



Published in final edited form as:

J Dev Life Course Criminol. 2021 March ; 7(1): 66–86. doi:10.1007/s40865-020-00152-6.

Applying the Social Development Model in Middle Childhood to Promote Healthy Development: Effects From Primary School Through the 30s and Across Generations

Richard F. Catalano^{1,*}, Hawkins J. David¹, Rick Kosterman¹, Jennifer A. Bailey¹, Sabrina Oesterle², Christopher Cambron³, David P. Farrington⁴

¹Social Development Research Group, School of Social Work, University of Washington. 9725 3rd Ave. NE, Suite 401, Seattle, WA 98115, USA ²Southwest Interdisciplinary Research Center, School of Social Work, Watts College of Public Service & Community Solutions, Arizona State University, 201 North Central Avenue, 33rd Floor, Phoenix, AZ 85004, USA ³College of Social Work, University of Utah, Salt Lake City, UT, USA ⁴University of Cambridge, England

Abstract

Purpose: This paper describes the origins and application of a theory, the social development model (SDM), that seeks to explain causal processes that lead to the development of prosocial and problem behaviors. The SDM was used to guide the development of a multicomponent intervention in middle childhood called Raising Healthy Children (RHC) that seeks to promote prosocial development and prevent problem behaviors. This paper reviews and integrates the tests of the SDM and the impact of RHC. While the original results of both model and intervention tests have been published elsewhere, this paper provides a comprehensive review of these tests. As such this integrative paper provides one of the few examples of the power of theory-driven developmental preventive intervention to understand impact across generations and the power of embedding controlled tests of preventive intervention within longitudinal studies to understand causal mechanisms.

Methods: Application of the SDM in the RHC intervention was tested in a quasi-experimental trial nested in the Seattle Social Development Project (SSDP). SSDP is a longitudinal study of 808 students who attended 18 public schools in Seattle, WA, and whose parents consented for their participation in longitudinal research when they were in Grade 5 (77% of the eligible population in participating schools). Students assented at each survey administration and consented to longitudinal follow-up when they turned 18. Panel subjects were followed and surveyed 15 times from Grade 5 through age 39, with most completion rates above 90%.

Terms of use and reuse: academic research for non-commercial purposes, see here for full terms. <http://www.springer.com/gb/open-access/authors-rights/aam-terms-v1>

*To whom correspondence should be directed. catalano@uw.edu.

Conflict of Interest: The authors declare that they have no conflict of interest.

Publisher's Disclaimer: This Author Accepted Manuscript is a PDF file of a an unedited peer-reviewed manuscript that has been accepted for publication but has not been copyedited or corrected. The official version of record that is published in the journal is kept up to date and so may therefore differ from this version.

Results: We describe effects of the full multicomponent RHC intervention delivered in Grades 1 through 6 by comparing outcomes of those children assigned to the full RHC intervention condition to controls from middle childhood through age 39. We also report the effects of the full RHC intervention on the firstborn children of participants compared with the firstborn children of controls.

Conclusions: We discuss use of the theory to guide development and testing of preventive interventions and the utility of nesting intervention tests within longitudinal studies for testing both theory and interventions.

Keywords

Longitudinal; Experimental; Prevention; Theory

A Goal for Social Theory

Societies seek to promote patterns of behavior that contribute to survival, well-being, and success of their members. In the United States and in most other countries, these include developing cognitive, social, and emotional skills during childhood; completing secondary school; establishing healthy relationships; gaining and maintaining employment; and participating in civic society (Scales, Benson, Oesterle, Hill, Hawkins, and Pashak 2016). The Social Development Model (SDM) refers to these as prosocial or positive behaviors (Catalano and Hawkins 1996). Societies also seek to extinguish patterns of behavior that threaten the health and welfare of their members. In the United States and in many other countries these include conduct problems, drug misuse, violence, crime, risky sexual behavior, teen pregnancy, and internalizing problems including anxiety and depression, called problem behaviors in the SDM. A goal of promotive and preventive research is to better understand and explain the processes that lead to patterns of both positive or prosocial behaviors and problem behaviors so that it might be possible to intervene in the development of these patterns to increase the prevalence of positive behaviors and decrease the prevalence of problem behaviors in the population.

The Social Development Model

Progress has been made over the last 40 years in the discovery of longitudinal predictors of problem and positive behaviors in adolescence and young adulthood (Catalano, Berglund, Ryan, Lonczak, and Hawkins 2002; Farrington 1989; Farrington, Gaffney, and Ttofi 2017; Farrington and Loeber 1999; Farrington, Ttofi, and Piquero 2016; C. M. Fleming, Eisenberg, Catalano, Kosterman, Cambron, Hawkins et al. 2019; Gloppen, David-Ferdon, and Bates 2010; Hawkins, Catalano, and Miller 1992; House, Bates, Markham, and Lesesne 2010; House, Mueller, Reininger, Brown, and Markham 2010; Markham, Lormand, Gloppen, Peskin, Flores, Low et al. 2010; Seligman, Steen, Park, and Peterson 2005; Shek, Siu, and Lee 2007; Stone, Becker, Huber, and Catalano 2012; The Commission on Positive Youth Development, Seligman, Berkowitz, Catalano, Damon, Eccles et al. 2005). Risk factors for problem behaviors and protective factors that inhibit problem behaviors as well as factors that promote prosocial behavior have been identified. Longitudinal studies have identified predictors within the individual as well as in family, school, community, and peer

environments. Risk, promotive, and protective factors have been found across development from before birth through young adulthood (National Academies of Sciences Engineering and Medicine [NASEM] 2019). Many empirically identified risk and protective/promotive factors predict multiple problem behaviors.

Theory seeks to organize the available evidence regarding predictors of positive and problem behaviors to describe the causal mechanisms by which positive and problem behavior are produced by these predictors (Bursik and Grasmick 1996; Vogel and Jaecques 2016). Theory seeks to explain and predict the onset, escalation, maintenance, de-escalation, and desistance from patterned behaviors. Much sociological, psychological, and criminological theory has focused on understanding and predicting problem behaviors (e.g., Bandura and Walters 1977; Durkheim 1951; Farrington 2017; Gottfredson and Hirschi 1990). Some attention has focused on understanding and explaining prosocial patterns of behavior (e.g., Seligman et al. 2005).

The social development model (SDM) is a theory of human behavior that attributes the etiology of both positive and problem behaviors to similar developmental processes (Catalano and Hawkins 1996; Hawkins and Weis 1985). It posits general processes by which behavior evolves and becomes maintained through social interaction and involvement in environmental contexts. Rooted in sociological, criminological, and psychological theories, the social development model organizes evidence on longitudinal predictors of risk, protective, and promotive factors (e.g., Hawkins, Catalano, and Miller 1992; NASEM 2019). The SDM integrates the strongest empirically supported elements of control theory (Hirschi 1969), social learning theory (Bandura 1977), and differential association theory (Matsueda 1988; Sutherland 1973) into a model of human behavior.

The social development model, depicted in Figure 1, hypothesizes two socialization paths through which positive and problem behaviors arise, a prosocial path and a problem behavior path. On each path, a process involving four elements leads to development of a social bond between an individual and others: (a) perception of opportunities for involvement with prosocial others or others engaged in problem behaviors; (b) involvement with others engaged in prosocial or problem behaviors; (c) social, emotional, and cognitive skills that increase recognition or reward from involvement; and (d) the perception of rewards for interactions with prosocial others or others engaged in problem behaviors. Skills are hypothesized as necessary to access rewards from others involved in either prosocial or problem behaviors. When an individual is provided opportunities for involvement, engages in these opportunities, participates skillfully when involved, and is reinforced for his or her involvement, the SDM hypothesizes that that person will become bonded (emotionally attached and committed) to the others with whom s/he is involved. The more strongly an individual is bonded to a group or social unit, the more likely he or she is to adopt its beliefs, norms, or standards for behavior, and to engage in prosocial or problem behaviors consistent with that group's norms (Catalano and Hawkins 1996).

The social development process is affected by three exogenous factors: position in the social structure, individual constitutional factors, and external constraints. These factors have been found to predict problem behavior (Dishion, Patterson, Stoolmiller, and Skinner 1991;

Gottfredson and Hirschi 1990; Herrenkohl, Hawkins, Chung, Hill, and Battin-Pearson 2001; Loeber and Stouthamer-Loeber 1998; Moffitt, Arseneault, Belsky, Dickson, Hancox, Harrington et al. 2011; Wasserman, Keenan, Tremblay, Coie, Herrenkohl, Loeber et al. 2003). The SDM hypothesizes that these factors exert influence on perceived opportunities for involvement, actual degree of involvement, skills for interaction, and perceived rewards for interaction. These exogenous factors are hypothesized to be fully mediated by social development processes (Catalano and Hawkins 1996). However, we note that these factors can be changed through intervention. Position in the social structure can be affected by changes in tax policies, lending practices, and wealth redistribution interventions (NASEM 2019). Individual constitutional factors are the focus of medical, behavioral, pharmaceutical, and genetic interventions (NASEM 2019). External constraints are affected by changes in laws and regulations defining consequences for behaviors such as possession of marijuana or the legal age of drinking (Fell, Fisher, Voas, Blackman, and Tippett 2009; Guttmannova, Jones, Johnson, Oesterle, Johnson, and Martins 2019). These “exogenous” variables are not the mechanisms that the social development model seeks to understand and explain. The SDM specifies how the daily social interactions of individuals with those in their environment lead to prosocial versus problem behaviors.

