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SOCIAL CAPITAL AND IMMIGRANT INTEGRATION:
THE ROLE OF SOCIAL CAPITAL IN LABOR MARKET AND HEALTH OUTCOMES

by

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A thesis submitted in partial fulfillment
of the requirements for the Doctor of
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The University of Iowa

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PH.D. THESIS

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To my family

ACKNOWLEDGEMENTS

ABSTRACT

This dissertation presents three empirical studies on the distribution and role of social capital among immigrants in the United States. Using data from two national datasets – the New Immigrant Survey (NIS 2003, 2007) and the Social Capital Community Benchmark Survey (SCCBS 2000) – it examines the implications of social capital for immigrants' social and economic integration. In doing so, it addresses several key limitations within migration research.

The first limitation it addresses is the focus of prior research on migrants' co-ethnic (bonding) social capital and the limited research on immigrants' "bridging" social capital and distributional inequities across immigrant groups. Second, while most research has focused on the role of social capital in economic integration, relatively little is known about the short-run and long-term implications of immigrants' social capital for their health and well-being. Third, prior research has generally focused on specific immigrant groups, particularly Hispanic and Asian immigrants, and it is unclear if prior findings are generalizable to immigrants overall or if they are simply capturing group and/or context-specific effects of social capital. This dissertation includes three studies that provide pieces of evidence that address these limitations and contribute to the migration literature.

In the first study, I explore the link between race, immigration status and social network diversity. Using data on personal network characteristics from the SCCBS (2000), I examine the role of race and immigration status in the distribution of ethnicity and status-bridging social capital. Findings confirm the double disadvantage of minority and outsider status for minority immigrants when it comes to access to network diversity, and group (i.e. race) differences in native-immigrant

gaps in access to ethnicity-bridging social capital. The findings also show there is an intersectional disadvantage in network quality that is explained away by group differences in network ethnic diversity, and that race and immigrant status are a factor in determining the return from network ethnic diversity in terms of network quality, which is reflective of the extant socioeconomic stratification system in the United States.

In the second study, I use a nationally representative data of immigrants from the NIS (2003), to examine the link between reliance of new immigrants on "bonding" social capital for job search and two indicators of labor market performance: earnings and occupational prestige. I find that while using a family or relative to find a job generally has a negative effect on both earnings and occupational prestige, this effect is not shared across all immigrants, which explains inconsistent findings in prior studies of the role of co-ethnic social capital in the labor market outcomes of Hispanic and Asian immigrants.

In the third study, I turn my attention to the immigrant health literature, which has largely focused on the acculturation-health relationship and largely ignores the significance of network processes, particularly the interethnic integration of new immigrants, for the short-term and long-term health outcomes of immigrants. I use longitudinal data from the NIS (2003, 2007), which includes various measures of health status and behaviors, and examine the contemporaneous and longitudinal associations between interethnic social capital and health. I find positive cross-sectional associations with negative health behaviors (smoking, drinking and dietary change), on the one hand, and positive long-term (lagged) effects on health status (self-rated health and the incidence of chronic diseases), on the other. I also find evidence for the time-dependent health implications of interethnic network integration for the health status of immigrants in the United States.

PUBLIC ABSTRACT

While immigrants' social networks have received considerable attention in migration studies, they have often been narrowly conceptualized in the literature. Most of this literature has equated immigrants' networks with social ties to family, kin and co-ethnics, and paid considerably less attention to network diversity and differences in network characteristics across groups. Further, studies of the implications of social ties for immigrant integration outcomes have produced inconsistent results because they ignore potential differences across immigrant groups. This dissertation presents three empirical studies that address these gaps in the literature. In the first study, I examine the ethnic and socioeconomic diversity of immigrants' friendship networks and examine native-immigrant gaps and differences across race groups. In the second study, I examine the implications of reliance of new immigrants on relatives to find job on labor market outcomes: hourly earnings and occupational prestige. In the third study, I consider linguistic social capital as a reflection of network composition and examine its implications for short-term and long-term health outcomes of immigrants. Implications for immigrant incorporation and future research are discussed.

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CHAPTER 1

INTRODUCTION

Sociological research on immigrants' social capital has often focused on the short-term beneficial impacts of immigrants' co-ethnic networks. This has put the role and significance of social capital for immigrant incorporation front and center in migration research. This prior research has largely been driven by a focus on specific groups, particularly Hispanic and Asian immigrants, which has not only led to inconsistencies with regard to findings about social capital and its implications for immigrant incorporation, but has also limited the generalizability of findings to immigrants overall. Such differences arise from various factors, including the "conditions of exit" from countries of origin, "contexts of reception" in the receiving country, social class backgrounds, and the "strength of the co-ethnic community" (Portes and Borocz 1989), all of which have implications for social and economic integration in host nations.

Further, social capital research on immigrant incorporation has focused on its role in economic advancement, particularly labor market integration. Therefore, relatively less is known about its significance for immigrants' short-term and long-term health and well-being. Notwithstanding the importance of understanding the group-specific roles of social capital, group variability in the distribution, role and significance of social capital, in and of itself, also has yet to be examined. This dissertation addresses these gaps by examining (1) distributional inequities in social capital, particularly bridging social capital, among immigrant groups, (2) the context-dependent effects of bonding social capital for immigrants' labor market performance, and (3) the implications of bridging (interethnic) social capital for the health status and behaviors of new immigrants in the United States.

Immigrants' Social Capital: Bridging vs. Bonding

Social capital generally refers to networks of personal relationships and contacts that enable or constrain the behaviors of its owners in some way. While the literature abounds with various definitions of the term "social capital" (Bourdieu 1986; Coleman 1988; Edwards, Foley, and Putnam 2001), more recent contributions highlight the importance of making a necessary distinction between different types, particularly between "bonding" and "bridging" social capital (Edwards et al. 2001; Paxton 2002; Woolcock 1998). Specifically, "[b]onding social capital refers to social networks that mainly comprise people that are similar in terms of their socioeconomic characteristics (age, gender, social class, and so on), whereas bridging social capital refers to crosscutting social networks" (Coffe and Geys 2007). A key implication of this distinction is that different types of social capital have differing effects on outcomes of interest, and while some types of social capital provide benefits to individuals, other types may have detrimental effects.

This distinction has been particularly important in labor market research. On the one hand are "the strength of weak ties" (Granovetter 1973) and "structural holes" (Burt 2001) hypotheses, which emphasize the importance of network diversity, arguing that individuals are more likely to obtain new and useful information through "weak" ties (i.e. acquaintances) rather than through "strong" family and kinship ties. On the other hand, there is the "social closure" perspective (Coleman 1988), which argues that dense or highly interconnected networks allow the emergence of relationships based on norms, obligations and reciprocal exchanges. From this view, social capital is "not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors […]" (Coleman 1988: p. 98). Specifically, Coleman identifies three forms of social capital, all of which facilitate the reinforcement of social norms: (1) obligations, expectations and trustworthiness of

structures, (2) information channels, and (3) norms and effective sanctions. Most of the social capital research on immigrants has largely adopted this view of social capital (e.g. Portes and Sensenbrenner 1993) and focused on the significance of social ties with co-ethnics.

Nevertheless, the bonding versus bridging distinction in social capital is particularly useful for research on immigrant outcomes given that it allows a better understanding of sources of disadvantage for some immigrant groups. In fact, one of the applications of this distinction has been in linking social capital to economic development, where it has been argued that while bonding social capital is valuable for poor communities, such communities lack the bridging social capital that is necessary for economic advancement (Woolcock and Narayan 2000). For immigrants, those that reside in co-ethnic communities and "ethnic enclaves" (Portes 1981) are more likely to have access to bonding social capital than their counterparts who live outside of these communities. While this network closure serves as (bonding) social capital in that it facilitates trust and exchange of reliable information among individuals in the group, it also creates "information redundancy" (Burt 2001; Granovetter 1973) and limits information transfer from higher status individuals in society (Lin, Ensel, and Vaughn 1981), which might be particularly useful in socioeconomic advancement. Similarly, immigrants who live outside of ethnic enclaves may be more likely to have access to numerous bridging ties that cut across ethnic and status boundaries.

Labor Market Outcomes

Social capital may have various implications for immigrants' incorporation outcomes and its effects may be context-dependent – that is, the effects of social capital may vary across immigrant groups and depend on the specific outcome in question. Some literature already suggests that reliance on close/family is positively related to higher earnings, but has a negative

effect on occupational prestige (Aguilera and Massey 2003; Sanders and Nee 1996). With regard to its positive or protective effects, this type of social capital may allow immigrants in the enclave economy to obtain higher returns to their human capital than they would in the mainstream market, since they would experience less discrimination in the enclave economy and co-ethnic employers are more likely to evaluate their credentials more favorably than are other employers. This line of reasoning would indicate that, in the labor market, racial minority immigrants might benefit more from bonding social capital than white/European immigrants.

Another point of view, however, might argue that bonding social capital leads to inferior labor market outcomes as a result of information redundancy (Granovetter 1973; Burt 2001). Prior research has found that interpersonal ties are not only used frequently by new immigrants in ethnic communities, but also that the majority of jobs obtained through such means are of low occupational prestige (Sernau et al. 2002). However, prior studies also have generally associated job market social capital with positive earnings return for some immigrants (e.g. Aguilera 2005; Aguilera and Massey 2003; Amuedo-Dorantes and Mundra 2004). It is important to note here that most of these studies have also focused on the Hispanic population, particularly Mexicans (e.g. Aguilera and Massey 2003; Amuendo-Dorantes and Mundra 2004; Livingston 2006), and the majority of prior studies have focused on Hispanics and Asians as these two immigrant groups make up the vast majority of immigrants in post-1965 United States. As a result, labor market research on the effects of immigrants' social capital has produced inconsistent results, and a comparative assessment of the value of social capital across different groups has yet to be undertaken. This will allow us to examine the generalizability of previous findings and the context-dependent effects of social capital on immigrants' labor market performance.

Health and Well-being

The study of the link between social capital and health is relatively new. Higher levels of social capital, whether at the individual or community/collective level, are associated with better health outcomes. Social networks, social support and cohesion are all believed to have health-enhancing or disease-preventing effects for individuals and communities. In fact, Putnam (2000) asserts that of all the areas where the effects of social capital have been explored, "in none is the importance of social connectedness so well established as in the case of health and well-being" (Putnam 2000: p. 326). Indeed, there seems to be an empirical link between social capital indicators and health.

There are several mechanisms through which social capital may be linked to health outcomes (Putnam 1995). The first is that the characteristics of networks affect the *flow of information*, impacting the stock of knowledge available to individuals in making health decisions. Second, social capital may directly affect the level of *resources* that are available to individuals that affect their ability to maintain a healthy lifestyle and seek medical attention when needed. Third, social networks may also play a role in influencing lifestyle, perhaps through *norms and values* that either promote or discourage healthful behaviors. Finally, the level of social support available to individuals in their networks and communities directly affects their ability to handle and cope with health-threatening events in their lives.

This link between social capital and health has implication for the immigrant population, in that one would expect both "bonding" and "bridging" social capital to have distinct effects on health outcomes. For instance, living with relatives and co-ethnic embeddedness may reduce the risk of isolation and provide similar protective effects against negative health outcomes. For most immigrants, life in a new environment is often associated, at least in the short-term, with some

degree of alienation and isolation, which has been shown to increase the risk of unfavorable health outcomes (House, Landis, and Umberson 1988). "Bridging" social capital, on the other hand, may serve as a source of valuable information for new immigrants, but it may also facilitate negative health assimilation (e.g. lead to faster dietary changes). While the immigrant health literature has largely focused on the negative effects of acculturative processes, very little is known about the role of social network processes, particularly the role of ethnicity and nativity "bridging" social capital, which might play a role in the link between acculturation and health outcomes.

Dissertation Overview

This dissertation uses national datasets to address these gaps in the migration literature. The first study focuses on the question of "who has bridging social capital?" Much of network research in migration studies has focused on the internal dynamics of co-ethnic ("bonding") networks and their implications for immigrants' short-run adjustment in receiving nations. Therefore, little is known about the nature and extent of social capital inequality in "bridging" networks between native and immigrant populations and among immigrant groups themselves. Using data from the Social Capital Community Benchmark Survey (2000), this study empirically examines race differences and native-immigrant gaps in (1) access to bridging social capital, as measured by the ethnic and socioeconomic diversity of personal networks, and (2) the benefits of ethnic diversity of personal networks, in terms of their effect on network quality. The results highlight that immigration, perhaps unsurprisingly, is both an ethnically AND socioeconomically segregating experience, and that ethnic diversity is strongly associated with access to high status network contacts. While no significant difference was observed between immigrants and non-immigrants in the average size of their friendship networks, immigrants' networks are more likely to be both racially and socioeconomically homophilous than non-immigrants' networks.

Moreover, race differences in access to bridging social capital and native-immigrant gaps in network diversity were observed. Particularly, the results reveal evidence for a double disadvantage in social network diversity and intersectional disadvantage whereby racial minority immigrants have significantly lower levels of interethnic diversity in their social networks than would be expected from the independent effects of race or immigration status. A similar disadvantage was observed in terms of access to high status contacts; however, it appears to be explained away by differences in network ethnic diversity, highlighting the "strength of weak ties" for immigrant minorities with respect to ethnicity-bridging ties. Implications for immigrant incorporation and future research are discussed.

In the second study, I examine the implications of immigrants' reliance on "bonding" social capital for their labor market outcomes and the extent to which the social capital-labor market outcome relationship is context-dependent – that is, the extent to which varies for different immigrant groups. While a growing body of literature investigates the role of social capital in the labor market outcomes of immigrants, the verdict is still out on whether or not reliance on social networks enhances or constrains labor market performance. This study explores the effect of relying on social ties to find a job on the hourly earnings and occupational prestige of new legal immigrants in the United States. Utilizing data from the New Immigrant Survey 2003 cohort, the effect on occupational outcomes of relying on social ties to locate a job is estimated using both linear regression (OLS) and propensity score matching, to minimize observable selection bias. Propensity score matching is used to identify the treatment effect of using social contacts by comparing the outcomes of closely matched treatment and control groups. Both OLS and propensity score matching estimates indicate that using a close contact to find a job has a detrimental effect on earnings and occupational prestige. The effect of social capital, however,

varies across groups. Particularly, while social capital has little or no effect on the labor market outcomes of Black and Hispanic immigrants, it has a detrimental effect on the occupational prestige of Asian and white immigrants (the effect being stronger for Asians than for whites). Social capital research on immigrants' outcomes should, therefore, take caution in generalizing from group-specific research, as these findings point to contextual labor market effects of social capital.

The third study frames English language use among immigrants in the U.S. as a reflection of bridging (interethnic) social capital that is indicative of social network ethnic diversity. Utilizing data from the first and second waves of the New Immigrant Survey (NIS), it investigates the link between immigrants' interethnic social capital, as measured by levels of linguistic integration, and health outcomes. Particularly, it examines the implications of ethnic diversity of immigrants' personal networks for various health outcomes, including self-rated health, body mass index, number of chronic diseases, smoking/drinking behavior, degree of dietary change and frequency of physical activity. Both cross-sectional and lagged dependent variable (LDV) models were estimated to examine contemporaneous and lagged associations between interethnic social capital and health. In addition, the lagged dependent variable models were used to rule out reciprocal effects and spurious associations between linguistic social capital and health. The results show cross-sectional correlations between negative health behaviors (smoking, drinking, and dietary change) and interethnic connectedness, but no similar effects in the LDV models. Interethnic integration does, however, have positive long-term (i.e. lagged) effects on health status: self-rated health and chronic diseases. Overall, these results highlight the time-dependent health implications of interethnic network integration for health status, and the presence of potential confounders in its association with immigrant health behaviors.

CHAPTER 2

RACE, IMMIGRATION AND SOCIAL NETWORK DIVERSITY: THE IMMIGRANT DISADVANTAGE IN BRIDGING SOCIAL CAPITAL

Migration research has increasingly acknowledged the role of social networks in the migration process and subsequent socioeconomic adjustment of immigrants in host nations (Massey and Espana 1987; Aguilera and Massey 2003; Baker and Espita 2000; Portes and Sensenbrenner 1993). Researchers have often treated immigrants' intra-group networks as taken-for-granted (Ryan 2011), emphasizing the importance of ethnic networks in the social incorporation of new immigrants (Aguilera and Massey 2003; Massey and España 1987; Portes 1987). While most immigrant communities do serve as important sources of "bonding" social capital, a key source of disadvantage for some immigrant groups may arise from limited access to ethnicity and status-crossing social ties, as a result of the socioeconomic context in which they find themselves. However, the significance of immigrants' environments and access to opportunities for the creation of "weak ties" (Granovetter 1973) has largely been ignored in the literature. Further, most empirical research on immigrants' social capital assumes that immigrant groups face similar "opportunity structures and reception factors" (Nelson and Tienda 1985), largely overlooking differences in social context and social capital acquisition, which may have implications for distributional inequities in access to ethnicity and status-bridging social capital.

Social network research suggests that individuals and social groups do not possess equal levels of access to social capital, nor do they receive similar returns from their social capital (Lin 2000, 2001). While it is also acknowledged that the significance of social capital may be context-dependent and may vary across different immigrant groups (Portes and Sensenbrenner 1993; Portes 1998), research has yet to empirically examine the extent to which different immigrant

groups have varying levels of access to bridging social capital, which may be an important mechanism through which socioeconomic inequality among immigrants is produced and maintained. Research suggests that social capital disadvantages exist among minorities generally, but the implications for the immigrant population are not clear, particularly because immigrants possibly face the double disadvantage of being an ethnic minority and an outsider. Further, race and immigration status might intersect to create a unique social capital disadvantage for minority immigrants. While the intersection of race and immigration status has been examined in the context of labor market outcomes (e.g. Stewart and Dixon 2010), migration research has overlooked such interactive effects on social capital. And this multiplicative effect of race and immigration status is more relevant when it comes to access to ethnicity and status-bridging ties, since the process through which co-ethnic social capital is acquired is relatively more egalitarian than the process through which ethnicity and status-crossing relationships are formed. While it would be unsurprising that there is an "immigrant penalty" in bridging social capital, we do not know the extent to which this immigrant disadvantage itself, if at all, is dependent upon minority status and whether or not race and immigrant status intersect to uniquely disadvantage minority immigrants.

This paper, therefore, examines (1) whether or not immigrants face a "double disadvantage," so to speak, of race and immigrant status when it comes to access to ethnicity and status-bridging social capital, and (2) whether or not these social locations intersect to create unique disadvantages for some immigrant groups, which may have lasting implications for immigrants' structural and socioeconomic integration in the host nation. Using data from the Social Capital Community Benchmark Survey (2000), I examine group differences and native-immigrant gaps in the characteristics of friendship networks, particularly in access to interethnic and status-bridging friendship ties. The results reveal that immigrants not only face a disadvantage

in terms of access to ethnicity-bridging ties, but they also experience the multiplicative effects of race and immigrant status that lead to wider native-immigrant gaps for Asians and Hispanics than for whites. Immigrants also face a double jeopardy in network quality (i.e. access to high status contacts), and an intersectional disadvantage exists for Asians and Hispanics. In addition, lower levels of ethnic diversity in immigrants' networks account for the multiplicative effects of race and immigration status on access to high status contacts within friendship networks. The results further highlight that minorities and some immigrant groups receive higher returns from interethnic contact in terms of access to high (socioeconomic) status individuals within their networks, which is perhaps a direct reflection of their relative position in the prevailing social stratification system in the United States.

