andreski, & Peterson, 1991; Cohen, Mannarino, Berliner, & Deblinger, 2000; Goenjian et al., 1995; Macksoud & Aber, 1996; March, Amaya-Jackson, Murray, & Schulte, 1998; Mufson et al., 2004; Weissman et al., 2005), neglect of intervention programs in schools that can specifically address these issues is especially worrisome.

The majority of the interventions that were effective in both domains were time-intensive as well as complex, with multiple targets (e.g., students, parents, and teachers) and across multiple contexts (school and home). Yet the modest impact of universal programs suggests a need to examine multitiered programs with varying levels of service intensity. Further, while the interventions appeared to have differential benefits for subgroups of children, none of the studies was designed to address issues of dosage and timing. More carefully titrated studies of the impact of specific intervention components (dosage) and the optimal timing for their delivery could significantly strengthen school mental health research and enable findings from this work to have more policy and practice relevance.

This review highlights the importance of expanding the scientific research base on school interventions so that the broad range of children's functioning, including academic, behavioral, emotional, and developmental, can be understood and optimized. Beyond this, however, for mental health services to become structurally configured within schools the entire framework by which school mental health issues are currently understood needs reconceptualization. Mental health cannot afford to continue to exist in isolation; it needs to be reframed, mainstreamed, and folded into the broader mission of schools. To this end, attention to indigenous resources, supports, and opportunities in schools that may provide entry points for delivery of mental health services in support of the school's mission are needed (Atkins et al., 2003; Frazier et al., 2007).

Additionally, a research agenda that concentrates on the ways in which school context affects the link between mental health and educational attainment is a high priority. What are the active contextual factors that influence educational gains and the mental health of students in schools? What types of contextual/organizational intervention strategies can be mobilized to improve both types of outcomes? A more differentiated approach to schools as environments that promote learning, social–emotional development, and testing of organizational strategies to improve achievement and mental health is needed. Refocusing on the principles, priorities, and possibilities for school mental health is long overdue.

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Note

A list of these studies is available from the first author upon request.

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