The SDM recognizes that the socializing units in which these processes occur change in importance developmentally. It specifies submodels corresponding to developmental phases defined by changes in the influence of major socializing units from infancy and early childhood (preschool period), through middle and late childhood (elementary school period—in the United States generally years/grades 1–5 or 6), early adolescence (middle school period generally years/Grades 7–9 or 6–8), and later adolescence (high school period, generally years/Grades 9(10)-12). While the same general social development processes operate, each submodel specifies the socialization units involved and the forms of positive and problem behavior most prevalent during that developmental period (Catalano and Hawkins 1996).

Changes in social environments across developmental phases can lead to continuity or change in developmental processes in the new environment. Forces of continuity across developmental periods include perceptions of rewards, social bonds, beliefs, and behaviors from earlier developmental periods. These condition perceptions of opportunities for positive and problem behaviors in the new developmental environment. For example, a child who has a strong bond to prosocial family members in the preschool period is likely to perceive more prosocial opportunities during the elementary school period. Even as this reciprocal effect across developmental periods is noted, transitions into new and novel environments provide sources of change, as a new mix of opportunities, involvement, skills, and recognition can provide significant potential for new prosocial or problem bonds as previous opportunity and reward structures may lose their immediacy and the influences of the current developmental environment become more salient (Catalano and Hawkins 1996). The general model is depicted in Figure 1. See Catalano and Hawkins (1996) for depiction of the developmental submodels.

The social development model has been tested in observational studies and found to predict different problem behaviors in childhood (ages 9 – 14) and adolescence (ages 15 – 18),

including **school problems** (Catalano, Park, Harachi, Haggerty, Abbott, and Hawkins 2005; S. Kim 2000); **antisocial behavior** (e.g., telling lies, being cruel, truancy), **conduct problems**, and **delinquency** (Brown, Catalano, Fleming, Haggerty, and Abbott 2005; Catalano, Oxford, Harachi, Abbott, and Haggerty 1999; Deng and Roosa 2007; C. B. Fleming, Catalano, Oxford, and Harachi 2002; Kosterman, Haggerty, Spoth, and Redmond 2004; Laundra, Kiger, and Bahr 2002; Roosa, Zeiders, Knight, Gonzales, Tein, Saenz et al. 2011); **violence and aggression** (Catalano et al. 2005; Choi, Harachi, Gillmore, and Catalano 2005; Herrenkohl, Huang, Kosterman, Hawkins, Catalano, and Smith 2001; Huang, Kosterman, Catalano, Hawkins, and Abbott 2001; M. J. Kim 2009; S. Kim 2000; Sullivan and Hirschfield 2011); and **alcohol, tobacco, marijuana, and other drug use** (Brown et al. 2005; Catalano, Kosterman, Hawkins, Newcomb, and Abbott 1996; Catalano et al. 2005; Choi et al. 2005; S. Kim 2000; Lonczak, Huang, Catalano, Hawkins, Hill, Abbott et al. 2001; Sullivan and Hirschfield 2011). An observational study testing the SDM in adulthood found that it predicted alcohol use disorder at age 30 as well as positive behaviors such as civic engagement, constructive engagement in work or school, and exercise (Kosterman, Hill, Lee, Meacham, Abbott, Catalano et al. 2014).

Observational studies using SDM constructs including bonding, parental monitoring, and peer involvement, that did not test the model in its entirety, have successfully predicted adolescent delinquency, arrest, and drug use (Ayers, Williams, Hawkins, Peterson, Catalano, and Abbott 1999; Jacob 2008; O'Donnell, Hawkins, and Abbott 1995), as well as positive behaviors such as civic engagement in high school (da Silva, Sanson, Smart, and Toumbourou 2004) and the course of alcohol use and abuse and criminal offending from childhood and adolescence into adulthood (Farrington and Hawkins 1991; Guo, Hawkins, Hill, and Abbott 2001; Locke and Newcomb 2004).

Using the SDM to Guide the Development of a Promotive and Preventive Intervention in the Elementary Period: The Raising Healthy Children Program

Raising Healthy Children (RHC) is a multicomponent preventive intervention program in which we applied existing interventions and created new interventions to reduce risks and enhance protection experienced in the primary socialization units that children are exposed to during the elementary school period (Grades 1 through 6 in the SSDP). The SDM asserts that families and schools are salient socialization units for children throughout the elementary school period, and that peers increase in salience during this period. The primary goals of the RHC intervention are to increase prosocial behavior and academic achievement and prevent initiation of problem behaviors including conduct problems, delinquent behavior, and drug use.

RHC sought to strengthen children's bonds to their families and schools by providing promotive and preventive interventions to parents and teachers. These interventions were designed to enhance children's opportunities for prosocial involvement; to reduce opportunities for antisocial involvement; to teach social, emotional, and cognitive skills; and to ensure that parents and teachers recognized children for skillful prosocial involvement and

provided corrective feedback when involvement was less skillful. Further, parents and teachers were taught to communicate prosocial family and school expectations for behavior (e.g., positive academic expectations, positive classroom and social behavior) in SDM terms, reinforcing external constraints on behavior. Promotive intervention components were designed to increase prosocial opportunities, skills, and recognition, thereby increasing prosocial bonding and prosocial beliefs or norms and, ultimately, prosocial behaviors. Preventive intervention components sought to decrease opportunities, rewards, and skills for involvement with others engaged in problem behaviors and communicate norms or standards against problem behaviors in order to reduce the likelihood of bonding to others engaged in problem behaviors, adoption of norms or beliefs favorable to problem behaviors, and the problem behaviors themselves.

More detailed descriptions of these intervention components have been provided elsewhere (Hawkins, Catalano, Jones, and Fine 1987; Hawkins, Catalano, Kosterman, Abbott, and Hill 1999; Hawkins, Kosterman, Catalano, Hill, and Abbott 2005; Lonczak, Abbott, Hawkins, Kosterman, and Catalano 2002). Through 5 in-service instructional days each year provided from late August through February, teachers of classrooms assigned to the full RHC intervention and the late RHC intervention condition were taught to use a set of three methods of classroom management and instruction: (a) proactive classroom management (establish clear guidelines for behavior, provide positive reinforcement for behavior that follows guidelines, minimize reactive management to increase time on task); (b) interactive teaching (provide motivational opportunities for engagement with academic material and methods to assess and recognize learning of all students); and (c) cooperative learning (engaged learning in multi-ability teams to harness peer reinforcement for academic learning). The specific elements of each of these classroom management and instructional methods are shown in Table 1 and depicted in Figure 2, showing the hypothesized effects of each intervention component in terms of the SDM constructs they affect. These instructional and classroom management workshops were provided to teachers of participants in the full RHC intervention when participants were in Grades 1 through 6 and to teachers of participants in the late RHC intervention when participants were in Grades 5 and 6 (Abbott, O'Donnell, Hawkins, Hill, Kosterman, and Catalano 1998; Cummings 1983; Cummings, Barber, and Cuervo 1982; Hawkins, Doueck, and Lishner 1988; Hawkins, Graham, Maguin, Abbott, Hill, and Catalano 1997; Slavin 1991). Teachers of RHC classrooms were observed and coached in use of these methods by intervention project staff and teachers who were experienced in the use of these specific methods of instruction and classroom management.

Parents of children assigned to the full RHC intervention were offered three developmentally appropriate parenting workshops when their children were in Grades 1 through 6. The reviews of the effects of parenting interventions (Piquero, Farrington, Welsh, Tremblay, and Jennings 2009; Piquero, Jennings, Diamond, Farrington, Tremblay, Welsh et al. 2016) have now demonstrated important effects. At the time of developing the RHC interventions, work by Gerald Patterson (1975) and Rex Forehand and Robert McMahon (McMahon, Forehand, and Griest 1981) suggested the promise of parenting interventions. As shown in Table 1, the first parenting series, now called Soaring Stars (originally called Catch 'Em Being Good), consisted of seven workshops offered to parents when participating children were in Grades 1 and 2 and emphasized behavior management skills (setting guidelines, monitoring,

reinforcement, and corrective feedback). The second parenting series, called Supporting School Success (originally called How to Help Your Child Succeed in School), consisted of four workshops offered to parents when participating children were in Grades 2 and 3 and focused on academic support skills (opportunities for academic learning in the home, guidelines for academic performance, recognition for achievement). The third series, now called Guiding Good Choices (originally called Preparing for the Drug Free Years) consisted of five 2-hour sessions offered to parents when children were in Grades 5 and 6 and focused on skills to reduce risks for drug use (guidelines re: drug use, opportunities for family involvement, skills for resisting peer influence, recognition for following the guidelines, strengthening family bonds). As shown in Figure 2, all three parenting workshop series encouraged parents to create developmentally appropriate opportunities and reinforcement for prosocial involvement, strengthen children's skills for prosocial involvement, reduce opportunities and reinforcement for problem behaviors, and increase bonding to family and school (Hawkins and Catalano 2003a, 2003b; Hawkins et al. 1987; Kosterman, Hawkins, Haggerty, Spoth, and Redmond 2001).

