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## Creating Nurturing Environments: A Science-Based Framework for Promoting Child Health and Development within High-Poverty Neighborhoods

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### Abstract

Living in poverty and living in areas of concentrated poverty pose multiple risks for child development and for overall health and wellbeing. Poverty is a major risk factor for several mental, emotional, and behavioral disorders, as well as for other developmental challenges and physical health problems. In this paper, the Promise Neighborhoods Research Consortium describes a science-based framework for the promotion of child health and development within distressed high-poverty neighborhoods. We lay out a model of child and adolescent developmental outcomes, and integrate knowledge of potent and malleable influences to define a comprehensive intervention framework to bring about a significant increase in the proportion of young people in high-poverty neighborhoods who will develop successfully. Based on a synthesis of research from diverse fields, we designed the *Creating Nurturing Environments* framework to guide community-wide efforts to improve child outcomes and reduce health and educational inequalities.

### Keywords

child; adolescent; health; wellbeing; poverty; framework

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Unemployment (U.S. Department of Labor, 2010), social inequalities (Braveman & Egerter, 2008), health disparities (Dow, Schoeni, Adler, & Stewart, 2010; National Center for Health Statistics, 2010), and rates of children living in poverty (from 19 to 21% between 2008 and 2009; DeNavas-Walt, Proctor, & Smith, 2009) are on the rise. Local, state, and federal governments are struggling with budget deficits (National Conference of State Legislatures, 2009), resulting in cuts to educational and social programs (Johnson, Oliff, & Williams,

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2010). For example, communities around the country are (a) facing major cuts to K-12 education (eSchool News, April 9, 2010), (b) reducing summer educational opportunities (eSchool News), (c) closing parks and recreational facilities (Sichko, 2010; Young, 2009), and (d) reducing police personnel (Jackman, 2010; Muro & Hoene, 2009). At the same time, the scientific community has generated a significant amount of research demonstrating effective ways of preventing costly child mental, emotional, behavioral, and academic problems using cost-effective interventions that can be accessible to entire communities (National Research Council [NRC] & Institute of Medicine [IOM], 2009). Current economic and social conditions make this a critical time for the scientific community to work closely with policymakers and local communities to support implementation of effective, science-based, and efficient strategies to promote child health and development.

The absolute rate of poverty, particularly the rate of poverty among children, is higher in the U.S. than in other industrialized nations (Smeeding, Rainwater, & Burtless, 2001; Valletta, 2004). Rank, Yoon, and Hirschl (2003) have argued that this is a “structural failing” of the U.S., including a lack of sufficient jobs and the ineffectiveness of the social safety net. The overall poverty rate in the U.S. in 2009 was 14.3%; however, it was higher among female-headed households (29.9%), African Americans (25.8%), Hispanics (25.3%), children (20.7%), and those living in central cities (18.7%; DeNavas-Walt et al., 2009).

Living in poverty and living in areas of concentrated poverty pose multiple risks for child development and for overall health and wellbeing. Poverty is a major risk factor for several mental, emotional, and behavioral disorders, as well as other developmental challenges and physical health problems (NRC & IOM, 2009). High-poverty neighborhoods have substantially higher levels of depression (Cutrona, Wallace, & Wesner, 2006), obesity (Burdette & Hill, 2008), infant mortality, low birth weight, teenage childbearing, dropping out of school, child maltreatment, adolescent delinquency, injuries, homicide, suicide (Sampson, Morenoff, & Gannon-Rowley, 2002), and overall self-reported health problems (Do et al., 2008). In addition to the deleterious effects of concentrated poverty, higher levels of income inequality are associated with an increased risk for a wide range of negative health outcomes among infants, children, adolescents, and adults (Pickett & Wilkinson, 2008; Wilkinson & Pickett, 2009). Stratification of neighborhoods and schools by economic status also indicates a correlation with negative outcomes. Children attending schools with higher proportions of students from low-income families have lower educational performance and achievement, regardless of their own current poverty status (Aikens & Barbarin, 2008; Shumow, Vandell, & Posner, 1999), increasing the risk of poverty in adulthood (Rank & Hirschl, 2001).

Earning a high school diploma is key to success in many areas of life, including being able to continue education, increasing one’s chance for a good job and earnings, and maintaining overall health and wellbeing (Egarter, Braveman, Sadegh-Nobari, Grossman-Kahn, & Dekker, 2009). Better-educated people are more likely to be healthy and to live longer; and, if they have children, their children are healthier (Egarter et al., 2009). The interrelatedness of educational achievement and social, psychological, behavioral, and physical health and wellbeing points to the need for comprehensive efforts to prevent the many and varied deleterious consequences of poverty. Given the multitude of risks and limited opportunities to which they are exposed, children growing up in persistent poverty and within areas of concentrated poverty have considerable disadvantages in breaking out of the cycle of poverty (Ratcliffe & McKernan, 2010; Sampson, 2009; Silver, Mijanovich, Uyel, Kapadia, & Weitzman, 2011).

Advances in social and behavioral science over the past two decades have led to substantial progress in developing effective preventive and health-promoting interventions. The recent

NRC and IOM report (2009) summarizes progress to date. The evidence summarized highlights the need for population-level, multicomponent, multilevel (e.g., family and community-wide strategies), and multiyear approaches to prevention and health promotion. The report also highlights the need to advance implementation science and the dissemination of evidence-based strategies into community practice. The report, as well as the President's education and poverty reduction initiatives, inspired our thinking and motivated us to create a framework for action. The purpose of this paper is to present 1) a science-based framework that defines a key set of child and adolescent developmental outcomes and 2) a comprehensive intervention template to increase nurturing environments that could affect those key outcomes. The ultimate goal is to use the framework as a guide to promote effective and lasting improvements in social and physical environments that result in optimal child outcomes and break the cycle of intergenerational poverty.

## **Promise Neighborhoods and the Harlem Children's Zone**

President Obama proposed an ambitious effort, the Promise Neighborhoods Initiative, to address intergenerational poverty and to promote child educational and health outcomes. Its model is the Harlem Children's Zone, a highly commendable effort to implement a continuum of school and community strategies to promote child success within distressed neighborhoods (Tough, 2008).

The Harlem Children's Zone, Inc., is a non-profit, community-based organization that works to enhance the quality of life for children and families by providing support and services within a defined neighborhood in central Harlem. Harlem is a predominately African American neighborhood within New York City with a long history of marginalization, economic deprivation, high unemployment rates, high crime rates, high infant mortality rates, and short life expectancies. Since the 1990s, the introduction of the Upper Manhattan Empowerment Zone, which brought in millions of dollars in development funds and tax incentives, has helped to support a level of economic redevelopment. The Harlem Children's Zone (HCZ), led by Geoffrey Canada, began as a 1-block pilot in 1990 and has expanded to serve children and families within 100 blocks in Harlem (Tough, 2008). HCZ's ambitious goals are to end multigenerational poverty and to help each child succeed. Its core principals include creating a neighborhood-based, scalable approach to build community; providing a pipeline of support for children and families from before birth through young adulthood; creating a culture of success; and relying on continuous assessment of outcomes to modify strategies as needed ([www.hcz.org](http://www.hcz.org)).

The HCZ developed and implemented a network of programs and strategies, including 1) parenting classes for expectant and new parents, 2) a pre-kindergarten program, 3) charter schools, 4) afterschool programs, 5) an office to help students apply for and make the transition into college, 6) an employment and technology center, and 7) organization of tenant and block associations (Dobbie & Fryer, 2009; Tough, 2008). Charter schools were a main component of their efforts and included a variety of strategies to help children succeed, including 1) hiring and maintaining only high-quality teachers who obtained measurable academic success with their students measured with standardized test scores; 2) teacher and student incentives (e.g., money, trips); 3) social workers; 4) extended school days and years, plus afterschool tutoring; 5) medical services within the school; and 6) a nutritious food program (Dobbie & Fryer, 2009). Dobbie and Fryer published their evaluation of the HCZ charter schools, taking advantage of the fact that HCZ students gained entry into the charter schools through a lottery drawing. They therefore compared children who were interested in attending the HCZ schools, "won" the lottery, and attended the schools to those who lost the lottery and did not attend the schools. Among elementary school students, third graders (the first year that children in New York take standardized exams) showed significantly higher

achievement in math and English Language Arts and students in the middle school had significantly higher achievement in math (Dobbie & Fryer, 2009). From their analysis of the results, within the context of the extant literature, Dobbie and Fryer concluded that the unique blend of school strategies and policies implemented in the HCZ charter schools could bring about the results from the HCZ initiatives. The effects of the community-based efforts were less clear given the lack of a rigorous research and evaluation design (Dobbie & Fryer, 2009). In an attempt to tease apart the effects of the HCZ school and community initiatives, Whitehurst and Croft (2010) compared test scores from the HCZ Promise Academy to other public charter schools in New York City that did not include wider community services and supports. From their analysis, in which they controlled for sociodemographic factors, they found that half or more of the public charter schools in Manhattan and the Bronx produced test scores on state assessments that were superior to those produced by the HCZ Promise Academy. They concluded that the community-based initiatives of the HCZ did not seem to increase achievement outcomes above school-based initiatives alone. However, their analysis did not consider other important outcomes, such as psychological, behavioral and health outcomes critical to a child's development and success.

