The influence of Own and Origin Socioeconomic Status on BMI Trajectories by Immigrant Generation During the Transition to Adulthood

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ABSTRACT

Research on immigrant health generally finds better health among the first generation and declining health with subsequent acculturation, despite being more likely to have a host of other factors normally associated with poor health such as ethnic/racial origin and low socioeconomic status. This phenomenon has been called the epidemiological paradox and has been found for many health outcomes including obesity. However, research has demonstrated that socioeconomic status may play an important and complicated role in this process. Children of immigrants tend to make great strides in SES compared to their immigrant parents. However, attaining a higher SES is usually associated with spending time in largely white native institutions, such as universities. This paper examines the influence of young adult and family of origin SES, focusing on education, and whether this differs for children of young immigrants. I find that family of origin SES is negativley associated with young adult body mass index (BMI), but this relationship is not as strong for children of immigrants compared to children of natives. Though the difference between children of immigrants and natives diminishes once controls are added) relationship diminishes after controls are added. Own SES is negatively associated with BMI for both children of natives and immigrants though low SES is more detrimental and high SES more beneficial for children of immigrants compared to children of natives.

The United States has experienced high levels of immigration for the last 4 decades, specifically from Latin America and Asia. In 2008 the Census Bureau made headlines as it announced that by the year 2050 the US is expected to be a minority majority country, with 54% of the population belonging

to a racial/ethnic minority group. Race/ethnic groups dominated by immigrants, such as Hispanics and Asians, are expected to see the largest increase in their share of the population. In 2050 it is projected that Hispanics will comprise 30% and Asians 9% of the population, up from 15% and 5% in 2008. However, the non-Hispanic white population will see its share decline from about 66% to 46% (US Census Bureau 2008). Examining these projections it becomes quite apparent that the future health profile of the United States will be heavily influenced by immigrants and their children.

Healthy People 2010 is focused on reducing health disparities and increasing quality years of life, listing overweight as one of leading health indicators. Overweight and obesity increase the probability of many types of health concerns including, cardiovascular disease, diabetes, respiratory disease, and joint issues (Daniels 2006). Obesity and overweight also come with a high price tag, in 1998 they accounted for 9.1 percent of medical spending, rivaling the costs of smoking (Warner, Hodgson, and Carroll 1999) and incurs indirect costs through lost productivity. Obesity during adolescence may be especially important predictor of adult obesity, as probabilities of continued obesity is greater the older the child (Guo et al 2002). While the breadth of the disease burden of obesity is experienced in adulthood, those who are obese and overweight younger and stay obese experience more serious health concerns earlier in adulthood than individuals with adult onset obesity (Daniels 2006).

Research on immigrant health generally finds that they have better outcomes than either non-Hispanic whites or their native born peers despite their low human and physical capital. This phenomenon has been termed the epidemiological paradox and has been found to apply to drinking, smoking, substance use, infant mortality, pregnancy outcomes, mortality, chronic conditions, and overweight and obesity. Though, for immigrants, this health advantage tends to deteriorate with acculturation, while human and physical capital tends to increase (Hummer et al 2008; Markeides and Coreil 1989; Palloni and Arias 2006). The epidemiological paradox is usually explained using two prominent theories; positive selection of immigrants on health factors and negative health assimilation.

The negative health assimilation hypothesis assumes that immigrants come with beneficial cultural orientations that promote healthier behaviors than their native born peers. However, acculturation, the process by which immigrants assume the culture of their receiving society, leads to the adoption of less health behaviors (Palloni and Arias 2004; Hummer et al 2008; Landale, Oropesa, and Gorman 2000; Antecol and Bedard 2006; Blumenthal 2002; Carter 2002; Fried and Nestle 2002; Gordon-Larsen et al 2003). For obesity, this relationship has been found cross-sectionally by generation and duration (Antecol and Bedard 2005; Popkin and Udry 1998), but has shown inconsistent results using other measures of acculturation, such as language.