Social, emotional, and cognitive skills taught to children in RHC included a component on interpersonal problem-solving skills that focused on communication, decision making, negotiation, and conflict resolution taught by first-grade teachers in full intervention classrooms (Shure and Spivack 1980, 1988), and a component on refusal skills that included awareness of antisocial influences, consequences of risky behaviors, and generation of alternatives to antisocial behaviors among peers taught by project staff to all students in the full and late intervention conditions during Grades 5 and 6 (Comprehensive Health Educational Foundation 1999). Teaching skills to all youth in the classroom and teaching teachers to reinforce the skills was hypothesized to create a peer environment that reduced classroom disruption, increased positive reinforcement for skillful behavior, and increased time for academic instruction. The content of each intervention component is listed in Table 1. In Figure 2 these intervention components are depicted in the SDM as shaded boxes.

In sum, as seen in Figure 2, RHC fosters developing opportunities, skills, and recognition; enhancing prosocial constructs; and limiting constructs predicting problem behaviors, most directly through parent, teacher, and youth skill development interventions. In addition, both classroom management and parent training intervention components should increase explicit norms or standards for prosocial behavior. We hypothesized that increasing prosocial opportunities, skills, and recognition and decreasing their counterparts would increase prosocial bonding and reduce bonding to those engaged in problem behaviors.

We hypothesized that, if the effects on the prosocial and problem behavior pathways in the elementary period are sufficiently strong, the hypothesized SDM mechanisms across developmental periods will increase continuity in behavior and environments. We hypothesized that the enhanced prosocial bonding, beliefs, and positive behavior in conjunction with reductions in problem behavior resulting from the RHC intervention during the elementary grades would encourage increased participation in the prosocial pathway in middle school and beyond. Further, we expected these potential changes to decrease the likelihood of engagement in the problem behavior pathway in patterned and persistent ways, despite potentially new problematic opportunities, recognition, and potential antisocial

bonding in the next developmental period. We were eager to learn whether changes in bonding and behavior during the elementary grades would translate into enduring improvements in prosocial behaviors and decreases in problem behaviors in subsequent developmental periods.

Methods and Analyses of the RHC Intervention Trial in the Seattle Social Development Project

RHC was tested using a nonrandomized controlled trial of 808 individuals classified into four treatment conditions: (a) full intervention ($n = 156$), consisting of children who were in classrooms that offered all RHC intervention components for teachers, parents, and children for at least one semester in Grades 1 through 4 and at least one semester during Grades 5 and 6; (b) late intervention ($n = 267$), consisting of children in classrooms offered the intervention components only during Grades 5 and 6 for at least one semester; (c) parent training only ($n = 141$), whose parents were offered only the Guiding Good Choices parenting program during Grades 5 and 6; and (d) a control group ($n = 220$) of children in classrooms receiving no RHC intervention components. The study design and consort chart are available in Kosterman et al. (2019); clinical trials registry #NCT04075019.

This four-condition quasi-experimental trial resulted from concerns raised by NIH grant reviewers in response to a proposal for continuation of a randomized experimental trial to test the full RHC intervention versus control condition that was initiated when children entered Grade 1. Reviewers argued that it might be unnecessary to begin implementation of interventions seeking to prevent drug misuse and delinquency before the typical ages of initiation of these behaviors. To address these concerns, a quasi-experimental study that added new schools and the late intervention and parent training only conditions was developed, funded, and implemented. However, analyses comparing the late intervention group and the parent training only group with the control group have found few significant enduring effects of the late intervention condition or the parent training only condition (Hawkins et al. 1999; Hawkins et al. 2005; Hawkins, Kosterman, Catalano, Hill, and Abbott 2008). In contrast, comparisons between the full RHC intervention condition and the control condition have found several desirable significant effects from age 7 through age 39 using two-tailed tests of significance unless otherwise noted. Prior to presenting these results, we discuss the comparability of these two groups.

Through age 39, participants in the full RHC intervention and control conditions did not differ with respect to gender (male is 47% vs. 51%, respectively; $\chi^2 = .32$, $p = .574$), ethnicity (European American is 48% vs. 46%; $\chi^2 = .20$, $p = .652$), foreign birth (15% vs. 12%; $\chi^2 = .54$, $p = .464$), childhood poverty (56% vs. 53%; $\chi^2 = .26$, $p = .611$), mother not a high school graduate (21% vs. 20%; $\chi^2 = .13$, $p = .720$), or single-parent home at age 11 (40% vs. 39%; $\chi^2 = .06$, $p = .809$). The overall distribution of participants in the full RHC intervention and control conditions through age 39 did not significantly differ for those lost to attrition (37% of whom were in the full intervention condition) versus the analysis sample (42% of whom were in the full intervention condition; $\chi^2 = .59$, $p = .444$).

Given the requirement that full intervention students attended project schools at least one semester in Grades 1 through 4 and in Grades 5 and 6, whereas some control students were added to the study at Grade 5 (and were not in project schools previously), it was important to rule out differences in residential stability, a potential threat to internal validity. Analyses comparing the full intervention and control groups found no significant differences between those in the full RHC condition and controls in number of years living in Seattle by age 12 (10.43 vs. 10.09, respectively; $F = .64$, $p = .425$), number of residences lived in from age 5 to 14 (2.98 vs. 3.37; $F = 1.05$, $p = .306$), or in perceived safety of residential neighborhood from age 10 to 12 ($M = 2.05$ vs. 2.31 on 4-point scale; $F = .13$, $p = .720$).

An exception to the pattern of initial condition equivalence was a higher proportion of participants in the control condition who reported that their mothers were 19 years of age or less when they were born. Eleven percent of the full intervention condition, compared with 20% of the control condition, reported that their mothers were teens when they were born ($\chi^2 = 4.22$, $p = .040$). Therefore, having a teen mother was included as a covariate in outcome analyses.

Differential school or teacher receptivity to intervention is an unlikely threat to internal validity. Teachers in six of eight participating schools during Grades 1 through 4 were randomly assigned to either intervention or control classrooms. At Grade 5, newly eligible schools were matched demographically to early experimental schools, and each agreed to serve as a control or late RHC intervention school prior to assignment to condition. During the course of the intervention in the 1980s, the Seattle school district used mandatory busing to achieve comparable racial makeup of schools, which substantially reduced the risk that outcomes observed reflected contextual or neighborhood differences, school demographic differences, or parent school-selection effects.

Results of the Full RHC Intervention

Intervention effects are summarized as they occurred across development in Figure 3. At the end of Grade 2 (age 7), teachers of full RHC intervention classrooms reported less externalizing behavior among boys and less self-destructive behavior among girls on the Teacher Report Form of the Child Behavior Checklist (Achenbach and Rescorla 2001; Lengua, Sadowski, Friedrich, and Fisher 2001) than did teachers of control classrooms (Hawkins, Von Cleve, and Catalano 1991). By the fall of Grade 5, children in the full intervention condition reported higher levels of proactive family management, family communication, family involvement, and attachment to family than controls. They also reported receiving significantly more rewards from school involvement and stronger attachment and commitment to school, and they had higher aggregate reading, math, and language scores on the California Achievement Test than controls. Further, in the fall of Grade 5, fewer children in the full RHC intervention condition than controls reported having initiated either alcohol use (20.7% vs. 27.3%) or delinquent behavior (45.5% vs. 52.2%) (Hawkins, Catalano, Morrison, O'Donnell, Abbott, and Day 1992).

Analysis of data collected at the end of the full RHC intervention in Grade 6 found that the full RHC intervention group had significantly better aggregate scores on the California

Achievement Test (CAT) provided by the Seattle school district than did controls, even after controlling for CAT scores at the end of Grade 4 (Abbott et al. 1998). Implementation analyses of RHC teaching practices in full intervention and control classrooms in Grade 6 found that full intervention classroom students reported higher levels on social development constructs, including positive school opportunities, involvement, rewards, and bonding to school at the end of Grade 6 (Abbott et al. 1998). Overall intervention effects on increased educational achievement at the end of Grade 6 were partially mediated by improvements in social development constructs as hypothesized, suggesting that they can be attributed in part to successful implementation of the social development model as operationalized in the RHC teacher intervention (Abbott et al. 1998).

At age 18, youth who had been in the full RHC intervention condition during the elementary grades reported significantly higher levels of commitment and attachment to school, better academic achievement, and less school misbehavior than control youth. Significantly fewer youth in the full intervention condition than controls reported violent delinquent acts (48.3% vs. 59.7%), heavy drinking (15.4% vs. 25.6%), sexual intercourse (72.1% vs. 83.0%), having multiple sex partners (49.7% vs. 61.5%), and pregnancy or causing pregnancy (17.1% vs. 26.4%) in their lifetime (Hawkins et al. 1999).

At age 21, the full RHC intervention group reported significantly higher levels of constructive engagement in school and work, greater social integration at school, more employment, more time at their present job, greater levels of responsibility on the job, and greater constructive self-efficacy than controls; and significantly more had graduated from high school (91% vs. 81%) and attended 2 or more years of college (14% vs. 6%) than controls. Those in the full RHC intervention group were significantly less likely to indicate poor emotional regulation, report symptoms of social phobia, and report suicidal thoughts than controls. They were significantly less likely to have sold drugs in the past year (4% vs. 13%) and to have experienced a noncriminal, misdemeanor, or felony charge in their lifetime than controls as indicated by official Washington State and national FBI records (42% vs. 53%). However, they did not report significantly less crime or drug use in the past year than controls (Hawkins et al. 2005). Also, at age 21, those in the full RHC intervention condition reported a significantly higher mean age at first sexual experience, significantly more use of condoms during their most recent intercourse, and significantly fewer lifetime sexual partners than controls. Significantly fewer females in the full RHC group than controls reported having been pregnant by age 21 (38% vs. 56%) and having had a baby by age 21 (23% vs. 40%). Males in these two conditions reported no significant differences in having caused a pregnancy or fathered a child. Significant main effects of the RHC intervention on sexually transmitted infections (STI) were not observed at age 21. However, after controlling for poverty, a significant ethnic group by treatment interaction was found. Seven percent of the African Americans in the full intervention group versus 34% of African Americans in the control group reported having been diagnosed with an STI by age 21 (Lonczak et al. 2002).