Background

A distinctively sociological contribution of network theory has been identifying the various implications of different types of social networks, particularly distinguishing between social networks characterized by closure (Coleman 1988) and those that crosscut network boundaries (Burt 2001; Granovetter 1973; Paxton 2002; Putnam 2000; Woolcock 1998). Network theory suggests that "bonding" and "bridging" (Putnam 2000) social networks have different functions and consequences. While bonding social capital, characterized by network closure among similar individuals or groups, facilitates trust and exchange of reliable information within the network, it also creates "information redundancy" (Burt 2001; Granovetter 1973) and limits information transfer from higher status individuals in society (Lin et al. 1981). Bridging social capital, on the other hand, refers to cross-cutting social ties (Coffe and Geys 2007) that create connections across social groups, and specifically arises from "horizontal ties […] that transcend heterogeneous differences of ethnicity, religion and socio-economic status" (Cheong et al. 2007). Even though

the bonding versus bridging distinction could be defined based on any of these social characteristics, it has often been conceptualized in the migration literature in terms of co-ethnic versus interethnic social ties (Bankston 2014; Lancee 2012), given the prominent roles of ethnicity and migration status in defining group identity among immigrants.

Despite the documented importance of the bonding versus bridging distinction in social networks, which is particularly crucial in the study of immigrants' networks, researchers are only beginning to understand their various implications for the immigrant population (e.g. Lancee 2012). Prior network studies have largely associated immigrants' networks with ties to family and kin and focused on the role of immigrants' personal networks. Such studies have not only identified the role of networks in migration streams (e.g. Massey 1999), but have also shed light on the internal dynamics of international migration, particularly the process of immigrant settlement and adjustment in host nations. Research has examined both the positive and negative implications of ethnicity-based social networks. Family and friendship networks appear to be important in migration (Massey and España 1987), primarily because they serve as conduits of information and resources that are instrumental in migration decisions. Family and personal networks also influence immigrants' decisions and outcomes in subsequent years after migration (Portes 1998a). They provide resources such as money, housing and accommodation, labor market information, information about health care, and social support. Both distant and immediate family ties influence immigrants' outcomes (Aguilera and Massey 2003) and immigrant enclaves and co-ethnic communities influence immigrants' trajectory of incorporation in receiving nations (Portes 1981; Sanders and Nee 1987).

Given the literature's focus on co-ethnic social capital, however, little is known about the extent to which immigrants have access to weak or bridging ties and potential distributional

inequities in bridging social capital among immigrant groups. This is particularly significant since socially diverse networks often provide weak ties or bridging social capital, and are therefore, generally more resourceful than social networks characterized mainly by bonding social capital (Coffe and Geys 2007; Granovetter 1973), and more beneficial for social mobility and status attainment (Granovetter 1973; Lin 1999).

Network diversity has important implications for economic and social well-being. A plethora of research has observed the significance of weak ties and network diversity (Granovetter 1973) and location within social networks (Burt 2000) for economic outcomes, such as entrepreneurship and job search. A key advantage of diverse networks here comes from their superior role as sources of valuable information (Granovetter 1973). Individuals with more diverse networks not only have more access to information about job openings (Lin 2003), but they also have better access to higher status job contacts (Son and Lin 2012). Beyond the economic realm, network diversity has also been implicated in health, health behaviors, civic engagement and trust. For instance, network diversity is associated with smoking and drinking less (Cohen and Lemay 2007) and increased physical activity. Network diversity has also been linked to a higher likelihood of volunteering and civic engagement (Musick and Wilson 2008; Paik and Navarre-Jackson 2011; Son and Lin 2008). All of this basically highlights the superior life outcomes of individuals who are embedded in more diverse (vis-à-vis homophilous) social networks.

Similar benefits of network diversity have been observed among immigrants, with prior research showing positive incorporation outcomes for immigrants with more diverse networks. For instance, migrants with a higher proportion of non-immigrants in their social networks have better jobs (Thomas 2011) and health (Rostila 2010) outcomes. Of course, both ethnicity and nativity-bridging social ties may serve as sources of useful information in the socio-economic

adjustment process. This is because ethnically homophilous networks not only limit the range of information and experiences that immigrants are exposed to, but they also potentially constrain the number of high-status contacts within their networks. Therefore, given a well-documented and persisting socioeconomic gap between immigrants and natives (Borjas 1985; Chiswick 1978; LaLonde and Topel 1992), ethnicity and nativity-bridging ties are an important source of social capital for immigrants. Social ties that bridge across race, ethnicity and nativity could provide access to higher-status social connections (Kanas, et. al, 2009; Putnam, 2007) and social networks with higher levels of embedded resources, which facilitate immigrants' incorporation and upward mobility (Nannestad et al. 2008).

These arguments about the relationship between network ethnic diversity and network quality raise important questions about the role of social capital inequality in immigrants' social and economic integration which prior research does not address. First, given the focus of migration research on immigrants' co-ethnic networks and communities, relatively little is known about immigrants' disadvantages in access to ethnicity-bridging social capital. While immigrants in general, by virtue of their newcomer status, often lack established and wide-spanning personal networks that might be taken-for-granted among non-immigrants, there are various social, cultural and economic factors that would make certain groups more reliant on the co-ethnic community and, consequently, influence network diversity and access to bridging ties. For instance, sources of disadvantage, including deficiencies in human capital and host-language proficiency that might encourage individuals to reside in co-ethnic communities and rely on ethnic organizations, might restrict opportunities for meaningful contacts with non-immigrants. Immigrants also face enormous social, economic and psychological barriers to developing social relationships, including time pressures due to work schedules, isolating environments and lack of trust (Hurtado-

de-Mendoza et al. 2014), that severely limit their opportunities to enhance their social capital. Network theory suggests that the principal deterrent of network diversity is social homophily, the idea that "birds of a feather flock together" (McPherson et al 2001). Differences in social network diversity, particularly between native and immigrant groups, arise from the fact that immigrants' experiences might encourage more homophilous network formation. That is, immigrants may be more likely to form homophilous networks due to shared cultural, racial and ethnic identity, and continue to rely on such networks because of negative experiences, such as discrimination and prejudice, in majority-dominated environments.

All of these factors associated with personal network diversity, therefore, raise questions about group variability in access to bridging social capital. These questions address an important gap in the migration literature given the various, well-documented benefits of network diversity. Specifically, there is no reason to expect that the native-immigrant gap in social capital would be uniform among immigrant groups or that all immigrant groups equally benefit from ethnicity-bridging social capital. Immigrant groups are faced with different opportunity structures upon migration, which potentially leads to emerging inequalities in social capital, in terms of differential access to diverse or bridging networks. Research suggests that dominant groups in general have higher levels of social capital, particularly connections to weak social ties (Chua 2013), which has implications for not only the native-immigrant gap in social capital, but also for gaps among immigrant groups themselves. More specifically, it suggests a double disadvantage for immigrants that result from both race and immigration status. And among minorities themselves, prior research indicates Hispanic immigrants experience a more negative reception in the U.S. than other immigrant groups (Portes and Rumbaut 2006). Differences in context of reception might, therefore, play a key role in determining the individuals, groups and organizations with which

immigrants associate, which would have implication for social capital inequality across immigrant groups.

This study also goes beyond the additive effects of race and immigration status, and takes an intersectional approach to understanding social capital inequality among immigrants. That is, it examines whether or not there are intersectional disadvantages for minority immigrants, whereby minority and outsider status intersect to produce differential access to bridging social capital. An intersectional approach (Browne and Misra 2003; Collins 1990; Crenshaw 1989) suggests that social categories or statuses form a "matrix of domination" (Collins 1990), where social categories intersect to form a system of stratification. Race and nativity status are salient characteristics that most profoundly influence minority immigrants' outcomes in the U.S. From an intersectional perspective, the underlying argument would hold that the "intersection of race and immigrant status forms a unique social space where minority group members and immigrants are afforded or denied the privileges that are routinely accorded to native born, non-Hispanic whites" (Stewart and Dixon 2010). Although research on the Hispanic population has long recognized the "inextricable" link between race and immigration status (Sanchez 1997), much of migration research overlooks how they interact to create unique experiences and outcomes for immigrant groups, with some exceptions in recent studies of immigrants' labor market outcomes (e.g. Stewart and Dixon 2010). These studies generally find evidence for an intersectional relationship between race and immigration status in the labor market, particularly that native-immigrant gaps in earnings are higher for minority immigrants than white immigrants.

When it comes to social capital, migration research has largely focused on the link between immigrant status and access to social networks (e.g. Massey and España 1987) and ignored the unique disadvantages potentially faced by minority immigrants with regard to access to quality,

racially and socioeconomically diverse, social networks. The extant research is generally silent on differential returns to social capital across immigrant groups, particularly the extent to which network ethnic diversity, and the return to diversity in terms of network quality, varies across groups. This is an important gap to address in the literature because differential returns to social capital, at least in this context, is reflective of the groups' relative socioeconomic position. In other words, while one would expect network ethnic diversity to be positively associated with the socioeconomic diversity of immigrants' personal networks, the degree of variability across groups in the return from ethnic diversity (in terms of increased access to high status contacts) is possibly an indicator of existing socioeconomic gaps. That is, as a result of socioeconomic gaps across groups and socioeconomic disadvantages for immigrants and minorities, one would expect interethnic social ties to be particularly beneficial to disadvantaged groups in terms of their effect on social network quality. Therefore, native-immigrant gaps and group differences in the return to personal network ethnic diversity should be reflective of the extant social stratification system in the United States.

To the best of the author's knowledge, no prior study has examined group variability and interactive effects of race and immigration status on access to bridging social capital, as most studies have focused on and the independent effects of migration status and family based or co-ethnic social capital. To address this limitation, this study examines (1) the extent to which access to bridging social capital varies by race and immigration status, and (2) whether or not race and immigration status intersect or interact to determine the distribution of bridging social capital and the returns to ethnic diversity in terms of social network quality. In doing so, it assesses the intricacies of the relationship between race, immigration and social network diversity.

Data and Methods

Data

The data for this study came from the Social Capital Community Benchmark Survey (SCCBS), a large national survey from 41 communities in selected metropolitan regions and states in the United States. The survey was conducted by the Saguaro Seminar at Harvard University, via random-digit dialing, between July and November 2000, with a total sample size of roughly 30,000, of which 1,500 are immigrants. The SCCBS also includes sampling weights to adjust for the unequal probability of selection of households in the sample, which were used to conduct the analyses that follow.

The survey is appropriate for this study because it includes questions on characteristics of respondents' friendship networks, which is a proxy for personal networks. The survey queries, among other things, the size, socioeconomic diversity and ethnic composition of respondents' personal friendship network. These measures have been developed by Putnam's Saguaro Seminar Project at Harvard and extensively used in the social capital literature as indicators of ethnicity and status-bridging social capital. These data were used to assess the extent to which social capital differences exist between immigrants and non-immigrants, and across white, Asian, Black, and Hispanic immigrants. Two samples were constructed from the SCCBS based on respondents' immigration status: a pooled sample that includes both immigrant and non-immigrant respondents (N=21, 608) and an immigrants-only sample (N=853). Listwise deletion was used to construct this analytical sample. Table 1 and 2 present descriptive statistics on the dependent and explanatory variables.

Measures

Dependent Variables *(Network Characteristics)*

Measures of individual level social capital from the SCCBS include friendship network size, ethnic diversity, and network status.

Friendship network size. Network size is the response to the question "how many close friends do you have these days?" and it is coded as an ordinal measure, with the following categories: 1 (no close friends), 2 (1-2 close friends), 3 (3-5 close friends), 4 (6-10 close friends) and 5 (more than 10 close friends).

Network Ethnic diversity. Ethnic diversity is a summation index of whether or not SCCBS respondents reported having a friend who is (1) white, (2) Asian, (3) Black, and (4) Hispanic. The proxy measure for their friendship networks' "ethnic diversity" is the sum of these variables (excluding the indicator for a same-race friendship tie). That is, only friendship ties to someone of a different race than the respondent's were included in the network ethnic diversity index. For example, if the respondent is white, the ethnic diversity is the summation of the dummy variables for Asian, Black and Hispanic friendship ties. The constructed measure ranges from 0 (i.e. ethnically homophilous) to 3 (most ethnically diverse).

Network Status (Network Quality). Network status or quality was measured by the level of access to high status contacts in the respondents' friendship network. Respondents were asked if they have a close friend who (1) owns a business, (2) owns a vacation home, and (3) is a community leader. The constructed measure ranges from 0 (no high status contact) to 3 (high status network).

Independent Variables *(Race and Immigration Status)*

Race and immigration status are the key independent variables.

Race. Race includes 4 categories: Asian, Black, Hispanic (reference category), and white. While all race groups include sufficiently large number of respondents, there is a relatively small (n=55) number of black immigrants in SCCBS data. Given how the network ethnic diversity measure is constructed, the analysis focuses on these four pan-ethnic categories, and respondents who identified as "other race" (668 non-immigrants and 63 immigrants) were, therefore, excluded (i.e. respondents identified as "other race" score artificially high on network ethnic diversity).

Immigration status. Unfortunately, the SCCBS does not query respondents' country of birth. However, it does ask about citizenship status. For this study, respondents who are not American citizens are categorized as "immigrant," which makes up 4% of the study sample.

Covariates

The analyses control for respondents' individual and community-level characteristics, which may be correlates of individual network characteristics. I include controls for gender (female coded as 1), age (measured in years, with a squared term added to capture non-linear relationships), marital status (married coded as 1, versus all other categories of marital status), and health status (self-reported health ranging from 1 ("poor") to 5 ("Excellent")). Network research suggests that gender and marital status play a role in determining the composition of personal networks (Hurlbert and Acock 1990; Moore 1990), particularly suggesting that women and married individuals may have more family and kin-based social networks than men and unmarried individuals, respectively. All models control for levels of organizational involvement, and models of network diversity control for network size. Prior research links organizational involvement with

social network diversity (Glanville 2004), and particularly the importance of involvement in multiple organizations.

The models also control for the respondents' length of residence in the community, which may be a factor in native-immigrant differences in individual network size and characteristics. Individuals who have lived in a community longer are not only more likely to have had more opportunities for friendship tie formation, but for immigrants, it is also a correlate of time spent in the U.S. which would be positively associated with both network size and diversity. Since migration is a network-based process and immigrants may be selected into co-ethnic enclaves or communities, at least upon migration, time spent in the United States may be positively associated with interethnic integration and lower level of reliance on family social capital (Tegegne 2015). For community characteristics, which may be related to respondents' friendship network size and ethnic composition, I include indicators of the community's socioeconomic status and ethnic composition. Specifically, I control for average education and average income in the community. To control for ethnic composition, I include the percent white, percent Asian, percent black, and percent Hispanic in the community. These community characteristics were available in the SCCBS for the 41 communities the sampling was based on. The sizes of these communities varies, but it includes mostly cities and metro areas.

The SCCBS, however, does not provide data on a direct measure of years of residence in the United States and English language proficiency and use, which have been used in the migration literature as indicators of acculturation. As indicated above, the models control for length of residence in the community, which would correlate with length of residence in the United States. With regard to language proficiency, the only language-related variable available in the SCCBS was language of interview (English vs. Spanish). Controlling for language of interview did not

alter any of the findings on Hispanic immigrants and the Hispanic native-immigrant gaps. That is, it did not explain away the wider native-immigrant gap in ethnic diversity among Hispanics (compared to whites), suggesting that English language proficiency is not responsible for the higher native-immigrant gap among Hispanics (75% of Hispanic immigrants completed the interview in Spanish).

Descriptive statistics for these variables are presented in Tables A1 and A2 and discussed in the results section.

Methods

Data from the 2000 SCCBS are used to examine differences in bridging social capital between natives and immigrants and among immigrant groups. First, group differences in network size and ethnic diversity are examined, and race differences in the general population are highlighted. Then, I examine group differences in personal network diversity (racial and socioeconomic diversity) and the returns from ethnic network diversity. Group differences refer to (1) differences across race groups, among immigrants themselves, and (2) native-immigrant gaps, where I compare the native-immigrant differences in network characteristics among whites to that of minority groups.

For each analysis, I run a set of three models. The first model (Model 1) uses the pooled sample (N= 21,608) to estimate the native-immigrant gap. The second model (Model 2) uses the immigrants-only sample (N=853) to estimate the gap between immigrant groups (Asian, Black, and Hispanic), with white immigrants as the reference group. In the third model (Model 3), I use the pooled sample again to estimate the interaction effect between race and immigration status and examine the differences across racial groups in the native-immigrant gap. Finally, I run a set of models to examine group differences in the return from ethnic network diversity, in terms of

contacts to high status individuals.

Results

Table A1 and A2 show baseline differences across race in selected characteristics for the pooled and immigrant samples, respectively. In the pooled sample, whites overall have larger friendship networks and more high status ties, whereas Asians have the highest average for network ethnic diversity. Among immigrants, in Table A2, the averages for white immigrants are highest for all three personal network measures (i.e. network size, ethnic diversity and the number of high status contacts) than other immigrant groups.

Table A3 shows the correlation coefficient matrix for the pooled and immigrants only samples. All correlation coefficients are significant at all conventional levels of significance. Positive correlations between network size and the other network characteristics are unsurprising. However, the correlation between network ethnic diversity and access to high status contacts appears to be much stronger among immigrants, compared to the correlation in the pooled sample.

Who has Ethnicity and Status-bridging social capital?

The statistical significance of group differences in friendship network characteristics are examined and the results are presented in Tables A4-A7. Table A4 presents three models using ordinal logistic regressions to estimate group differences in friendship network size by race and immigration status. Model 1 in Table A4 highlights that there is no statistically significant difference in friendship network size between immigrants and non-immigrants, controlling for socioeconomic status, demographic characteristics, community composition, and length of residence in community. This model also finds that, in the general population, minorities are more likely to have smaller friendship networks than whites, even though race differences in network

size were not statistically significant in the immigrants-only sample, Model 2. The interactions between race and immigration status, as presented in Model 3, were also not significant, showing no evidence for native-immigrant differences in social network size across different race groups.

The set of models in Table A5 examine ethnic diversity of friendship networks by race and immigration status. Results from three models are presented here. The first two examine race differences in levels of network ethnic diversity in the general population and among immigrants, respectively. As can be observed in model 1, in the general population, racial minorities report higher levels of interethnic diversity within their personal networks compared to whites. Further, while immigrants, overall, do have lower levels of interethnic network diversity than non-immigrants, they do not exhibit similar race differences in interethnic diversity among themselves, as shown in Model 2.

The findings on race differences in ethnic diversity are, of course, neither surprising nor revealing of racial inequality in social capital. That is, given the relative differences in group size, one would generally expect minorities to have higher levels of ethnic diversity than whites. The more interesting question here is whether or not minorities are more likely to experience a higher level of immigrant disadvantage in racial integration, which is precisely what model 3 addresses. More specifically, model 3 adds interaction terms between race and immigration status to model 1. The findings show significant race differences in native-immigrant gaps in personal network ethnic diversity. Notice that the odds ratios for both the Asian and immigrant and Hispanic and Immigrant interactions are significantly less than one. This suggests that the difference in network interethnic diversity between Asian immigrants and non-immigrants is significantly greater than the difference between white immigrants and white non- immigrants. In other words, Asian and Hispanic immigrants have less network ethnic diversity than would be expected based on the

independent effects of race and immigration alone. Figure A1 shows predicted probabilities of having the most ethnically diverse friendship network by race and immigration status and also depicts the native-immigrant gaps across racial groups.

Models of group differences in access to high status ties are in Tables A6 and A7. Table A6 presents race differences in access to high status contacts within friendship networks, without accounting for group differences in the ethnic diversity of networks. Interestingly, for both the general population (model 1) and among immigrants (model 2), I do not find differences between blacks and whites in the levels of connections to high status individuals, whereas Asians and Hispanics do have significantly lower levels access to high status contacts. Immigrants, overall, do have lower levels of high status individuals in their networks. However, this immigrant disadvantage in access to high status contacts is completely explained away by the lower level of ethnic diversity among immigrants (as shown in model 1 in Table A7). The results in A6 find that there is a double disadvantage (from race and immigrant status) in access to high status contacts for Asians and Hispanics (as shown in Models 1 and 2). Further, model 3 also finds intersectional disadvantages in network quality, whereby Asian and Hispanic immigrants have lower levels of access to high status contacts than would result from the independent effects of race or immigration status. These wider native-immigrant gaps in network quality among Asians and Hispanics (compared to whites) seem to be accounted for by network ethnic diversity, highlighting the status implications of network ethnic diversity for the immigrant population.

