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Neighborhood poverty and children's food insecurity

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ABSTRACT

Food insecurity among children and their families negatively affects children's health and well-being. While the link between household resources and food insecurity is well-established, family income alone does not explain food insecurity; neighborhood disadvantage, shown to affect other areas of children's development, may also play a role in food insecurity. This study examines associations between neighborhood poverty and children's food insecurity, and whether family characteristics account for identified associations. We merge data on kindergarten-age children from the Early Childhood Longitudinal Study-Kindergarten 2010–11 Cohort (ECLS-K:2011) with data on poverty rates from the American Community Survey (ACS) and on food access from the USDA's Food Environment Atlas using children's residential census tracts ($N = 12.550$ children in 3750 tracts). Using a series of multilevel models, we test for associations between neighborhood poverty, household economic, demographic, and parenting characteristics, and food insecurity at the child, adult, and household levels. Children living in higher-poverty neighborhoods are more likely to experience food insecurity than those in lower-poverty neighborhoods. Associations between neighborhood poverty and household- and adult-level food insecurity disappear when household characteristics are controlled. However, living in a very high poverty neighborhood remains predictive of child-level food insecurity, which may be an indicator of severe hardship. Findings indicate that neighborhood poverty may be a useful proxy to identify vulnerable children.

1. Introduction

In 2014, two in ten (19.9%) U.S. households with children under age six were considered to be food insecure, meaning that the food intake or eating patterns of one or more members were disrupted because the household lacked resources for food, at some point during the year (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015). Although adults in food-insecure households often shield children, in nearly one in ten (9.1%) U.S. households with children under age six, children themselves experienced disrupted eating or reduced food intake (Coleman-Jensen et al., 2015). The rates of food insecurity among children and their families are alarming, as poor nutrition or disrupted eating has negative impacts for children's health and well-being (Nord, 2009). Even when children do not experience inadequate food themselves, there is evidence that their parents' food insecurity negatively affects children's physical, cognitive, and social-emotional outcomes (Johnson & Markowitz, 2015), through increased parent stress or depression (Bronte-Tinkew, Zaslow, Capps, Horowitz, & McNamara, 2007; Nord, 2009).

Although the link between household resources and food insecurity is well-established, family income alone does not explain food insecurity; neighborhood resources may also play a role (Carter, Dubois, & Tremblay, 2013; Gorton, Bullen, & Mhurchu, 2010; Nord & Parker, 2010). Living in communities of concentrated neighborhood poverty has been shown to affect the health, development, and long-term educational and economic outcomes of residents (Brooks-Gunn & Duncan, 2000; Chetty & Hendren, 2015; Chetty, Hendren, & Katz, 2015; Leventhal & Brooks-Gunn, 2000; Ludwig et al., 2011). However, the research investigating the relations between neighborhood resources, household characteristics, and food insecurity is limited (Carter, Dubois, & Tremblay, 2014).

This paper addresses these gaps in the literature on neighborhood resources and food insecurity. First, using a recent, large nationally representative dataset of children merged with census tract-level data on poverty and the community food environment, we descriptively analyze the associations between neighborhood poverty and food insecurity. Second, we investigate the extent to these associations vary between children living in rural and urban neighborhoods.

1.1. Neighborhoods and child development

Within a bioecological systems framework (Bronfenbrenner & Morris, 2006), family characteristics and circumstances, operating within children's microsystem, would be expected to be strongly predictive of children's outcomes. Indeed, research finds that a variety of child outcomes, including achievement and food security, vary with characteristics such as family income, parental employment, household

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composition, and race and ethnicity (Coleman-Jensen et al., 2015; Duncan, Morris, & Rodrigues, 2011; Jacknowitz, Morrissey, & Brannegan, 2015; Morrissey, Hutchison, & Winsler, 2014; Nord & Parker, 2010). Neighborhoods, as part of children's macrosystems, represent daily, sustained environments that may also affect children's development. Disadvantaged neighborhoods, such as those with high poverty rates, average fewer and lower levels of both social and institutional supports, lower levels of collective socialization, and higher levels of social isolation, than low-poverty neighborhoods (Sampson, Morenoff, & Gannon-Rowley, 2002; Small & McDermott, 2006; Wilson, 2012), and these aspects have been found to be pathways through which neighborhood disadvantage affects children's development (Galster, 2010; Kohen, Leventhal, Dahinten, & McIntosh, 2008; Leventhal & Brooks-Gunn, 2000). A growing body of research demonstrates the importance of neighborhood resources, particularly poverty level, for a range of child and adult outcomes, including educational achievement, health, and long-term economic outcomes (Chetty et al., 2015; Chetty & Hendren, 2015; Ludwig et al., 2011; Sharkey, 2010; Wodtke, Harding, & Elwert, 2011; Wolf, Magnuson, & Kimbro, 2015).

1.2. Neighborhood poverty and food insecurity

Despite the increased research attention on the effects of neighborhoods on children's cognitive, social-emotional, or economic outcomes, studies examining the associations between neighborhood poverty and children's health and nutrition, particularly food insecurity, are few. Characteristics of the physical environment, such as the proximity of food stores, the availability of social support, access to public or private transportation, or crime levels may play an important role in linking neighborhood disadvantage with food insecurity, especially in more densely populated areas (Bader, Purciel, Yousefzadeh, & Neckerman, 2010).

Research in public health and nutrition demonstrates the importance of food insecurity, both as experienced directly by children and by their adult caregivers, for concurrent and later measures of children's health and development. Food insecurity as experienced during the earliest years of development appears particularly important to children's behavioral and socio-emotional impairments (Howard, 2011) and school readiness at kindergarten entry (Johnson & Markowitz, 2015), although food insecurity experienced during elementary school is also associated with poorer cognitive outcomes (Alaimo, Olson, & Frongillo, 2001; Jyoti, Frongillo, & Jones, 2005). Young children living in food-insecure households are more likely to experience poorer health (Bronte-Tinkew et al., 2007; Ryu & Bartfeld, 2012) and exhibit more behavioral problems (Whitaker, Phillips, & Orzol, 2006) than those in food-secure households. Similarly, other research indicates that young children living with adults who experience transient food insecurity score lower on cognitive measures than their peers living with food-secure adults (Hernandez & Jacknowitz, 2009).

If associated with food insecurity, the neighborhood poverty rate could be a useful indicator for identifying at-risk children and communities, particularly given the regularly gathered geographic data available on poverty. Existing research in this area is limited, however, although several studies have found associations between the neighborhood characteristics linked with poverty and food insecurity. Using nationally representative data from the 1998 Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) linked with census data, Kimbro, Denney, and Panchang (2012) found that children living in the poorest and racially segregated neighborhoods were likely to persist in food insecurity (Kimbro et al., 2012). Likewise, research in the United Kingdom and Canada have found positive associations between measures of disadvantage such as disorder and social deprivation and food insecurity (Carter, Dubois, Tremblay, & Taljaard, 2012; Pilgrim et al., 2012). Other work using a sample of households in Wisconsin with elementary-age children found no associations between neighborhood poverty per se and food security, but other community factors such as access to transportation, housing costs, and grocery store availability were predictive of food security (Bartfeld, Ryu, & Wang, 2010). Likewise, in a sample in Iowa, Garasky, Morton, and Greder (2006) found that inadequate numbers of food stores, together with high food prices, were viewed by families as barriers to meeting their food needs. This research also suggests a protective effect of living in rural areas compared to urban or micro-urban areas (Bartfeld et al., 2010; Carter et al., 2014; Garasky et al., 2006).

An important challenge to neighborhood research is selection into neighborhoods. Indeed, some quasi-experimental research finds that family characteristics account for much of the association between neighborhood poverty and children's outcomes (Page & Solon, 2003a, 2003b; Solon, Page, & Duncan, 2000). To address the selection issue, the Moving to Opportunity (MTO) Study randomly assigned a sample of families living in high-poverty census tracts to one of three groups: to have housing vouchers that could only be used in low-poverty neighborhoods (poverty rates less than 10%); to have traditional vouchers with no location requirements; or to have no vouchers at all. While the random-assignment in the MTO study partially addressed the issue of neighborhood selection, it confounds neighborhood characteristics and residential moves, the latter of which has been shown to predict food insecurity in households with young children (Jacknowitz et al., 2015). Further, it only provides for an estimate of the average effect of neighborhood, which is problematic when generalizing to families who would not be willing to move.

1.3. The current study

Although estimating the causal pathways of neighborhoods on children and families is important, descriptive associations between neighborhood disadvantage, family poverty, and food security can be useful in a policy context to identify potentially vulnerable children in order to use resources most efficiently and effectively. To date, although much is known about the micro-level (e.g., household income) factors that predict food insecurity, we know less about the contextual factors, particularly neighborhood disadvantage, that are associated with food insecurity among families with children. Children facing disadvantage at either, or both, the household and neighborhood levels may be at risk for food insecurity. Given the increase in the concentration of poverty in recent years (Bishaw, 2014; Jargowsky, 2014; Kneebone, 2014) and the negative effects of food insecurity on children's short- and long-term outcomes (e.g., Hernandez & Jacknowitz, 2009; Johnson & Markowitz, 2015; Nord, 2009), examining the associations between neighborhood poverty and food insecurity among households with young children warrants greater attention. This study addresses this gap in the literature using the 2010–2011 Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K:2011), a recent, large, nationally representative dataset, linked with contextual data on neighborhood poverty, to descriptively examine associations between neighborhood poverty, family poverty, and food insecurity among households with children. Specifically, we address two research questions:

1. Does food insecurity among kindergarten children vary by neighborhood poverty? We hypothesize the likelihood of food insecurity will increase with the neighborhood poverty.
2. Do the (expected) associations between neighborhood poverty and food insecurity vary between rural and urban or suburban areas? We expect that associations between neighborhood poverty and food insecurity will be weaker among rural communities.

2. Methods

2.1. Data and sample

This study uses data from three sources. First, the Early Childhood Longitudinal Study-Kindergarten 2010–11 Cohort (ECLS-K:2011),