At ages 24 and 27, a significant multivariate effect of the full RHC intervention compared with controls was found across eight primary indicators of prosocial and problem behaviors measured at both time points (Hawkins et al. 2008). Specific effects included significantly

better educational and economic attainment, mental health, and sexual health by age 27. However, no significant differences between the full RHC condition and controls remained at ages 24 or 27 for drug-related behaviors or criminal behavior outcomes (Hawkins et al. 2008). By age 27, significantly more in the full RHC intervention group than controls (93% vs. 84%) were above the U.S. median in socioeconomic status, as indicated by an index of educational completion and household income. Moreover, in subgroup analyses after controlling for childhood poverty, African Americans in the full intervention condition reported significantly higher household income at age 27, compared with their control counterparts (mean incomes of \$55,594 vs. \$35,288, respectively) (Hawkins et al. 2008). By age 27, significantly fewer in the full RHC intervention group than controls (15% vs. 26%) met diagnostic criteria for one of four DSM IV diagnoses of a mental health disorder on the Diagnostic Interview Schedule (American Psychiatric Association 1994). Both these comparisons showed a desirable trend at age 24, but these differences did not reach significance until age 27. At age 27, significantly fewer in the full RHC condition than controls reported suicidal thoughts (7% vs. 17%). At age 24, significantly fewer in the full RHC condition than controls reported having been diagnosed with an STI in their lifetime (19% vs. 31%), and this significant difference remained at age 27 (23% vs. 35%). In subgroup analyses, at both ages 24 and 27 after controlling for childhood poverty, significantly fewer of the African Americans in the full RHC intervention group compared with African Americans in the control group reported having been diagnosed with an STI (12% versus 55% at age 24 and 16% versus 61% at age 27).

At age 30, significant differences between the proportions of those in the full intervention condition and controls who had been diagnosed with an STI remained (27% vs. 40%). Subgroup analyses, controlling for childhood poverty, found that significantly fewer African Americans in the full RHC intervention reported STI diagnosis than did African Americans in the control condition at age 30 (26% versus 65%) (Hill, Bailey, Hawkins, Catalano, Kosterman, Oesterle et al. 2014).

The most recent evaluation of the RHC elementary grade intervention compared the full RHC intervention with the control condition when participants were in their 30s using data collected at ages 30, 33, and 39 across nine constructs covering three domains of adult life: healthy behavior, positive functioning, and adult health and success. An omnibus test conducted across all nine constructs to avoid threats from multiple testing found a significant positive overall effect of the full RHC intervention. Specific significant differences between those in the full intervention condition and controls included better overall mental and physical health and economic success (indicated by better emotion regulation; fewer depressive symptoms; fewer anxiety symptoms; better general health; absence of obesity; absence of high blood pressure; and economic success as indicated by exceeding the U.S. median SES, owning ones' own home or condominium, and less dependence on public assistance between the ages of 30 and 39), and more reported health maintenance behaviors (e.g., exercise, getting adequate sleep, and stress management). However, no significant effects of the full RHC intervention on drug use disorder were observed between the ages of 30 and 39 (Kosterman et al. 2019), nor were effects found on criminal behavior (unreported analyses). Also, in unreported analyses, we found no significant differences in criminal behavior in the 30s. For example, in a measure that sums across criminal acts in the past year

including serious driving offenses, petty theft, drug selling, assaults, and more serious (and rare) crimes, the means of the control versus full groups at ages 30, 33, and 39, respectively, were low for both groups and not statistically significant 1.87 vs. 1.91, 1.29 vs. 1.12, and .63 vs. .75 (adjusted for having been born to a teen mother).

While many of the long-term benefits experienced by the full intervention group were in prosocial adult functioning, they also were manifested in areas of parent functioning that are closely linked to child outcomes. For example, higher parental educational attainment and socioeconomic status and lower parental depressive symptoms have been found to be important predictors of better child functioning (Ramchandani, Stein, Evans, and O'Connor 2005; Reiss 2013). We wondered whether the benefits of the RHC intervention might be carried over into the next generation. In 2000, when many of the SSDP children were having children of their own, we secured funding for The Intergenerational Project (SSDP-TIP) to study the intergenerational transmission of substance use and the impact of parenting behaviors on child development. The intergenerational sample families include those SSDP participants who had become parents, the oldest biological child with whom they had regular contact, and a second caregiver, when applicable. SSDP-TIP began data collection in 2002 when SSDP participants were about 27 years old, and followed 423 families through 2018. Study details have been reported elsewhere (Bailey, Epstein, Steeger, and Hill 2018; Bailey, Hill, Epstein, Steeger, and Hawkins 2018; Hill, Bailey, Steeger, Hawkins, Catalano, Kosterman et al. 2020).

The SSDP-TIP study allowed us to test for differences in developmental outcomes and prosocial and problem behaviors between children of parents who had been in the full RHC intervention condition ($n = 72$) and children of parents who had been in the control condition ($n = 109$). Initial testing found no evidence of differential eligibility for, recruitment into, or attrition from the SSDP-TIP study in the full intervention group compared to the control group families (Hill et al. 2020).

Using intent-to-treat analyses and a Benjamini-Hochberg False-Discover Rate (FDR; Benjamini and Hochberg 1995) procedure to account for multiple testing, children of those in the full RHC intervention condition showed sustained benefits compared with children of controls (Hill et al. 2020). Specifically, with regard to cognitive functioning, parents who had been in the full intervention condition reported fewer developmental delays from ages 1 – 5 in their children than did parents who had been in the control condition, as measured by the Ages and Stages Questionnaire (Singh, Squires, Yeh, Heo, and Bian 2016; Squires, Potter, and Bricker 1999). This included lower overall rates of any delay, and fewer deficits in communication, gross motor, and fine motor skills.

From ages 6 – 18, teachers of children of full intervention condition parents reported lower standardized mean rates of externalizing problem behaviors than did teachers of children of control group parents on the Teacher Report Form of the Child Behavior Checklist (Achenbach and Rescorla 2001; Lengua et al. 2001). Specifically, rates of oppositional-defiant behaviors, attention deficit/hyperactivity, and overall externalizing problem behaviors were significantly lower among children whose parents were in the full RHC intervention condition than among children of controls. Further, using items from the

Walker-McConnell Scale of Social Competence and School Adjustment (Walker and McConnell 1988), teachers rated children of parents in the full intervention group as having significantly better cognitive, academic, and emotional skills than children of parents in the control condition. Finally, according to their own reports, children of parents who had been in the full intervention condition were less likely than children of controls to have initiated drug use (alcohol, cigarettes, marijuana) by age 18. These findings indicate the potential of the RHC promotive and preventive intervention, guided by the social development strategy, to benefit not only those individuals receiving the intervention during the elementary grades, but also the children of those exposed to the full RHC intervention.

Summary and Conclusions

As noted earlier, like longitudinal studies of children and adolescence led by Richard Catalano, Del Elliott, David Farrington, David Huizinga, Rolf Loeber and Terry Thornberry, the Seattle Social Development Project (SSDP) has contributed to knowledge on a wide range of topics of concern to sociologists, psychologists, criminologists, and health and public health scientists through descriptive longitudinal analyses of predictors of problem health and behavior outcomes.

If adequately powered, longitudinal studies that include interventions nested within them provide additional opportunities for knowledge development (Farrington 1992, 2006; Farrington, Loeber, and Welsh 2010). They can increase variation in meaningful outcomes in the populations and subgroups studied. More importantly, if adequately designed and implemented, intervention studies allow testing of the predictive validity of hypotheses regarding causation through both assessment of the effectiveness of the theory and through testing the effects of theoretically guided interventions designed to achieve the conditions that produce desired outcomes. The Raising Healthy Children (RHC) intervention was nested in SSDP first in a randomized controlled experiment in 1981 in which first-grade teachers and students in six participating schools were randomly assigned to classrooms that were randomly assigned to receive either the full RHC intervention or no intervention, and two additional schools were randomly assigned to receive either the full RHC intervention or no intervention. As noted earlier, this experimental design was augmented with the addition of 10 schools and two added conditions, late RHC intervention and parenting training only, when full intervention and control students entered Grade 5. At that point, SSDP became a quasi-experimental study with four conditions. Of the three intervention conditions, only the full RHC intervention obtained patterned and sustained differences in outcomes that persisted into the 20s and 30s. It is noteworthy that in analyses not presented here, the late RHC intervention was followed by desirable trends in several prosocial and problem behaviors, but these rarely reached statistical significance when compared with controls, suggesting a dose-response effect (Hawkins et al. 2005, 2008). These findings indicate that social development model-based interventions should begin earlier than Grade 5. The results of the full RHC intervention provide support for beginning these interventions at entry into Grade 1.