Differential Returns to Ethnic Diversity

Given that network ethnic diversity accounts for native-immigrant gaps across racial groups, I also examined differences across ethnic groups and native-immigrant gaps in the return from ethnic diversity in terms of network quality. Figure A2 summarizes findings from this

analysis. This figure makes comparisons within groups (i.e. among immigrants and among non-immigrants), on the one hand, and across groups (i.e. immigrants and non-immigrants), on the other. The return to ethnic diversity of friendship network in terms of increased access to high status ties is generally higher among immigrants compared to non-immigrants (as also evidenced by the higher slopes for immigrant groups compared to non-immigrant groups), and this difference is statistically significant[1]. Further, there are important race differences among non-immigrants and immigrants themselves. The return to ethnic diversity is, overall, higher for Blacks and Hispanics compared to whites. However, the black-white difference among immigrants did not achieve statistical significance, which may be due to the small sample of black immigrants in the sample. Among non-immigrants, there was no statistically significant difference in the return to ethnic diversity between Asians and whites, whereas Asian immigrants receive a statistically lower return on ethnic diversity than white immigrants. These differences in the return to interethnic diversity potentially reflect important differences in the relative socioeconomic positions of immigrant and non-immigrant groups.

While Figure A2 allows a visual comparison of native-immigrant differences across race groups in the return to ethnic diversity, these differences are better depicted in Figure A3, which shows the average marginal effects of interethnic diversity on network quality by race and immigration status. Whereas the native-immigrant gap in the return from network ethnic diversity is virtually non-existent for whites, Asian, black and Hispanic immigrants receive higher returns than their non-immigrant counterparts. The Black-white and Hispanic-white differences in native-immigrant gaps in the return to ethnic diversity were not statistically significant, however, whereas

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[1] I ran a regression model of network quality that includes the interaction between immigration status and ethnic diversity, which showed that immigrants generally have a higher return to ethnic diversity in terms of access to high status contacts.

the native-immigrant gap for Asians was significantly larger compared to whites. This is because, as shown in Figure A2, while non-immigrant Asians do get returns from ethnic diversity that is comparable to non-immigrant whites, the return to ethnic diversity is relatively flat for Asian immigrants.

Discussion and Conclusion

Most of the prior research on immigrants' networks has focused on the short-term implications of immigrants' co-ethnic networks for their settlement and adjustment in receiving nations. As important for immigrants' incorporation outcomes, however, is the extent to which different groups have access to ethnicity-crossing social ties, which play a critical role in providing access to high status, more resourceful, social contacts that facilitate socioeconomic advancement. Furthermore, differential access to such ethnicity and class-bridging social ties may also be implicated in native-immigrant differences and emerging socioeconomic disparities among immigrants themselves. This study contributes to the immigration literature by documenting the nature of social capital inequality using data from the SCCBS. The findings suggest that immigrants do face the double disadvantage of their minority and immigrant status in terms of their access to ethnically diverse networks. The data show that Asian and Hispanic immigrants have much lower levels of ethnic diversity in their friendship networks than would be expected by the independent effects of race and immigration status, and that the native-immigrant gaps in ethnicity bridging social capital are much wider for racial minorities than they are for whites.

The results also highlight differences across immigrant groups not only in the size and ethnic composition of their personal networks, but also in the return from the ethnic diversity of their social networks in terms of access to high status contacts. There is a positive and significant association between the ethnic diversity of immigrants' friendship networks and the number of

high status friendship contacts, highlighting an important implication of immigrants' ethnic integration for their level of access to high status individuals, which is to say the quality of their social networks. That is, more ethnically integrated individuals are much more likely to be embedded in higher quality networks, which presumably provides better access to information and resources that facilitate positive incorporation outcomes. In addition, group differences in the ethnic diversity personal networks accounts for the native-immigrant gap in access to high status contacts and the multiplicative effect of race and immigration status on network quality.

These findings have important implications for how we understand the stratifying effects of both race and immigration, with social networks being the pipes through which key resources are (unequally) distributed. One of the main implications is that intergroup relations are particularly important for disadvantaged groups, particularly ethnic minorities. For most minority immigrant groups, interethnic relations might be more useful in terms of creating opportunities for the establishment of high status contacts. This highlights not only the strength of weak ties for immigrant minorities, but also "the weakness of strong ties," which is to say that ethnically homophilous networks provide immigrants with fewer connections to high status contacts.

CHAPTER 3

IMMIGRANTS' SOCIAL CAPITAL AND LABOR MARKET PERFORMANCE: THE EFFECT OF SOCIAL TIES ON EARNINGS AND OCCUPATIONAL PRESTIGE[2]

Immigrants are a rapidly growing demographic group in most industrialized democracies (Segal, Elliot, and Mayadas, 2010). In the United States, where foreign-born individuals makeup about 13 percent of the total population, a third of annual growth in population and about half of the growth in the labor force is attributable to immigration (Massey, 2010). As a result, interdisciplinary research on immigrants and their integration into host societies continues to be an important part of social science research. Numerous studies have examined factors that influence the economic integration of immigrants, particularly the determinants of labor market assimilation of newcomers. Studies have looked at such outcomes as self-employment (e.g. Bailey & Waldinger, 1991; Jensen & Portes, 1992), earnings (e.g. Aguilera, 2005; Aguilera & Massey, 2003), wealth (Akresh 2011), occupational prestige and mobility (Akresh 2006, 2008a), and job tenure (Aguilera, 2003). While these and other studies continue to show the significance of human capital for labor market success (Akresh, 2008; Friedberg, 2000; Sanders & Nee, 1996), more sociological approaches have turned their attention to the distinct roles of social capital in the labor market adjustment of immigrants.

Social capital research on immigrants' outcomes has shown that social ties are instrumental in economic and social adjustment. This growing literature highlights the role of co-ethnic social networks in the migration and settlement process (e.g., Massey et al., 1987; Massey and España, 1987), entrepreneurship and self-employment (e.g., Portes & Sensenbrenner, 1993; Portes and

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[2] Adapted from "Tegegne, Mesay A. 2015. "Immigrants' Social Capital and Labor Market Performance: The Effect of Social Ties on Earnings and Occupational Prestige." *Social Science Quarterly* 96(5):1396–1410".

Zhou, 1992; Sanders & Nee, 1996), and other employment outcomes, such as earnings (Aguilera and Massey 2003; Aguilera 2005) and occupational prestige (Sanders et al. 2002). While this research suggests that co-ethnic social capital encourages entrepreneurial activities and facilitates employment, the role of immigrants' family, friendship and kinship ties in job search and labor market performance is not well-understood. Particularly, there is limited research on the labor market implications of reliance on close family and friendship ties in the job search process, despite being a common strategy for new immigrants (Sanders et al. 2002). Moreover, the extant research has generally been limited to Hispanics and Asians, as these groups make up the vast majority of the foreign-born population in post-1965 United States. We, therefore, have a limited understanding of the precise role of social capital in the labor market incorporation of immigrants and the extent to which extant findings are generalizable to various groups. The aim of this study, therefore, is to investigate the empirical relationship between using close personal ties to find a job and labor market outcomes, particularly immigrants' earnings and occupational prestige. Using data from the New Immigrant Survey (2003 cohort), a national survey of legal immigrants with recently-acquired permanent resident status, this paper examines whether there is a penalty or premium in terms of both earnings and occupational prestige for those who rely on relatives and friends in the job search process and the extent to which these effects of job search strategy vary across immigrant groups.

Background

Social capital theory argues that social ties and connections influence labor market behavior and outcomes, and that the types of networks and relations in which individuals are embedded are important (Burt, 2001; Granovetter, 1973; Lin 2001; Putnam, 2000). Particularly, the distinction between bonding and bridging social capital has emerged to highlight the numerous implications

of different types of social capital (Paxton 2002; Putnam 2000; Woolcock, 1998). Bonding social capital is a feature of dense networks, such as close family, relatives and friends, whereas bridging social capital often resides in relations that connect different social groups. While both bonding and bridging social capital may play a role in the labor market, bridging social capital is generally thought to be more valuable than bonding social capital. When it comes to immigrants, competing hypotheses have emerged as to the effects of bonding social capital on labor market performance (Fong and Ooka, 2002; Portes and Sensenbrenner, 1993), and empirical findings are generally limited and inconsistent.

Theoretical perspectives in social capital theory suggest that bonding social capital may have both positive and negative implications for the labor market outcomes of immigrants. On the one hand, some argue that the high degree of closure (Coleman, 1988) that emerges in ethnic networks breeds trust and solidarity that encourages cooperation and reciprocity and, consequently, facilitates non-redundant information flow and economic activities, such as job search and employment (Portes & Sensenbrenner, 1993; Waldinger, 1994). Further, the enclave economy hypothesis (Wilson and Portes 1980) suggests that the ethnic labor market provides immigrants with opportunities not available in the mainstream market. On the other hand, researchers have also highlighted the constraining effects of such networks emphasizing not only the implications of emerging obligations and sanctions (Portes and Sensenbrenner 1993; Portes 1998b), but also the limiting effects of information redundancy (Burt, 2001; Granovetter, 1973) or restricted flow of information from the mainstream society (Fong and Ooka, 2002). Moreover, employment in the ethnic economy, characterized by the presence of co-ethnic employers (Bonacich and Modell 1980), linguistic closure (Reitz & Sklar, 1997; Sanders et al., 2002) and employee concentration in select sectors, such as services (Zhou and Logan, 1989), leads to lower returns to human capital

inside the ethnic enclave (Sanders and Nee, 1987).

While many have noted these two aspects of bonding social capital operate simultaneously (Portes and Sensenbrenner, 1993; Waldinger, 1994), we still have a limited empirical understanding of the significance of immigrants' personal networks in labor market adjustment, particularly their role in job search and their implications for occupational outcomes. On the supply side of the labor market, personal and family ties serve as a key resource for recent immigrants, particularly in job search, as friends and relatives are said to "provide transportation, show the new worker how to perform the job, and look out for his or her interests" (Gold, 2005) and possibly "reserve the best jobs" for their friends and relatives (Aguilera and Massey, 2003; Aguilera, 2008; Hagan, 1994). On the demand side of the labor market, however, ethnic employers actually rely on the ethnic economy because informal methods of hiring are cost-effective and co-ethnic workers are more likely to accept lower wages and endure unfavorable working conditions (Waldinger and Lichter, 2003). Therefore, while bridging social capital, particularly interethnic social ties, might be beneficial for immigrants in obtaining employment in higher-paying and better-quality jobs in the mainstream economy (Aguilera and Massey, 2003), reliance on close family and friendship ties might increase the probability of employment in the ethnic economy (Sanders et al., 2002).

A limited number of studies have directly examined the labor market effects of using personal and family ties in job search, even though the extant research highlights the particular importance of family networks in the labor market integration of immigrants (Nee and Sanders 2001; Nee and Sanders 1996; Sanders et al 2002; Aguilera 2005, Aguilera and Massey 2003). While these studies have shown that immigrants' family networks have a positive influence on earnings (Aguilera and Massey, 2003; Greenwell et al., 1997), they generally find no evidence that job search method

influences earnings. Aguilera and Massey (2003), for instance, find that having close family ties is associated with higher wages for documented Mexican immigrants, whereas undocumented immigrants get a similar benefit from distant families. However, they find no effect of finding a job through a friend or relative on earnings and the probability of employment in the formal sector for documented immigrants. Similarly, Greenwell et al. (1997) found no relationship between this method of job search and the wages of Salvadorian and Filipino migrants. For Asians, however, reliance on interpersonal ties appears to increase the odds of employment in a low-prestige job (Sanders et al., 2002).

A notable limitation of these studies is that they have not used nationally representative samples of immigrants, which casts doubt on the generalizability of their findings to the broader immigrant population in the United States. Prior studies have generally focused on Hispanics or Asians (e.g. Aguilera and Massey 2003; Sanders et al., 2002), and it is unclear the extent to which the effects of social capital, at least of reliance on family and friendship ties, are similar or different across groups. It remains to be determined whether these findings tell us something about social capital and its implications for immigrants in general or if they are simply capturing group and/or context-specific effects of social networks on job outcomes. For instance, research has shown that job search through friends and relatives is a more common strategy among Hispanics (Falcon and Melendez, 2001; Green et al., 1995), and it might generally have a beneficial effect for more disadvantaged groups (Aguilera and Massey, 2003). Similarly, interethnic differences in the context of reception (Portes and Rumbaut, 2001, 2006) might also have implications for the meaning and effects of social capital. It is recognized, for instance, that Hispanics experience a more negative reception in terms of discrimination than Asians, and this is thought to have implications for their respective assimilation trajectories. It is important, therefore, to examine the

effects of social capital on labor market outcomes at the national level and determine if it is more or less consequential for certain immigrant groups. This would allow us to better understand the significance of social networks for labor market integration of immigrants and their role in emerging group inequities.

Analytical Strategy

This study uses a nationally representative data of new immigrants to examine the association between reliance on a close social tie and labor market outcomes. Multiple regression is used to estimate the effect of finding a job with the help of a relative on the earnings and occupational prestige of immigrants, net of human capital and demographic characteristics. Since part of the effect of social capital on earnings may be through occupational prestige (Sanders et al., 2002), this study examines both in order to assess the labor market significance of immigrants' social ties. Further, interaction terms for race and social capital are included to examine if the effect of reliance on the help of a relative varies across immigrant groups.

One issue that arises in estimating the effect of social contacts on labor market outcomes is that of self-selection. Self-selection bias arises when a predictor of an outcome is associated with other observed or unobserved variables. In this case, self-selection is an issue to the extent that the use of a relative to find a job is itself associated with other variables, including human capital and demographic characteristics. This study, therefore, conducts an additional analysis using propensity score matching (Guo and Fraser, 2010; Rosenbaum and Rubin, 1983; Steiner and Cook, 2013) to adjust for such observable bias and estimate the treatment effect of using a relative to find a job on earnings and occupational prestige. While propensity score matching does not address selection on unobservable or unmeasured characteristics (Winship & Morgan, 1999), which may be associated with both the use of social capital and labor market outcomes, it has been empirically

tested (Luellen, Shadish, and Clark 2005) to show that it reduces observable selection bias.

Data and Measures

The data for this study come from the 2003 New Immigrant Survey (NIS), which was a survey of recent immigrants age 18 or older who obtained legal permanent residency between May and November 2003. A sample of 12,500 new immigrants was selected from this sampling frame, and a total of 8,573 interviews were completed for a response rate of 69% (surveys were conducted in the respondent's choice of language). The survey was aimed at addressing the significant lack of data on the foreign-born population of the United States and to shed light on the pre-immigration experiences of immigrants, labor market assimilation, and the role of family networks in these processes. This survey is appropriate for this study because it contains measures of job market outcomes and social capital. It is customary for survey questions related to employment to include questions on method of search and finding employment, and the NIS specifically asks respondents if they obtained their current job with the help of a relative.

The analytical sample includes all respondents who provided information on their main current job. Only six percent of the sample held more than one job, and there was no systematic difference between the treatment and control groups in the likelihood of holding more than one job or the number of hours worked per week. Respondents reported their two most current jobs and answered a series of questions related to each job. They provided information on hourly wages and/or salary, and indicated whether or not they used a relative to find their job. As is often the case with most variables related to income, there was missing data on hourly wages and salary. The final analytic sample was constructed through list-wise deletion of missing data (N=3320). The NIS used stratified sampling and included probability weights to adjust for sampling design. Sampling weights are, therefore, employed throughout the analyses.

Dependent Variables

The dependent variables are the log of hourly wages and the occupational prestige score for the main current job of the respondent, which is the focus of the analyses. In addition, hourly wage was computed for those who reported a salary instead of hourly earnings. Specifically, respondents were asked to report before-taxes salary, the number of weeks per year and number of hours per week that they worked on their job. Since some respondents reported their salary in different units (e.g. bi-weekly and monthly), non-hourly figures were divided by the number of hours per week and the number of weeks in the period to compute the hourly wage rate. For example, to derive an hourly wage rate, monthly salary is divided by four times the number of hours worked per week. Since the distribution of hourly wages has a significant positive skew, the dependent variable is normalized by log transformation. For occupational prestige, this study uses the Nakao & Treas (1994) scale, which ranges from 0 to 100. Each respondent's 4-digt occupation code is matched to its corresponding occupational prestige score.

Independent ("Treatment") Variable

The key independent variable is whether or not respondents found their current job with the help of a relative. This variable is also the treatment variable for which propensity scores are calculated based on a set of covariates that are believed to be related to the probability of using contacts in the labor market. Respondents were also asked to specify their relation to the relative who was instrumental in obtaining their job. Most respondents (about 61%) relied on immediate family, which includes in-laws and step family of respondents and their partners. The rest used either distant family (about 29%), including cousins, aunts, uncles, nephews and nieces, or other relations (about 10%), such as friends and roommates.

Other Covariates

Control variables include human capital, socio-demographic variables, and indicators of social network characteristics. The number of years of education, an indicator of whether or not the respondent obtained their highest degree in the United States, respondent's age, and the number of years since arrival (including its quadratic term) are included in the analyses as human capital controls. Another human capital variable included is English language proficiency, which is also a measure of acculturation most commonly used in the literature (Bennett et al. 2008). Respondents were asked to self-rate how well they speak English on a scale of 1 to 4 (1 being "not at all" and 4 being "very well"). Age, time in the U.S. and English language use are the most frequently used measures of acculturation in the immigration literature (Bennett et al., 2008; Hall and Farkas, 2008).

The analyses also control for other demographic and social network characteristics. Social network indicators include whether the respondent speaks English with friends, whether they speak English at home, and the number of individuals in the household. In this case, English language use with others is considered an indicator of access to bridging or interethnic social contacts, whereas church membership and household size are possibly associated with the level of embeddedness in co-ethnic networks. Immigrants' churches are often considered a source of informal social ties with co-ethnics that provide useful information and social support to new immigrants (Chafetz and Ebaugh, 2000). Dummy variables for gender (female=1), marital status (married=1), and categories of race (Asian, Black, Hispanic, white, and other) were also included as socio-demographic controls. Descriptive data for all the variables in the analyses are provided in table A8.

Methods

OLS is used to estimate the effect of using social ties on hourly earnings and occupational prestige and interaction effects between social capital and race. One limitation of OLS regression is that it may not sufficiently address the issue of selection bias (Heckman, Ichimura, and Todd, 1997; Winship and Mare, 1992). In this case, selection bias may arise as a result of confounding covariates simultaneously affecting labor market outcome and the probability of reliance on social ties to find a job. The present study uses propensity score matching, which offers a way to minimize observable selection bias. This method uses a logistic regression model to generate, for each observation, a "propensity score" that measures the probability of receiving treatment (Rosenbaum and Rubin, 1983). Each observation is then assigned into one of several blocks or strata, where each has both control and treatment observations that are similar on propensity scores. One requirement of propensity score matching is that the "balancing property" is satisfied, which means that treatment and control cases in each stratum are statistically similar on the select characteristics. To predict the use of relatives by immigrants, this analysis uses 20 covariates (including interaction terms) to model the propensity to use a relative to find a job.

The output that is of interest in propensity score matching is the ATT, the "average effect of treatment on the treated." The ATT is the difference in the outcome variable (earnings and occupational prestige) for the treatment and control cases that match on propensity scores. There are different matching methods that can be used to estimate the ATT. In order to assess the reliability of the results, this study uses four widely used matching methods to estimate the ATT: nearest neighbor matching, kernel matching, radius matching and stratification matching (Becker and Ichino, 2002). OLS regression, employing the same set of covariates in the propensity score model, is used to estimate the average treatment effect of using contacts on the hourly earnings of

immigrants, which is then compared to those obtained from propensity score matching estimates.