Inconsistent findings may be due in part to the lack of attention to the complex relationship that socioeconomic status plays in acculturation and health behaviors. Research has consistently demonstrated that low socioeconomic status is associated with worse health, including obesity. This is particularly true for non-Hispanic white and Hispanic women, especially when examining education as a measure of socioeconomic status. However, the relationship for other ethnic/gender groups is more complex. Acculturation is also associated with economic gains, prior research has demonstrated an earnings bonus for proficiency in English for immigrant men, increasing generation is associated with higher educational attainment and duration and generation is associated with higher incomes. Despite the obvious connections between acculturation, SES, and obesity, few studies have sought to disentangle these effects. The few that have, however, demonstrate that acculturation may be particularly harmful for the those with the lowest human and physical capital (Baker, Van Hook and Balistreri 2008; Sanchez-Vanughn et al 2008; Van Hook and Balistreri 2007) suggesting further research would be fruitful.

This research adds to this body of literature by focusing in on educational attainment, BMI, and family of origin SES by parental nativity status for young adults. To examine this relationship I use the waves 1 through 11 of the National Longitudinal Survey of Youth 1997. I will examine variation by generation and by pathways into adulthood focusing on education. I concentrate on adolescents as they

transition into adulthood for several reasons. First, for Asian and Latino immigrants, exposure to U.S. environment during childhood and adolescence has important implications for adult BMI (Bates et al 2008). Therefore, understanding the factors that influence adolescents' BMI would further our knowledge on adolescents and potentially be helpful in preventing adult obesity. Second, this age period is marked by drastic behavior changes, such as a rapid decrease in physical activity (Gordon-Larsen, Nelson, and Popkin 2004). Lastly, this would be an important phase for children of immigrants, who may move away from their natal home and the cultural protection provided by it. However, increases in physical and human capital that move children of immigrants into the middle class mainstream may have important and potentially positive influences on their health (Meich et al 2006; McLaren 2007). The pathway into adulthood for children of immigrants is far more volatile than children of natives, often complicated by their lower socioeconomic origins (Mollenkopf et al 2005; Rumbaut 2005). For children of immigrants furthering their education and obtaining white collar jobs may indicate Both immigrant scholars and health scholars state that there is a dearth of research concerning this phase (Fulgini and Hardway 2004; Rumbaut 2005; Obesity 2005).

THE EPIDEMIOLOGICAL PARADOX, IMMIGRANT HEALTH, AND OBESITY

Assimilation theories have been applied to patterns of educational attainment, occupation, residential patterns, living arrangements, marriage, education, wages, and health (Landale 2000; Van Hook and Glick 2007; Brown 2005; Smith 2002). For most of these outcomes immigrants come with an initial disadvantage or unique patterns attributed to cultural orientations retained from their countries of birth. Through continued acculturation immigrants move into the middle class mainstream. However, concerning health immigrants actually tend to be in *better* health than their native born peers, despite their economic disadvantage. This phenomenon is referred to as the epidemiological paradox and has been found for many health outcomes, such as mortality, chronic conditions, infant mortality, functional limitations, and overweight/obesity, across Asian, Hispanic, and black immigrant groups (Antecol and Bedard 2006; Landale, Oropesa, and Gorman 2000; Palloni and Arias 2006; Cho, Frisbie,

and Rogers 2004; Popkin and Udry 1998; Goel et al 2004; Parker et al 2007).

Explanations for this paradox include: the healthy immigrant effect, salmon bias, and cultural/social protection. Migration is not a random process. Rather, migrants are selected from their origin communities based on several factors (Rumbaut 1997). The healthy immigrant effect refers to the idea that unhealthy individuals are less likely to migrate compared to healthier individuals due to the arduous and stressful process of international migration (Palloni and Arias 2006). Salmon bias hypothesis is similar to the healthy immigrant effect, but concerns return migration rather than immigration, where less healthy immigrants return to their country of origin. The cultural/social protection hypothesis is the idea that Hispanics are believed to have cultural orientations that protect them from the negative impact of their lower SES. These protective cultural aspects are assumed to be cultural orientations brought with them. As immigrants assimilate they lose these protective factors and their health deteriorates. According to this theory selective acculturation would be the most beneficial path for children of immigrants to take.