The full RHC intervention, delivered universally to all children who were assigned to that condition during the elementary grades, appears to have had population-level effects on

economic, health, and behavioral health outcomes among those assigned to that intervention. It is noteworthy that the observed effects of the RHC intervention changed with development. At age 18, significant effects of the full RHC intervention during the elementary grades on the externalizing behaviors of heavy alcohol use and delinquency were observed. However, few effects on crime or drug-related behaviors were observed at age 21, and no significant effects on crime or drug use were sustained beyond age 21. In contrast, the observed effects of the full intervention on internalizing mental health problems including depression and anxiety, on prosocial behaviors like health maintenance activities, on physical health and economic outcomes, and on sexually transmitted infections were sustained, and for some outcomes, grew larger in the 30s when internalizing problem behaviors increase in prevalence and health maintenance and economic achievements increase in salience as predictors of later health and economic well-being in adulthood.

The findings summarized here are consistent with the prevention paradox (Rose 1981). It is true that large proportions of problems like crime and mental disorders are experienced by a small proportion of individuals in the population who are at highest risk for these problems. Nevertheless, providing universal promotive and preventive interventions that include those at low and moderate risk as well as those at high risk is likely to have greater effects on the total prevalence of problem behaviors in the population than limiting these interventions only to those at risk. This is because those from low and moderate risk groups make up a large proportion of the cases of these problems in the population.

The theoretically guided, universally focused approach used in the RHC intervention was followed by reductions in STIs and enhanced economic outcomes in the overall multiethnic full intervention group. However, it also impacted those at higher risk of STIs and poverty, African Americans. We found that the full RHC intervention, provided universally to all children in the full RHC intervention classrooms, had stronger effects on sexually transmitted infections and economic outcomes for the subgroup of African Americans in the study than for the population as a whole, thereby decreasing or eliminating disparity in these outcomes.

We recognize that the observed results summarized here do not prove the validity of the social development model (SDM) or prove that the full RHC intervention caused these results. However, the results are consistent with the hypotheses of the SDM and support the assertion that the full RHC intervention can have promotive and preventive effects. It is plausible that the observed outcomes in adulthood were produced by providing parents and teachers, the day-to-day caretakers of children, with a promotive and preventive intervention to strengthen children's bonding to family and school during the elementary grades.

Consistent with the hypotheses of the social development model, the findings indicate that the elementary school period provides an important opportunity to strengthen the skills of parents and teachers to promote children's attachment and commitment to prosocial groups of the family and school by increasing children's opportunities, skills, and recognition/rewards for prosocial involvement in family and school. The data indicate that children can learn skills in elementary grades to participate in prosocial ways in family, school, and with peers that decrease risk for problem behaviors. The data also indicate that parents and

teachers can be taught to change their own behaviors to increase the prosocial opportunities, skills, and recognition their children and students experience. The data are consistent with the hypothesis that these changes increase children's bonds of attachment and commitment to school and education. Finally, the data are consistent with the hypothesis that these changes, in turn, can increase prosocial behaviors and the health and economic success of children that persist through the 30s. In sum, the data from the intervention trial nested within the Seattle Social Development Project are consistent with the hypotheses of the social development model and support the use of the theoretically guided universal promotive and preventive interventions included in the full RHC intervention during the elementary grades.

Ethical approval:

All procedures performed in studies involving human participants were in accordance with the ethical standards of the University of Washington Institutional Review Board and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent:

Informed consent was obtained from all individual participants included in the study.

Acknowledgments

Funding: Work on this paper was supported by National Institute on Drug Abuse grant numbers R01DA021426, R01DA003721, R01DA009679, R01DA033956, and R01DA023089. The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the funding agency.

References

- Abbott RD, O'Donnell J, Hawkins JD, Hill KG, Kosterman R, & Catalano RF (1998). Changing teaching practices to promote achievement and bonding to school. *American Journal of Orthopsychiatry*, 68(4), 542–552.
- Achenbach TM, & Rescorla LA (2001). *Manual for ASEBA School-Age Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.
- Ayers CD, Williams JH, Hawkins JD, Peterson PL, Catalano RF, & Abbott RD (1999). Assessing correlates of onset, escalation, deescalation, and desistance of delinquent behavior. *Journal of Quantitative Criminology*, 15(3), 277–306.
- Bailey JA, Epstein M, Steeger CM, & Hill KG (2018). Concurrent and prospective associations between substance-specific parenting practices and child cigarette, alcohol, and marijuana use. *Journal of Adolescent Health*, 62(6), 681–687.
- Bailey JA, Hill KG, Epstein M, Steeger CM, & Hawkins JD (2018). Seattle Social Development Project – The Intergenerational Project (SSDP-TIP). In Eichelshiem VI, & van de Weijer SGA (Eds.), *Intergenerational continuity of criminal and antisocial behavior. An international overview of current studies* (pp. 186–206). New York, NY: Routledge.
- Bandura A (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215. [PubMed: 847061]
- Bandura A, & Walters RH (1977). *Social learning theory* (Vol. 1). Englewood Cliffs, NJ: Prentice Hall.
- Benjamini Y, & Hochberg Y (1995). Controlling the false discovery rate - a practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society. Series B (Methodological)*, 57(1), 289–300.

- Brown EC, Catalano RF, Fleming CB, Haggerty KP, & Abbott RD (2005). Adolescent substance use outcomes in the Raising Healthy Children project: A two-part latent growth curve analysis. *Journal of Consulting and Clinical Psychology, 73*(4), 699–710. [PubMed: 16173857]
- Bursik RJ Jr., & Grasmick HG (1996). The use of contextual analysis in models of criminal behavior. In Hawkins JD (Ed.), *Delinquency and crime: Current theories* (pp. 236–267). New York, NY: Cambridge University Press.
- Catalano RF, Berglund ML, Ryan JAM, Lonczak HS, & Hawkins JD (2002). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *Prevention and Treatment, 5*(1), Article 15 (target article), 6 24, 2002.
- Catalano RF, & Hawkins JD (1996). The social development model: A theory of antisocial behavior. In Hawkins JD (Ed.), *Delinquency and crime: Current theories* (pp. 149–197, Cambridge criminology series). New York, NY: Cambridge University Press.
- Catalano RF, Kosterman R, Hawkins JD, Newcomb MD, & Abbott RD (1996). Modeling the etiology of adolescent substance use: A test of the social development model. *Journal of Drug Issues, 26*(2), 429–455. [PubMed: 17848978]
- Catalano RF, Oxford ML, Harachi TW, Abbott RD, & Haggerty KP (1999). A test of the social development model to predict problem behaviour during the elementary school period. *Criminal Behaviour and Mental Health, 9*(1), 39–56.
- Catalano RF, Park J, Harachi TW, Haggerty KP, Abbott RD, & Hawkins JD (2005). Mediating the effects of poverty, gender, individual characteristics, and external constraints on antisocial behavior: A test of the social development model and implications for developmental life-course theory. In Farrington DP (Ed.), *Advances in criminological theory: Vol. 14. Integrated developmental and life-course theories of offending* (pp. 93–123). New Brunswick, NJ: Transaction.
- Choi Y, Harachi TW, Gillmore MR, & Catalano RF (2005). Applicability of the social development model to urban ethnic minority youth: Examining the relationship between external constraints, family socialization, and problem behaviors. *Journal of Research on Adolescence, 15*(4), 505–534. [PubMed: 21625351]
- Comprehensive Health Educational Foundation (1999). *Here's Looking at You 2000*. Seattle, WA: Author.
- Cummings C (1983). *Managing to teach*. Edmonds, WA: Teaching, Inc.
- Cummings C, Barber C, & Cuervo AG (1982). *School enhancement research and demonstration project. Methods of instruction. Teacher's manual (secondary)*. Washington, DC: Prepared for Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.
- da Silva L, Sanson A, Smart D, & Toumbourou J (2004). Civic responsibility among Australian adolescents: Testing two competing models. *Journal of Community Psychology, 32*(3), 229–255.
- Deng S, & Roosa MW (2007). Family influences on adolescent delinquent behaviors: Applying the social development model to a Chinese sample. *American Journal of Community Psychology, 40*(3–4), 333–344. [PubMed: 17924187]
- Dishion TJ, Patterson GR, Stoolmiller M, & Skinner ML (1991). Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Developmental Psychology, 27*(1), 172–180.
- Durkheim E (1951). *Suicide: A study in sociology [1897]*. Translated by Spaulding JA and Simpson G. Glencoe, IL: Free Press.
- Farrington DP (1989). Early predictors of adolescent aggression and adult violence. *Violence and Victims, 4*(2), 79–100. [PubMed: 2487131]
- Farrington DP (1992). The need for longitudinal-experimental research on offending and antisocial behavior. In McCord J, & Tremblay RE (Eds.), *Preventing antisocial behavior* (pp. 353–376). New York, NY: Guilford.
- Farrington DP (2006). Key longitudinal-experimental studies in criminology. *Journal of Experimental Criminology, 2*(2), 121–141.
- Farrington DP (Ed.). (2017). *Advances in criminological theory: Vol. 14. Integrated developmental and life-course theories of offending*. London and New York: Routledge.