A limitation of using propensity score matching is the possibility of omitted variables related to both the outcome and the treatment variable. To the extent that immigrants with more extensive and/or better-quality networks are more likely to rely on social ties to find a job, one may reasonably argue that the inclusion of direct measures of these characteristics would improve the model. Unfortunately, the New Immigrant Survey lacks extensive measures of social network characteristics of respondents that may be related to the propensity to use contacts. However, English language use, church membership, marital status and household size are proxy indicators of network characteristics for these otherwise omitted variables. The PSM estimates in this study, therefore, attempt to minimize or reduce some of the selection bias by including as many relevant variables as possible that are related to both labor market outcomes and the probability of using contacts in job search.

Results and Discussion

OLS regression model

OLS regression results are presented in tables A9 and A10. Model I in table A9 shows estimates from multiple regression of the log of hourly earnings on social capital, including controls for human capital, network indicators, occupational prestige, race, gender, marital status and its interaction with gender. Using a social tie to find a job is, on average, associated with an 8% penalty in hourly earnings. Model I in table A10 also shows that immigrants who used the help of a social tie to find a job are, on average, employed in lower prestige occupations. A separate analysis (not included) was conducted to see if the type of social tie used matters, which showed that those who relied on family (immediate and distant) ties, on average, have lower earnings and occupational prestige than those who did not rely on a social tie to find a job. There was no

statistical difference between the latter and those who found a job through a friend, roommate or professional tie.

These models also highlight differences across demographic groups in labor market outcomes. Immigrant women earn significantly less and are more likely to be employed in lower prestige occupations than immigrant men (these were tested excluding the interaction term between gender and marital status). Moreover, there seems to be a gender difference in the effect of marriage. Specifically, while being married has a positive effect for men, there is no marriage advantage for women. The dummy variables for race indicate that black immigrants face a significant earnings penalty. Black immigrants' earnings are 18% lower on average than their white counterparts. All the race variables are significant in the occupational prestige model (Model I in table A10). Black and Hispanic immigrants are, on average, employed in occupations with lower prestige scores than white immigrants, while Asians are more likely to be employed in higher prestige occupations.

As expected, those with higher levels of human capital have higher earnings and occupational prestige. Unsurprisingly, occupational prestige is a strong predictor of earnings. Both education and English language proficiency are positively associated with earnings and occupational prestige. While age and obtaining a degree in the United States do not seem to have an effect on earnings, both have a positive influence on occupational prestige. Time since arrival, on the other hand, has an inverted-U relationship with both earnings and occupational prestige, which indicates that the return to experience is positive for new immigrants and flattens out with increasing time in the U.S. Additional analyses (not included) were also conducted to determine if the effect of social capital varied across groups with different levels of time in the U.S. (one year or less; more than one year, but no more than five years; and more than five years). The results

indicate that social capital has a negative effect on earnings in the first year. However, the effect was not significant for more established immigrants who have been in the U.S. for more than one year. For occupational prestige, reliance on social ties has a negative effect for the second group only (i.e. immigrants who have been in the U.S. for more than one year, but no longer than five years). The effect was negative, but not significant for the most recent and the well-established immigrants.

These findings also suggest that there are race differences in the effect of social capital on labor market outcomes. With regard to earnings, it is worth noting that the interactions between social capital and race lose statistical significance once we control for occupational prestige (Model II in table A9). However, two of these interactions are significant in the occupational prestige model (Model II in table A10). Specifically, while reliance on social ties has little or no effect for Hispanics and Blacks, it is more detrimental for Asians than it is for white immigrants.

Propensity score matching and treatment effects

Propensity score matching was used to compare the labor market outcomes of immigrants who used a social tie to find their current job with those who did not, but had the same probability of using a social tie in the job market as determined by a set of covariates that predict the probability of using social contacts. The propensity score model for this study is a logistic regression model that determines each respondent's probability of receiving the treatment (i.e. using a social contact to find a job) using all covariates in the OLS model. These baseline characteristics represent human capital, social capital, and demographic characteristics that are then used to generate the propensity scores employed in the estimation of the treatment effects. The propensity score, therefore, serves as an index of similarity on these covariates. Table A11 presents the results from the logistic model estimating the odds of relying on social ties to find a

job. Respondents were also matched on occupation when estimating the treatment effect on earnings (this model is available upon request). As expected, respondents with higher levels of human capital (education, language proficiency, age and time in the U.S.) are less likely to have found their job with the help of a relative. The model also shows that married women are more likely to rely on social ties. While Hispanics and Asians are more likely to rely on social ties than white immigrants, the effect for Blacks is not significant. Even though speaking English with friends is negatively correlated with reliance on social capital, the effect is also not statistically significant. However, household size is positively related to the likelihood of relying on a relative to find a job.

Estimates of the "treatment" effect of using contacts on earnings and occupational prestige were produced using the four matching techniques. Table A12 and A13 present the coefficients/ATTs and bootstrapped standard errors (produced with 1,000 reps) for the effect of social capital on earnings and occupational prestige, respectively, from the four matching methods. The estimated treatment effects were all negative. For earnings, in all cases but nearest neighbor matching, the estimates were statistically significant. The estimated effects on occupational prestige from all four matching methods were negative and statistically significant. It is important to note, however, that Kernel and Radius matching are preferred to both stratification and nearest neighbor matching, since the latter two often lead to poorly matched treatment and control cases (Becker and Ichino, 2002). Table A13 presents the estimates for occupational prestige, which show a similar pattern. Therefore, while the PSM results on earnings are somewhat mixed, they provide a stronger evidence for the negative effect of social capital on the occupational prestige of immigrants. That is, a comparison of immigrants who used contacts to find a job with closely matched others who did not shows that contact-users obtained jobs that were, on average, lower

paying and of lower occupational prestige.

Overall, both the probability of reliance on social networks and the outcomes vary across groups. The results suggest that immigrants do rely on close social ties, even though this strategy may not be advantageous in terms of earnings and prestige. This raises the possibility that immigrants' reliance on social networks is not an independent rational decision based on a full knowledge of its pros and cons, but it is rather one that is shaped by social constraints and uncertainties about the labor market. This argument would be consistent with the view that disadvantaged groups, such as racial minorities (Falcon & Melendez, 2001), undocumented immigrants (Aguilera and Massey 2003), and those with low levels of English language proficiency (Elliott and Sims, 2001), would not only be more likely to rely on social networks in the job search process, but they would also be more likely to be successful in finding a job through these social ties (Falcon and Melendez, 2001). Particularly for new immigrants, reliance on family and friendship networks is also driven by the lack of access to a wider set of social ties outside the co-ethnic community (Falcon and Melendez, 2001) and lack of information about opportunities in the mainstream labor market. Further, for some immigrants, employment through kinship ties may also be the result of obligations and reciprocity payments (Portes and Sensenbrenner, 1993) to co-ethnics who may have been helpful to them in the immigration process.

Conclusions

This study has examined the effects of reliance on close social ties in job search on immigrants' labor market outcomes, and specifically investigated whether there is a penalty or premium on earnings and occupational prestige for finding a job through the help of a relative or a friend. Whereas previous research has focused on the effects of using social contacts on the labor market outcomes of Hispanic or Asian immigrants, the present study used a nationally representative

sample of immigrants and examined if the effects of social capital varied across groups. The results confirm the expected effects of human capital on the labor outcomes of immigrants. However, while prior research has found little evidence for the effect, on immigrants' labor market outcomes, of reliance on social ties to find a job, the findings in the current study suggest that this job search strategy has a detrimental effect on both earnings and occupational prestige. Net of human capital and socio-demographic controls, immigrants' reliance on close social ties to find a job leads to lower-prestige and lower-paying jobs, and some of this effect of social capital on earnings appears to come through occupational prestige. Finding a job with the help of friends and relatives, therefore, seems to influence labor market outcomes partly by channeling immigrants into lower-prestige jobs, presumably because jobs found through immigrants' close social ties are more likely to be in the ethnic economy, where there is a higher concentration of co-ethnic employers (Bonacich and Modell, 1980) and employee concentration in certain occupations (Zhou and Logan, 1989).

The results from the propensity score matching corroborate this conclusion and increase our confidence in the finding that immigrants' reliance on social ties for job search has a negative effect on earnings and occupational prestige. The estimated treatment effects are consistent with the OLS estimates and indicate that the negative effect of social capital is not due to observable bias. That is, instead of comparing the average outcomes (earnings and occupational prestige) for all individuals in the analytical sample, the estimated treatment effects in propensity score matching compare averages for subsamples (cases) that are as similar to each other as possible. Comparing closely matched treatment and control cases, therefore, the analyses confirm that immigrants who found their job with the help of a relative or friend have lower earnings and occupational prestige.

This strategy does not have the same effect for all immigrants, however. While the use of social capital seems to have little or no effect on the labor market outcomes of Black and Hispanic immigrants, it has a detrimental effect on occupational prestige for Asians. These findings are consistent with prior studies that have found a positive or no effect of social capital on the earnings of Hispanic immigrants (e.g. Aguilera and Massey 2003), and a negative effect on the occupational prestige of Asians (e.g. Sanders et al., 2002). This group differential in the effect of social capital is also consistent with the view that social capital may compensate for deficiencies in other areas (Aguilera & Massey, 2003; Portes & Rumbaut, 2006), including human capital, employment opportunities and the context of reception. In other words, to the extent that Black and Hispanic immigrants have fewer employment opportunities in the mainstream market and are more likely to experience labor market discrimination than Asian and white immigrants, the effect of reliance on close social ties and employment in the ethnic economy may be less detrimental. This finding highlights that the effects of social capital are context-dependent and raises our understanding of the role of social capital in the labor market incorporation of new immigrants. Future research should, therefore, use extended data on immigrants' networks to construct a multitude of measures of bonding and bridging social capital to further examine the relative importance and empirical significance of various types of social capital for different immigrant groups.

CHAPTER 4

**INTERETHNIC SOCIAL CAPITAL AND IMMIGRANT HEALTH: THE
LONGITUDINAL EFFECTS OF LINGUISTIC INTEGRATION**

As the demographic significance of immigration continues in the United States, immigrant health has received increasing scholarly attention. Prior research has examined various health outcomes for the immigrant population, such as self-rated health (e.g. Chiswick, Lee, & Miller, 2008), health care utilization (Akresh 2009), obesity (Akresh 2008b; Cawley, Han, and Norton 2009), cancer and coronary heart disease (Kasl and Berkman 1983; Marmot and Syme 1976), and the incidence of chronic medical conditions (Marmot and Syme 1976; McDonald and Kennedy 2004). This literature suggests a healthy immigrant effect and a post-migration decline in health that has mainly been attributed to acculturation, which has been measured using proxy indicators, such as length of residence in the United States and English language use. Being the most-widely used measure of acculturation, language acculturation in particular has received a lot of attention. However, the mechanisms that link acculturation, and in particular English language use, and health outcomes are poorly understood.

Prior studies of the effects of English language use on health outcomes attribute this relationship to acculturative processes, largely ignoring the potential role of network mechanisms, and focusing on English language use at home.   In addition to their focus on one social setting (language use at home), such studies often raise methodological and generalizability concerns in that they rely on cross-sectional data and focus on one immigrant group, particularly Hispanics. This limits our ability to make causal connections between language use patterns and health outcomes and examine the implications of linguistic integration for immigrants' health trajectories. This study argues that English language use is a source of social capital that is indicative of the

composition of immigrants' social networks. That is, English language use with friends, colleagues and family among immigrants represents the extent of embeddedness in co-ethnic and ethnicity-bridging social capital.

Despite the documented, multifaceted functions of social networks for new immigrants, very little is known about how they influence immigrant health and health behaviors. While we do know that immigrants' co-ethnic ties, particularly family and kinship ties, may provide social capital that is protective against acculturative stress, the role of ethnicity-bridging social capital is not well understood. Migration research suggests that immigrants' social capital extends beyond co-ethnic networks and increasingly distinguishes between the bonding and bridging roles of immigrants' social networks (e.g. Lancee 2012), a typology that may be important in identifying the various implications of social ties for immigrant health. Immigrants are exposed to different types of resources, information, norms and values through bonding (co-ethnic) and bridging (interethnic) social ties. While ties to co-ethnics have generally been associated with the promotion of immigrants' economic and social well-being (e.g. Bankston and Zhou 1995), the sociology of migration has yet to examine the empirical implications of interethnic connectedness for immigrants' health and health behaviors. This literature is also silent on whether or not the social capital of new immigrants has any implications for long-their term health outcomes. A contributing factor for these gaps in the literature is the lack of large panel data sets that provide direct measures of immigrants' social network composition and various measures of health outcomes. To fill this gap, this study examines the health implications of the composition of immigrants' social networks using a proxy indicator of network ethnic diversity, English language use with friends, colleagues and family.

I use panel data from the first (2003) and second (2007) waves of the New Immigrant Survey (NIS) to examine the short-term and long-term health consequences of new immigrants' interethnic social capital. The NIS provides nationally representative, longitudinal data on various health outcomes, including self-rated health, body mass index, smoking and drinking behavior, dietary change and frequency of physical activity. I construct a proxy indicator of interethnic connectedness based on English language use with friends, colleagues and at home, and examine its cross-sectional and lagged associations with health outcomes are examined. In doing so, this study make a threefold contribution to the immigrant health literature. First, it examines the implications of bridging social capital for immigrants' health outcomes, and it extends this analysis beyond the global measure of self-rated health. Second, whereas prior studies focus on the health outcomes of Hispanic and Asian immigrants, this study uses a nationally representative data of new immigrants to examine the health implications of network composition. Third, it contributes to our understanding of the language acculturation-health link by examining the long-term health effects of immigrants' interethnic social capital, and sheds light on the extent to which the interethnic integration influences immigrants' health trajectories.

Background

Despite the economic opportunities that may come with immigration, ample evidence exists for its deleterious effect on immigrants' health (Akresh 2008b; Cunningham, Ruben, and Narayan 2008; Gordon 1957; Marmot and Syme 1976). A so-called "healthy immigrant effect" has been documented in the literature, suggesting that immigrants report better health status than the native-born population upon arrival (e.g. Antecol and Bedard 2006), but that this health advantage dissipates with years since immigration (Antecol and Bedard 2006; Jasso et al. 2004; Marmot and Syme 1976). Even though debate persists as to whether the "healthy immigrant effect" is due to

self-selection, health-screening or under-reporting of health conditions among immigrants (Akresh and Frank 2008; Chiswick et al. 2008; McDonald and Kennedy 2004), the negative effect of immigration on health has largely been attributed to both cultural and social determinants of health, including the effects of acculturation (Escarce, Morales, and Rumbaut 2006; Lara et al. 2005), "acculturative stress" (Finch and Vega 2003), experiences of prejudice and discrimination (House and Williams 2000; Viruell-Fuentes, Miranda, and Abdulrahim 2012; Williams and Collins), and possibly the increased diagnosis of health conditions among immigrants as a result of increasing use of health services after migration (McDonald and Kennedy 2004). The decline in immigrant health has also been linked to socio-economic status, race, and language barriers, which may be sources of health disadvantages for the immigrant population (Derose, Escarce, and Lurie 2007). The role of language proficiency, in particular, has been examined because it influences behaviors related to seeking health care (Lebrun 2012; Yoo, Gee, and Takeuchi 2009) and knowledge of the health care system (Wilson et al. 2005). Race differences in health status have been attributed to both SES gaps across groups (Feinstein 1993; Marmot and Wilkinson 1999) and the effects of prejudice and discrimination (House and Williams 2000; Kington and Nickens 2001; Williams and Collins).

This literature on immigrants' health has highlighted the limitations of cultural explanations of immigrant's health outcomes (e.g., Acevedo-Garcia and Almeida 2012; Escobar and Vega 2000; Hunt, Schneider, and Comer 2004; Viruell-Fuentes et al. 2012). Particularly, while the concept of acculturation has gained interdisciplinary traction, many have noted the "fuzzy" nature of the concept in terms of how it is defined and operationalized. It is often measured by proxy indicators, primarily the length of residence in the United States, English language proficiency and English language use. English language use, in particular, has been the most widely measure of

acculturation, and findings generally associate it with declining health and increases in negative health behaviors. For instance, Unger et al. (2000) find an association between the degree of English language use at home and cigarette smoking among Hispanic and Asian immigrants in California. They also find evidence for the mediating role of social norms, particularly peer influence in their friendship networks in this association. Amaro et al. (1990) find a link between English language use (vs. Spanish) and rates of drug use (marijuana and cocaine) among Mexicans and Puerto Ricans. English language use at home was also found to influence the odds of alcohol use among Asian-American adolescents (Hahm, Lahiff, and Guterman 2003). Further, Akresh (2007) finds that English language at work is positively associated with the level of dietary change among Hispanic immigrants. Overall, most of these studies focus on English language at home and attribute the link between language use and health outcomes to acculturative processes.

An important limitation of literature is that most studies rely on cross-sectional data, and fail to control for important potential confounders, such as pre-migration characteristics, that may be associated with both language use and health outcomes. Moreover, most of these studies focus on the Hispanic population, which casts doubt on the generalizability of findings to other immigrant groups. The mechanisms linking English language use and health are often poorly understood, and some studies of language acculturation conflate English language proficiency with English language use into a single measure of acculturation (Evenson, Sarmiento, and Ayala 2004). In doing so, they potentially conflate acculturative processes with social network mechanisms that may link English language use with health outcomes.

But what is it that links English language use with the health outcomes of immigrants? Is it "culture" (i.e. acculturation) or network processes? Critics of the cultural perspective on immigrant health have often called for examining the role of structural factors, including social

networks, in explaining links between acculturation and health. Some have actually found that social network processes mediate or explain the relationship between acculturation and health behaviors (Allen et al. 2008; Unger et al. 2000). In a study of substance use among Latino adolescents, for instance, Allen and colleagues found that Spanish language use with others was associated with lower likelihood of alcohol use, and direct measures of social network composition fully mediate the relationship between Spanish language use and substance use. Social networks are, therefore, particularly important for research on immigrant health given that acculturation and social network processes are inextricably linked. That is, social networks could be best viewed as the "pipes and prisms" of acculturation since they are not only important channels of cultural information, but they are also reflective of the level of participation in the mainstream society and adoption of the norms and values of the majority culture.

Social networks play a central role in immigrant communities. In fact, migration itself could be viewed "as a special case of the development of social networks" (Eve 2010). The process of migration is indeed characterized by significant changes in migrants' physical and social environments, which include disruptions in social relationships and the establishment of new social ties. Despite the centrality of network processes in migration, however, very little is known about the health consequences of such changes in network and network structure that accompany the migration process. This is an important gap in the literature to consider given that health research in general links social networks with positive health outcomes (Kawachi, Kennedy, and Glass 1999; Putnam 2000).

The limited research on immigrants has focused on Hispanic immigrants and generally links social capital to better health status. For instance, social support was found to be positively associated with self-rated health and seems to have protective effects against acculturative stress

among Latinos in California (Finch and Vega 2003). Social trust and volunteering were positively associated with acculturation and found to promote better mental health (Valencia-Garcia et al., 2012). Family support and cohesion was also found to positively influence self-rated physical and mental health among Asian immigrants (Zhang and Ta 2009). What seems to be missing in this empirical literature, however, is an important distinction between different types of social capital to which immigrants have access by virtue of their memberships in different types of networks. Particularly, levels of social connectedness with the co-ethnic community and the native population may have different effects on the incorporation outcomes of immigrants. Recent research, in particular, highlights the potentially differential effects of bridging and bonding social capital for immigrant adjustment (Lancee 2012), suggesting that ties to non-immigrants and embeddedness in the co-ethnic community represent different types of social capital. The implication for research on immigrant health is that different types of social capital may have different effects on the health status and behaviors of immigrants.