The Obama administration's Promise Neighborhoods initiative seeks to encourage efforts similar to the HCZ to make significant improvements in educational and developmental outcomes of children living in the most distressed communities. The U.S. Department of Education funded 21 neighborhoods for one-year planning grants that began in October 2010. Its goal is to release additional RFAs within a year to support implementation grants and additional planning grants. President Obama included \$150 million in his FY 2012 budget proposal.

### **Promise Neighborhoods Research Consortium**

Without significant involvement of the scientific community, efforts such as the Promise Neighborhoods will likely fall short of expectation. The HCZ, funded Promise Neighborhoods, and other communities working to improve the outcomes of children living within distressed neighborhoods will benefit from assistance in framing, selecting, and implementing evidence-based and efficient strategies. Without careful research and monitoring of outcomes, it will not be possible to determine if these efforts are working to achieve desired ends. Dissemination research will help to define barriers and solutions to widespread implementation of evidence-based strategies within community-based settings (Schoenwald, Kelleher, & Weisz, 2008; Weisz, Hawley, Pilkonis, Woody & Follette, 2000). Conducting dissemination research will also help to refine activities so they become increasingly effective and efficient over time.

Further progress to improve child outcomes requires a new framework to organize the scientific evidence, define the most important substantive priorities, and articulate the empirical methods needed to use existing knowledge to help achieve widespread benefit in the population. We created the PNRC for this purpose. The National Institute on Drug Abuse funded the PNRC in September 2009, under the American Recovery and Reinvestment Act (ARRA). The PNRC is a network of more than 30 nationally known researchers from a wide array of disciplines and fields, including behavioral and social sciences, education, epidemiology, evolutionary science, health behavior, human development, information technology, neuroscience, policy research, poverty research, prevention science, psychiatry, psychology, and public health. We have organized existing evidence and defined strategies for assisting high-poverty neighborhoods in improving development, health, and wellbeing among children and adolescents. We continue to monitor the scientific literature for the latest relevant research findings, and we are articulating methodological principles needed for integrating current knowledge into

practice to ensure meaningful improvement in the lives of people living in high-poverty neighborhoods (Biglan et al., 2010; Flay et al., under review). We suggest a combination of design options to enhance causal inference and to allow for continuous quality improvement of complex multi-component interventions. We conclude that a standardized measurement system is also fundamental to the evaluation of complex multi-component interventions.

The PNRC consists of four workgroups: 1) *networking*, to link and develop relationships between scientists and high-poverty neighborhoods; 2) *technology*, to develop and maintain an interactive website (promiseneighborhoods.org) for information dissemination, data collection, and networking; 3) *measurement*, to develop comprehensive yet feasible data collection tools and strategies for neighborhoods; and 4) *intervention*, to provide a foundation for choosing, integrating, and implementing evidence-based strategies. The intervention workgroup has five teams: policies, programs, kernels (simple, evidence-based, behavior-influenced practices), and education intervention, plus a research team to advance science within high-poverty neighborhoods. Each workgroup and team includes senior and early career scientists and at least one neighborhood representative. In this paper, the PNRC provides an initial statement of a science-based framework for the promotion of child health and development within distressed, high-poverty neighborhoods. It lays out a model of optimal child and adolescent developmental outcomes and defines a comprehensive intervention framework to bring about a significant increase in the proportion of young people in high-poverty neighborhoods who will develop successfully.

## Promise Neighborhoods Research Consortium's Framework: "Creating Nurturing Environments"

We created a developmentally informed, science-based framework to guide comprehensive efforts to promote health and wellbeing among children living within high-poverty neighborhoods. The framework specifies developmental outcomes that are vital to health and successful development. For each stage of development—from the prenatal phase through infancy (age 2), early childhood (ages 3–5), childhood (ages 6–11), early adolescence (ages 12–14), and adolescence (15–19)—we defined a set of key measurable outcomes that provide the foundation for success in later development. Secondly, guided by the ecological systems theory of human development (Bronfenbrenner, 1979, 1981), a comprehensive theory of health behaviors (Flay & Petraitis, 1994; Flay, Snyder, & Petraitis, 2009), our collective expertise, and a thorough review of the literature within each domain of our model, we identified and categorized malleable influences that most affect key outcomes at each phase of development. Finally, within this framework, we identified evidence-based programs, curricula, policies, and practices shown to benefit families, schools, and neighborhoods to improve these influences on child outcomes specific to each developmental phase. This section describes the outcomes and influences within the framework. The following section describes how to use the framework within distressed neighborhoods to promote optimal child development, health, and wellbeing.

Figure 1 illustrates the overall framework, entitled *Creating Nurturing Environments*. This figure is a summary of key outcomes and influences that apply across developmental phases. However, we elaborate and provide further specification of these outcomes for each developmental phase, and provide measures of outcomes and influences at each phase. This detailed information is on our website, [promiseneighborhoods.org](http://promiseneighborhoods.org). We define *nurturing* and *environments* broadly (Biglan, Flay, & Embry, under review). By *nurturing*, we mean any act, process, or condition that promotes and supports optimal developmental outcomes within a given environmental context. We define *environments* to include the social, economic, and physical conditions of a neighborhood or community. We intend the framework to be comprehensive and inclusive to guide the creation of social, economic, and



physical conditions within communities that will promote and support optimal educational, social, behavioral, and physical health outcomes among youth. Our goal was to create a comprehensive and science-based framework while keeping it parsimonious, comprehensible, and usable. Although we understand the interrelatedness, interaction, and feedback loops within and between influences and multiple outcomes (Bronfenbrenner, 1979, 1981; Flay & Petraitis, 1994; Flay et al., 2009), for simplicity, we present the model with one-directional arrows only.

We defined key outcomes at each stage of development in terms of four central domains: cognitive development, social-emotional competence, the absence of psychological and behavioral problems, and physical health. These four categorical domains highlight the diversity of outcomes requiring monitoring and promotion from birth through late adolescence (NRC, IOM, & the Committee on Evaluation of Children's Health, 2004). The four domains are interrelated (NRC et al., 2004) and the most favorable outcomes within each domain are necessary for optimal development, health, and wellbeing throughout the lifecourse (Commission on Social Determinants of Health, 2008). Table 1 includes a summary of key constructs in each outcome domain by developmental phase.

### Key Developmental Outcomes

**Cognitive development**—The broad definition of cognitive development is having age-appropriate language and numeracy skills, as well as basic cognitive skills and executive functioning. Acquiring a full, rich vocabulary is vital to young people's language skills and successful development. Children with extensive vocabularies learn to read more easily and become better readers (Nation, 2009). Thus, language is a vital precursor for a child's cognitive and social development (Cohen & Mendez, 2009). In fact, emergence of executive cognitive functions relies heavily upon language-processing abilities, a complex mediated process that allows for self-regulation, organization, and guidance of social behavior, future orientation, and abstraction. Executive functions are higher-order cognitive skills that develop throughout childhood and well into early adulthood (DeLuca et al., 2003). Examples of executive functions include working memory, attention, impulse control, goal-directed behavior, decision-making, problem solving, and sensitivity to consequences. Executive functions also operate to regulate emotional responses to the environment by interpreting social cues during interpersonal interactions, coping with stress situations, executing appropriate social responses, and inhibiting inappropriate emotional reactions (Giedd, 2004). Numeracy skills (including the ability to manipulate numbers) contribute to young people's success throughout development. Adults who lack significant numeracy skills have poorer health, financial, and employment outcomes (Dieckmann, 2008; Parsons & Bynner, 1997). Numeracy skills begin with the ability to count and perform simple arithmetic. Children who have developed these skills appropriate for their age group are more likely to grasp and do well in elementary school arithmetic (Welsh, Nix, Blair, Bierman, & Nelson, 2010). Reading and mathematics proficiency and progression through school to high school graduation are readily available indicators of successful cognitive development.