- Farrington DP, Gaffney H, & Ttofi MM (2017). Systematic reviews of explanatory risk factors for violence, offending, and delinquency. *Aggression and Violent Behavior*, 33, 24–36.
- Farrington DP, & Hawkins JD (1991). Predicting participation, early onset and later persistence in officially recorded offending. *Criminal Behaviour and Mental Health*, 1(1), 1–33.
- Farrington DP, & Loeber R (1999). Transatlantic replicability of risk factors in the development of delinquency. In Cohen P, Slomkowski C, & Robbins LN (Eds.), *Historical and geographical influences on psychopathology* (pp. 299–329). Mahwah, NJ: Lawrence Erlbaum Associates.
- Farrington DP, Loeber R, & Welsh BC (2010). Longitudinal-experimental studies. In Piquero AR, & Weisburd D (Eds.), *Handbook of quantitative criminology* (pp. 503–518). New York, NY: Springer.
- Farrington DP, Ttofi MM, & Piquero AR (2016). Risk, promotive, and protective factors in youth offending: Results from the Cambridge Study in Delinquent Development. *Journal of Criminal Justice*, 45, 63–70.
- Fell JC, Fisher DA, Voas RB, Blackman K, & Tippetts AS (2009). The impact of underage drinking laws on alcohol-related fatal crashes of young drivers. *Alcoholism: Clinical and Experimental Research*, 33(7), 1208–1219.
- Fleming CB, Catalano RF, Oxford ML, & Harachi TW (2002). A test of generalizability of the social development model across gender and income groups with longitudinal data from the elementary school developmental period. *Journal of Quantitative Criminology*, 18(4), 423–439.
- Fleming CM, Eisenberg N, Catalano RF, Kosterman R, Cambron C, Hawkins JD, et al. (2019). Optimizing assessment of risk and protection for diverse adolescent outcomes: Do risk and protective factors for delinquency and substance use also predict risky sexual behavior? *Prevention Science*, 20(5), 788–799. [PubMed: 30645734]
- Gloppen KM, David-Ferdon C, & Bates J (2010). Confidence as a predictor of sexual and reproductive health outcomes for youth. *Journal of Adolescent Health*, 46(3 Suppl.), 42–58.
- Gottfredson MR, & Hirschi T (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- Guo J, Hawkins JD, Hill KG, & Abbott RD (2001). Childhood and adolescent predictors of alcohol abuse and dependence in young adulthood. *Journal of Studies on Alcohol*, 62(6), 754–762. [PubMed: 11838912]
- Guttmanova K, Jones AA, Johnson JK, Oesterle S, Johnson RM, & Martins SS (2019). Using existing data to advance knowledge about adolescent and emerging adult marijuana use in the context of changes in marijuana policies *Prevention Science*, 20(2), 291–299. [PubMed: 30719616]
- Hawkins JD, & Catalano RF (2003a). *Guiding Good Choices*. South Deerfield, MA: Channing Bete Company.
- Hawkins JD, & Catalano RF (2003b). *Preparing for School Success*. South Deerfield, MA: Channing Bete Company.
- Hawkins JD, Catalano RF, Jones G, & Fine DN (1987). Delinquency prevention through parent training: Results and issues from work in progress. In Wilson JQ, & Lounsbury GC (Eds.), *From children to citizens: Vol. III. Families, schools, and delinquency prevention* (pp. 186–204). New York, NY: Springer-Verlag.
- Hawkins JD, Catalano RF, Kosterman R, Abbott R, & Hill KG (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives of Pediatrics and Adolescent Medicine*, 153(3), 226–234. [PubMed: 10086398]
- Hawkins JD, Catalano RF, & Miller JY (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112(1), 64–105. [PubMed: 1529040]
- Hawkins JD, Catalano RF, Morrison DM, O'Donnell J, Abbott RD, & Day LE (1992). The Seattle Social Development Project: Effects of the first four years on protective factors and problem behaviors. In McCord J, & Tremblay RE (Eds.), *Preventing antisocial behavior: Interventions from birth through adolescence* (pp. 139–161). New York, NY: Guilford Press.

- Hawkins JD, Doueck HJ, & Lishner DM (1988). Changing teaching practices in mainstream classrooms to improve bonding and behavior of low achievers. *American Educational Research Journal*, 25(1), 31–50.
- Hawkins JD, Graham JW, Maguin E, Abbott RD, Hill KG, & Catalano RF (1997). Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of Studies on Alcohol*, 58(3), 280–290. [PubMed: 9130220]
- Hawkins JD, Kosterman R, Catalano RF, Hill KG, & Abbott RD (2005). Promoting positive adult functioning through social development intervention in childhood: Long-term effects from the Seattle Social Development Project. *Archives of Pediatrics and Adolescent Medicine*, 159(1), 25–31. [PubMed: 15630054]
- Hawkins JD, Kosterman R, Catalano RF, Hill KG, & Abbott RD (2008). Effects of social development intervention in childhood 15 years later. *Archives of Pediatrics and Adolescent Medicine*, 162(12), 1133–1141. [PubMed: 19047540]
- Hawkins JD, Von Cleve E, & Catalano RF Jr. (1991). Reducing early childhood aggression: Results of a primary prevention program. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30(2), 208–217. [PubMed: 2016224]
- Hawkins JD, & Weis JG (1985). The social development model: An integrated approach to delinquency prevention. *The Journal of Primary Prevention*, 6(2), 73–97. [PubMed: 24271382]
- Herrenkohl TI, Hawkins JD, Chung I-J, Hill KG, & Battin-Pearson S (2001). School and community risk factors and interventions. In Loeber R, & Farrington DP (Eds.), *Child delinquents: Development, intervention, and service needs* (pp. 211–246). Thousand Oaks, CA: Sage.
- Herrenkohl TI, Huang B, Kosterman R, Hawkins JD, Catalano RF, & Smith BH (2001). A comparison of the social development processes leading to violent behavior in late adolescence for childhood initiators and adolescent initiators of violence. *Journal of Research in Crime and Delinquency*, 38(1), 45–63.
- Hill KG, Bailey JA, Hawkins JD, Catalano RF, Kosterman R, Oesterle S, et al. (2014). The onset of STI diagnosis through age 30: Results from the Seattle Social Development Project intervention. *Prevention Science*, 15(Suppl. 1), S19–S32. [PubMed: 23539433]
- Hill KG, Bailey JA, Steeger CM, Hawkins JD, Catalano RF, Kosterman R, et al. (2020). Effects of childhood preventive intervention across two generations: A nonrandomized controlled trial. *JAMA Pediatrics*. 10.1001/jamapediatrics.2020.1310.
- Hirschi T (1969). *Causes of delinquency*. Berkeley, CA: University of California Press.
- House LD, Bates J, Markham CM, & Lesesne C (2010). Competence as a predictor of sexual and reproductive health outcomes for youth: A systematic review. *Journal of Adolescent Health*, 46(Suppl. 3), S7–S22.
- House LD, Mueller T, Reininger B, Brown K, & Markham CM (2010). Character as a predictor of reproductive health outcomes for youth: A systematic review. *The Journal of Adolescent Health*, 46(Suppl. 3), S59–S74. [PubMed: 20172460]
- Huang B, Kosterman R, Catalano RF, Hawkins JD, & Abbott RD (2001). Modeling mediation in the etiology of violent behavior in adolescence: A test of the social development model. *Criminology*, 39(1), 75–107.
- Jacob M (2008). The significance of gender in choosing an etiological model of delinquency (doctoral dissertation). *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 68, 3591.
- Kim MJ (2009). Youth violence prevention: Social development model approaches to predicting and preventing the progression of childhood aggression into youth violence. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 69, 3320.
- Kim S (2000). The effects of parent bonding, school bonding, belief on the structure of problem behaviors in elementary school-age children. Doctoral dissertation, University of Washington, Seattle.
- Kosterman R, Haggerty KP, Spoth R, & Redmond C (2004). Unique influence of mothers and fathers on their children's antisocial behavior. *Journal of Marriage and Family*, 66(3), 762–778.

