Socioeconomic gradients in overweight/obesity in young immigrants: exploring the roles of parental status and inter-generational social mobility

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Extended Abstract

Introduction

Over the past 20 years, immigrants have represented a growing share of the U.S. population (Martin and Midgley 2006). Studies of U.S. immigrants during this period have consistently documented of a health advantage relative to the native-born (Gushulak 2007). This pattern is observed particularly in studies of obesity, a major risk factor for chronic disease morbidity and mortality and one that has affected an increasingly large segment of the U.S. population (Wang and Beydoun 2007). In one of the few prospective studies in the literature, first generation young adults were shown to gain less weight compared to the second and third generation (Harris, Perreira et al. 2009). These findings are intriguing considering that many immigrant subpopulations tend to be lower on standard measures of socioeconomic status (SES) like educational attainment and income. Although inverse associations between SES and obesity are commonly observed in studies of children and adults (McLaren 2007), SES gradients are often weak in immigrants.

Patterns of weight gain among first generation immigrants are likely to be variable, and may depend on their socioeconomic trajectory over the life-course. Although SES measured at a single point in time has been shown to be weakly correlated with health in immigrants (Goldman, Kimbro et al. 2006), over time, limited social and economic mobility may reduce any health advantage initially held by first generation immigrants. Alternatively, it is also possible that immigrants, despite low life-course SES, are able to maintain their health advantage. We draw on data from the National Longitudinal Study of Adolescent Health (Add Health) to investigate the relationship between life-course SES trajectories (upward/downward social/economic mobility) and variation in overweight/obesity status by immigrant generation. Understanding how SES is patterned among U.S. immigrants over the long-term can facilitate intervention efforts to maintain their health advantage even with longer length of residence in the U.S.

Background

Socioeconomic status and obesity

Low SES has been observed to predict obesity in the U.S. and other developed countries (McLaren 2007), but causal mechanisms underlying these patterns remain unclear and likely to be multiple and complex. Low SES has been observed to correlate with poorer health behaviors such as unhealthy diet, lack of physical activity, and greater alcohol consumption which play a prominent role in the development of obesity. Differential access to knowledge regarding healthy behaviors, as well as to the physical and social resources to support these behaviors are also

likely to be influential. From a more biological perspective, low SES has also been associated with greater cumulative physiological toll on multiple biological regulatory systems via stress pathways which can promote weight gain and weight retention over time (Seeman, Epel et al. 2010). Conversely, weight status may also impact educational attainment and SES, and there may be other individual, family, or social characteristics that drive both SES and weight.

Socioeconomic gradients in immigrants

Contrary to the established patterns between SES and weight in predominantly U.S.-born samples, SES has been shown to be weakly patterned in both immigrant children and immigrant adults (Goldman, Kimbro et al. 2006; Kimbro, Bzostek et al. 2008). Although existing literature is primarily cross-sectional, longitudinal studies also show a lack of an SES gradient in weight patterning over time among young immigrants (Jackson 2011).

Reasons for the absence of a gradient remain elusive however potential hypotheses have focused on selection dynamics in migration, as well as protective cultural factors (Akresh and Frank 2008). Individuals who migrate may be drawn from the healthiest parts of the distribution of their native population. This process results in immigrant streams that may not be necessarily representative of their native counterparts with respect to several health indicators. Cultural factors have also been cited as part of the rationale for the immigrant health advantage, regardless of SES. It has been hypothesized that values and customs rooted in an immigrant's native society may serve to foster better health behaviors, possibly through the presence of stronger family ties and other forms of social support that may reinforce healthier behaviors relevant to obesity, such as retention of traditional diets, and lower rates of smoking and alcohol consumption (Jasso, Massey et al. 2004; Acevedo-Garcia, Soobader et al. 2007).

How long after migration do SES gradients remain weak? Previous work investigating relationships between parental education and BMI trajectories from adolescence into young adulthood showed the expected inverse relationship in U.S.-born individuals, but no relationship in first generation immigrants (Jackson 2011). Does this protection against the adverse influences of low parental SES extend into adulthood? Does a gradient emerge in terms of SES outcomes of the immigrants themselves when they reach adulthood? Low parental education may have played a relatively smaller role in shaping weight patterning for immigrant adolescents, but is that health advantage lost in the absence of the sort of socioeconomic mobility that is often observed in the first and second immigrant generations? Does greater acculturation to the U.S. give rise to SES gradients that mirror existing patterns among non-immigrants? We will examine these patterns in a longitudinal framework, documenting relationships between SES trajectories, weight trajectories, and time since immigration.

Methods

Data

The Add Health cohort is a nationally representative school-based study of multi-ethnic adolescents (white, Black, Hispanic, and Asian) (grades 7-12), followed up with multiple

interview waves into young adulthood. The study used a multistage, stratified, school-based, clustered sampling design. The baseline data were collected in 1995 with 20,745 adolescents (age: 12-19 years) and approximately 17,500 of their parents. Of these adolescents, 88% were interviewed at Wave II in 1996 (age: 12 - 21 years) and 73% at Wave III in 2002 (age: 18 to 27 years). Finally, of 15,197 Wave III respondents, 80% (N = 12,157) were interviewed at Wave IV in 2008 (age: 24-33 years).

Measures

Weight (kg) and height (m) (to calculate BMI (kg/m^2) were self-reported at wave I and measured at waves II through IV during in-home surveys using standardized procedures. We define categories of overweight in adolescence (≤18 years old) using the International Obesity Task Force (IOTF) reference, which statistically links childhood and adolescent BMI centiles to the adult BMI cut-points for overweight (BMI > or = 25 kg/m^2) (Cole, Bellizzi et al. 2000). The IOTF cut-points provide comparability to otherwise discrepant weight classifications for adolescents and adults (Cole, Bellizzi et al. 2000; Gordon-Larsen, Adair et al. 2004). Overweight status among individuals > 18 years old is defined using adult BMI overweight cut-points.

Data on race/ethnicity were obtained by self-report at wave I. Immigrant generation is based on questions about adolescents' and parents' place of birth. Generation one includes children not born on the mainland U.S., Alaska or Hawaii. Generation two or greater includes children born in the U.S. but with at least one parent who is foreign-born, or children who were born in the U.S. to U.S.-born parents.

Parents' education is constructed using data from the wave I Parent Questionnaire and is measured as the higher of either the mother's or father's education. In cases where parental report of education is missing, we use adolescent reports. Reponses are grouped into the following categories: less than high school, high school/GED, some college, and college degree and/or graduate or professional degrees. Education of the respondent in young adulthood is constructed using data from wave IV when respondents were between the ages of 24-33 years. Using these variables, four SES mobility indicators are created, low-low: parents' education (PE) - high school or less, respondents' education (RE) - high school or less; low-high: PE – high school or less, RE – some college or more; high-low: PE – some college or more, RE – high school or less; high-high: PE – some college or more, RE – some college or more.

Other measures of SES (for parents of respondents and for respondents in adulthood) are available and will be considered for use in these analyses. These include indicators for income, employment status, receipt of public assistance, home ownership, and possession of other assets.

Analysis

We have estimated multinomial regression models to estimate the relative risk of (1) becoming overweight/obese, or (2) remaining persistently overweight/obese (compared to remaining non-overweight/obese) from wave I to wave IV. Our right-hand side variables include parental educational attainment and the educational attainment of the respondents themselves in

adulthood. All models adjust for age, sex, and race/ethnicity. Interactions between these education variables and immigrant generation test whether education gradients and overweight/obese patterns differ by immigrant generation. We also examine whether differences in overweight/obesity differ depending on patterns of socioeconomic mobility (for example, parents with high school or less and respondents with college or more, versus parents with college or more and respondents with college or more, versus parents with high school or less and respondents with high school or less). Interactions with immigrant generation are tested to investigate whether first generation immigrants remain buffered from the detrimental influences of low SES on obesity incidence that are hypothesized to affect second and third generation immigrants. Additional models will also examine other components that are hypothesized to influence one's socioeconomic status.

Preliminary Results/Implications

Early results replicate findings reported previously in the literature that among immigrants, there is little association between parental education and overweight/obesity patterning into adulthood, in contrast to the inverse association observed among U.S.-born respondents (2^{nd} or 3^{rd} generation). However, the educational attainment of respondents themselves is observed to correlate with overweight/obesity, regardless of immigrant generation. Results suggest that with longer time in the U.S., SES gradients among immigrants may converge to patterns observed in the U.S.-born.

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