**Social and emotional competence**—This refers to a person's ability to engage effectively in social interactions (with peers and adults), to perceive and interpret social cues accurately, and to regulate emotional responses (Denham et al., 2003). Of particular relevance to the PNRC model, abilities that fall within this domain manifest as self-regulation and prosocial behaviors, skills, and attitudes. Age-appropriate social and emotional regulatory functions underlie many aspects of child development (Bronson, 2000; Buckner, Mezzacappa, & Beardslee, 2009; NRC & IOM, 2000; Posner & Rothbart 2000). Self-regulation increases over time, allowing children to develop situational awareness and,

in effect, to inhibit disadvantageous impulses, become aware of their emotions, and apply the requisite cognitive skills to exert effortful control over behavior in emotional situations, delay gratification, consider consequences, and identify a course of action that would benefit them and those around them. Children who do not fully develop this ability often exhibit aggression, anxiety, depression, frustration, anger, and other negative behaviors and moods (Denham et al., 2003). Very young children experience emotions and react to them long before they can verbalize their experiences or understand their own emotions. Learning to regulate these emotional experiences to support prosocial interactions is a primary developmental goal (Bronson, 2000; Kochanska, Murray, & Harlan, 2000; NRC & IOM, 2000). Self-regulatory abilities are more likely to develop fully within supportive environments (NRC & IOM, 2000). A nurturing environment and interventions designed to foster cognitive and emotional development have the potential to enhance self-regulation and, in effect, reduce maladjustment (Domitrovich, Cortes, & Greenberg, 2007).

Prosociality is a matter of wanting to help others, to contribute to one's community, and to have respectful and caring relationships with others. Even in a hostile or dangerous environment, children who maintain a positive attitude toward social relationships with peers, adults, parents, and others are more resilient and able to cope with challenges (Wilson, O'Brien, & Sesma, 2009). Young people with a prosocial orientation have significantly fewer psychological and behavioral problems, do better in school, and contribute more to those around them (Hankins & Biglan, in preparation; Wilson & Csikszentmihalyi, 2007; Wilson et al., 2009). However, there is also evidence that prosocial young people experience more distress in stressful situations (Wilson & Csikszentmihalyi, 2007), presumably because they are not accustomed to coping with such situations.

**Absence of psychological and behavioral problems**—Very young children can manifest early predictors of future mental and behavioral disorders. For example, most two- and three-year-olds are distractible, but there is both a qualitative and a quantitative difference with how some children show rather extreme hyperactivity, opposition, or defiance (Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). Young children with speech-language impairments that persist into school-age years are at risk for psychological problems (Conti-Ramsden, & Botting, 2008; Snowling, Bishop, Stothard, Chipchase, & Kaplan, 2006). Early signs of aggression and problem behaviors present a risk factor for more severe mental and behavioral problems before and during adolescence (Loeber, 1982; World Health Organization, 2002). Three especially vital problems to monitor and prevent during childhood are 1) aggressive behavior with other children, 2) uncooperative behavior with teachers and adults, and 3) elevated levels of depressive symptoms (Bradshaw, Schaeffer, Petras, & Jalongo, 2010; Odgers et al., 2008). Children who behave aggressively with other children are more likely to have problems making friends and more likely to have serious behavior problems, including criminal activity, as adolescents and adults (Farrington, 2001).

Important psychological and behavioral problems to monitor during adolescence include 1) alcohol, tobacco, and other drug use, 2) violent and delinquent behaviors, 3) depression and suicide ideation, and 4) risky sexual behaviors (Centers for Disease Control and Prevention [CDC], 2008). These behaviors put youth at risk for deleterious outcomes during adolescence and into adulthood (CDC, 2008).

**Physical health**—Physical health includes health conditions, functioning, and health potential (NRC et al., 2004). Health potential is a child's risk state and capacity to respond to challenges. Children in good physical health are in a better position to acquire knowledge (Council of Chief State School Officers, 1991). Health outcomes, problem behaviors, and competency indicators are interrelated (Kim, Guerra, & Williams, 2008). Through

immunizations, we have made great progress in preventing serious health conditions among youth due to infectious diseases (CDCP, 1999). Yet young people living in poverty still suffer disproportionately from preventable health conditions, such as asthma, type 2 diabetes, dental morbidity, and injuries (Environmental Protection Agency [EPA], 2009; Heron, 2007; National Institutes of Health, 2008).

Childhood and adolescence should be times of great physical health and functioning, yet numbers of young people face poor health, with the rates of asthma and type 2 diabetes increasing (Akinbami, 2006; Nadeau & Dabelea, 2008). Both low-income and ethnic minority youth have increased risk for asthma and type 2 diabetes (EPA, 2009; NIH, 2008). Most reports of health disparities by race/ethnicity do not tease apart effects of poverty and lack of resources or biological differences across different ethnic backgrounds (Barr, 2008). What we do know is that toxins in the environment (pollution, high ozone levels, secondhand smoke, dust mites, molds, cockroaches, and pet dander) cause asthma attacks, these are preventable risk factors, and young people living in poverty are at increased risk from them (EPA, 2009). The major risk factor for developing type 2 diabetes is obesity (NIH, 2008), with poor diet and limited exercise causing an increase in youth obesity (Eyre, Kahn, Robertson, & ACS/ADA/AHA Collaborative Writing Committee, 2004).

Injuries are the leading cause of death during the first several decades of life (Heron, 2007). Major advances in the prevention of injuries have occurred with child safety seats and seat belt use (Du et al., 2010; Vick, 2010), yet the burden of injury remains high and requires continuing preventive efforts. African American youth, especially those living within distressed cities, have higher mortality rates due to homicide and unintentional injuries (excluding those related to motor vehicle crashes; Silver et al., 2011). Precocious and risky sexual activity puts youth at risk for sexually transmitted disease and early pregnancy. Significant racial disparities appear in the rates of STD and HIV prevalence (Hallfors, Iritani, Miller, & Bauer, 2007). Compared to their prevalence among Whites, HIV infections are seven times more common among African Americans and three times more common among Hispanics (Hall et al., 2008). Importantly, 80–90% of adolescent HIV infections result from sexual activities (CDC, 2008). In addition, adolescents who live in high-poverty neighborhoods are at increased risk for early pregnancy (Harding, 2003).

**Summary**—Our first step in creating a framework to promote optimal outcomes was to define key outcomes across developmental phases. At each phase of development and across developmental phases, outcomes are interconnected and have a similar set of causes. Outcomes within the cognitive, social/emotional, psychological/behavioral, and physical health domains often correlate at one point in time, and influence subsequent developmental outcomes within and across domains. In the next section, we outline six domains of malleable influences on these child and adolescent outcomes. We conceptualized three of the six chief domains as proximal (immediate) influences (including family, school, and peers) and three as distal (background) influences (those important conditions in a child's neighborhood, including income and resources, social cohesion, and the physical environment). We define proximal or immediate influences as those within the immediate social environment, which have direct influences on outcomes. We define distal or background influences as predisposing factors, with effects fully or partially mediated through the proximal influences (Flay et al., 2009; Flay & Petraitis, 1994).

## Proximal Influences

**Family influences**—Parents influence the lives of children in many ways, by creating the home environment, establishing parenting practices, modeling behaviors, and communicating values and norms. The ways in which parents interact with, and provide role



models for, their children have a significant effect on children's overall development and health.

**Involvement in learning-related activities:** Parents are key teachers for their children beginning while the children are still infants. Receiving stimulation and interaction during infancy and early childhood is vital to successful development (Barros, Matijasevich, Santos, & Halpern, 2009; Bonnier, 2008; Mustard, 2006). Cognitive, social-emotional, and physical development is essential for healthy development during the early years, which provide essential building blocks for success throughout childhood and into adulthood (Irwin, Siddiqi, & Hertzman, 2007). Young children develop best in warm, responsive environments with opportunities to explore, play, and learn how to speak and listen (Irwin et al., 2007). Family members provide most environmental stimuli for young children, so they are key to development (Irwin et al., 2007). As children enter the school system, they have better academic outcomes when their parents become involved in learning-related activities (such as homework), join parent organizations at school, and partake in extracurricular activities (Rutter & Maughan, 2002; Slavin, 1984, 1994; Spera, 2005). Parents can also encourage learning-related activities by communicating their goals and aspirations for their children along with their own values about education and achievement (Spera, 2005).

**Involved monitoring:** This is an important component of effective parenting. Monitoring means staying engaged with children in ways that enable the parents to know what the children are doing and to guide their behavior. It includes environmental strategies (i.e., not allowing a television, computer, or video game in the bedroom), verbal monitoring (i.e., stating rules), and tracking of the child (i.e., calling to see if the child is at a friend's house; Dishion & McMahon, 1998). Involved monitoring also includes monitoring homework and school progress (Spera, 2005). Monitoring activities will change as the child ages. As children age and enter school, it becomes more important to monitor school attendance, grades, and activities away from home. As children become more involved with their peers, it becomes critical to monitor where they spend time and with whom they spend it (Crouter & Head, 2002; Dishion & McMahon, 1998). Involved monitoring has been associated with reduced alcohol and other drug use, conduct problems, juvenile delinquency, and risky sexual behavior, and with increased positive academic outcomes (Crouter & Head, 2002).