English Language use as Social Capital

Migration scholars have increasingly recognized the significance of "linguistic social capital" for the economic integration of immigrants (e.g. Chiswick 1991), but it is only recently that its noneconomic and social significance has received attention (Nawyn et al. 2012). Even though research on acculturation and linguistic isolation has focused on English language use at home, the use of English language in different social settings is often a key source of language-based social capital. For instance, immigrants' ability to form nativity and ethnicity-bridging social ties, which are often an important source of information that is instrumental in the economic and social adjustment process, is dependent upon language proficiency and use. English language proficiency is, in fact, often "a necessary but not sufficient condition" (Akresh, Massey, and Frank

2014) for English language use in social interactions, and living in a community of co-ethnics reduces the odds of English language use in various social settings.

Prior research on the determinants of English language use has established that individual, demographic and community characteristics are responsible for variations in patterns of language use (Stevens 1992). At the individual level, human capital, language proficiency, years in the United States, and age at migration determine patterns of English language use. In addition, immigrants' social environments, particularly linguistic homogamy and residential segregation are important demographic predictors of language use patterns, highlighting the importance of immigrants' social network characteristics. Stevens (1992) concludes that immigrants' frequency of English language use is dependent upon both "the resources and incentives encouraging or allowing them to use English [and] the demographic context that underlies the opportunities for [immigrants] to participate in social situations in which their minority language is a possible means of communication" (p. 181).

Immigrants' English language use, therefore, constitutes a type of social capital because it is not only an indicator of the level of language and cultural assimilation (Alba 1990), but it is also a key indicator of who immigrants interact with and the type of social network in which they are embedded (Akresh 2007). More specifically, English language use represents bridging (interethnic) social capital since host language usage among immigrants is influenced more by contacts with natives and co-ethnics than it is by language proficiency itself (Vervoort, Dagevos, and Flap 2012), and social network composition might actually explain the link between language use and health outcomes (Allen et al. 2008). Therefore, the degree to which immigrants use their native language indicates the extent to which they are connected to their respective ethnic community (Alba 1990). That is, given similar levels of proficiency, immigrants who indicate that

they do not speak English at home, with their friends and/or colleagues, are more likely to have personal and professional networks composed primarily of co-ethnic contacts than immigrants who say they do speak English in these social settings. Holding language proficiency constant, therefore, variations in the extent of English language use in social interactions capture network ethnic diversity.

The Significance of Interethnic Network Diversity

Immigrants' networks, particularly co-ethnic and interethnic social ties, play various roles in how immigrants adapt and cope in their new environment. Several competing mechanisms could be identified that link social network ethnic diversity with immigrant health, based on prior works that have identified pathways through which social networks influence health (Kawachi, Takao, and Subramanian 2013). Specifically, interethnic social networks could be linked to immigrants' health and health behaviors through their role in social influence, social support, information and resource acquisition, and acculturative stress.

There are many reasons to associate co-ethnic social capital with positive health benefits for immigrants, but research highlights its primary role in providing a social support system, which protects immigrants from adaptation and acculturative stress (Kasl and Berkman 1983; Kuo and Tsai 1986). That is, ties to the co-ethnic community often lead to the emergence of supportive networks that have positive effects on the physical and emotional well-being of immigrants, and that may be protective from experiences of prejudice and discrimination, which are linked to negative health outcomes (Vega and Amaro 1994). While social integration in general may provide a buffer against acculturative stress, not all social networks provide social support, and co-ethnic networks may provide a higher level of social support than interethnic social ties because of the salient role of network homophily in supportive networks. In addition to providing social support,

network closure within the co-ethnic community encourages the development and maintenance of social norms (Coleman 1988) that positively influence immigrants' health, including keeping home country diet and avoiding unhealthy behaviors, such as smoking and drinking. Embeddedness within co-ethnic networks may not only enable the maintenance of healthful behaviors (e.g. traditional non-western diets), but it may also serve as a social control mechanism that discourages unhealthy behaviors and prevents immigrants from succumbing to negative lifestyle influences.

Less clear, however, are the health effects of interethnic connectedness. One important link between network diversity and immigrant health is acculturative stress, which refers to the social and psychological strain that results from intercultural contact (Berry 2006). At least in the short-run, diverse networks may be associated with higher levels of stressors that result from the process of adaptation to a new social and cultural environment. That is, the more different, in terms of culture and lifestyle, new immigrants find themselves to be than others in their social networks, the more social pressure they feel to adapt. Typologies of acculturative stress suggest that it may have different sources or components (Rodriguez et al. 2002; Salas-Wright et al. 2015). Acculturative stressors may include the lack of English language proficiency, discrimination, family disruptions, pressure from the host culture to adapt and pressure from the home culture to retain ones' ethnic identity (Rodriguez et al. 2002). To the extent that higher levels of contact with non-immigrants increases the social and psychological pressures to adapt to the host culture, acculturative stress provides an important link between interethnic social networks and immigrant health outcomes. Of course, decades of sociological research on stress has not only established a strong link between chronic stress, ill health and detrimental health behaviors, but it has also suggested that differential levels of persistent stress might even account for health disparities

across demographic groups (Thoits 2010). Among immigrants, acculturative stress in particular has been linked to poor physical and mental health. Moreover, ties to non-immigrants could be associated with faster or higher degrees of acculturation, which may have negative effects on health and health behaviors independent of the effects of acculturative stress.

Nevertheless, interethnic social contact may also be indicative of a higher level of social integration and a smaller "social distance" with the native population, which may have its own psychosocial benefits. Interethnic networks could play a role in social support, particularly instrumental and appraisal support, which is often ignored or underestimated in the migration literature. Better social integration with members of the host society not only lessens the alienating and isolating effects of migration and the disruption in immigrants' pre-migration networks, but it also provides the social capital that is requisite to successful interaction with the various social institutions of the host society. Non-immigrant ties could also serve as conduits of useful health-related information, such as information about health care access, that are unavailable in co-ethnic networks or inaccessible through strong ties. Ethnicity and nativity-bridging social capital may, therefore, have a positive implication for immigrant health in that they may add to immigrants' stock of knowledge about the health care system and enhance their abilities to make better health decisions in their new environment. Social ties with non-immigrants may also influence and facilitate the adoption of health-related norms and behaviors in the host culture. While these may include negative health behaviors, such as smoking, drinking, and unhealthy dietary changes, they may also apply to salubrious behaviors, such as such as smoking cessation or involvement in sports and physical fitness activities. Social connectedness (i.e. the absence of disconnection) in general may generally promote positive health behaviors and protect from risky ones.

Analytical Framework

This study uses a longitudinal approach to examine the relationship between immigrants' interethnic social capital and several health measures. While self-rated health has been used extensively in the literature (e.g. Kawachi, Kennedy, & Glass, 1999), primarily because studies have shown it to be a reliable predictor of mortality (Idler and Benyamini 1997), its predictive ability among immigrants and its efficacy in cross-ethnic comparisons of health status has been questioned (Finch et al. 2002). Further, recent studies have suggested that change in self-rated health is a better indicator of general health status than self-rated health measured at one point (Ferraro and Kelley-Moore 2001; Han et al. 2005). In addition to self-rated health, five objective indicators of health outcomes are also included: the number of chronic diseases, health behaviors (smoking, drinking and frequency of exercise), and the degree of dietary change.

The main objective is to use a panel design to examine the extent to which immigrants' social network composition upon migration, or soon after, is associated with health outcomes and health trajectories. In doing so, it addresses several methodological concerns in both the migration and social capital literatures. First, it addresses a common methodological criticism of social capital research on health, which has to do with the issue of causality (Kawachi et al. 2013). Some have generally questioned the causal status of social capital (e.g. Chen 2012; Mouw 2003, 2006), as a result of its potential endogeneity in statistical models. Further, it examines the time-dependent nature of the link between interethnic social capital and health. Research suggests that acculturation may have a U-shaped impact on immigrant health (Rumbaut 1995; 1989) and that the health effects of acculturative stress – a possible mechanism linking network diversity and health – may be stronger for new immigrants than more established ones. Therefore, the negative

effects of network diversity, if any, may also be more likely to be experienced by new immigrants compared to more established immigrants.

To accomplish these objectives, I employ a lagged dependent variable (LDV) approach. The LDV model has two main advantages here. First, an important concern in immigrant integration research is the extent to which variations in immigrant outcomes are determined by variations in unmeasured pre-migration characteristics. The lagged model controls for baseline characteristics and allow us to measure differences in health outcomes between two time points after migration. The lagged dependent variable, therefore, serves as a control for pre-immigration confounders that may be associated with both linguistic integration or interethnic social capital and health outcomes. Second, it allows us to rule out reverse causality, which is a concern in health research generally. Looking at the relationship between baseline interethnic social capital and health outcomes in both 2003 and 2008, the LDV model allows us to establish the appropriate temporal order between the two variables.

Data and Methods

Data

Panel data from the adult sample of the New Immigrant Survey (NIS) were used to analyze the effects of social capital on various health outcomes. The New Immigrant Survey is a nationally representative longitudinal survey of recent immigrants age 18 or older who obtained legal permanent residency between May and November 2003 (i.e. as soon as the immigrant was granted permanent residency). The sample includes both new arrivals and adjustees, immigrants who changed their visa status after some time in the United States. A sample of 12,500 new adult immigrants was selected from this sampling frame, and a total of 8,573 interviews were completed for a response rate of 69% in the first wave. The second round of interviews were conducted

between 2007 and 2009 and includes 3902 fully completed and 461 partially completed adult interviews, yielding a response rate of 46.1%. That is, from the 8,573 adult respondents in the first round, only 4,363 were located in round 2 (50.9% attrition rate). In addition to the various measures of health, the NIS provides some data on indicators of immigrants' social network diversity. Particularly, it includes measures of language proficiency, language use, and information about religious organization affiliation. Items on religious organization affiliation include membership, attendance and ethnic diversity at the religious organization. The survey also provides probability weights, to correct for the oversampling of migrants with employment visas, which were used in these analyses. While immigrants from all over the world were included in the New Immigrant Survey, the analytical sample for this study was also restricted to immigrants who resided in the United States at the time of the interview. One limitation of using these data is the high attrition rate and other missing data on key covariates, particularly household income. Given this limitation, listwise deletion was used for these analyses with sample sizes ranging from sample sizes ranged from 2384 to 3095.

There is a relatively high rate of attrition in the NIS panel data (~51%). Attrition analysis was conducted to examine differences on baseline characteristics between attrited and panel respondents. Education, household size and income were negatively associated with the probability of attrition, whereas language proficiency was a positive predictor. Men and Asians were also more likely to drop out (than women and other race categories, respectively) in the second wave. However, controlling for these differences, there was no association between any of the health outcomes and the probability of attrition, indicating no systematic differences between attrited and panel respondents in health status and health behaviors and that the observed results were unlikely to be due to attrition.

Measures

Dependent Variables

The dependent variables are various measures of health status and health behavior. Below is a description of each of the outcome variables. See Table A14 for descriptive statistics on these variables.

Self-rated health. The NIS includes a measure of self-reported health with five response options (excellent, very good, good, fair or poor). Respondents were specifically asked "Would you say your health is excellent, very good, good, fair, or poor?"

Body Mass Index (BMI). This was calculated as 703 multiplied by weight (in lbs) divided by height (in inches) squared.

Chronic diseases. For chronic diseases, respondents were asked if they were ever diagnosed with each of the following conditions: high blood pressure, diabetes or high blood sugar, cancer, heart disease, chronic lung disease, heart attack, angina, stroke, psychiatric problems, arthritis, asthma, poor eyesight, poor hearing, trouble with pain, and depression. For each respondent, the total number of diagnosed chronic diseases was calculated. This construct is a preferred indicator of health status than any of the individual items measuring the incidence of a specific health condition reflects any change in the respondents' health during the study period.

Smoking frequency. The number of cigarettes the respondent smokes per day (0 for non-smokers).

Drinking frequency. The number of days the respondent consumed alcohol in the last three months (0 for non-drinkers).

Dietary change. In addition, respondents were asked to rate the degree to which their current diet is different from their diet in their home country. They were asked the question, "*using*

a scale from one to ten where 10 indicates exactly the same and 1 means completely different, how would you compare the similarity in the diet in the food you now normally eat in the United States with the food you normally ate in your home country?" The variable was reverse coded for this analysis to measure the degree of dietary change (i.e. 10 indicates the highest degree of dietary change).

Physical activity. A physical activity measure was constructed that based is on how many times per week respondents engaged in light and vigorous physical activities. Respondents were asked "how often do you participate in light physical exercise such as walking, dancing, gardening, golfing, bowling etc." and how often do you participate in vigorous exercise or sports such as aerobics, running, swimming or bicycling." Respondents reported the frequency in different units (e.g. per week, per month, or per year). I converted all responses into their weekly equivalents (e.g. a respondent who engaged in light physical activity four times a month was coded as once a week. The final physical activity measure was the sum of the frequencies of light and vigorous physical activity per week. The resulting variable was a continuous measure of frequency of exercises that is left-censored at zero.

Table A14 presents summary statistics for these outcomes measures from the NIS panel data.

Interethnic Social Capital

Interethnic connectedness. While language usage has been widely used as an indicator of cultural assimilation, it has been suggested that it also indicates the kinds of personal and professional networks in which immigrants are embedded (Akresh 2007). In this study, interethnic connectedness index was constructed as an ordinal measure from questions about language usage with friends, at work and at home. Specifically, respondents were asked to check from a list the

languages ("check all that apply"), the languages they use at home, with friends, and at work. Three binary variables were constructed for English language usage with friends, at work and at home. The final interethnic connectedness index is the row total of English language usage with friends, at work and at home, and it ranges from 0 (28% of the sample who do not use English at all in any of these social domains) to 3 (34% of the sample who use English at home, with friends and co-workers). These values represent increasing levels of linguistic integration (0 = linguistically isolated, 1= low integration, 2 = medium integration, and 3 = high integration). The logic here is that, holding English language proficiency constant, higher levels of linguistic integration as measured by English language usage indicate increasing levels of interethnic social interaction in the immigrant's social network, and non-usage is highly indicative that their social network is composed primarily of co-ethnics.

Covariates. The analyses control for other predictors of health and health behaviors, such as human capital, socio-demographic characteristics, and household income. Human capital measures include both education in years and the level of English language proficiency. Respondents self-rated their English language ability on a scale of 1 to 4 (1 being "not at all" and 4 being "very well"). Controls for socio-demographic characteristics include age (in years), gender (1=female), race, and marital status. Marital status was dichotomized to distinguish between the married and non-married (i.e. single, cohabiting, divorced or widowed). In addition, years since arrival in the United States, commonly used as a proxy measure of acculturation, was controlled. This was calculated as time since migration (respondents were asked their first year of arrival in the United States).

The analysis also controls for religion and religious organization involvement. I control for religion because it may be correlated with both health and social network characteristics. Church

membership and attendance were used as indicators of religious involvement. In the NIS data, church membership is a binary variable constructed from the response to the question, "*Do you presently consider yourself to be a member of a specific church, parish temple, synagogue, or mosque in the United States?*" While the NIS includes a variable on frequency of attendance, the variable measured total numbers of attendance since the attainment of permanent residency, which makes comparisons across respondents problematic. Therefore, in addition to membership, a binary variable was constructed to indicate whether or not the respondent currently attends a religious service. In addition, I control for religious affiliation to account for variation in health outcomes that may arise from differences across religions in attitudes towards certain health behaviors. Hispanic and Catholic are the modal categories for race and religion, respectively, and are used as reference categories. The models also control for household size, which represents the number of people living with the respondent at the time of the interview, and household income. Household income coded as an ordinal variable. There were a lot of missing data on household income. Household income was, therefore, coded as an ordinal variable to retain these cases (with missing cases coded as one category). See Table A15 for summary statistics on the key independent variable and covariates, which are all measured in 2003.

Statistical Methods

Data from the first (2003) and second (2008) waves of the New Immigrant Survey (NIS) are used to estimate three separate models for each health outcome. The first model ("Model 1") is a cross-sectional model using data from the first wave of the NIS and estimates the cross-sectional associations between social network composition measures and health outcomes. The second model ("Model 2") includes the same set of independent variables and covariates to estimate their effects of time 2 health outcomes. The final model ("Model 3") includes the lagged dependent

variable to estimate the effect of including the lagged variable on the association between social network composition and health[3]. Whereas Model 1 allows us to examine if immigrants with higher network diversity had better health outcomes upon migration, Models 2 and 3 enable us to estimate the consequence of this network diversity for their health outcomes several years later. A comparison of Model 2 with Model 3 allows us to examine the statistical effect of including the LDV. By estimating both the cross-sectional and lagged associations, we are able to compare cross-sectional correlations with longitudinal effects. In doing so, we are able to distinguish between the contemporaneous and lagged effects of social capital on health outcomes, controlling for potential reciprocal effects (Kawachi et al. 2013) and spuriousness. Including the lagged variable also reduces omitted variable bias due to unobserved characteristics.

Ordered logit regression models were used for the analysis of the ordinal outcome self-rated health. Negative binomial regression models were used for count dependent variables, namely the incidence of chronic diseases, smoking frequency and drinking frequency. Negative binomial regression was appropriate for the analyses of these three outcomes because the variables were over-dispersed count variables (i.e. variances were significantly greater than means), in which case the negative binomial model provides better model fit than the alternative Poisson model. Ordinary Least Squares (OLS) regression was used to model the continuous outcomes of body mass index and degree of dietary change. Since the level of physical activity was left-censored at zero, a tobit regression model was used to analyze this outcome.

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[3] While a fixed-effects model would be best for studying changes in health, the lagged dependent variable approach is used here because data on the English language use is only available in the first wave. It has also been noted (Johnson 1995) that the lagged dependent variable (LDV) has a statistical power advantage over the fixed-effects approach. That is, while LDV models use both within and between-individual variations to estimate coefficients, the fixed-effects approach relies on within-individual variations only.

Results

Table A14 presents descriptive statistics for the outcome variables. For the sample overall, there was a decline in health as indicated by the decline in self-rated health and the increase in the number of chronic conditions, which is consistent with prior findings that suggest declining immigrant health over time. The trends in health behavior are somewhat mixed. Particularly, while there was an increase in the frequency of alcohol consumption and physical activity, there were declines in smoking and the degree of dietary change since the first interview (2003).

Health Status

Table A16 presents results from ordered logistic regression models of self-rated health. While there is no association between interethnic connectedness and self-rated health in the cross-sectional model, the results suggest that interethnic connectedness, as measured by English language use with others, has a lagged effect on self-rated health (in 2007) as shown in model 2. That is, immigrants who were embedded in a more ethnically diverse network in 2003 reported higher levels of self-rated in 2007, net of human capital, English language proficiency, socio-demographic characteristics, household characteristics, and length of residence in the U.S. More specifically, a unit increase in interethnic connectedness (say from complete linguistic isolation to low linguistic integration or an increase from low to medium level of linguistic integration) is associated with a 22% increase in the odds of reporting excellent or very good health, versus the combined categories of good, fair or poor health. This is net of other predictors of self-rated health, including English-language proficiency, which itself has an independent positive effect on self-rated health (a unit increase in English language proficiency is associated with a 36% increase in the odds of excellent or very good versus the combined categories of good/fair/poor health). Figure A4 presents the predicted probabilities of self-rated health status by levels of interethnic

connectedness and highlights that the probability of reporting excellent or very good health increases with increasing level of interethnic integration, whereas the probability of reporting good, fair or poor health declines.