Assimilation theories, as applied to health or weight status of immigrants and their offspring, have largely been found in the negative health assimilation model. This concept fits most closely with the last explanation given above, that immigrants are healthier due to their cultural/social protection. Not only are the foreign-born healthier than the native born, but this advantage also tends to deteriorate with increasing US duration or generation (Antecol and Bedard 2007; Popkin and Udry 1993; Gordon-Larsen et al 2004). The negative health assimilation model posits that increased exposure to American environment where cheap energy dense foods are readily available, reliance on cars, and fairly sedentary lifestyles results in immigrants adopting these negative health habits. Among adult and adolescent population generation and duration is positively associated with BMI and overweight (Antecol and Bedard 2005; Popkin and Udry 1998). Using Add Health Popkin and Udry (1998) found that prevalence of overweight increased with generation for Hispanic and Asian boys and girls. Similarly Antecol and Bedard (2006) find that among adults the most newly arrived immigrants (those

who have been in the United States for 5 years or less) have lower BMI's than immigrants who have been here longer and natives. For women, they find that immigrants catch up to native's BMI within 10 years and men close a third of the gap in 15 years.

Gordon-Larsen and collegues (2003) attribute the better health of Hispanic immigrant adolescents to acculturation factors, such as language, neighborhood, and family characteristics and find that these operate primarily through better physical activity patterns and eating habits. However, examining more direct measures of acculturation such as language and neighborhood characteristics reveals that among adolescents lower acculturation is associated with better health and physical activity patterns and this is partially responsible for lower prevalence of overweight especially for immigrants (Gordon-Larsen et al 2003). However, some inconsistencies in the research exists. While Gordon-Larsen and collegues (2003) find lower prevalence of overweight among among first generation Hispanic adolescents in general, among Mexican adolescents the prevalence in the first generation is actually higher than natives. Among adults, research finds that U.S. born Spanish speaking women are by far the most at risk for obesity (Sundquist and Winkleby 1998). The inconsistent findings and current research suggests a need to more closely examine the complex relationship that SES can play in the relationship between obesity and acculturation (McLaren 2007; Stunkard and Sobal 1989)

SES AND OBESITY: INCREASING EDUCATION AND DECREASING WAISTLINES?

Socioeconomic status, usually defined as education, income, wealth, and occupation, tends to be negatively associated with many health outcomes, including overweight and obesity (Stunkard and Sobal 1989; Link and Phelan 1995). The epidemiological paradox is the term given to the phenomenon of better health among the less acculturated. It is paradoxical because less acculturated immigrants tend to have lower SES, but better health outcomes compared to the more acculturated. The relationship between SES and obesity, while still negative for the population as a whole (Zhang and Wang 2004a), has gone through significant changes over the last three decades (Zhang and Wang 2004b), varies by indicator (Miech et al 2006; Zhang and Wang 2004a; Zhang et al 2007; Wang and

Zhang 2007 Moore, Howell, and Treiber 2002) and the relationship varies by demographic characteristics, such as age, gender, race/ethnicity, and nativity (Balistreri and Van Hook Forthcoming; Gordon-Larsen, Adair, and Popkin 2003; Van Hook and Balistreri 2007; Wang and Zhang 2007; Zhang and Wang 2004a).

It is hypothesized that SES is related to obesity because, in part, those with higher SES are able to afford healthier environments. Link and Phelan (1995) view SES as a fundamental cause of disease, where those with greater resources are able to employ those resources to protect them from disease and the negative consequences associated with it. Past research has demonstrated that areas where low SES individuals tend to involve more health hazards and less health benefits. For example, Gordon-Larsen and colleagues (2006) used geo-coded Add Health data and found that low SES individuals and minorities were more likely to live in census blocks that had fewer facilities for physical activity, such as parks, YMCA, or fitness centers, compared to their more advantaged peers. Increasing average education of a census block is positively associated with the number of facilities and, holding SES constant, increases in the number of facilities had a positive, significant effect on the achieving the recommended amount of weekly physical activity and significantly reduced the odds of overweight. Similarly, other research has found that low income areas have 2.5 times more fast food outlets and fewer grocery stores than wealthier areas (Avcedo-Garcia et al 2008; Riedpath et al 2002).