**Non-harsh limit setting:** Non-harsh limit setting is a type of parenting that uses moderate amounts of restrictiveness, expects appropriately mature behavior from children, sets reasonable limits, uses high levels of warmth, and is responsive and attentive to children's needs (Parke & Buriel, 1998). Discipline, when used, is reasoned, consistent, and democratic, with mutual respect and give-and-take between the parent and child (Jackson, 2002; Simons-Morton & Hartos, 2002). Non-harsh limit setting is associated with many psychological and social advantages in adolescence, such as adolescent adjustment, school performance, and psychosocial maturity (Gray & Steinberg, 1999; Simons-Morton & Hartos, 2002), as well as lower rates of negative outcomes such as aggression, delinquency, school misconduct, violence, drug use (Simons-Morton & Hartos, 2002), and alcohol use (Jackson, Henriksen, & Foshee, 1998).

**Reinforcing interactions:** Parents influence child development and outcomes through reinforcing interactions and support of positive behaviors (Brooks, 2005; Dishion et al., 2008). A family intervention that was successful in increasing positive behavior support resulted in improvements in children's early problem behavior (Dishion et al., 2008). Positive behavior support includes positive reinforcement, proactive parenting, parent involvement, and verbal interaction. Among adolescents, positive daily conversations with parents can promote and enhance feelings of closeness with parents (Collins & Laursen,

2004). Parent-child relationship quality, measured by perceived quality of communication, trust, and alienation, predicted depressive symptoms in a longitudinal study of adolescents (Branje, Hale, Frijns, & Meeus, 2010).

**Positive role modeling:** Parents are important role models for their children. Children and adolescents learn through observation and modeling of behavior (Bandura, 1977, 1986). Parental role modeling includes modeling beliefs, attitudes, and overt behavior. By watching and interacting with their parents, children and adolescents learn what behaviors and beliefs the family accepts and values (Whitbeck, 1999). Children and adolescents exposed to family and community violence are more likely to have behavioral problems and engage in violent behavior (Linares et al., 2001; McMahon, Felix, Halpert, & Petropoulos, 2009). Additionally, children and adolescents exposed to parental substance use, including smoking, alcohol use, and other drug use, are more likely to engage in these behaviors (Richter & Richter, 2001). If their parents model healthful eating and exercise, children are more likely to eat healthful foods and exercise (Lindsay, Sussner, Kim, & Gortmaker, 2006).

**Health maintenance, hygiene:** Parents are important gatekeepers for health, hygiene, and the provision of healthy food. Providing access to medical care and teaching hygiene habits (e.g., proper dental care and overall hygiene) are key parenting practices. Youth with access to healthy foods in the home are more likely to eat fruits and vegetables (Pearson, Biddle, & Gorely, 2009). As noted above, parents are powerful role models for eating and exercise behaviors (Lindsay et al., 2006). Additionally, parents should encourage daily breakfast consumption, which can lead to a decreased risk of obesity and a better diet overall, and appears to improve memory and attention, leading to better academic outcomes (Rampersaud, Pereira, Girard, Adams, & Metz, 2005). Another important area in which parents influence their child's overall health is sleep. Adolescents typically do not get enough sleep; this is especially true during the school week (Carskadon, 1999; Strauch & Meier, 1988). Several negative outcomes, such as academic problems and increased risk for substance use and depression, result from inadequate sleep or widely varying patterns in sleep from the weekday to the weekend (Fredriksen, Rhodes, Reddy, & Way, 2004; O'Brien & Mindell, 2005; Pasch, Laska, Lytle, & Moe, 2010; Wolfson & Carskadon, 1998).

**Involvement in positive activities:** Parents can promote their children's involvement in positive, health-promoting activities. Positive activities include physical activities like sports, non-competitive organized physical activity, and other activities such as religious groups, music classes and lessons, and/or supervised afterschool clubs and programs (Duncan, Duncan, Strycker, & Chaumeton, 2002). When early adolescents engage in positive and healthy activities and entertainment, their prosocial skills and tendencies grow. Research on youth behavior tells us that involvement in structured, positive activities reduces youth negative behavior, such as substance use (Cooley, Henriksen, Nelson, & Thompson, 1995), misbehavior at school (Marsh, 1992), school dropout (Mahoney & Cairns, 1997), and delinquent activity (Landers & Landers, 1978). Participation in positive activities leads to better grades (Marsh, 1992), improved test scores (Gerber, 1996), and increased school attendance (Mahoney & Cairns, 1997).

**Cumulative family risk:** Maternal depression is associated with increased risk for most mental, emotional, and behavioral problems among youth (NRC & IOM, 2009). Several studies have highlighted the negative effects of cumulative family risk factors, including maternal depression, on child health and wellbeing across developmental phases. Cumulative family risk was associated with an increase in behavior problems among first grade students (Lima, Caughy, Nettles, & O'Campo, 2010). Lima et al. (2010) measured cumulative family risk by child-to-adult ratio, maternal education, marital status, current

household smoking status, maternal depression, inter-partner violence, life stress, parental medical condition affecting parenting, harsh parenting, hostility, parental monitoring, parental affection, and parental eliciting behavior. Negative neighborhood social climate moderated the effect of family risk on behavior problems: more risk was associated with a larger increment in both psychological and behavioral problems for children living in high-versus low-risk neighborhoods. Eiden, Edwards, and Leonard (2007) examined the relations between parental alcohol diagnosis and parental warmth/sensitivity on kindergarteners' problem behaviors. They found that paternal alcohol diagnosis led to lower maternal and paternal warmth/sensitivity, and that maternal warmth/sensitivity was longitudinally predictive of problem behaviors in kindergarten. Among adolescents and young adults, Forehand, Biggar, and Kotchick (1998) examined cumulative family risk on psychosocial adjustment. Measurement of family risk included parental divorce, interpersonal conflict, maternal physical health problems, maternal depressive mood, and mother-adolescent relationship difficulties. They found both concurrent and longitudinal associations between family risk and adolescent and young adult adjustment.

**School influences**—Effective schools can ensure that most young people develop the cognitive, social, and emotional regulation skills needed to succeed in life.

**High quality early childhood education:** High quality early childhood education improves the life prospects of poor children through improved IQs, school success, and reduced rates of delinquency during adolescence (Gorey, 2001; Pianta, Barnett, Burchinal, & Thornburg, 2009; Zoritch, Roberts, & Oakley, 2000). Characteristics of high-quality preschool programs include teacher credentials, teacher/preschooler ratios, and program intensity and duration (Gorey, 2001). Preschool programs are cost-effective: for every dollar invested in preschool programs, the benefits range from \$3.78 to \$17.07 per dollar (Heckman, Grunewald, & Reynolds, 2006). A review of the scientific evidence found that high-quality early education programs result in moderate improvements in academic achievement, school readiness, IQ test scores, and high school graduation rates, and in reductions in grade retention and the need for special education (Anderson et al., 2003). In addition to positive academic outcomes, early childhood programs increase social competence, employment, and home ownership, and decrease delinquency, teen pregnancy, teen arrests, and welfare use (Anderson et al., 2003).

**High quality education:** Quality teaching and curricula are vital to effective schools. Unqualified teachers, ineffective teaching practices, and low-quality curricula lead to academic failure (Ball, 2000; Darling-Hamond, 2000; Shulman, 1987). Teaching students the academic and social skills necessary to succeed in school and in life requires that schools address social and emotional concerns that could interfere with learning and classroom management (Adelman & Taylor, 1999). Perhaps the highest priority is to ensure that children learn to read, since those who do not learn to read by the end of third grade are unlikely ever to read effectively, even though reading is fundamental to most other learning (Juel, 1988; Shaywitz & Shaywitz, 1993). Solid evidence indicates that children can learn to read if they receive evidence-based reading instruction. Kame'enui et al. (1995, 1998) have stressed the need for a systematic, schoolwide approach to reading instruction. Continuous progress monitoring, in which educators adjust instruction in light of students' progress, is also essential in every subject (Baker & Baker, 2008). In addition, a school is more effective when the staff shares a set of instructional goals, agrees on optimal instructional strategies for teaching, has strong support from the school and district leadership, and enjoys positive social relations (Bryk & Driscoll, 1988).

**Positive school climate:** The school environment has a very strong influence on the health, relationships, and academic success of students (Jia et al., 2009; Rowe & Stewart, 2009). Negative school environments include violence; bullying; limited academic and extracurricular activities; unfair discipline practices; and inadequate books, supplies, and other resources. Positive school environments show evidence of caring and supportive relationships among teachers and students, use of effective and collaborative teaching strategies, teacher commitment to student wellbeing, and parent involvement (Bowen & Bowen, 1999; Rumberger, 1995). Positive school environments help students feel connected to school, which is associated with improved academic achievement. Students who feel connected to school earn better grades, attend school more frequently, and are less likely to drop out compared to students who do not feel connected to school (CDCP, 2010a). A positive school environment and school connectedness also prevent adolescent risky behaviors, like alcohol and drug use, violence and gang involvement, and sexual risk-taking, and bring about fewer emotional problems (Battistich & Hom, 1997; CDCP, 2010b; McNeely, Nonnemaker, & Blum, 2002; Resnick et al., 1997; Whitlock, 2006).

