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Family functioning as a mediator between neighborhood conditions and children's health: Evidence from a national survey in the United States

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ABSTRACT

This study examines whether the associations between neighborhood conditions and children's health can be indirect and operate through aspects of family functioning. We use data from the 2007 National Survey of Children's Health in the United States with the interviewed parents/guardians as the only source of the data. Our study sample includes 53,023 children aged between 6 and 17 years. Using structural equation modeling, we test both direct and indirect relationships between a family functioning index, a general indicator of children's health status, and three neighborhood factors: neighborhood physical resources, environmental threats, and collective efficacy. Covariates in the analysis include gender, age, income, race, family structure, parental education, and health insurance coverage. All the three neighborhood factors show direct associations with children's general health status, as well as indirect associations mediated by aspects of family functioning. Among the three neighborhood factors, collective efficacy and environmental threats are found to have much stronger associations with children's general health than physical resources. When designing health-promoting neighborhoods for children and families, it may be more efficient for urban planners and health professionals to focus on community programs that reduce environmental stressors and foster neighborhood cohesion than programs that solely improve physical infrastructure. This study also verifies that aspects of family functioning mediate the associations between neighborhood conditions and children's health. It is recommended that both family and neighborhood are critical points for child health intervention.

Introduction

A rich body of research has offered theoretical frameworks for understanding the associations between neighborhood conditions and children's health in North America (Brooks-Gunn, Duncan, & Aber, 1997; Burton & Jarrett, 2000; Cohen & Wills, 1985; Earls & Carlson, 2001; Evans, 2006; Jencks & Mayer, 1990; Leventhal & Brooks-Gunn, 2000, 2003). These frameworks in general have roots in social and environmental psychology or in social ecology. The psychologically-driven frameworks have focused on identifying mechanisms and pathways through which neighborhood effects operate on children (Brooks-Gunn et al., 1997; Burton & Jarrett, 2000; Evans, 2006; Jencks & Mayer, 1990; Leventhal & Brooks-Gunn, 2000, 2003). Prevailing models along this line include the resource models (Leventhal & Brooks-Gunn, 2000), the collective socialization models (Leventhal & Brooks-Gunn, 2000), the contagion/epidemic models (Jencks & Mayer, 1990), the models of competition (Jencks & Mayer, 1990), the relative deprivation models (Jencks & Mayer, 1990), the environmental stress models (Evans, 2006), the relationship models (Leventhal & Brooks-Gunn, 2000), and the buffering models (Cohen & Wills, 1985).

The first six sets of models, including the resource, collective socialization, contagion, competition, relative deprivation, and environmental stress models, can be considered as "direct-effect structural models" showing how children's health may be directly related to the structures of physical environment and social organization in their neighborhoods (Ellen, Mijanovich, & Dillman, 2001). The resource models posit that children's outcomes are related to their access to neighborhood resources including parks, libraries, and community centers—all of which provide healthy learning and living environments for children. The collective socialization models emphasize the importance of community-level formal and informal institutions in supervising and monitoring the behavior of neighborhood children. The contagion, competition, and relative deprivation models all suggest how

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characteristics of neighborhood peers may directly relate to children's health as peers spread behavior problems, compete for scarce resources, and stimulate self evaluation of one's own circumstance relative to other neighborhood children.

As one of the "direct-effect structural models", the environmental stress models describe an additional mechanism through which neighborhood conditions may be directly associated with children's health: Environmental conditions may directly interfere with optimal human functioning and evoking the individual stress and coping process (Ellen et al., 2001; Evans, 2001, 2006). According to this set of models, exposure to neighborhood conditions with multiple, persistent stressors (e.g., crime, violence, pollution, noise, and overcrowding) generates accumulated psychological stress which may acerbate hypertension and other stress-related disorders, increase engagement in unhealthy behaviors, weaken the immune system, and increase vulnerability to disease and disability (Ellen et al., 2001; Evans, 2001, 2006).

The relationship models and the buffering models are distinct from the "direct-effect structural models" discussed above. Both types of models focus on conceptualizing the indirect mechanisms through which neighborhood conditions relate to children's health:

- The relationship models highlight active roles that family and parental relationships play in mediating the associations between neighborhood conditions and children's health (Leventhal & Brooks-Gunn, 2000). This set of models suggests that the associations between neighborhood conditions and children's health may be indirect and operate through parental behaviors and family functioning. Adverse neighborhood characteristics like poverty, violence, and lack of social support may increase parental stress, disrupt family functioning, and lead to negative effects on children's health (Conger, Ge, Elder, Lorenz, & Simons, 1994; Elder, Eccles, Ardelt, & Lord, 1995). In an opposite situation, strong neighborhood cohesion may mitigate parental stress and strengthen family functioning, thus lead to positive associations with children's health (Conger, Ge, Elder, Lorenz, & Simons, 1994; Elder et al., 1995). Additionally, parent behavior such as harshness/control may mediate between neighborhood conditions and children's health. Living in impoverished and dangerous neighborhood is often associated with harsh parental control (Furstenberg et al., 1993). The extent to which parents monitor or control their children's activities in turn affects children's exposure to the neighborhood, which could positively or negatively affect children's health (Klebanov, Brooks-Gunn, & Duncan, 1994; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996).
- The buffering models, originally put forward by Cohen and Wills (1985), have been generalized to highlight that social support either within or outside the family provides a 'buffer effect', protecting children from neighborhood risks and contributing to children's 'resilience' to adverse neighborhood conditions (Caughy, O'Campo, & Muntaner, 2003; Ceballo & McLoyd, 2002; Fagg, Curtis, Stansfeld, & Congdon, 2006; Fagg et al., 2008). The buffering models emphasize the interaction effects between adversity in the neighborhood and social support in the family/immediate social circle. In other words, social support in the family/immediate social circle modifies or buffers the negative effects of neighborhood-level risks on children's health.

The relationship and buffering models, as they focus on how neighborhood conditions relates to children's health indirectly—either through the mediation of family processes and parenting behavior or through neighborhood conditions' interaction with family- and individual-level factors, to some degree overlap with models following social ecology theories. Social ecology models of children's health highlight the nested arrangement of family, school, neighborhood, and community contexts in which children grew up (Bronfenbrenner, 1979; Earls & Carlson, 2001; Eisenmann et al., 2008; Leventhal & Brooks-Gunn, 2000). The models envision family processes and child development as embedded in school, neighborhood, and other environmental settings. It has been suggested that family variables play two substantial roles in neighborhood studies: as mediators that transmit the effects of neighborhood conditions on children's health, and as moderators that interact with neighborhood conditions and modify or buffer the effects of neighborhood conditions on children's health (Earls & Carlson, 2001).

The models reviewed above are complementary rather than conflicting. Regardless of the psychologically- or ecologically-driven models, they indicate that neighborhood conditions may impact on children's health directly and indirectly. However, the ongoing advancement in theoretical research have not brought equally sizable leap in empirical research in the field.

First, although there is a large body of empirical research examining the associations between neighborhood conditions and children's health (Aneshensel & Sucoff, 1996; Caspi, Taylor, Moffitt, & Plomin, 2000; Caughy et al., 2003; Curtis, Dooley, & Phipps, 2004; Fagg et al., 2006, 2008; Fortson & Sanbonmatsu, 2010; Franzini et al., 2009; Garbarino, 1992; Kohen, Leventhal, Dahinten, & McIntosh, 2008; Lee & Cubbin, 2002; Steptoe & Feldman, 2001; Xue, Leventhal, Brooks-Gunn, & Earls, 2005), most of them focus on specific neighborhood dimensions (e.g., poverty, noise, crowding, built environment, social fragmentation) and specific health-related outcomes (e.g., low birth weight, risk behaviors, depression and anxiety, physical activity). As such, results from existing empirical research are rarely comparable. It is difficult to identify which neighborhood dimensions have the strongest association with children's general health.

Second, although most empirical studies on the subject refer to psychology and ecology models as their underlying theoretical foundations, only a small subset of them follow the theoretical models closely enough to develop corresponding analytical models that examine both the direct and indirect relationships between neighborhood conditions and children's health. As noted by Sampson (2001) and Sampson, Morenoff, and Gannon-Rowley (2002), the most common strategy in the field is to estimate a direct effects model where a host of individual, family, peer, and school variables are entered as controls alongside current neighborhood characteristics of residence.

The field is especially lacking in empirical studies that examine the indirect pathways between neighborhood conditions and children's outcomes (Sampson, 2001; Sampson et al., 2002). There are exceptions in the general child development literatures where sophisticated methods such as structural equation models (Kohen et al., 2008; Simons et al., 1996), multi-level or hierarchical linear models (Beyers, Bates, Pettit, & Dodge, 2003; Ceballo & McLoyd, 2002), and qualitative case studies (Cattell, 2001) have been used to verify specific pathways through which neighborhood conditions relate to children's developmental outcomes. In the more specific child health literatures, exceptions include Wickrama and Bryant (2003), Caughy et al. (2003), and Fagg et al. (2006). These studies, following the theoretical frameworks of the socio-ecological models and/or the buffering models, empirically examined the meditational and interactive roles of family factors in shaping the relationship between neighborhood conditions and mental health among children and adolescents (Caughy et al., 2003; Fagg et al., 2008; Wickrama & Bryant, 2003). However, while these studies have made significant headway in verifying or de-verifying the indirect pathways between neighborhood conditions and children's health set forth by the theoretical literature on the subject, their contribution is somewhat limited by the fact that