Variation in the SES and obesity relationship by nativity status

Among adults, prior research finds little no clear pattern between education and BMI for the least acculturated immigrants (measured by duration) with the least and most educated having the highest BMI. However, increasing acculturation is associated with increasing BMI for lower education categories, while the BMI of the more highly educated changes little with acculturation, resulting in a negative relationship between education and BMI for the most educated. Research among young children of immigrants finds similar results, where increasing acculturation is associated with higher BMI for children with low family SES (Van Hook and Balistreri 2007). Further research examines

differing impact of family income and parental education on child's BMI in kindergarten and growth in BMI by parental nativity status for Hispanics and non-Hispanic whites (Balistreri and Van Hook Forthcoming). The relationship between parental education and kindergarten BMI and growth was negative for non-Hispanic whites and Hispanic children of immigrants, but curvilinear for Hispanic children of immigrants. However, using family income shows a relatively flat or positive gradient for children of immigrants and a negative gradient for children of natives, especially non-Hispanic whites.

Prior research suggests that SES has a negative and significant impact on obesity especially for non-Hispanic and Hispanic girls, however this relationship appears to be more complicated among immigrants. Among adults and children increasing acculturation is positively associated with BMI for low SES individuals and relatively flat for high SES individuals. While the influence of SES is relatively flat to positive for the least acculturated (Sanchez-Vangnh et al 2008; Van Hook and Balistreri 2007; Balistreri and Van Hook Forthcoming), with the exception of parental education on BMI for young children (Balistreri and Van Hook Forthcoming). Drawing on past research suggests a complicated relationship between SES and obesity. Immigrants appear to have a non-significant to positive relationship with BMI, but among natives and potentially more acculturated immigrants we would expect SES to be negatively associated with BMI. This research focuses on the relationship between the potentially competing influences of own and origin SES on obesity for children of immigrants as they enter young adulthood. In order to understand this relationship we need a further understanding of the potential health hazards during adulthood and the difficulties that children of immigrants face during this transition.

Immigrant parents tend to have fewer resources, work longer hours, and provide less supervision to their children during adolescences and this may impact their pathways into adulthood. For example, children who receive less supervision and less parental involvement are more likely to drop out of high-school, have lower educational aspirations (Astone and McLanahan 1991). Unfamiliarity with English and the lower educational attainment of most immigrant parents also makes

it difficult to help with homework. Children from low SES backgrounds and children with less parental supervision are also at an increased risk for an earlier pregnancy than their peers, which tends to lower educational attainment (Arnett 2004; Miller et al 1986; Fergusson and Woodward 2000; Rindfuss and St. John 1983). Lastly, the lower material resources of immigrant parents mean that their children have less of a parentally provided safety net to aid them during this time of rapid change. Schonei and Ross (2005) find that this form of support is especially important for young adults as parents continue to support them well into early adulthood. They estimate that parents spend about $38,000 in for housing, education expenses, food, or direct cash assistance during the ages of 18 to 34, though assistance does decrease with age.

THE PRESENT STUDY

Past research has generally found that less acculturated individuals are thinner, but as they acculturated they lose this advantage (Abribano-LAnza and Florez 2009). The process of acculturation though is generally a complex relationship where acculturation increases as SES increases. In turn this relationship could influence health. For children of immigrants having a higher education means that children of immigrant spend a significant amount of time in a socializing institution that could result in greater acculturation. This could lead them to lose their cultural protection resulting in higher BMI than would normally be found in someone with a high SES. However, having a low SES could also result in a double disadvantage for children of immigrants. They may be less able than similarly situated children of natives to navigate their health hazardous environment.