- Kosterman R, Hawkins JD, Haggerty KP, Spoth R, & Redmond C (2001). Preparing for the Drug Free Years: Session-specific effects of a universal parent-training intervention with rural families. *Journal of Drug Education*, 31(1), 47–68. [PubMed: 11338965]
- Kosterman R, Hawkins JD, Hill KG, Bailey JA, Catalano RF, & Abbott RD (2019). Effects of social development intervention in childhood on adult life at ages 30 to 39. *Prevention Science*, 20(7), 986–995. [PubMed: 31152329]
- Kosterman R, Hill KG, Lee JO, Meacham MC, Abbott RD, Catalano RF, et al. (2014). Young adult social development as a mediator of alcohol use disorder symptoms from age 21 to 30. *Psychology of Addictive Behaviors*, 28(2), 348–358. [PubMed: 24955663]
- Laundra KH, Kiger G, & Bahr SJ (2002). A social development model of serious delinquency: Examining gender differences. *Journal of Primary Prevention*, 22(4), 389–407.
- Lengua LJ, Sadowski CA, Friedrich WN, & Fisher J (2001). Rationally and empirically derived dimensions of children's symptomatology: Expert ratings and confirmatory factor analyses of the CBCL. *Journal of Consulting and Clinical Psychology*, 69(4), 683–698. [PubMed: 11550734]
- Locke TF, & Newcomb MD (2004). Adolescent predictors of young adult and adult alcohol involvement and dysphoria in a prospective community sample of women. *Prevention Science*, 5(3), 151–168. [PubMed: 15470936]
- Loeber R, & Stouthamer-Loeber M (1998). Development of juvenile aggression and violence: Some common misconceptions and controversies. *American Psychologist*, 53(2), 242–259.
- Lonczak HS, Abbott RD, Hawkins JD, Kosterman R, & Catalano RF (2002). Effects of the Seattle Social Development Project on sexual behavior, pregnancy, birth, and sexually transmitted disease outcomes by age 21 years. *Archives of Pediatrics and Adolescent Medicine*, 156(5), 438–447. [PubMed: 11980548]
- Lonczak HS, Huang B, Catalano RF, Hawkins JD, Hill KG, Abbott RD, et al. (2001). The social predictors of adolescent alcohol misuse: A test of the Social Development Model. *Journal of Studies on Alcohol*, 62(2), 179–189. [PubMed: 11327184]
- Markham CM, Lormand D, Gloppen KM, Peskin MF, Flores B, Low B, et al. (2010). Connectedness as a predictor of sexual and reproductive health outcomes for youth. *Journal of Adolescent Health*, 46(3 Suppl.), S23–S41.
- Matsueda RL (1988). The current state of differential association theory. *Crime and Delinquency*, 34(3), 277–306.
- McMahon RJ, Forehand R, & Griest DL (1981). Effects of knowledge of social learning principles on enhancing treatment outcome and generalization in a parent training program. *Journal of Consulting and Clinical Psychology*, 49(4), 526–532. [PubMed: 7264034]
- Moffitt TE, Arseneault L, Belsky D, Dickson N, Hancox RJ, Harrington H, et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *PNAS Proceedings of the National Academy of Sciences of the United States of America*, 108(7), 2693–2698.
- National Academies of Sciences Engineering and Medicine (2019). Fostering healthy mental, emotional, and behavioral development in children and youth: A national agenda. <https://www.nap.edu/catalog/24625/the-health-effects-of-cannabis-and-cannabinoids-the-current-state>.
- O'Donnell J, Hawkins JD, & Abbott RD (1995). Predicting serious delinquency and substance use among aggressive boys. *Journal of Consulting and Clinical Psychology*, 63(4), 529–537. [PubMed: 7673530]
- Patterson GR (1975). *Families: Applications of social learning to family life*. Champagne, IL: Research Press.
- Piquero AR, Farrington DP, Welsh BC, Tremblay R, & Jennings WG (2009). Effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, 5(2), 83–120.
- Piquero AR, Jennings WG, Diamond B, Farrington DP, Tremblay RE, Welsh BC, et al. (2016). A meta-analysis update on the effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, 12(2), 229–248.
- Ramchandani P, Stein A, Evans J, & O'Connor TG (2005). Paternal depression in the postnatal period and child development: A prospective population study. *Lancet*, 365(9478), 2201–2205. [PubMed: 15978928]

- Reiss F (2013). Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. *Social Science & Medicine*, 90, 24–31. [PubMed: 23746605]
- Roosa MW, Zeiders KH, Knight GP, Gonzales NA, Tein J-Y, Saenz D, et al. (2011). A test of the social development model during the transition to junior high with Mexican American adolescents. *Developmental Psychology*, 47(2), 527–537. [PubMed: 21142368]
- Rose G (1981). Strategy of prevention: Lessons from cardiovascular disease. *British Medical Journal (Clinical Research Editions)*, 282(6279), 1847–1851.
- Scales PC, Benson PL, Oesterle S, Hill KG, Hawkins JD, & Pashak TJ (2016). The dimensions of successful young adult development: A conceptual and measurement framework. *Applied Developmental Science*, 20(3), 150–174. [PubMed: 30344455]
- Seligman MEP, Steen TA, Park N, & Peterson C (2005). Positive psychology progress: Empirical validation of interventions. *American Psychologist*, 60(5), 410–421.
- Shek DTL, Siu AMH, & Lee TY (2007). The Chinese Positive Youth Development Scale: A validation study. *Research on Social Work Practice*, 17(3), 380–391.
- Shure MB, & Spivack G (1980). Interpersonal problem solving as a mediator of behavioral adjustment in preschool and kindergarten children. *Journal of Applied Developmental Psychology*, 1(1), 29–44.
- Shure MB, & Spivack G (1988). Interpersonal cognitive problem solving. In Price RH, Cowan EL, Lorion RP, & Ramos-McKay J (Eds.), *Fourteen ounces of prevention: A casebook for practitioners* (pp. 69–82). Washington, DC: American Psychological Association.
- Singh A, Squires J, Yeh CJ, Heo KH, & Bian H (2016). Validity and reliability of the developmental assessment screening scale. *Journal of Family Medicine and Primary Care*, 5(1), 124–128.
- Slavin RE (1991). Synthesis of research of cooperative learning. *Educational Leadership*, 48(5), 71–82.
- Squires J, Potter L, & Bricker D (1999). *The ASQ user's guide for the Ages & Stages Questionnaires: A parent-completed, child-monitoring system* (2nd ed.). Baltimore, MD: Paul H. Brookes.
- Stone AL, Becker LG, Huber AM, & Catalano RF (2012). Review of risk and protective factors of substance use and problem use in emerging adulthood. *Addictive Behaviors*, 37(7), 747–775. [PubMed: 22445418]
- Sullivan CJ, & Hirschfield P (2011). Problem behavior in the middle school years: An assessment of the social development model. *Journal of Research in Crime and Delinquency*, 48(4), 566–593.
- Sutherland EH (1973). Development of the theory [Private paper published posthumously]. In Schuessler K (Ed.), *Edwin Sutherland on analyzing crime* (pp. 13–29). Chicago, IL: University of Chicago Press.
- The Commission on Positive Youth Development, Seligman MEP, Berkowitz MW, Catalano RF, Damon W, Eccles JS, et al. (2005). The positive perspective on youth development. In Evans DL, Foa EB, Gur RE, Hendin H, O'Brien CP, Seligman MEP, et al. (Eds.), *Treating and preventing adolescent mental health disorders: What we know and what we don't know* (pp. 496–527, 760–769). New York, NY: Oxford University Press, The Annenberg Foundation Trust at Sunnyslands, and The Annenberg Public Policy Center of the University of Pennsylvania.
- Vogel M, & Jaecques B (2016). Contextual analysis of crime. <https://www.oxfordbibliographies.com/view/document/obo-9780195396607/obo-9780195396607-0200.xml>.
- Walker HM, & McConnell SR (1988). *The Walker-McConnell Scale of Social Competence and School Adjustment*. Austin, TX: Pro-Ed.
- Wasserman GA, Keenan K, Tremblay RE, Coie JD, Herrenkohl TI, Loeber R, et al. (2003). Risk and protective factors of child delinquency. *OJJDP Juvenile Justice Bulletin, Child Delinquency Bulletin Series*, 4.

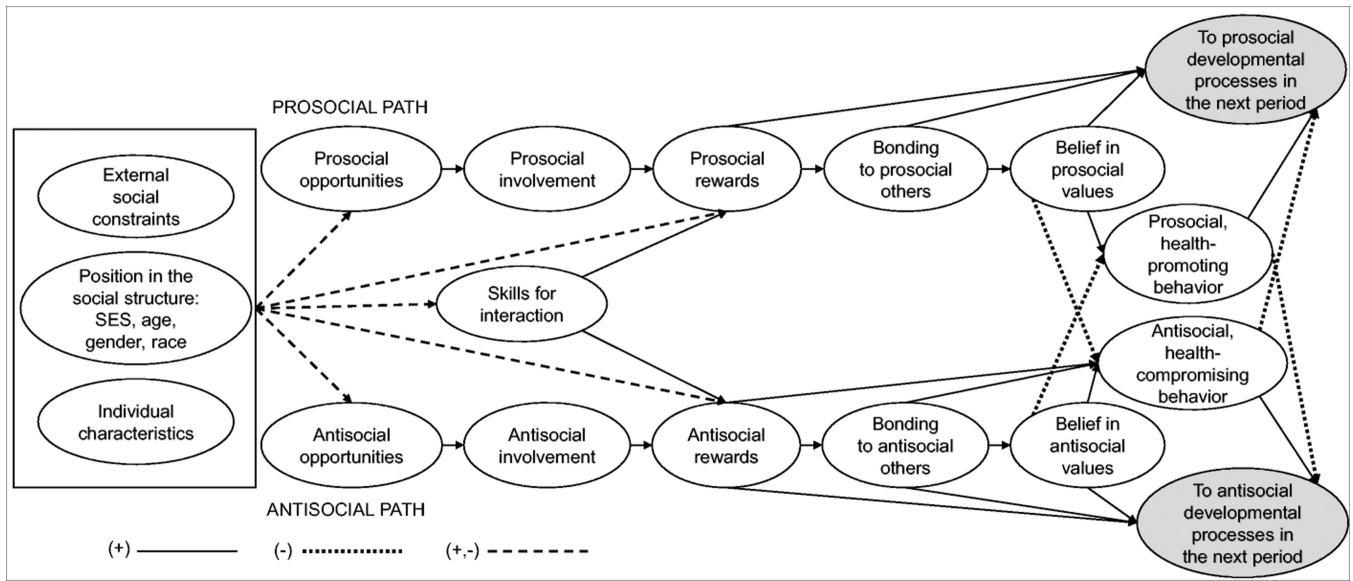


Fig. 1.

The social development model

From: Cambron, C., Catalano, R. F., & Hawkins, J. D. (2019). The social development model. In D. P. Farrington, L. Kazemian, & A. R. Piquero (Eds.), *The Oxford handbook of developmental and life-course criminology* (pp. 224–247). New York, NY: Oxford University Press. Reproduced with permission of the Licensor through PLSclear.