This protective effect of interethnic social capital on self-rated health in 2007 withstands the inclusion of the lagged self-rated health variable, which controls for unmeasured predictors of self-rated health that could bias the results. As expected, education was positively associated with self-rated health in both the cross-sectional and lagged models, whereas household size and being female were negatively associated with self-rated health in 2003 (but no such difference was observed in the second wave for gender and household size). The gender difference observed in the cross-sectional model is consistent with other studies that find a negative effect of being female on self-rated health in immigrant populations (Newbold 2005). Finally, while black immigrants had higher levels of self-rated health than Latinos upon migration, this health advantage has disappeared in 2007. The result shows, instead, that an Asian health advantage emerges overtime. No significant association was observed between religious social capital (i.e. religious organization attendance and/or membership) and self-rated health status in any of the models.

Table A17 shows results from regression models of body mass index, which find no association between body size and interethnic connectedness net of other covariates. Both age and years of residence in the U.S. were positively associated with BMI, whereas each year of additional education was associated with a 0.1 reduction in body mass index. Education, age, years of residence, and gender had durable effects on BMI across these models. With regard to gender and race, immigrant women's BMI was, on average, 0.78 points lower than men's and Asian's BMI was 1.62 points lower than Hispanics. It is worth noting here that, while all race groups, on average, had lower BMI than Hispanic immigrants in 2003 (Model 1), the Hispanic-black difference in BMI

had disappeared by 2007 (Models 2 and 3). While it seems at first that whites did have lower BMI, on average, than Hispanics in 2007, this difference also disappears in model 3, suggesting that baseline differences in BMI between whites and Hispanics explain away differences in 2007 between the two groups.

Negative binomial regression models of the number of diagnosed chronic conditions are presented in Table A18. Net of all covariates, I did not find associations between interethnic connectedness and the number of chronic conditions in 2003 (model 1). Controlling for baseline differences in the number of chronic conditions, interethnic connectedness in 2003 is negatively associated with chronic conditions in 2007. More specifically, a unit increase in the interethnic connectedness index in 2003 is associated with a 5% reduction in the incidence of chronic conditions in 2007. Unsurprisingly, age was positively associated with the incidence of chronic conditions both in 2003 and 2007. There seems to be a durable effect of gender on the incidence of chronic conditions among immigrants (observed across all models of chronic conditions), that suggests a higher incidence of chronic conditions upon female immigrants both upon migration and years after migration. With regard to race, black immigrants reported fewer chronic conditions upon migration (Model 1), which seems consistent with the literature that finds that black immigrants, particularly immigrants from Africa, often report better health status than other immigrant groups (Hamilton and Kawachi 2013). A similar black advantage was observed in 2007 (Model 2). However, controlling for baseline differences in chronic conditions, the health advantage of black immigrants disappears and the white advantage over Hispanic immigrants becomes marginally statistically significant (model 3). Any black advantage in health may, therefore, be a result of pre-migration processes or selective migration, and there are little, if any,

differences across groups in the negative effects of time in the U.S. on health status as measured by the incidence of chronic diseases.

Health Behaviors

Tables A19 and A20 present negative binomial regression models of smoking and drinking status, respectively. In table 6, interethnic connectedness in 2003 is positively associated with smoking frequency in 2003 net of all covariates (model 1) and drinking frequency in 2007 (model 2). A similar result was observed for smoking frequency (table 7). However, interethnic connectedness in 2003 does not appear to impact changes in health behaviors (Model 3). While immigrants with a higher level of linguistic integration had lower rates of drinking (and smoking) upon migration and in 2007, this appears to be due to a spurious association between interethnic integration and drinking/smoking behavior. In other words, the only reason immigrants with higher levels of interethnic connectedness had higher drinking/smoking rate in 2007 (i.e. model 2) is because they had higher levels of drinking/smoking in 2003. Therefore, controlling for health behavior in 2003, this disadvantage disappears (i.e. model 3).

The models for smoking and drinking frequency also reveal an important link between religious social capital and health behaviors among immigrants. While there seems to be no relationship between religious organization involvement and the health status of immigrants, religious organization attendance seems to deter both smoking and drinking behaviors. Smoking frequency for immigrants who attend a religious service was 43% lower than those with no attendance, and 56% lower for religious organization members compared to non-members. Only attendance had an effect on drinking frequency, however, with the result showing that the incidence rate for drinking was 27% lower for immigrants who attend compared to attend compared to those who do not. Therefore, the data provides evidence for the protective effects of

religious social capital from negative some negative health behaviors; however, as discussed below, I did not find protective effects of religious social capital from dietary change or a sedentary lifestyle.

Gender differences in smoking and drinking rate were consistent across models. Immigrant women were less likely to smoke and drink than men upon migration and years after migration (Models 1 and 2), and women were also more likely to cut back on negative health behaviors than men (Model 3). That is, among immigrants who had the same smoking rate upon migration, women were more likely to report lower levels of smoking a number of years later. A similar effect of gender was observed on drinking behavior, with women reporting lower levels of drinking at first interview and being more likely to report lower levels of drinking years later.

Race differences in smoking rate were also consistent across models. That is, Asian and white immigrants were more likely to report higher levels of smoking than Hispanic immigrants, and they were also more likely to increase their smoking rate over the years. With regard to drinking behavior, Asian and white immigrants report lower and higher rates of drinking, respectively, upon migration compared to Hispanic immigrants. However, while Asian immigrants consistently report lower levels of drinking than Hispanics, the Hispanic-white difference disappears overtime and a Hispanic-black difference emerges. Moreover, among immigrants who reported the same rate of drinking upon migration, Asian and black immigrants reported lower levels of drinking than Hispanic immigrants.

Table A21 shows results from OLS regression of the degree of dietary change on predictors of health behaviors. Interethnic social capital is positively associated with dietary change in the cross-sectional model, which is consistent with (Akresh 2007) who found a similar result for among Hispanic immigrants. However, there interethnic integration was not associated with long-term

changes in dietary behaviors, which may indicate that the effect of interethnic connectedness on dietary change may be most significant soon after migration and that its effect wanes overtime (notice that both model 2 and 3 fail to find significant associations between interethnic connectedness and dietary change).

A comparison of models 1 and 3 further suggests that education is positively associated with long-term change in diet, whereas it is negatively associated with dietary change soon after migration. That is, while more educated immigrants, on average, had lower levels of dietary change in 2003, they experienced a higher level of dietary change in 2007, controlling for baseline differences in the degree of dietary change. While it has been suggested that more educated immigrants might value the maintenance of home-country diet (Akresh 2007), there is no evidence in this analysis that education has a long-lasting protective effect on dietary change. The lagged model (model 3) further suggests that dietary change follows a u-shaped relationship with age and time in the U.S., and has a positive association with household size.

With regard to race, while all immigrant groups reported lower levels of dietary change than Hispanics upon migration, there was no difference between Asian, black and Hispanic immigrants in 2007, whereas white immigrants had lower levels of dietary change. However, as shown in Model 3, among immigrants who reported the same degree of dietary change soon after migration, black immigrants reported a higher degree of dietary change than Hispanics years later, highlighting that the long-term effect of migration on dietary change (compared to home-country diet) might be strongest for black immigrants.

Unlike the models for smoking and drinking frequency, I did not find any gender difference in the degree of dietary change in 2003 or 2007. This might partially support the changing gender roles explanation of changes in health behavior. That is, given lower levels of smoking and

drinking among immigrant women compared to immigrant men upon migration, we are likely to observe higher rates of smoking and drinking initiation and frequency among immigrant women. However, given that there are no gender differences in diet, gender differences in the degree of dietary change are likely to be minimal.

Finally, tobit Regression models of physical activity are presented in Table A22. Contrary to the models for negative health behaviors, these models find no association between linguistic integration and levels of physical activity. However, there were durable, positive effects of human capital (education and language proficiency) on frequency of physical activity. While there were baseline gender differences in levels of physical activity, gender differences disappear in the lagged model. In addition, whereas Hispanic immigrants reported lower levels of physical activity than black and white immigrants at baseline, they had higher levels of physical activity than Asian and black immigrants at follow-up. Hispanic immigrants seem to have higher levels of physical activity in 2007 than both Asian and black immigrants, controlling for baseline differences in levels of physical activity, suggesting that Asian and black immigrants may have a higher risk of adopting a more sedentary lifestyle than Hispanic immigrants overtime. Finally, the physical activity models also show a cross-sectional association with religious attendance. However, this advantage was not observed in 2007, suggesting that current religious attendance is not associated with long-term frequency of physical activity, contrary to the relationship between religious social capital and negative health behaviors.

Discussion

This study focused on the role of interethnic connectedness in immigrant health status and health behaviors. Using longitudinal data to study the relationship between the language-based social capital of new immigrants and their health, I was able to show the implications of social

integration on long-term health trajectories. Particularly, it focused on the potentially ethnicity-bridging role of English language use among immigrants and the implications of this kind of social capital for self-rated health, the number of diagnosed chronic conditions, smoking frequency, drinking frequency, degree of dietary change and frequency of physical activity. The results suggest that the health effects of social capital depend on both the specific type of social capital and the specific health outcome in question. Overall, while there were some cross-sectional associations between interethnic connectedness and health outcomes, the lagged models find effects only for self-rated health and chronic conditions. More specifically, while cross-sectional associations were present between interethnic connectedness and levels drinking, smoking, and degree of dietary change, the lagged models find no such effects. Similarly, whereas interethnic connectedness is not associated with current health status, it appears that immigrants who were embedded in a more ethnically diverse network in 2003 experienced less of a decline in self-rated health and lower levels of increase in chronic diseases.

These results have implications for how we understand the significance of linguistic integration among immigrants. To the extent that we understand linguistic integration to largely indicate acculturative processes, then we are saying that acculturation is not associated with long-term increases in negative health behaviors (smoking, drinking and dietary change). In other words, acculturation does not have the long-lasting effect on health behaviors that acculturation theory seems to suggest. More importantly, the results would also imply that acculturative processes lead to long-term improvements in self-rated health and lower rates of incidence of chronic health conditions, which is contrary to findings in the migration literature. I argue, however, that linguistic integration is better understood as bridging social capital that represents the presence of cross-cutting ties, which is to say a higher level of social interaction with the non-immigrant

population. While the processes of social influence may lead to increases in negative health behaviors among immigrants with higher levels of bridging social capital, the long-term effect of interethnic connectedness oh health status may very well be protective due to the benefits associated with better social integration with the native population.

A few other findings are worth discussing here. There were consistent results on the effect of religious social capital, suggesting that religious involvement – particularly religious organization membership seems to deter negative health behaviors (smoking and drinking frequency). While this highlights the durable effects of religious social capital on immigrants' health behaviors, it also raises the question of whether or not involvement in other types of voluntary associations, such as credit associations and labor unions, and interethnic social capital accessed through such organizations, have similar effects on the health and health behaviors of immigrants. Future empirical research should, therefore, examine if this is indeed a phenomenon that describes the relationship between organizational involvement and immigrant outcomes and the extent to which it shapes the integration trajectories of new immigrants.

The findings on gender and race are also interesting, particularly because these are time-invariant variables and allow us to observe changes in group differences across time. It appears that while the gender gap in self-rated health wanes over time, the gender gap in the number of chronic conditions, and smoking and drinking behavior persists. No gender differences in dietary change and levels of physical activity were observed. As discussed above, there were much more significant differences in the effects of race on health status and health behaviors between the cross-sectional and lagged models. This is important to note particularly because most prior research focuses on one immigrant group. Further, group differences in health outcomes appears to change over time. For instance, while black immigrants report better health at baseline (higher

self-rated health and lower incidence of chronic conditions), which is consistent with recent research that reports better health among immigrants from Africa, this health advantage disappears overtime, suggesting group differences in the health implications of migration. This could also be viewed as evidence for a higher degree of selective migration among black immigrants compared to other immigrant groups.

A comparison of the cross-sectional and lagged models highlights important methodological concerns in cross-sectional research on immigrant health. First, the models for health status highlight the presence of lagged effects of interethnic social capital, in the absence of cross-sectional associations. This suggests that longitudinal designs may be required to identify the potentially lagged effects of immigrant integration on health status in the absence of contemporaneous associations in new immigrant populations. Second, the results for health behavior indicate that positive associations between linguistic integration (and acculturation) and negative health behaviors (e.g. Unger et al. 2000) may be due to the lack of controls for important spurious confounders, particularly pre-immigration characteristics, such as socioeconomic status in the home-country. Parental SES and country-of-origin effects could both be linked to immigrant social integration upon migration and health behaviors prior to migration, and they may be partly responsible for the association that prior research finds between linguistic integration and health behaviors. Since the lagged models control for baseline differences in health behavior and find no effects, the link between linguistic integration and health behaviors may be spurious.

A couple of limitations of this study should be noted. First, in the absence of direct measures of interethnic network diversity, linguistic integration serves as a proxy measure. Given that language use patterns has been used as a proxy for acculturation, it is impossible to empirically distinguish the effects of acculturation from the effects of interethnic network integration. Second,

while the analytical approach employed in this study allows us to distinguish between the contemporaneous and lagged effects of linguistic integration, the lagged models should be taken with caution, as some have argued that the LDV model is a very conservative approach, which means that it could potentially underestimate the effects of linguistic integration. This is a particular concern in the smoking and drinking models, where the observed relationship is sensitive to the inclusion of baseline outcomes.

To conclude, to the best of the author's knowledge, this is the first study that uses a longitudinal design to examine the effects of linguistic integration on various health outcomes of immigrants in the U.S. In doing so, it provides important empirical insight into not only the time-dependent implications of interethnic connectedness on immigrant health, but it also highlights important methodological concerns for future research on immigrant health. While one of the strengths of this study is that it uses data from the New Immigrant Survey (NIS), which provides a large dataset that exclusively sampled new immigrants in the United States and includes data on various measures of health and health behaviors, it also relies on proxy measures of social capital due to the lack of direct social network measures. Future research on immigrant health could, therefore, benefit from producing higher quality data on the immigrant population that includes more direct measures of different types of social capital.

CHAPTER 5

CONCLUSION

This dissertation examined immigrants' social capital and its role in labor market and health outcomes. Immigrants' social networks, particularly ties to co-ethnics, are implicated in labor market and health outcomes. However, research has yet to identify the extent to which social capital inequities, particularly in terms of access to network diversity, exist among immigrants. Further, while prior research has focused on the economic implications of the co-ethnic community, with a particular attention to Hispanic and Asian immigrants, it remains to be seen whether or not much of this research is identifying group-specific effects of social capital. Beyond immigrants' economic performance, the implications of bridging social capital for immigrants' health and health trajectories has yet to be understood. Prior research on immigrant health has largely focused on impacts of acculturation and has, consequently, ignored the potential role of network processes in determining immigrants' health and health behaviors. This dissertation presented a set of studies that address these gaps in the international migration literature.

Chapter 2 examined the question of who has bridging social capital, particularly ethnicity and status-bridging social capital. To answer this question, this study focused on personal networks and used data from the SCCBS (2000) on the characteristics of friendship networks. The analyses made comparisons between native and immigrant groups and among immigrant groups themselves in network ethnic diversity and access to high status contacts. In addition, it compared native-immigrant gaps across racial groups. In doing so, it shed light on the nature and extent of social capital inequality in the United States across ethnicity and nativity. The focus on bridging networks contributes to the migration literature, which has largely concentrated on the implications of co-ethnic networks, by documenting differential access to ethnicity-crossing social networks

and their implications for network quality. The results showed that immigrants' social networks have lower levels of ethnic and socioeconomic diversity than natives', and highlighted the presence of a "double jeopardy" in bridging social capital for minority immigrants. Moreover, native-immigrant gaps in ethnicity-bridging social capital are much wider for racial minorities than they are for whites. While a similar disadvantage in network quality also exists, it was explained away by differences in the level of network ethnic diversity. Moreover, the effect of network ethnic diversity on network quality also varies across immigrant groups. That is, there was group variability in return to ethnicity-bridging social capital, which is reflective of existing socioeconomic inequalities among native and immigrant groups.

Chapter 3 shifted the focus to the literature on the role of bonding social capital in immigrants' labor market outcomes. While migration studies has generally focused on bonding or co-ethnic networks, findings on the link between bonding social capital and labor market performance have been inconsistent. This study contributes to this literature by examining whether or not reliance on bonding social capital, particularly reliance on the help of relatives, for job search has a beneficial or detrimental effect for new immigrants in terms of earnings and occupational prestige. This chapter also examined the extent to which the effect of reliance on the help of a relative to find a job varies across groups. The findings highlight that reliance on strong or bonding social capital has a detrimental effect for the earnings and occupational prestige of immigrants in general. However, the effect of this kind of social capital on these labor market outcomes varied across immigrant groups. Specifically, while the use of social capital had little or no effect on the earnings and occupational prestige of black and Hispanic immigrants, it has a detrimental effect on the occupational prestige of Asians. This study also tackles the issue of self-selection, particularly the extent to which the use of a relative to find a job may itself be associated

with other variables, including human capital and demographic characteristics. Propensity score matching (PSM) was used to adjust for such observable bias and estimate the treatment effect of using a relative to find a job on earnings and occupational prestige. The estimated treatment effects from the PSM were consistent with the Ordinary Least Squares (OLS) regression estimates and confirmed the finding that immigrants' reliance on close social ties for job search has a negative effect on earnings and occupational prestige.

Chapter 4 examined the implications of interethnic social capital for the short-run and long-term health outcomes of immigrants in the United States. It focuses on linguistic social capital – English language use – as a reflection of bridging (interethnic) social capital and examines its implications for immigrants' health outcomes. While English language use, particularly English language use at home, has been widely used as a measure of acculturation, the mechanisms linking it to health outcomes are poorly understood and empirical studies have largely relied on cross-sectional data. This study considers the role of network mechanisms in linking English language use patterns to the health and health trajectories of immigrants in the United States. English language use, in this case, is used as a type of (linguistic) social capital that is indicative of the composition of immigrants' social networks. Prior studies have suggested that English language use partly indicates the type of networks in which immigrants are embedded (Akresh 2007) and is more influenced by contact with natives than it is by language proficiency itself (Vervoort et al. 2012). Using panel data from the first (2003) and second (2007) waves of the New Immigrant Survey (NIS), this study took a comprehensive approach to understanding the health impacts of ethnicity-bridging social capital among new immigrants. Various health outcomes were used, including self-rated health, diagnosed chronic conditions, alcohol drinking frequency, smoking frequency, degree of dietary change and levels of physical activity.

The methodological approach in Chapter 4 used both cross-sectional and longitudinal models to identify cross-sectional associations and lagged effects of interethnic connectedness, as measured by linguistic integration, on these health outcomes. The use of lagged models in this context not only identify the long-term effects of social capital, but also address the issue of reverse causality, which is an important concern in social capital research on health outcomes. The results showed cross-sectional associations between interethnic connectedness and negative health behaviors, drinking, smoking and dietary change. The lagged models found no such effects. However, whereas interethnic connectedness was not related with current health status, immigrants with more personal network ethnic diversity in 2003 appeared to have experienced less of a decline in self-rated health and lower levels of increase in chronic diseases. This study suggested that linguistic integration could be understood as bridging social capital that represents a higher level of native-immigrant social interaction. Whereas the positive association with negative health behaviors, in the short-term, could potentially be attributed to social influence, the results provided evidence for a long-term protective effect of interethnic integration vis-à-vis health status.

This ensemble of studies on immigrants' social capital provides pieces of evidence that highlight not only "the strength of weak ties," but also the "weakness of strong ties" when it comes to immigrants' incorporation. Notwithstanding the positive roles of bonding social capital in the migration process and short-term adjustment of immigrants in the United States, reliance on bonding social capital overall appears to be a costly strategy in terms of labor market performance, particularly earnings and occupational prestige (Tegegne 2015). In addition, bridging social capital in the form of interethnic diversity of personal networks, is positively associated with socioeconomic diversity and access to high status contacts, which presumably have positive implications for immigrants' socioeconomic advancement. However, while interethnic diversity

or integration appears to be positively linked to negative health behaviors in the short-term, this dissertation provides evidence for its long-term benefits for health and well-being, particularly in terms of alleviating declines in self-rated health and increases in chronic conditions that are often associated with time in the United States

The first and second studies also provide some evidence for the context-dependent effects of immigrants' social capital. It is context-dependent in that immigrants are not a monolithic group, and various immigrant groups are exposed to different levels of interethnic contact upon migration and experience different levels of ethnic diversity within their personal networks, which has implications for their levels of access to status-bridging ties. It is also context-dependent in that the effects of social capital vary across groups. Ethnic diversity is particularly important for immigrants and minority immigrants, since it provides a higher benefit to these groups in terms of increasing access to high status contacts. That is, ethnic diversity is more strongly related to network quality for immigrants and minorities, than it is for natives and whites, respectively. It is also context-dependent in that the effects of bonding social capital on labor market performance vary across groups, and its detrimental effect may not be experienced by groups that are more disadvantaged in terms of their context of reception or their opportunities, or lack thereof, in the mainstream labor market.