METHODS

The data for this project come from the National Longitudinal Study of Youth (NLSY), 1997 cohort. The NLSY is a nationally representative random sample of approximately 9,000 youths who were between the ages of 12 and 16 in 1997. These youth are then followed on an annual basis until 2007 when the respondents are now in between 22 and 26. I use ordinary least squares regression to examine whether own and family of origin SES differs for children of immigrants compared to children

of natives controlling for a host of other factors not offered in other datasets, such as parental BMI and BMI during adolescence. Also, because this study began in adolescence children of immigrants most likely received some high school education in the US and all of their post-secondary education in the US.

Dependent Variable

BMI. Body mass index (BMI) is a commonly used measure to examine adiposity among individuals and is calculated using weight/height^2. We use reported height and weight. Though the definition of overweight and obesity changes from adolescence to adulthood BMI is stable and is recommended for examining changes in adiposity (Cole et al 2003).

Independent Variables

Generation. Generational status is determined based on the parents' responses to questions concerning place of birth. If the parent is born outside of the US or its territories then he/she is defined as a child of an immigrant. Further analyses examined whether education differed for other generational status including the 1.0, 1.5, and 2nd generation. Preliminary results indicated the effect of education differed for children of natives compared to children of natives and found no differences between the 1.0, 1.5, and 2nd generation.

Education. Respondents were asked information of college attendance and highest degree received. From this information I created four categories; less than high school, high school, some college, and college (reference).

Origin SES. Origin SES or parent's SES is determined by mother's education. This is measured continuously in years.

Controls. In this paper I control for the respondent's gender, race/ethnicity (black, Mexican, other Hispanic, white, or other), and family status growing up, parental BMI, adolescent BMI, smoking, marital status, and number of children. Table 1 presents descriptive statistics on the analytic variables.

RESULTS

Table 1 presents the multivariate results. As suggested by past research model 1 demonstrates that children of immigrants do have a lower BMI than children of natives ($p<.05$), family of origin SES is negatively associated with BMI ($p<.001$), and own SES is negatively associated with BMI net of controls.

Model 2 includes the interactions between children of immigrants and SES. The interaction between children of immigrant and family of origin SES is not significant. However, this is only true once controls are included in the model, prior to controls the interaction is significant and positive, suggesting that family of origin SES is less influential on young adult BMI for children of immigrants. However, this may be attributable to differences in child bearing habits, smoking, or ethnic differences between children of immigrants and children of natives. The interaction between own SES and children of immigrants is also significant and suggests that own SES is more influential for children of immigrants compared to children of natives. Figure 1 displays the difference for children of immigrants compared to children of natives. Among those of low SES, children of natives have a higher BMI than children of natives. However, high SES appears to have an even greater protective factor for children of immigrants compared to children of natives, as suggested by their lower BMI.

DISCUSSION

Undoubtedly immigrants and their children will play a big role in the United States in the years to come, as indicated by their high levels of migration and fertility. Therefore it is essential to understand the factors influencing this group's health as they will continuously play a larger role in the health profile of the United States. This project focuses on BMI as an indicator of health and examines the role of generational status and SES on young adults. BMI or obesity has become an ever more pressing health concern as prevalence rates have soared over the last three decades (Ogden et al 2004; Ogden et al 2006). The current high rates of obesity are associated with higher rates of morbidity, such as diabetes or hypertension, and some researchers believe that this will lead to a shorter life expectancy of this generation compared to their parents, stopping a long term trend of increasing life expectancy

(Daniels 2006; Olshansky et al 2005).

I find that origin SES is negatively associated with young adult BMI and this does not significantly differ between children of immigrants and children of natives. Examining own SES I find that it is also negatively associated with BMI, but that this does differ by generational status. Among those with low SES, children of immigrants are more likely to be heavier than their children of native counterparts AND high SES is more beneficial for children of immigrants than children of natives. Drawing on past research this could suggest two things. First of all low children of immigrants may be at a double disadvantage, both by their generational status and low SES. Children of immigrants may have fewer resources than their similarly situated peers to aid in navigating their health hazardous environment. However, children of immigrants may be able to carry some of the cultural protection provided to them by their generational status, such as better health habits, and be able to move themselves to environments that are more likely to be health promoting. They have the cultural protection endowed to them AND a better ability to navigate the American environment than their peers with low SES.

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