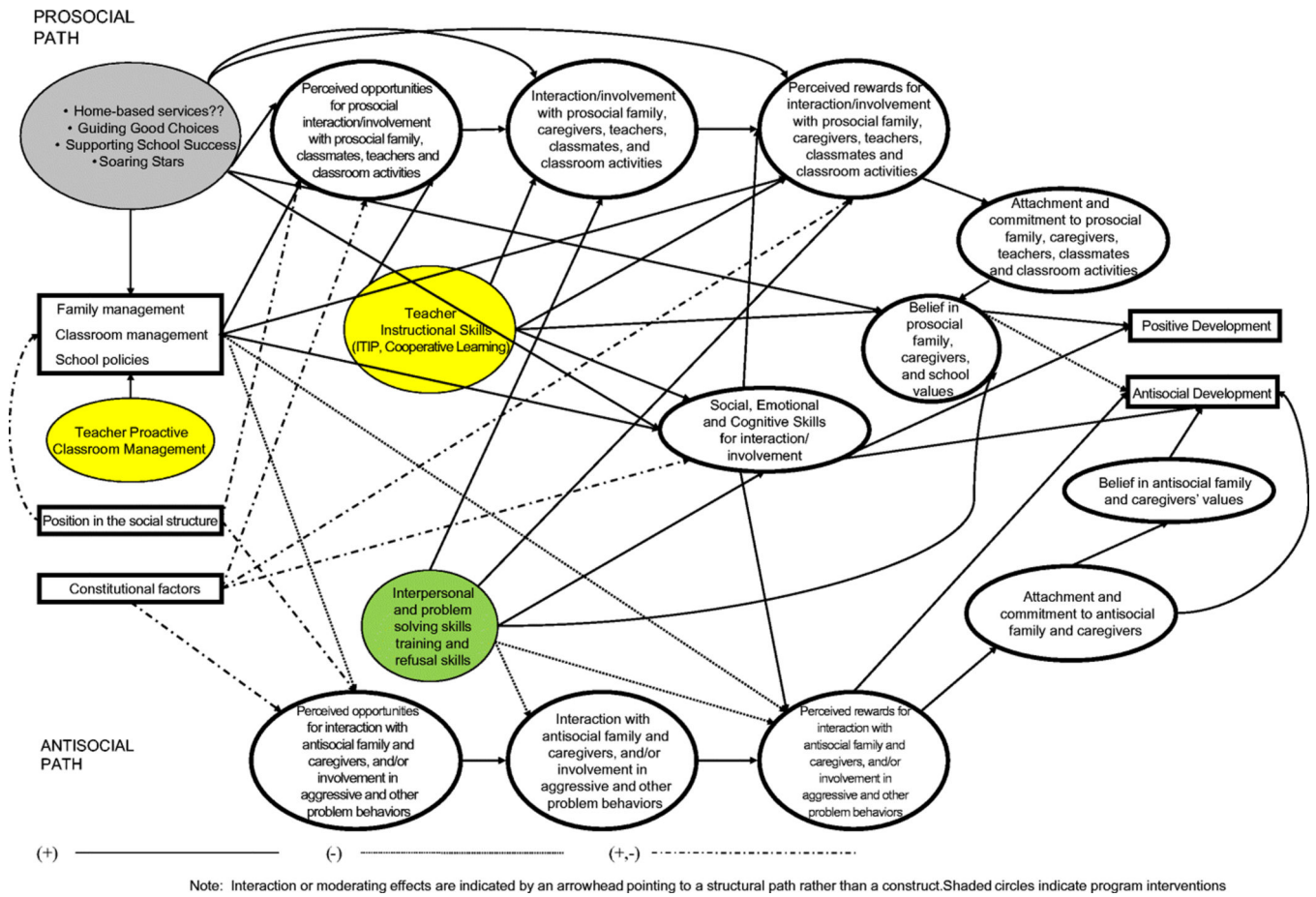


Fig. 2.
The social development model: Raising Healthy Children intervention

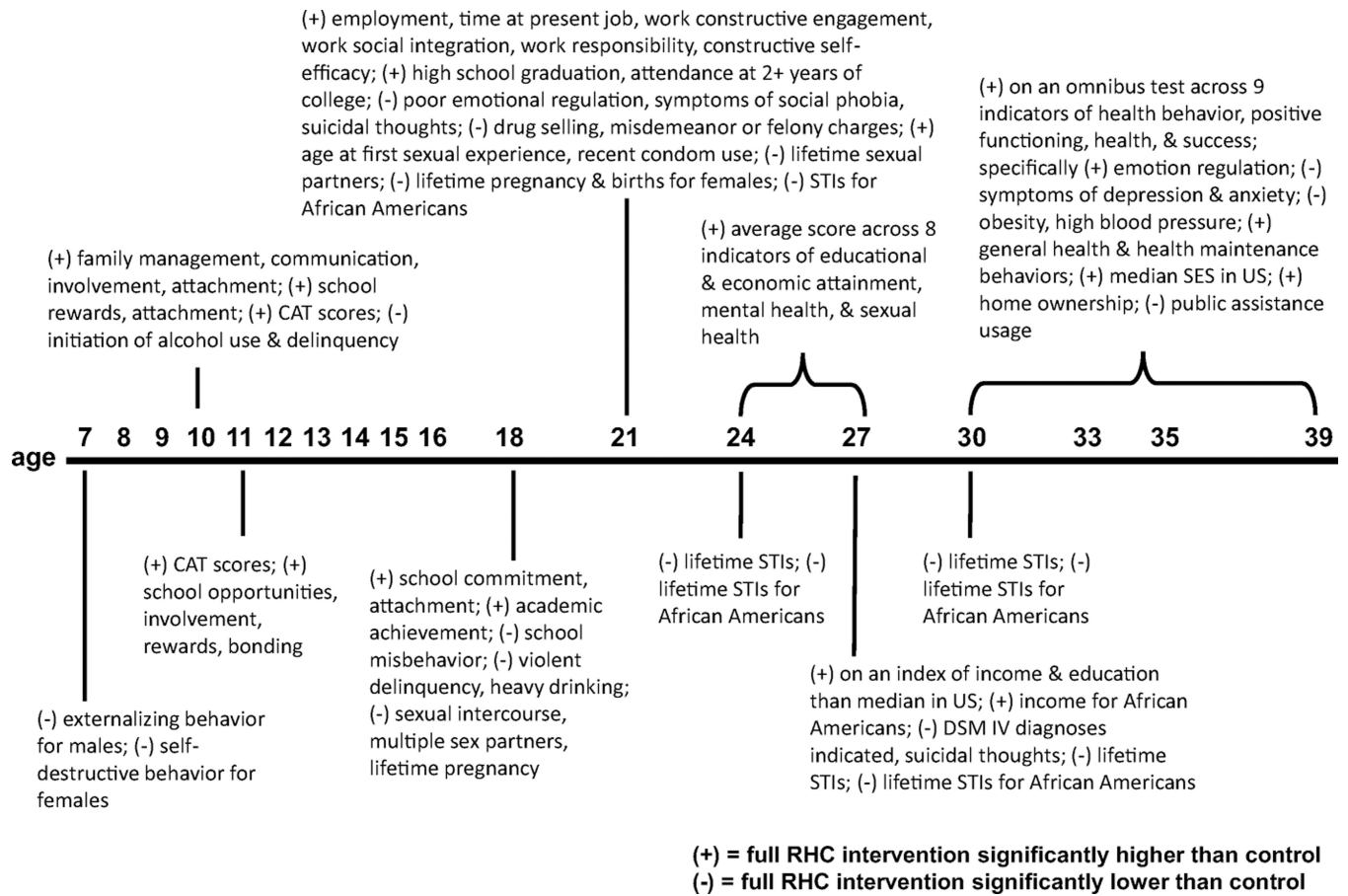


Fig. 3. Observed differences in prosocial and problem behaviors for the full Raising Healthy Children (RHC) intervention group compared to the control group from age 7 to 39

Table 1.**Raising Healthy Children (RHC) Interventions**

Component One: Teacher Training in Classroom Instruction and Management**Proactive classroom management**

- Establish consistent classroom expectations and routines at the beginning of the year
- Give clear, explicit instructions for behavior
- Recognize and reward desirable student behavior and efforts to comply
- Use methods that keep minor classroom disruptions from interrupting instruction

Interactive teaching

- Assess and activate foundation knowledge before teaching
- Teach to explicit learning objectives
- Model skills to be learned
- Frequently monitor student comprehension as material is presented
- Re-teach material when necessary

Cooperative learning

- Involve small teams of students of different ability levels and backgrounds as learning partners
- Provide recognition to teams for academic improvement of individual members over past performance

Component Two: Child Social and Emotional Skill Development**Interpersonal problem-solving skills**

- Communication
- Decision making
- Negotiation
- Conflict resolution

Refusal skills

- Recognize social influences to engage in problem behaviors
- Identify consequences of problem behaviors
- Generate and suggest alternatives
- Invite peer(s) to join in alternatives

Component Three: Parent Training**Soaring Stars**

- Behavior management skills
 - Observe and pinpoint desirable and undesirable child behaviors
 - Teach expectations for behaviors
 - Provide consistent positive reinforcement for desired behavior
 - Provide consistent and moderate consequences for undesired behaviors

Supporting School Success**Academic support skills**

- Initiate conversation with teachers about children's learning
- Help children develop reading and math skills
- Create a home environment supporting of learning

Guiding Good Choices

- Skills to reduce risks for drug use

- Establish a family policy on drug use
 - Practice refusal skills with children
 - Use self-control skills to reduce family conflict
 - Create new opportunities in the family for children to contribute and learn
-

Reproduced with permission from *Archives of Pediatrics and Adolescent Medicine*. 2002. 156(5): 438–447. Copyright©2002. American Medical Association. All rights reserved.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript