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The Emergence of the Educational Gradient in Health among Children in Immigrant Families

Introduction

In the United States, socioeconomic disparities in child health are striking—health is a marker of population welfare that is unequally distributed at the time of birth (Currie 2005; Finch 2003). The association between parental resources and child health is more ambiguous among children in immigrant families, however, despite strong disparities in child health in native-born families. Immigrant mothers and their infants often experience more favorable health than would be expected on the basis of their socioeconomic resources (e.g., Abraido-Lanza, Chao and Florez 2006). Moreover, there is evidence of a weaker socioeconomic patterning to health among immigrant adults than among native-born adults, as well as among babies born to immigrant vs. native-born mothers (Goldman et al. 2006; Jackson, Kiernan and McLanahan, forthcoming)—despite evidence of socioeconomic gradients in health among second-generation adolescents (Jackson 2011). These findings suggest that a gradient in health emerges within a generation. I will examine the emergence of the educational gradient in health among children in immigrant families. Longitudinal data spanning the period of birth through middle childhood will permit examination of two questions: 1) when does the gradient in health emerge among children in immigrant families?; and 2) does the gradient emerge more quickly among children who experience rapid change in their family circumstances?

Background

Socioeconomic and Racial/Ethnic Gradients in Child Health

That there is a socioeconomic gradient in health among adults and children in many industrialized nations is well-established—those at successively higher levels of education and income experience better health than those below them, whether health is self-reported or defined by particular acute, chronic, or disabling conditions (Lynch 2003; Marmot et al. 1991; Smith 2007; Winkleby et al. 1992). While much of the work on socioeconomic gradients in health has centered on adults, a growing body of research demonstrates that strong gradients also exist among children. Children in families of successively higher levels of education and income experience better health than those below them (Case et al. 2002; Finch 2003). Though race is highly correlated with socioeconomic resources, abundant evidence documents an independent association between race and health. Black children are more likely than both their white and nonwhite peers to be born with a low birth weight, to have asthma and other chronic physical health conditions, and to be overweight or obese (Currie 2005; Lu and Halfon 2003; McDaniel, Paxson and Waldfogel 2006).

The Complicating Role of Immigrant Status

Relative socioeconomic disadvantage in child health is much less pronounced among Latinos and Asians, the other two large ethnic minority groups in the United States. In fact, despite their greater likelihood of social and economic disadvantage, Latinos exhibit a "mortality paradox;" that is, they experience lower rates of many diseases than non-Latino whites, lower rates of infant mortality, and higher life expectancy (Abraido-Lanza et al., 1999; Lansdale et al., 2000). In trying to understand the greater ambiguity in ethnic group differences in health, it is important to consider the role of immigration. Abundant research in the United States documents striking advantages in birth outcomes and infant health among the children of foreign-born mothers—the second generation

(Hummer et al. 1999; Landale, Oropesa and Gorman 1999). Similarly, the occurrence of infant mortality and low birth weight is significantly lower among foreign-born, Hispanic mothers (Hummer et al. 1999). In some cases, the healthiest outcomes are observed among the most socioeconomically disadvantaged immigrant families (Balistreri and Van Hook 2009; Jackson, McLanahan and Kiernan, forthcoming) challenging common understanding about how health is socially patterned.

Uncovering the Emergence of the Gradient

One important determinant of weaker social gradients in health among immigrant families is mothers' health behaviors. Foreign-born Hispanic mothers, for example, are more likely than native-born mothers to avoid smoking, to breastfeed and to fully immunize their children (Anderson et al. 1997; Kimbro et al. 2008), increasing the likelihood that the health of their children—who make up the second generation—will be more weakly tied to socioeconomic status. However, there is a socioeconomic gradient in health-related outcomes among second-generation adolescents and adults (Jackson 2011; Winkleby and Cubbin 2003). These findings raise the possibility that the socioeconomic gradient emerges within a generation and, moreover, that this process takes place relatively early in the life cycle.

Occurring alongside the emergence of the social gradient in health among the children of immigrants are changes in children's family circumstances. There are striking nativity differences in the composition and quality of families' resources, both within and across nativity groups. Children in immigrant families, for example, are more likely than their peers to live with two parents (Landale, Oropesa and Bradatan 2006) and to live in extended family residential arrangements (Glick, Bean and Van Hook 1997). Research on earnings growth and social mobility among immigrants indicates that youth experience improving economic resources within their families with increasing time in the U.S. (e.g., Chiswick 1978), suggesting an improvement in families' resources over time. Accompanying an increase in resources, however, may be behavioral and environmental changes within families that lead to declines in health environments and outcomes (e.g., Finch, Frank and Vega 2004). Despite ample speculation, very little is known about how resources change over time among children in immigrant families, and how any changes may be implicated in the early life cycle emergence of the gradient among this population.

Data

Data for this research will come from the birth cohort of the US *Early Childhood Longitudinal Study* (ECLS-B). The study represents the national population, contains rich longitudinal information on families' and children's health, and oversamples ethnic minority families. The ECLS-B is a longitudinal survey of children of about 14,000 children between ages 9 months and kindergarten. The survey began in 2001 and continued at two years, preschool, and two interviews around the time of kindergarten, ending in 2008.

Measures

Nativity and Race/Ethnicity. All ECLS-B children are native-born, but parents can be foreign-born, permitting separation and second and third-plus generation children. When possible, I will disaggregate by both nativity and ethnicity. The ECLS-B includes over 2,000 foreign-born mothers, over 20% of the sample.

Socioeconomic Status. I will use a measure of *maternal education* that distinguishes between mothers with less than a high school diploma; a high school diploma; some college; or college or more. *Income* will measured using household poverty ratios (adjusted for household size and the number of children).

Child Health. To begin, I will focus on two markers of child health: *weight for age* (measured at all ages) and *parents' rating of children's health* on a scale ranging from excellent to poor. Previous work has shown that foreign-born Hispanics tend to report poorer health, even after adjusting for clinical measures of physical and mental health (Franzini and Eugenia Fernandez-Esquer 2004), but that controlling for the language of the interview explains much of this difference (Viruell-Fuentes et al. 2011). I will control for the language of the interview.

Other Measures. I will measure several *sociodemographic markers*: mothers' age at birth, the child's sex, family structure (married, cohabiting, single) at birth, and the language spoken at home. I will also control for *maternal health behaviors* at each age: breastfeeding, early prenatal care (first trimester), and maternal smoking during pregnancy. Mothers' breastfeeding behavior and the quality of prenatal medical care are strongly related to children's physical, behavioral and cognitive development (Alexander and Korenbrat 1995; Heikkila et al. 2011; Kelly, Day and Streissguth 2000; Oddy et al. 2003; Wakschlag et al. 2002).

Changes in Resources. In order to examine the changes in children's family circumstances that accompany changing socioeconomic gradients in health, I will measures changes in the *household poverty ratio* over time, as well as changes in mothers' *family structure*.

Analytic Plan

I will begin by establishing a weaker socioeconomic gradient at birth among children in immigrant families than among their peers in native-born families. For each outcome I will use either binary logistic regression or OLS regression to estimate nativity differences in the size of the gradient around the time of children's birth, net of the age-specific measured sociodemographic factors, to establish nativity differences within and across countries. A general model is as follows:

$$y = \beta_0 + \beta_1 N + \beta_2 S + \beta_3 S * N + \beta_4 X + \varepsilon \quad (1)$$

In this model nativity (*N*) and socioeconomic status (*S*) influence child health, and the size of the gradient varies by nativity. *X* includes the previously described other measures, including maternal health behaviors and sociodemographic characteristics. This model will permit me to establish differences in the shape and magnitude of the gradient around the time of birth. I will then estimate a similar model at each age thereafter. From the parameter estimates I will calculate the predicted probability of being in a particular category of each outcome, for children born to immigrant and native mothers with otherwise average characteristics.

Next, I will build on the cross-sectional models represented in equation (1) to examine the evolution of the gradient between birth and middle childhood, using a latent growth curve approach. A general form of the dynamic model is as follows:

$$y_{it} = \alpha_i N_i + \alpha_i S_i + \alpha_i X_i + \lambda_t N_i + \lambda_t S_i + (\alpha_i S_i + \lambda_t S_i) N_i + \varepsilon_{it} \quad (2)$$

In this model socioeconomic status is associated with child health around the time of birth (α), as well as the rate of change in health between birth and middle childhood (λ) for each individual (*i*), over time (*t*). This relationship differs between second and third-plus generation children. Equation (2) will permit examination of the emergence of the gradient as children age.

Finally, I will extend equation (3) to examine changes in children's family circumstances that accompany changes in the gradient:

$$y_{it} = \alpha_i S_i + \alpha_i X_i + \lambda_t S_i + \lambda_t F_{0-9i} + \lambda_t F_{0-9i} * S + \varepsilon_{it} \quad (3)$$

Here, by measuring family circumstances (*F*) at multiple ages, I will be able to examine whether the gradient emerges more quickly among second-generation children when their families experience declines in financial resources or when there is a change in family structure that reduces resources in the family. I will estimate separate models for second and third-plus generation children and will be able to examine family-level changes in two ways. First, latent family resource trajectories will become predictors of latent health trajectories, estimating how a change in the propensity for family-level change is related to a change in health. Secondly, I will be able to examine the influence of changes within specific age windows (e.g., between birth and age three, between ages three and five, etc.) as they relate to health.

Conclusions

This research will extend consideration of the socioeconomic gradient in health beyond the non-Hispanic black and white population, to a population among whom the gradient is more ambiguous. By using longitudinal data on diverse populations of children, the findings will reveal whether and when the gradient emerges in the early life cycle among the second generation; and whether the pace of the pattern is conditioned by changes that occur within the family.

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