A couple of implications and directions for future research are noteworthy. First, studies 2 and 3 have relied on pan-ethnic categories to measure group differences and the context-dependent effects of social capital. It is often suggested that pan-ethnic categories potentially homogenize groups that may be very different. Future research should, therefore, examine country of origin effects on social capital and the extent to which such effects are sources of group differences in host nations. Future research could also study distributional inequities and the implications of

social capital for various immigrant groups by examining the roles of gender and age/age at migration, which have received considerable attention in migration research. Gender has received some attention in the social capital literature, but little is known about how it intersects with other social categories, namely race and immigration status, to create social capital disadvantages for immigrant minority women. Most of these suggestions, of course, assume that quality and comprehensive social network data on the immigrant population will be available in the future. This is particularly important when it comes to addressing an important empirical concern in social capital research – endogeneity. While this dissertation has taken important steps to address issues of selection and reverse causality, migration research could greatly benefit from large panel datasets that provide direct measures of social capital on the immigrant population in the United States. Such data could allow future research in this area to better address endogeneity concerns arising from potentially omitted variables.

APPENDIX

Table A1. Descriptive Statistics and Sample Composition by Race, Pooled Sample (N=21,608), SCCBS (2000)

	All		White		Asian		Black		Hispanic	
	Mean/ Prop	sd	Mean /Prop	sd	Mean/ Prop	sd	Mean/ Prop	sd	Mean/ Prop	sd
Immigrant	0.04	-	0.01	-	0.33	-	0.02	-	0.33	-
Friendship network size	3.33	1.05	3.44	1.01	3.23	1.02	2.90	1.06	3.03	1.16
Network ethnic diversity	1.40	1.08	1.37	1.09	1.84	1.08	1.43	1.02	1.59	1.07
High status ties	1.63	1.07	1.71	1.05	1.27	1.04	1.49	1.07	1.20	1.08
Member of organizations	3.09	2.97	3.09	2.93	2.83	2.79	3.49	3.14	2.44	2.96
Education										
<= high school	0.34	-	0.32	-	0.14	-	0.38	-	0.57	-
some college	0.33	-	0.32	-	0.30	-	0.39	-	0.26	-
>= college	0.33	-	0.36	-	0.56	-	0.23	-	0.17	-
Age	44.42	16.35	46.02	16.45	34.60	12.26	40.97	15.25	35.79	13.28
Gender	0.59	-	0.59	-	0.52	-	0.63	-	0.55	-
Married	0.52	-	0.55	-	0.48	-	0.34	-	0.50	-
Household Income										
< $30,000	0.30	-	0.27	-	0.23	-	0.40	-	0.50	-
> $30,000 & < $50,000	0.29	-	0.30	-	0.28	-	0.28	-	0.25	-
> $50,000 & < $75,000	0.20	-	0.21	-	0.21	-	0.17	-	0.13	-
> $ 75,000	0.21	-	0.23	-	0.28	-	0.14	-	0.12	-
Community characteristics										
Mean education	3.31	0.28	3.29	0.29	3.52	0.31	3.35	0.22	3.39	0.23
Mean income	3.15	0.28	3.13	0.29	3.35	0.33	3.19	0.23	3.15	0.24
Percent Asian	0.02	0.05	0.02	0.04	0.09	0.11	0.02	0.04	0.04	0.06
Percent black	0.13	0.09	0.12	0.09	0.12	0.08	0.19	0.08	0.13	0.07
Percent Hispanic	0.07	0.06	0.06	0.06	0.12	0.08	0.07	0.06	0.12	0.08
Percent white	0.75	0.13	0.77	0.13	0.64	0.15	0.69	0.10	0.67	0.12
Length of residence	3.58	1.48	3.70	1.47	2.71	1.30	3.32	1.48	2.92	1.34
Self-rated health	2.72	1.03	2.77	1.02	2.74	1.00	2.56	1.02	2.54	1.10
N	21608		16829		330		2856		1593	

Table A2. Descriptive Statistics and Sample Composition by Race, Immigrants only (N=853), SCCBS (2000)

	ALL		White		Asian		Black		Hispanic	
	Mean/Prop	sd	Mean/Prop	sd	Mean/Prop	sd	Mean/Prop	sd	Mean/Prop	sd
Friendship network size	3.03	1.15	3.31	1.09	3.17	1.03	2.75	1.09	2.94	1.18
Network ethnic diversity	1.22	1.06	1.60	1.11	1.46	1.00	1.45	1.07	1.02	1.00
High status ties	1.00	1.02	1.60	1.02	1.01	0.93	1.18	1.04	0.79	0.96
Member of organizations	1.78	2.23	2.53	2.33	2.41	2.62	2.11	1.75	1.39	2.07
Education										
<= high school	0.54	-	0.18	-	0.12	-	0.38	-	0.76	-
some college	0.18	-	0.28	-	0.19	-	0.35	-	0.13	-
>= college	0.28	-	0.55	-	0.69	-	0.27		0.11	-
Age	34.18	10.59	37.34	12.00	32.54	9.30	33.49	10.38	33.61	10.23
Gender (Female=1)	0.50	-	0.50	-	0.52	-	0.56	-	0.49	-
Married	0.56	-	0.55	-	0.57	-	0.31	-	0.58	-
Household Income										
< $30,000	0.54	-	0.21	-	0.27	-	0.47	-	0.70	-
> $30,000 & < $50,000	0.25	-	0.30	-	0.29	-	0.27	-	0.22	-
> $50,000 & < $75,000	0.12	-	0.25	-	0.24	-	0.16	-	0.05	-
> $ 75,000	0.09	-	0.25	-	0.20	-	0.09	-	0.03	-
Community characteristics										
Mean education	3.41	0.26	3.42	0.30	3.47	0.29	3.51	0.31	3.39	0.23
Mean income	3.20	0.26	3.25	0.30	3.30	0.30	3.21	0.25	3.16	0.24
Percent Asian	0.05	0.07	0.05	0.08	0.06	0.09	0.04	0.05	0.04	0.06
Percent black	0.14	0.08	0.13	0.09	0.13	0.08	0.13	0.07	0.14	0.07
Percent Hispanic	0.12	0.08	0.09	0.08	0.10	0.08	0.09	0.06	0.14	0.08
Percent white	0.66	0.13	0.69	0.15	0.67	0.14	0.70	0.13	0.64	0.12
Length of residence	2.32	0.96	2.34	1.11	1.95	0.77	2.35	1.17	2.38	0.91
Self-rated health	2.47	1.06	2.89	0.89	2.67	0.98	2.60	0.99	2.28	1.09
N	853		163		108		55		527	

Table A3. Pearson Correlation Coefficient Matrix for Friendship Network Characteristics

Variable	Pooled Sample (N=21,608)			Immigrants Only (N=853)		
	Network size	Interethnic diversity	High status friends	Network size	Interethnic diversity	High status friends
Network size	-	0.17	0.28	-	0.19	0.25
Interethnic diversity	-	-	0.33	-	-	0.45
High status friends	-	-	-	-	-	-

All correlation coefficients are significant at P < 0.001

Table A4. Friendship Network Size by Race and Immigration Status, SCCBS (2000)

	(1)		(2)		(3)	
	b	se	b	se	b	se
Variable						
Race						
Asian	0.66**	(0.09)	0.72	(0.17)	0.67*	(0.11)
Black	0.41***	(0.02)	0.63	(0.22)	0.41***	(0.02)
Hispanic	0.61***	(0.05)	0.77	(0.19)	0.59***	(0.05)
Immigrant	1.08	(0.11)			0.91	(0.16)
AsianXImmigrant					*1.12*	*(0.34)*
BlackXImmigrant					*1.35*	*(0.52)*
HispanicXImmigrant					*1.30*	*(0.29)*
Organization memberships	1.09***	(0.01)	1.18***	(0.05)	1.09***	(0.01)
Education						
some college	1.11**	(0.04)	0.95	(0.23)	1.11**	(0.04)
>= college	1.18***	(0.05)	1.02	(0.22)	1.18***	(0.05)
Age	0.95***	(0.01)	1.01	(0.03)	0.95***	(0.01)
Age squared	1.00***	(0.00)	1.00	(0.00)	1.00***	(0.00)
Gender	0.85***	(0.03)	0.72*	(0.11)	0.85***	(0.03)
Married	0.97	(0.03)	1.15	(0.19)	0.97	(0.03)
Income						
> $30,000 & < $50,000	1.19***	(0.05)	1.73**	(0.34)	1.19***	(0.05)
> $50,000 & < $75,000	1.19***	(0.06)	1.38	(0.34)	1.20***	(0.06)
> $ 75,000	1.28***	(0.07)	1.66+	(0.46)	1.29***	(0.07)
Community Characteristics						
Mean Education	1.11	(0.08)	0.80	(0.32)	1.11	(0.08)
Mean Income	0.84*	(0.06)	1.60	(0.55)	0.84*	(0.06)
Percent Asian	2.91*	(1.24)	1.29	(2.22)	2.95*	(1.26)
Percent black	0.96	(0.17)	1.68	(1.74)	0.96	(0.17)
Percent Hispanic	0.61+	(0.16)	1.86	(2.03)	0.61+	(0.16)
Length of residence	1.08***	(0.01)	1.15	(0.11)	1.08***	(0.01)
Self-rated health	1.14***	(0.02)	1.01	(0.08)	1.14***	(0.02)
N	21608		853		21608	
Pseudo R^2	0.031		0.030		0.031	

Note: Marginal effects in odds ratio shown from Ordered Logistic Regresssions; intercepts not shown. Robust standard errors in parentheses; + $p < .10$, * $p < .05$, ** $p < .01$ (two-tailed significance tests).

Table A5. Network Ethnic Diversity by Race and Immigration Status, SCCBS (2000)

Variables	(1) b	(1) se	(2) b	(2) se	(3) b	(3) se
Race						
Asian	1.56**	(0.22)	0.80	(0.22)	1.54*	(0.27)
Black	1.12*	(0.05)	1.09	(0.43)	1.11*	(0.05)
Hispanic	1.56***	(0.11)	0.69	(0.17)	1.99***	(0.14)
Immigrant	0.42***	(0.04)			1.12	(0.21)
AsianXImmigrant					0.42*	(0.15)
BlackXImmigrant					0.88	(0.32)
HispanicXImmigrant					0.20***	(0.05)
Friendship network size	1.35***	(0.02)	1.30**	(0.11)	1.36***	(0.02)
Organizational memberships	1.14***	(0.01)	1.18***	(0.05)	1.14***	(0.01)
Education						
some college	1.29***	(0.05)	1.15	(0.30)	1.27***	(0.05)
>= college	1.31***	(0.06)	1.70*	(0.39)	1.29***	(0.06)
Age	1.00	(0.01)	0.94	(0.04)	1.00	(0.01)
Age squared	1.00**	(0.00)	1.00	(0.00)	1.00**	(0.00)
Gender	0.86***	(0.03)	0.98	(0.16)	0.86***	(0.03)
Married	0.88***	(0.03)	0.90	(0.15)	0.89***	(0.03)
Household income						
> $30,000 & < $50,000	1.15**	(0.05)	1.09	(0.24)	1.14**	(0.05)
> $50,000 & < $75,000	1.15**	(0.06)	1.10	(0.29)	1.14**	(0.05)
> $ 75,000	1.27***	(0.07)	1.48	(0.45)	1.26***	(0.07)
Community Characteristics						
Mean Education	1.10	(0.08)	2.79**	(1.02)	1.08	(0.08)
Mean Income	1.26***	(0.09)	0.56	(0.21)	1.28***	(0.09)
Percent Asian	17.84***	(8.43)	1.55	(2.70)	16.05***	(7.63)
Percent black	3.50***	(0.62)	1.90	(2.05)	3.62***	(0.65)
Percent Hispanic	13.75***	(3.79)	0.02***	(0.02)	14.36***	(3.97)
Length of residence	0.93***	(0.01)	1.04	(0.09)	0.93***	(0.01)
Self-rated health	1.01	(0.02)	1.08	(0.08)	1.01	(0.02)
N	21608		853		21608	
Pseudo R^2	0.061		0.078		0.063	

Note: Marginal effects in odds ratio shown from Ordered Logistic Regresssions; intercepts not shown. Robust standard errors in parentheses; + p < .10, * p < .05, ** p < .01 (two-tailed significance tests).

Table A6. High Status Network Ties by Race and Immigration Status, SCCBS (2000) (Before Controlling for Network Ethnic Diversity)

Variables	(1) b	(1) se	(2) b	(2) se	(3) b	(3) se
Race						
Asian	0.66**	(0.09)	0.31***	(0.09)	0.69*	(0.12)
Black	0.99	(0.05)	0.72	(0.27)	0.99	(0.05)
Hispanic	0.83**	(0.06)	0.42**	(0.12)	0.92	(0.07)
Immigrant	0.71***	(0.07)			1.18	(0.21)
AsianXImmigrant					*0.54+*	*(0.17)*
BlackXImmigrant					*0.82*	*(0.33)*
HispanicXImmigrant					*0.47***	*(0.10)*
Friendship network size	1.51***	(0.02)	1.37***	(0.10)	1.51***	(0.02)
Organizational memberships	1.23***	(0.01)	1.33***	(0.07)	1.23***	(0.01)
Education						
some college	1.47***	(0.06)	1.50	(0.40)	1.46***	(0.06)
>= college	1.54***	(0.07)	1.97**	(0.47)	1.54***	(0.07)
Age	1.05***	(0.01)	0.97	(0.04)	1.05***	(0.01)
Age squared	1.00***	(0.00)	1.00	(0.00)	1.00***	(0.00)
Gender	1.01	(0.03)	0.96	(0.16)	1.00	(0.03)
Married	1.16***	(0.04)	0.81	(0.14)	1.16***	(0.04)
Income						
> $30,000 & < $50,000	1.46***	(0.06)	1.68*	(0.36)	1.45***	(0.06)
> $50,000 & < $75,000	1.63***	(0.08)	1.07	(0.28)	1.62***	(0.08)
> $ 75,000	2.11***	(0.11)	2.33**	(0.65)	2.10***	(0.11)
Community Characteristics						
Mean Education	0.99	(0.07)	1.46	(0.69)	0.98	(0.07)
Mean Income	0.92	(0.06)	0.68	(0.27)	0.93	(0.06)
Percent Asian	0.66	(0.30)	0.99	(1.93)	0.62	(0.28)
Percent black	1.04	(0.19)	0.53	(0.65)	1.05	(0.19)
Percent Hispanic	0.64+	(0.17)	0.92	(1.16)	0.65	(0.17)
Self-rated health	1.12***	(0.02)	1.11	(0.09)	1.12***	(0.02)
Length of residence	1.05***	(0.01)	1.12	(0.11)	1.05***	(0.01)
N	21608		853		21608	
Pseudo R^2	0.104		0.137		0.104	

Note: Marginal effects in odds ratio shown from Ordered Logistic Regresssions; intercepts not shown. Robust standard errors in parentheses; + p < .10, * p < .05, ** p < .01 (two-tailed significance tests).

Table A7. High Status Network Ties by Race and Immigration Status, SCCBS (2000) (Controlling for Network Ethnic Diversity)

Variables	(1) b	(1) se	(2) b	(2) se	(3) b	(3) se
Race						
Asian	0.58***	(0.08)	0.31***	(0.10)	0.60**	(0.10)
Black	0.97	(0.05)	0.75	(0.28)	0.97	(0.05)
Hispanic	0.72***	(0.05)	0.45**	(0.13)	0.76***	(0.06)
Immigrant	0.88	(0.08)			1.12	(0.20)
AsianXImmigrant					*0.71*	*(0.25)*
BlackXImmigrant					*0.90*	*(0.33)*
HispanicXImmigrant					*0.70*	*(0.15)*
Network Ethnic diversity	1.67***	(0.03)	1.98***	(0.17)	1.66***	(0.03)
Friendship network size	1.42***	(0.02)	1.31***	(0.10)	1.42***	(0.02)
Organization memberships	1.19***	(0.01)	1.27***	(0.06)	1.19***	(0.01)
Education						
some college	1.39***	(0.05)	1.46	(0.42)	1.38***	(0.05)
>= college	1.46***	(0.06)	1.76*	(0.45)	1.46***	(0.06)
Age	1.05***	(0.01)	0.98	(0.04)	1.05***	(0.01)
Age squared	1.00***	(0.00)	1.00	(0.00)	1.00***	(0.00)
Gender	1.05+	(0.03)	1.03	(0.18)	1.05+	(0.03)
Married	1.21***	(0.04)	0.83	(0.15)	1.21***	(0.04)
Income						
> $30,000 & < $50,000	1.43***	(0.06)	1.74*	(0.38)	1.43***	(0.06)
> $50,000 & < $75,000	1.61***	(0.08)	1.11	(0.30)	1.61***	(0.08)
> $ 75,000	2.05***	(0.11)	2.07*	(0.65)	2.05***	(0.11)
Community Characteristics						
Mean Education	0.95	(0.07)	0.98	(0.46)	0.95	(0.07)
Mean Income	0.86*	(0.06)	0.79	(0.32)	0.86*	(0.06)
Percent Asian	0.29**	(0.14)	1.31	(2.65)	0.28**	(0.13)
Percent black	0.74	(0.14)	0.38	(0.45)	0.74	(0.14)
Percent Hispanic	0.29***	(0.08)	3.82	(4.72)	0.29***	(0.08)
Length of residence	1.07***	(0.01)	1.11	(0.10)	1.07***	(0.01)
Self-rated health	1.13***	(0.02)	1.07	(0.09)	1.13***	(0.02)
N	21608		853		21608	
Pseudo R^2	0.130		0.183		0.130	

Note: Marginal effects in odds ratio shown from Ordered Logistic Regresssions; intercepts not shown. Robust standard errors in parentheses; + p < .10, * p < .05, ** p < .01 (two-tailed significance tests).

Table A8. Selected Characteristics of Respondents by Treatment Status, The New Immigrant Survey, 2003

Variable	Contact Users (N=580)	Contact non-users (N=2740)
PERCENTAGE DISTRIBUTIONS		
Race		
Asian	25.69	31.75
Black	8.28	9.16
Hispanic	48.28	32.88
White	17.07	25.33
Other	0.69	0.88
English Language Proficiency		
Does not speak English at all	21.72	9.16
Does not speak English well	40.34	27.74
Speaks English Well	25.00	30.84
Speaks English Very well	12.93	32.26
Social Network Variables		
Speak English with friends	38.79	60.21
Speak English at home	36.55	50.40
Church Membership	19.14	22.12
Gender (female)	41.55	40.51
Married	60.86	68.94
MEANS		
Age	35.61 (9.55)	35.03 (10.7)
Household size	4.24 (2.2)	3.22 (1.89)
Occupational Prestige	32.7 (9.21)	39.39 (14.38)
Years in the U.S.	4.99 (6.52)	6.22 (6.04)
Years of education	11.59 (4.16)	14.07 (4.64)
Years of education in the U.S.	0.08 (0.26)	0.17 (0.38)

Standard deviations in parentheses.