In recent years, various systems have emerged to create schoolwide conditions that nurture positive social behavior and prevent behavioral problems. These systems manage student behavior positively and create conducive learning environments. The systems include 1) monitoring behavior and performance, 2) providing positive rewards and feedback for good behavior, 3) setting clear expectations, and 4) applying fair and consistent discipline and rules. These strategies encourage students to take responsibility for their behavior and motivate them to follow school rules so that discipline problems do not occur (Rutter & Maughan, 2002; Sugai & Horner, 2002, 2008).

Positive behavior management also makes students feel safe and connected at school (McNeely et al., 2002), and has been shown to improve academic performance (Blonigen et al., 2008). Punitive strategies that rely on excessive discipline and focus only on correcting bad behaviors are counterproductive. They increase behavior problems, coercive interactions among adults, and academic failure (Mayer, 1995; McEvoy & Welker, 2000; Skiba & Peterson, 1999, 2000).

**School attendance:** A strong link exists between poor school attendance and school dropout and academic failure. Students who attend school regularly use fewer drugs, alcohol, and tobacco; are less violent; and are less likely to have risky sex compared to students with high rates of absenteeism (Kirby, 2002; Rutter & Maughan, 2002; Suss, Tinkelman, Freeman, & Friedman, 1996). School attendance also aligns with student behaviors that are associated with good mental and physical health (Jessor, Turbin, & Costa, 1998).

**Health education and prevention:** Health education programs are an important component of quality education. Adolescents' emotional, social, and physical health influences their academic success. Evidence-based health education programs can decrease substance use, risky sex, violence, physical inactivity, poor diet, and other health-risk behaviors that put student health at risk and lead to academic failure (Brown & Summerbell, 2009; NRC & IOM, 2009). Decreasing student health-risk behaviors leads to improved academic performance (NRC & IOM, 2009). School-based health education and prevention programs also protect adolescents against suicide, HIV/AIDS, sexually transmitted diseases, unwanted pregnancy, obesity, and diabetes (Joe, Joe, & Rowley, 2009; Needham, Crosnoe, & Muller, 2004).

**Afterschool education and activities:** Many young people have no supervision in the hours after school. Afterschool programs with an academic component provide adolescents with opportunities to develop academic, interpersonal, and other skills they will need to succeed

in life (Durlak et al., 2007; Fashola, 1998; Lauer et al., 2006). Participation in afterschool activities improves homework completion, grades, standardized test scores, and school attendance (Cooper, Valentine, Nye, & Lindsay, 1999; Eccles, Templeton, & Larson, 2002; Jordan & Nettles, 2000; Kane, 2004). Afterschool programming provides adolescents with an opportunity to learn social, emotional, and communication skills needed to have successful relationships (Roth & Brooks-Gunn, 2000). Students who participate in afterschool activities have better relationships with their friends compared to those who do not participate in such activities (Ream & Rumberger, 2008). Participation in afterschool activities teaches teamwork, good sportsmanship, cooperation, problem-solving skills, and conflict-resolution skills (Fashola, 1998). Participation in afterschool programming also prevents health-risk behaviors, including drug and alcohol use, risky sex, violence and criminal activity (Eccles et al., 2002), pregnancy (Sabo, Miller, Farrell, Melnick, & Barnes, 1999), and obesity (Whitney, Cohen, Koralewicz, & Taylor, 2004). Compared to those who do not participate, adolescents who take part in extracurricular activities in school report fewer mental health concerns (Bohnert & Garber, 2007). Young people with no supervision during the afterschool hours have a greater risk of developing substance abuse (Richardson, Radziszewska, Dent, & Flay, 1993).

**Peer influences**—A healthy social environment for children is important for their overall wellbeing. As children move through elementary school, it becomes increasingly important for them to make and retain friends. Additionally, their friends have a great influence on decisions they make and behaviors they display. Therefore, the types of friends that children have can play a very important role in their wellbeing.

**Prosocial peers, role models:** Children who exhibit prosocial behavior (e.g., cooperative, helpful) are more likely to have friends, gain acceptance from peers, and encourage prosocial behaviors in each other. Children who frequently exhibit disruptive or aggressive behaviors are less likely to gain acceptance from prosocial children and tend to affiliate with other children who exhibit aggressive behaviors (Farmer et al., 2002). Even in communities in which violence occurs frequently, having prosocial peers can help these children avoid participating in violent and antisocial behaviors (Smith, Flay, Bell, & Weissberg, 2001). During early adolescence, social networks, including friends and peers, become much more important to youth (Larson & Richards, 1991). In middle school, youth begin to select friendships based on mutual interests, rather than on convenience (Csikszentmihalyi & Larson, 1984; Giordano, 2003). Research on adolescent behavior tells us that adolescents who ‘hang out’ with positive, prosocial youth are more likely to do better in school and participate in positive extracurricular activities (Wilson et al., 2009). Youth with prosocial friendships are less likely to engage in risky behavior, including dropping out of school, substance use, early and risky sexual activity, violence, and crime (Berndt & Keefe, 1995).

Prosocial friendships and social skill development will help youth become successful adults. Positive role models, or people they admire, also influence youth behavior. Research with adolescents indicates that youth benefit from relationships with positive adults they respect, such as parents, other relatives, adult friends, or professionals. This includes enhanced feelings of self-worth, higher grades, and less substance use (Hurd, Zimmerman, & Yange, 2009; Yancey, Siegel, & McDaniel, 2002).

**Exposure to alcohol, tobacco and other drug use, violence, and crime:** Community violence and youth exposure to violence have many negative consequences (Buka, Stichick, Birdthistle, & Earls, 2001). Reducing youth exposure to violence, drug use, and crime has a positive effect on adolescent youth development (Gardner, Roth, & Brooks-Gunn, 2008; Lerner et al., 2005; Roth, Brooks-Gunn, Murray, & Foster, 1998). Peer influences are also important. Adolescents’ estimates of the norms and expectations of their peers concerning



drug use affect their use of alcohol, tobacco, and other drugs, as does the actual use by their peers (Hawkins, Catalano, & Miller, 1992). Therefore, a key component of effective preventive interventions is creating positive and health-promoting peer influences and norms, which has shown to be a significant mediator of program effects on behavior (Komro et al., 2001).

**Social networking technologies:** Regular use of the Internet is widespread among youth, although use rates among low-income (73%) and African American (77%) youth are lower than among higher income (90%), white (87%), and Hispanic (89%) youth (Lenhart, Madden, & Hitlin, 2005). Social networking sites are particularly popular among youth, who use them primarily to socialize and make plans with friends, and to make new friends (Pujazon-Zazik & Park, 2010). Online social interactions provide a venue to expand social skills during adolescence (Pujazon-Zazik & Park, 2010). However, potential risks accompany social networking sites, including promotion of risk-taking behaviors, cyberbullying, and exposure to sexual predators (Pujazon-Zazik & Park, 2010).

## Distal Influences

**Income and resources—**Poverty harms people in many ways. It affects development; puts stresses on families, which results in increased conflict; affects parent and child health; and undermines cooperation among neighbors in high-poverty neighborhoods. Poor children are much more likely to grow up to be poor adults and to raise children with the same problems they had as children.

**Neighborhood poverty:** Families face special challenges when they live in neighborhoods with a high poverty rate, including 1) a high proportion of single-parent families, 2) racial segregation, and 3) families frequently moving in and out of the neighborhood (Sampson et al., 2002). Such neighborhoods have higher levels of child abuse, infant mortality, school dropout, crime, delinquency, and mental illness (Gephart, 1997; Leventhal & Brooks-Gunn, 2004; Sampson et al., 2002). In neighborhoods with high rates of poverty and frequent moving, it becomes harder for people to get to know and trust one another, making it more difficult to support each other, monitor each other's children, and guide their young people in consistent ways (Sampson et al., 2002).

**Family poverty:** In the U.S., medium family income has a negative correlation and income inequality a positive correlation with preterm births, low birth rate, and infant mortality (Olson, Diekema, Elliott, & Renier, 2010). Family poverty puts stress on parents, making it more difficult for them to be attentive, warm, and caring with their children. Therefore, within families living in poverty, parents are less likely to help their children develop social skills (Gershoff, Aber, Raver, & Lennon, 2007). Poverty undermines the quality of the time parents can spend with their children, which results in less time spent on interacting and teaching their children (Gershoff et al., 2007). Children from low-income families are less likely to be prepared for school and more likely to fall behind in school (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; West, Denton, & Germino-Hausken, 2000). Throughout children's development, poverty reduces parents' ability to invest in their children's learning. Parents with low incomes find it difficult to buy books, attain quality childcare, or pay for afterschool programs. They even lower their expectations for their children's education (Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001; Yoshikawa, Weisner, & Lowe, 2006). In this way, the effects of family poverty can stretch outside the home, affecting the quality of learning opportunities in childcare and after school. The longer children live in poverty, the more harmful its effect on their learning (Najman et al., 2009).

When their families are poor or experience job instability, children and adolescents have a higher number of psychological problems (such as depression) and behavioral problems, such as delinquency and substance use (Costello, Compton, Keeler, & Angold, 2003; Lipman, Offord, & Boyle, 1994). Economic stressors increase family conflict and reduce the quality of parenting, which in turn influences the development of problem behavior (Conger, Ge, Elder, Lorenz, & Simons, 1994).

**Relative deprivation and inequality:** Poverty is especially harmful in societies with great differences between the wealthiest and poorest people. Despite the fact that the United States is a wealthy country, the gap between rich and poor is higher in the U.S. than in most economically developed countries. Wilkinson and Pickett (2009) provide an overview of the relationship between economic inequality and various measures of health and wellbeing. Countries and U.S. states with greater inequality in wealth have higher levels of health and social problems. They have lower life expectancy, lower levels of trust, higher rates of mental illness and obesity, inferior school performance, more teenage births, more homicides, higher imprisonment rates, and less social mobility. In a subanalysis of income inequality specific to child wellbeing, they found similar relations (Pickett & Wilkinson, 2008). In an analysis of all 50 U.S. states, income inequality was associated with all indicators of child wellbeing and higher average income was associated with lower rates of teenage births and dropping out of school (Wilkinson & Pickett, 2009). As summarized above, income inequality showed a positive correlation with preterm births, low birth rate, and infant mortality in the U.S. (Olson et al., 2010).

**Access to dental and health care:** Low-income families are much less likely to have health insurance and access to dental care and healthcare, which results in many consequences, including 1) being unlikely to have a regular source of medical care; 2) unhealthy parents, which adds to their financial distress; 3) less prenatal care, resulting in unhealthy infants and increased infant mortality; 4) less health and dental care for children; and 5) poorer health outcomes among children (IOM, 2002). Many children without access to adequate healthcare suffer life-long effects from conditions such as iron deficiency anemia, asthma, attention deficit–hyperactivity disorder, and dental morbidity (IOM, 2002).

**Social cohesion**—Social cohesion involves people trusting and supporting each other in the neighborhood. It is a critical factor for neighborhoods striving to raise children successfully (Sampson et al., 2002).

**Prosocial norms, informal social control:** Laws and law enforcement are helpful to neighborhoods (Wagenaar, Toomey, & Erickson, 2005), but informal social norms are also important for maintaining neighborhood viability (Cialdini, 2007), even for such issues as public consumption of illegal drugs (Johnson, Ream, Dunlap, & Sifanek, 2008). When neighbors are mindful of each other's children, for example, boys tend to do better in school (Drukker, Feron, Mengelers, & Van Os, 2009). In a similar way, such mindfulness of each other's children and discussion of rules reduces binge drinking and drug use among adolescents (Fulkerson, Pasch, Perry, & Komro, 2008). Informal policies, such as public reinforcement for prosocial behavior in schools, can reduce vandalism in and around the schools (Mayer, Butterworth, Nafpaktitis, & Sulzer-Azaroff, 1983). Communities can use a similar reinforcement strategy for adults not to sell alcohol or tobacco to minors, with positive results (Biglan et al., 1995, 1996).

**Connectedness, social capital:** A close relationship exists between having informal social norms and having a socially supportive neighborhood. Research shows that neighborhoods where people know and trust each other have reduced crime and juvenile delinquency

(Sampson, Raudenbush, & Earls, 1997). In neighborhoods where people get to know each other and establish mutual respect and trust, people can agree on norms for behavior in the neighborhood, which encourages people to take action when young people violate those norms (Sampson et al., 1997; Veysey & Messner, 1999). This form of collective action to set limits and guide youth behavior is critical in preventing crime and other problem behavior (Sampson et al., 1997). It is easier for neighbors to cooperate in monitoring and guiding youth if the neighborhood has good common spaces for young people to play and where adults can be present (Sampson et al., 1997). Having recreational facilities, family support centers, libraries, and other places where people can gather in supportive ways is also important in ensuring that young people are guided in positive directions (Sampson et al., 2002).

**Healthy community norms:** Neighborhood norms about a healthy community can be created and have immense effects (Cubbin et al., 2008; Maddock et al., 2006; Sorensen et al., 2007). A focus on creating healthy community norms is vital since interventions focused only on individuals in poor neighborhoods often have weak effects (Maddock et al., 2006).

**Social exclusion, discrimination:** Social exclusion and discrimination break social cohesion. Certain racial, ethnic, income, and gender groups continue to receive differential treatment and face restricted access to available goods and services. Researchers have tried to understand discrimination both as social processes that affect identifiable groups and as social acts experienced by individual members of that group. Discriminatory policies and practices have limited the power, status, and wealth of particular subgroups, which contributes to patterns of social isolation and concentrated poverty (Wilson, 2009). As a result, residents in high-poverty neighborhoods tend to experience lower levels of physical and mental health, educational attainment, and employment than residents of other neighborhoods (Lamberty, Pachter & Crnic, 2000; Pachter & Coll, 2009).

Either a structural or cultural perspective has informed research on the implications of discrimination and social exclusion for the wellbeing of children and youth. For example, those concerned with structural inequalities argue that adverse educational and health outcomes may be due to differential access to material needs, such as adequate nutrition, quality housing, and schools, as well as increased exposure to environmental toxins and hazards (Williams, Neighbors, & Jackson, 2003). Others suggest that, in the absence of effective coping strategies, children and adults feel the stress associated with experiencing discrimination, which can lead to psychological and behavioral responses that undermine their optimal individual and collective development and wellbeing (Pachter & Coll, 2009; Harrell, Hall, & Taliaferro, 2003; Sellers, Copeland-Linder, Martin, & Lewis, 2006).

**Physical environment—**Many aspects of the physical environment harm young people's development. Physical design of the neighborhood affects social relations, crime, and the amount of physical activity. Decayed and abandoned buildings fuel more crime. Neighborhoods with easy access to alcohol have more drinking problems, injuries, and violence. Types of food available in the neighborhood affect people's nutrition and health. Additionally, neighborhoods often have many physical toxins (e.g., air or soil pollution) that directly affect health and behavior.

**Decay: abandoned buildings, substandard housing:** Much research shows that neighborhoods with greater physical disorder and decay (i.e., abandoned buildings, trash, and crumbling structures) have higher levels of social problems, including crime, higher levels of fear, lack of social cohesion, and more physical illness (Sampson et al., 2002). Evidence suggests that improving neighborhood conditions can increase social cohesion and mental health outcomes (Williams, Costa, Odunlami, & Mohammed, 2008). Simple street

lighting can decrease crime, traffic crashes, and injuries (Beyer & Ker, 2009; Welsh & Farrington, 2006).

**Neighborhood design, land use:** Recent research on the design of neighborhoods shows that people benefit from living in neighborhoods made up of a mix of residential, commercial, and business activities, with housing that facilitates social interactions, and that makes walking from home to work and shopping easy (Bellair, 1997; Boarnet, Greenwald, & McMillan, 2008; Felner, Seitsinger, Brand, Burns, & Bolton, 2007; Frank, Andresen, & Schmid, 2004). Such neighborhoods encourage people to walk more, to get to know their neighbors, and to participate in neighborhood activities. These neighborhoods have lower levels of obesity and greater social contact and do better at guiding the prosocial behavior of young people (Biglan & Hinds, 2009). Changing community- and street-scale urban design and land use policies such as zoning can achieve significant increases in physical activity (Heath et al., 2006).

**Access to alcohol, tobacco, other drugs, firearms:** Easy access to health-compromising products poses a significant risk for child health and wellbeing. Tobacco availability and promotion is associated with all stages of smoking among children and adolescents, from experimentation through addiction (U.S. Department of Health and Human Services, 1994). A relationship is also evident between availability of alcohol and both alcohol use and alcohol-related problems among youth (Wagenaar & Perry, 1994). Neighborhoods with easy access to alcohol have more problem drinking, crime and violence, and alcohol-related injuries (Popova, Giesbrecht, Bekmuradov, & Patra, 2009). Reducing the number of alcohol outlets and the days and hours of sale can reduce all of these problems (Campbell et al., 2009; Popova et al., 2009). Reducing young people's exposure to alcohol advertising also helps reduce problem drinking and alcohol-related problems (Anderson, de Bruijn, Angus, Gordon, & Hastings, 2009).

Easy access to firearms is a serious risk for youth living in high-poverty neighborhoods. In 2007, firearm-associated homicides accounted for greater than 80% of the deaths among African American male youth (Xu, Kochanek, & Tejada-Vera, 2009). In 1998, the firearm-homicide rate for black male teenagers was 63 out of every 100,000 (Fingerhut & Christoffel, 2002; Teplin, McClelland, Abram, & Mileusnic, 2005). The available evidence from time series, cross-sectional international and US studies indicates an association with increased firearm availability and an increased homicide rate (Hepburn & Hemenway, 2004). A 10-year time series analysis of data from the 50 states indicated a significant association between firearm availability and the rates of unintentional firearm deaths, suicides, and homicides among 5–14 year olds (Miller, Azrael, & Hemenway, 2002).

**Access to nutritious foods:** Consumption of fruits and vegetables is essential to healthy nutrition, chronic disease prevention, and weight control (World Cancer Research Fund, 1997). In urban areas, a higher density of fast food restaurants may contribute to racial differences in obesity rates (Powell, Chaloupka, & Bao, 2007). Residents of low income and minority neighborhoods most often encounter poor access to supermarkets and healthful food, and greater access to fast food restaurants and energy-dense foods (Powell et al., 2007). Increasing fruit and vegetable availability in low-access neighborhoods appears to improve dietary choices (Glanz & Yaroch, 2004). Research suggests that neighborhood residents with better access to supermarkets and limited access to convenience stores tend to have healthier diets and lower levels of obesity (Larson, Story, & Nelson, 2009). Larson et al. (2009) also examined the accessibility of restaurants and, although their results were somewhat less consistent, they found some evidence to suggest that residents with limited access to fast food restaurants have healthier diets and lower levels of obesity.

Exposure to poor quality food environments negatively affects adolescent eating patterns and weight (Davis & Carpenter, 2009). Home and school food environments influence fruit and vegetable consumption in children (French & Stables, 2003; Rasmussen et al., 2006). Eating fast food is associated with low or less frequent consumption of fruit and vegetables in children and adolescents (Rasmussen et al., 2006). Further, proximity of fast food restaurants to schools correlates with students consuming more soda and less fruits and vegetables, and having a greater likelihood of becoming overweight or obese (Davis & Carpenter, 2009). Policy interventions affecting the food environment could reduce adolescent obesity and improve overall health (Davis & Carpenter, 2009; French & Stables, 2003; Glanz & Yaroch, 2004; Rasmussen et al., 2006).

**Exposure to toxins:** Residents of high-poverty neighborhoods face a greater risk of exposure to physical toxicants. Physical toxins are detrimental to general health, behavior, cognitive capacity, and social capital. While most people know of lead (Pb) toxicity, many assume this is due only to lead paint. However, an additional problem is the lead in dust and water. Even low levels of lead exposure lower children's IQs (Jusko et al., 2008), increase ADHD (Braun, Kahn, Froelich, Auinger, & Lamphear, 2006; Nigg et al., 2008), and increase conduct disorders (Braun et al., 2006). The effects intensify when people have other stressors in their lives (Fergusson, Swain-Campbell, & Horwood, 2004). Another airborne toxin is black carbon, a marker for motor vehicle exhaust. It is associated with decreased verbal and nonverbal intelligence and impaired memory (Suglia, Gryparis, Wright, Schwartz, & Wright, 2008).

The public is less aware of other already scientifically proven toxic influences. For example, omega-3 fatty acid deficiency and cytotoxic levels of omega-6 resulting from the consumption of fast foods, processed foods, and free-lunch programs, harm infant and child cognition and development into the eighth year of life (Helland, Smith, Saarem, Saugstad, & Drevon, 2003; Hibbeln et al., 2007; Tofail et al., 2006). It increases hyperactivity (Gale et al., 2008), aggression, and mental illnesses (Arora et al., 2008; Hibbeln, Nieminen, Blasbalg, Riggs, & Lands, 2006). These adverse fatty acid ratios also cause obesity (Dziedzic, Szemraj, Bartkowiak, & Walczewska, 2007) and worsen the negative impact of lead exposure (Arora et al., 2008).

Some toxins involve physical but not chemical mechanisms. For example, the chronic noise of many poor urban neighborhoods is associated with reductions in reading and math scores, even when studies control for poverty levels (Haines, Stansfeld, Head, & Job, 2002). Even the noise generated by the classroom itself affects literacy (Shield & Dockrell, 2008).

Some toxins involve only social mechanisms. Witnessing violence directly at home (Cummings, El-Sheikh, Kouros, & Buckhalt, 2009), in the neighborhood (Foster & Brooks-Gunn, 2009; Cooley-Strickland et al., 2009), in school (Embry, Flannery, Vazsonyi, Powell, & Atha, 1996; Linares et al., 2001; McMahan et al., 2009), or indirectly via media (Hopf, Huber, & Weiß, 2008; Huesmann, Lagerspetz, & Eron, 1984) contributes to children's stress and aggressive behavior. Exposure to verbal coercion can also have this effect (Patterson, Dishion, & Bank, 1984; Patterson & Stouthamer-Loeber, 1984). Chronic exposure to these experiences appears to reset young people's biology to render them prone to impulsivity, poor self-regulation, early sexual maturity, addictions, psychiatric disorders, and "gang-like behavior" (Embry, 2002; Embry, Lopez, & Minugh, 2005; Tsankova, Renthal, Kumar, & Nestler, 2007).

**Media:** Media exposure, including television, movies, rock music and videos, advertising, video games, and computers and the Internet, significantly affects child and adolescent outcomes. Media exposure can lead to increased violent and aggressive behavior, alcohol



and tobacco use, and early onset of sexual activity (Villani, 2001). Among low-income preschool children, having a television in one's bedroom puts one at risk of being overweight, with each additional hour of time spent watching television increasing that risk (Dennison, Erb, & Jenkins, 2002). Evidence also suggests that television viewing by infants is associated with delayed language and cognitive development (Christakis, 2009). Several researchers have found manufacturers to advertise addictive products more frequently in African American and Hispanic neighborhoods compared with non-Hispanic white neighborhoods (Altman, Schooler, & Basil, 1991; Hackbarth et al., 2001; Hackbarth, Silvestri, & Coper, 1995; Mitchell & Greenberg, 1991; Pasch, Komro, Perry, Hearst, & Farbaksh, 2009). Researchers have also found that outdoor advertising for unhealthy food and beverages prevails around schools and other youth-serving institutions (Kelly, Cretikos, Rogers, & King, 2008; Maher, Wilson, & Signal, 2005; Yancey et al., 2009).

## Summary

The Creating Nurturing Environments framework provides a summary of potent and malleable influences on key child health and wellbeing indicators encompassing cognitive, social-emotional, psychological, behavioral, and physical health outcomes across developmental phases. We have provided a summary of evidence to support the importance of each construct and domain within the framework. Cognitive, social-emotional, psychological, behavioral, and health outcomes are interrelated and have an interacting set of key influences within the family, school, peer, and neighborhood environments. Negative health and developmental outcomes are concentrated among children living within high-poverty and disadvantaged neighborhoods (Dupéré & Perkins, 2007; Leventhal & Brooks-Gunn, 2000; NRC & IOM, 2009). Therefore, community-wide efforts—integrating strategies to improve the social and physical environments within families, schools, peer groups, and neighborhoods—are vital in promoting optimal child health and wellbeing. We designed this framework to guide comprehensive community efforts. It helps to highlight and promote cooperation and synergism among diverse actors within a community to integrate policies, programs, and practices more effectively to achieve community planning and action. Because all the factors we have reviewed interact (e.g., it is difficult for children to do well academically if they are in poor physical health), community sectors working on one problem have a direct interest in cooperating with and helping other sectors working in a different domain. Key implications of the Creating Nurturing Environments framework include the following:

1. Cognitive, social-emotional, psychological, behavioral, and health outcomes have inherent interrelationships.
2. The framework warrants a developmental perspective and multiyear efforts, given the significance and long-lasting effects of influences during earlier phases on later phases of development.
3. The framework includes comprehensive multicomponent and multilevel strategies, considering the interrelatedness of outcomes and interactions among influences.

## Application of the Creating Nurturing Environments Framework

In the final section of this paper, we provide recommendations regarding application of the Creating Nurturing Environments framework to improve child health and wellbeing and to reduce risks associated with poverty and with living in high-poverty neighborhoods. As we wrote earlier, the PNRC is a collaborative effort of neighborhood representatives, early career scientists, and senior scientists from a wide array of disciplines and fields. Developing this framework was one of the PNRC's initial tasks. We then used the framework to guide our analysis and synthesis of the scientific literature to provide

recommendations for evidence-based strategies that target key proximal and distal influences on child outcomes. We used the standards of evidence recommended by the Society for Prevention Research (Flay et al., 2005) to identify evidence-based strategies, including policies, programs, and practices that fit within the framework. We have placed our recommendations on our website (<http://promiseneighborhoods.org/what-works/>) as a tool for neighborhoods and fellow scientists. Implementation quality is key to the success of rolling out evidence-based strategies, with implementation process affected by program, provider, delivery system, support system, and community factors (Durlak & DuPre, 2008). Effective dissemination of evidence-based interventions will require capacity building, quality training, promotion of practitioner self-efficacy, workplace support, and supervision (Turner & Sanders, 2006; Wandersman et al., 2008). Each step of the dissemination process will require monitoring and continuous quality improvement to ensure desired outcomes.

The framework also guided our development of a comprehensive monitoring and measurement system. We assembled measures for the cognitive, social-emotional, psychological, behavioral, and health outcomes at each stage of development (from pregnancy through adolescence). In addition, we have assembled (and in some cases, developed) a comprehensive set of measures to assess the characteristics of families, schools, and neighborhoods as they relate to child outcomes. The measures include neighborhood-, school-, family-, and individual-level data from archival (pre-existing) sources, as well as surveys of enrolled students, parents, and teachers. Our website (<http://promiseneighborhoods.org/measures/>) provides details regarding these measures. We are now developing an infrastructure to support standardized collection of data and a summary of results for neighborhoods to use in achieving continuous quality improvement and to construct rigorous evaluations of each intervention component and an overall evaluation of multicomponent, community-wide initiatives (Biglan et al., 2010; Flay et al., under review).

We close with five principles to guide the application of the Creating Nurturing Environments framework:

1. A focus on high-poverty neighborhoods makes sense, given significant health and educational inequalities that currently exist (Aikens & Barbarin, 2008; Burdette & Hill, 2008; Cohen, Farley, & Mason, 2003; Cutrona et al., 2006; NRC & IOM, 2009; Sampson et al., 2002; Shumow et al., 1999).
2. The implementation of evidence-based strategies is necessary, but not sufficient. Ongoing measurement and monitoring is essential to determine the effectiveness of each component within specific neighborhood contexts (Biglan et al., 2010).
3. It is important to integrate, coordinate, and sustain a comprehensive set of evidence-based strategies efficiently across developmental phases. This requires development and ongoing efforts for communication and cooperation across community organizations.
4. Community-wide and non-stigmatizing approaches are fundamental in achieving high-levels of community support, participation, and population-level change.
5. The framework highlights malleable proximal and distal influences to create healthful and nurturing environments. To begin, neighborhoods should focus on feasible changes to existing structures, functions, and environmental influences. The successful completion of feasible changes will then promote continued efforts and success.

Based on a synthesis of research from diverse fields, we designed the Creating Nurturing Environments framework to guide community-wide efforts to improve child outcomes and reduce health and educational inequalities. It is our sincere hope that this framework, along

with the evidence-based strategy recommendations and measurement system provided on our website, will be valuable tools for the promotion of optimal success and wellbeing among children living within distressed communities. Integrating knowledge of potent and malleable influences and effective strategies into regular ongoing community-based practice, along with promotion and assistance in the use of scientific methods for continuous quality improvement and analysis of results, are key to determining what is and what is not working to improve the wellbeing of children within our communities. To make this happen, we encourage strong partnerships between the scientific community and neighborhood-based organizations.

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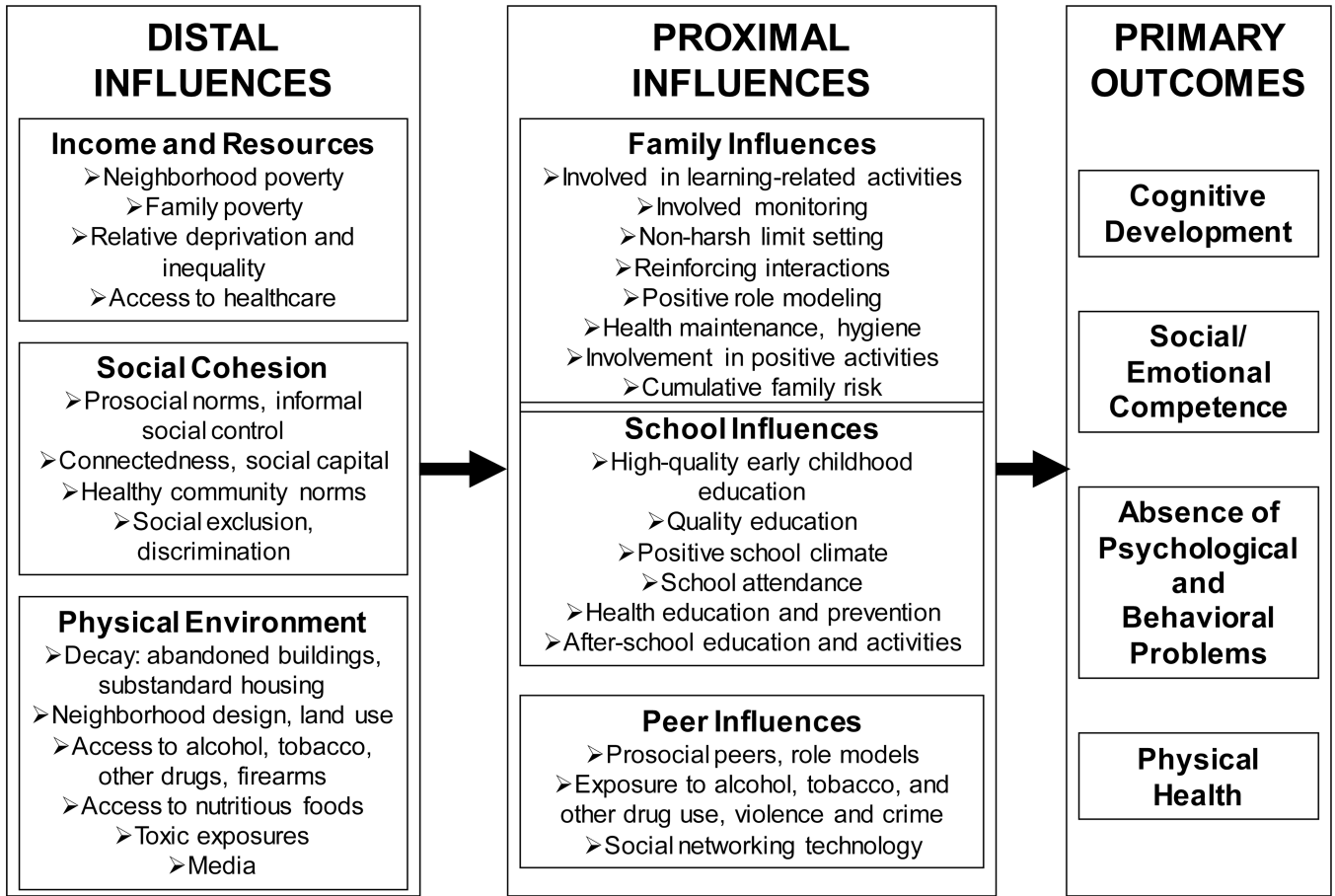
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**Figure 1.**  
A Framework for Creating Nurturing Environments

**Table 1**

## Key outcomes by developmental phase

Developmental phase	Outcome Domain			
	Cognitive Development	Social & Emotional Competence	Absence of Psychological and Behavioral Problems	Physical Health
Prenatal- infancy (birth to age 2)	language development; executive functioning	social and emotional development; attachment	self awareness develops; behavioral development	birth weight; physical and motor skill development; injuries
Early childhood (3–5)	language and early literacy development (e.g., picture naming, rhyming, letter naming); executive functioning	self-regulation; emotional symptoms; social relations; prosocial behavior, skills, attitudes	self-concept develops; behavioral development; attentional and hyperactivity difficulties; conduct problems	physical development; injuries; asthma-like illness; diet; physical activity; height/weight percentiles; oral health
Childhood (6–11)	reading proficiency; mathematics proficiency (at or above grade level); executive functioning	Same as above, plus: gradual shift in control from parents to child; peers assume a more central role	Same as above, plus: self- concept becomes more complex; disruptive and aggressive behavior; depressive symptoms	Same as above, plus: strength and athletic skills improve
Early adolescence (12–14)	Same as above, plus intellectual development, abstract thinking	Same as above, plus: central role of peer group, identity formation	Same as above, plus: violent behaviors; drug use; risky sexual behaviors	Same as above, plus: more rapid physical growth and changes; puberty and reproductive maturity; self- inflicted injuries; type 2 diabetes; STDs; any pregnancy
Adolescence (15–19)	Executive functioning; intellectual development; critical and rational thinking; high school graduation	Same as above, plus: moral development; intimacy development	Same as above	injuries; self-inflicted injuries; diet; physical activity; BMI; type 2 diabetes; STDs; unplanned pregnancy, repeat pregnancy