Table A9. Results from OLS Regression Models of the Log of Hourly Earnings (N=3320)

Variable	Model I (Estimates)	Standard Error	Model II (Estimates)	Standard Error
Helped by a relative to find current job	-0.08**	0.03	-0.12*	0.06
Education	0.01***	0.003	0.01***	0.003
Highest degree in the U.S.	-0.01	0.04	-0.01	0.04
Experience				
Time since arrival in U.S.	0.04***	0.004	0.04***	0.004
Time since arrival in U.S. Squared	-0.001***	0.0001	-0.001***	0.0001
Age	0.002	0.001	0.002	0.001
English Language Proficiency				
Does not speak English well	0.04	0.03	0.05	0.03
Speaks English Well	0.06	0.04	0.06	0.04
Speaks English Very well	0.14**	0.05	0.14**	0.05
Occupational Prestige	0.02***	0.001	0.02***	0.001
Social Network Variables				
Speak English with friends	0.03	0.03	0.03	0.03
Household size	-0.01	0.01	-0.01	0.01
Speak English at home	0.00	0.02	0.00	0.02
Church Membership	0.01	0.03	0.01	0.03
Gender (female)	-0.104**	0.04	-0.104**	0.04
Married	0.08**	0.04	0.08**	0.04
Gender X Married	-0.08*	0.05	-0.08*	0.05
Race				
Asian	0.01	0.03	0.02	0.03
Black	-0.18**	0.07	-0.17*	0.08
Hispanic	-0.03	0.03	-0.04	0.03
Other	-0.09	0.12	-0.104	0.13
Interactions of Race and SC				
Asian X Using a relative			-0.05	0.08
Black X Using a relative			-0.08	0.21
Hispanic X Using a relative			0.09	0.07
Other X Using a relative			0.2	0.17
R^2	0.36		0.36	

*p<0.05, **p<0.01, ***p<0.001

Table A10. Results from OLS Regression Models of Occupational Prestige (N=3320)

Variable	Model I (Estimates)	Standard Error	Model II (Estimates)	Standard Error
Helped by a relative to find current job	-1.7***	0.53	-2.27*	1.15
Education	1.0***	0.08	0.99***	0.08
Highest degree in the U.S.	4.44***	0.82	4.4***	0.82
Experience				
Time since arrival in U.S.	0.07***	0.101	0.69***	0.101
Time since arrival in U.S. Squared	-0.03***	0.004	-0.03***	0.004
Age	0.04*	0.02	0.04*	0.02
English Language Proficiency				
Does not speak English well	-0.97	0.61	-0.82	0.61
Speaks English Well	2.76**	0.87	2.9***	0.87
Speaks English Very well	6.04***	1.03	6.11	1.03
Social Network Variables				
Speak English with friends	0.19	0.62	0.17	0.62
Household size	-0.36***	0.11	-0.36***	0.11
Speak English at home	-0.5	0.54	-0.53	0.54
Church Membership	-0.16	0.57	-0.21	0.57
Gender (female)	1.05	0.68	1.05	0.67
Married	3.53***	0.63	3.56***	0.62
Gender X Married	-3.95***	0.89	-3.92*	0.89
Race				
Asian	1.38*	0.71	2.2**	0.8
Black	-4.7***	1.003	-4.76***	1.1
Hispanic	-2.56***	0.702	-3.14***	0.76
Other	5.53*	3.07	5.67*	3.31
Interactions of Race and SC				
Asian X Using a relative			-3.91*	1.51
Black X Using a relative			1.004	2.27
Hispanic X Using a relative			2.87*	1.35
Other X Using a relative			-1.3	7.78
R^2	0.36		0.37	

*p<0.05, **p<0.01, ***p<0.001

Table A11. Results from Logistic Regression Model Estimating Propensity Scores

Variable	Estimate	Standard Error
Education	0.93***	0.02
Highest degree in the U.S.	0.97	0.20
Experience		
Time since arrival in U.S.	0.88***	0.02
Time since arrival in U.S. Squared	1.004***	0.001
Age	0.99*	0.006
English Language Proficiency		
Does not speak English well	0.88	0.0.15
Speaks English Well	0.72	0.16
Speaks English Very well	0.44**	0.12
Social Network Variables		
Speak English with friends	0.98	0.16
Household size	1.18***	0.03
Speak English at home	1.03	0.14
Church Membership	1.02	0.15
Gender (female)	0.69*	0.18
Married	0.56***	0.09
Gender X Married	1.66**	0.39
Race		
Asian	1.7**	0.3
Black	1.04	0.26
Hispanic	1.74**	0.3
Other	0.83	0.49
Log likelihood	-1342.36	

*p<0.05, **p<0.01, ***p<0.001

Table A12. Estimates of the Effect of Using Social Ties on the Log of Hourly Earnings

	ATT/OLS Estimate	Standard Error	N (Treatment)	N (Control)	N (Total)
Kernel Matching	-0.15***	0.03	580	2649	3320
Nearest Neighbor Matching	-0.05	0.04	580	430	3320
Radius Matching	-0.27***	0.03	580	2649	3320
Stratification Matching	-0.09**	0.03	579	2650	3320
OLS	-0.08**	0.03			3320

*p<0.05, **p<0.01, ***p<0.001

Table A13. Estimates of the Effect of Using Social Ties on Occupational Prestige

	ATT/OLS Estimate	Standard Error	N (Treatment)	N (Control)	N (Total)
Kernel Matching	-3.5***	0.46	580	2600	3320
Nearest Neighbor Matching	-2.32**	0.81	580	452	3320
Radius Matching	-6.43***	0.53	580	2600	3320
Stratification Matching	-2.44***	0.47	580	2600	3320
OLS	-1.7***	0.53			3320

*p<0.05, **p<0.01, ***p<0.001

Table A14. Descriptive Statistics for Outcome Variables, NIS Panel (2003-2007)

Dependent variable	NIS (2003)	NIS (2007)	diff	N
Self-rated health	3.89 (1.01)	3.47 (0.02)	-0.42	3075
Body mass index (BMI)	25.21 (5.80)	25.91 (4.75)	0.70	2922
Chronic diseases	0.79 (1.11)	1.26 (1.56)	0.46	3095
Smoking frequency	0.60 (2.46)	0.58 (2.42)	2.32	3085
Drinking frequency	0.49 (1.12)	0.60 (1.26)	0.11	3014
Dietary change	5.31 (3.13)	5.06 (3.14)	-0.26	2935
Exercise frequency	4.41 (3.72)	4.60 (3.68)	0.19	2384

Table A15. Descriptive Statistics for the NIS panel (2003-2007), N=3095

	MEAN/PROPORTION
Independent Variable	
Interethnic connectedness	1.55 (1.20)
Covariates	
Age	38.54 (12.48)
Years in U.S.	5.23 (6.34)
Household size	3.73 (2.14)
Years of education	12.95 (5.15)
English proficiency	2.53 (1.03)
Gender (female)	53.51%
Race	
Asian	31.21%
Black	10.27%
Hispanic	35.35%
White	22.13%
Other	1.03%
Religion	
Catholic	41.65%
Orthodox Christian	10.24%
Protestant	13.63%
Muslim	6.25%
Jewish	1.32%
Buddhist	3.72%
Hindu	7.43%
No religion	13.12%
Other	2.07%
Religious organization involvement	
Membership	20.16%
Attendance	61.52%

Note. Standard deviations are presented in parentheses.
Percentage distributions shown for gender, race, religion, and religious organization involvement.

Table A16. Logistic Regression Models of Self-rated Health, NIS (2003-2007)

Variables	(1) b	(1) se	(2) b	(2) se	(3) b	(3) se
Interethnic connectedness	0.98	(0.05)	1.21***	(0.06)	1.22***	(0.06)
Years of education	1.05***	(0.01)	1.06***	(0.01)	1.05***	(0.01)
English language proficiency	1.38***	(0.09)	1.45***	(0.09)	1.36***	(0.09)
Age	1.02	(0.02)	0.96*	(0.02)	0.95**	(0.02)
Age squared	1.00**	(0.00)	1.00	(0.00)	1.00	(0.00)
Years in the U.S.	0.93***	(0.01)	0.97*	(0.01)	0.99	(0.01)
Years in the U.S. squared	1.00**	(0.00)	1.00	(0.00)	1.00	(0.00)
Household size	0.95**	(0.02)	0.98	(0.02)	0.99	(0.02)
Household income						
Less than $25,000	1.25*	(0.12)	1.01	(0.10)	0.93	(0.09)
$25,000 to $49,999	1.21	(0.16)	1.00	(0.13)	0.95	(0.12)
$50,000 to $75,000	1.25	(0.21)	1.04	(0.16)	0.94	(0.15)
More than $75,000	1.90***	(0.32)	1.25	(0.21)	1.04	(0.17)
Married	0.85+	(0.08)	1.02	(0.09)	1.08	(0.10)
Gender (female=1)	0.75***	(0.06)	0.90	(0.07)	0.96	(0.08)
Race						
Asian	1.00	(0.13)	0.68**	(0.09)	0.66**	(0.09)
Black	1.36+	(0.23)	0.94	(0.17)	0.85	(0.15)
White	1.01	(0.14)	0.88	(0.12)	0.87	(0.11)
Other	2.46*	(1.08)	1.02	(0.48)	0.82	(0.41)
Religious organization attendance	0.92	(0.09)	1.14	(0.11)	1.17	(0.11)
Religious organization membership	0.99	(0.12)	0.95	(0.11)	0.96	(0.12)
Religion						
Orthodox Christian	0.79	(0.12)	0.99	(0.14)	1.06	(0.15)
Protestant	0.95	(0.13)	1.10	(0.16)	1.16	(0.17)
Muslim	0.90	(0.16)	1.33+	(0.23)	1.40+	(0.24)
Jewish	0.55	(0.25)	0.37***	(0.11)	0.42***	(0.11)
Buddhist	0.85	(0.19)	0.83	(0.19)	0.89	(0.22)
Hindu	0.92	(0.17)	1.59*	(0.31)	1.67**	(0.32)
No Religion	0.77+	(0.11)	1.03	(0.15)	1.10	(0.16)
Other	1.10	(0.34)	1.17	(0.37)	1.09	(0.35)
Self-rated health in 2003					1.79***	(0.09)
N	3075		3075		3075	
Pseudo R^2	0.079		0.104		0.129	

Note: coefficients are exponentiated; robust standard errors in parentheses
+ p < .10, * p < .05, ** p < .01 (two-tailed significance tests)

Table A17. OLS Regression Models of Body Mass Index (BMI), NIS (2003-2007)

Variables	(1) b	se	(2) b	se	(3) b	se
Interethnic connectedness	-0.19	(0.17)	0.00	(0.12)	0.07	(0.11)
Years of education	-0.13***	(0.03)	-0.14***	(0.03)	-0.10***	(0.02)
English language proficiency	-0.11	(0.21)	-0.25	(0.16)	-0.21	(0.14)
Age	0.32***	(0.05)	0.25***	(0.04)	0.13***	(0.04)
Age squared	-0.00***	(0.00)	-0.00***	(0.00)	-0.00**	(0.00)
Years in the U.S.	0.17***	(0.04)	0.11***	(0.03)	0.05+	(0.03)
Years in the U.S. squared	-0.00***	(0.00)	-0.00***	(0.00)	-0.00*	(0.00)
Household size	0.04	(0.06)	-0.03	(0.05)	-0.04	(0.05)
Household income						
Less than $25,000	0.43	(0.30)	0.39	(0.25)	0.23	(0.22)
$25,000 to $49,999	0.57	(0.37)	0.35	(0.32)	0.13	(0.27)
$50,000 to $75,000	0.68+	(0.41)	0.29	(0.39)	0.04	(0.31)
More than $75,000	0.34	(0.46)	-0.39	(0.38)	-0.51	(0.36)
Married	-0.34	(0.32)	-0.32	(0.24)	-0.19	(0.22)
Gender (female=1)	-1.51***	(0.26)	-1.35***	(0.20)	-0.78***	(0.19)
Race						
Asian	-2.83***	(0.46)	-2.68***	(0.32)	-1.62***	(0.30)
Black	-1.19*	(0.48)	0.01	(0.44)	0.46	(0.39)
White	-1.26**	(0.42)	-0.97**	(0.33)	-0.50	(0.30)
Other	-0.81	(0.75)	-0.21	(1.03)	0.10	(0.88)
Religious organization attendance	-0.04	(0.30)	0.19	(0.25)	0.21	(0.22)
Religious organization membership	0.22	(0.33)	0.05	(0.29)	-0.03	(0.26)
Religion						
Orthodox Christian	-0.68+	(0.38)	-0.33	(0.56)	-0.08	(0.52)
Protestant	-0.39	(0.39)	0.13	(0.35)	0.27	(0.31)
Muslim	0.42	(0.64)	0.35	(0.46)	0.19	(0.46)
Jewish	2.20+	(1.15)	1.05	(0.90)	0.23	(0.76)
Buddhist	-1.52**	(0.51)	-1.22**	(0.44)	-0.65+	(0.36)
Hindu	0.07	(0.40)	0.26	(0.40)	0.24	(0.34)
No Religion	-0.68	(0.54)	-0.62+	(0.35)	-0.37	(0.32)
Other	0.05	(0.65)	0.16	(0.65)	0.15	(0.49)
BMI in 2003					0.37***	(0.04)
Constant	21.24***	(1.32)	24.27***	(0.95)	16.31***	(1.16)
Observations	2922		2922		2922	
R^2	0.168		0.185		0.363	

Note: robust standard errors in parentheses

+ $p < .10$, * $p < .05$, ** $p < .01$ (two-tailed significance tests)

Table A18. Negative Binomial Regression Models of Chronic Conditions, NIS (2003-2007)

Variables	(1) b	se	(2) b	se	(3) b	se
Interethnic connectedness	1.04	(0.03)	0.96	(0.03)	0.95+	(0.02)
Years of education	1.00	(0.01)	1.00	(0.01)	1.00	(0.00)
English language proficiency	1.03	(0.04)	0.98	(0.03)	0.98	(0.03)
Age	1.03*	(0.01)	1.06***	(0.01)	1.07***	(0.01)
Age squared	1.00	(0.00)	1.00+	(0.00)	1.00***	(0.00)
Years in the U.S.	1.03***	(0.01)	1.02**	(0.01)	1.00	(0.00)
Years in the U.S. squared	1.00***	(0.00)	1.00**	(0.00)	1.00	(0.00)
Household size	1.00	(0.01)	1.00	(0.01)	1.00	(0.01)
Household income						
Less than $25,000	1.06	(0.07)	0.99	(0.05)	0.97	(0.05)
$25,000 to $49,999	1.09	(0.09)	0.94	(0.07)	0.91	(0.05)
$50,000 to $75,000	1.15	(0.13)	1.00	(0.11)	0.97	(0.09)
More than $75,000	0.95	(0.11)	0.78**	(0.07)	0.79**	(0.07)
Married	0.97	(0.06)	0.97	(0.05)	0.99	(0.05)
Gender (female=1)	1.23***	(0.06)	1.19***	(0.05)	1.13**	(0.04)
Race						
Asian	0.92	(0.07)	1.05	(0.07)	1.08	(0.06)
Black	0.67***	(0.08)	0.82*	(0.08)	0.89	(0.08)
White	0.89	(0.09)	0.89	(0.07)	0.89+	(0.06)
Other	0.57*	(0.14)	1.06	(0.19)	1.31	(0.22)
Religious organization attendance	1.01	(0.06)	1.01	(0.05)	1.01	(0.05)
Religious organization membership	1.03	(0.08)	1.00	(0.07)	0.95	(0.05)
Religion						
Orthodox Christian	1.04	(0.12)	1.10	(0.10)	1.04	(0.08)
Protestant	1.06	(0.09)	1.03	(0.08)	1.02	(0.07)
Muslim	1.03	(0.12)	0.92	(0.10)	0.93	(0.09)
Jewish	1.14	(0.25)	1.34*	(0.18)	1.40*	(0.23)
Buddhist	0.73+	(0.12)	0.89	(0.12)	0.98	(0.12)
Hindu	1.05	(0.13)	0.84+	(0.09)	0.78**	(0.07)
No Religion	1.17+	(0.10)	1.22**	(0.09)	1.11	(0.08)
Other	1.10	(0.19)	1.13	(0.18)	1.07	(0.12)
Chronic conditions in 2003					1.36***	(0.02)
Observations	3095		3095		3095	
Pseudo R^2	0.085		0.099		0.163	

Note: coefficients are exponentiated; robust standard errors in parentheses
+ p < .10, * p < .05, ** p < .01 (two-tailed significance tests)

Table A19. Negative Binomial Regression Models of Smoking Frequency, NIS (2003-2007)

Variables	(1) b	(1) se	(2) b	(2) se	(3) b	(3) se
Interethnic connectedness	1.33*	(0.15)	1.29*	(0.15)	1.03	(0.12)
Years of education	1.01	(0.03)	1.00	(0.02)	0.98	(0.01)
English language proficiency	0.94	(0.15)	0.88	(0.14)	1.11	(0.17)
Age	1.07+	(0.04)	1.17**	(0.06)	1.08	(0.06)
Age squared	1.00	(0.00)	1.00**	(0.00)	1.00+	(0.00)
Years in the U.S.	0.96	(0.05)	0.98	(0.05)	0.95	(0.05)
Years in the U.S. squared	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
Household size	0.92+	(0.04)	1.02	(0.04)	1.06	(0.05)
Household income						
Less than $25,000	1.66+	(0.44)	0.92	(0.23)	0.66+	(0.16)
$25,000 to $49,999	1.54	(0.47)	0.74	(0.22)	0.62	(0.19)
$50,000 to $75,000	1.44	(0.64)	0.25**	(0.12)	0.12***	(0.06)
More than $75,000	0.81	(0.31)	0.33**	(0.14)	0.27**	(0.12)
Married	0.54**	(0.12)	0.54**	(0.12)	0.82	(0.19)
Gender (female=1)	0.28***	(0.05)	0.20***	(0.04)	0.21***	(0.04)
Race						
Asian	1.56	(0.54)	2.06*	(0.72)	2.25*	(0.75)
Black	0.53	(0.24)	0.46+	(0.20)	0.69	(0.30)
White	4.31***	(1.18)	5.66***	(1.59)	6.11***	(2.03)
Other	1.18	(0.93)	1.05	(0.76)	0.34+	(0.20)
Religious organization attendance	0.76	(0.16)	0.43***	(0.10)	0.57*	(0.13)
Religious organization membership	0.37**	(0.11)	0.47**	(0.14)	0.44**	(0.13)
Religion						
Orthodox Christian	0.51*	(0.15)	0.49+	(0.18)	0.62	(0.27)
Protestant	0.29***	(0.09)	0.25***	(0.09)	0.54	(0.21)
Muslim	0.93	(0.39)	1.21	(0.56)	0.38**	(0.14)
Jewish	0.71	(0.44)	0.44	(0.33)	0.34	(0.25)
Buddhist	0.48	(0.25)	0.27**	(0.11)	0.70	(0.31)
Hindu	0.21**	(0.12)	0.12***	(0.07)	0.10***	(0.07)
No Religion	0.77	(0.24)	0.30***	(0.10)	0.39**	(0.12)
Other	0.04*	(0.05)	0.00***	(0.00)	0.00***	(0.00)
smoking frequency in 2003					1.57***	(0.05)
Observations	3085		3085		3085	
Pseudo R^2	0.039		0.047		0.107	

Note: coefficients are exponentiated; robust standard errors in parentheses

+ $p < .10$, * $p < .05$, ** $p < .01$ (two-tailed significance tests)

Table A20. Negative Binomial Regression Models of Drinking Frequency, NIS (2003-2007)

Variables	(1) b	se	(2) b	se	(3) b	se
Interethnic connectedness	1.27***	(0.07)	1.12*	(0.06)	1.09	(0.06)
Years of education	0.99	(0.01)	1.02+	(0.01)	1.01	(0.01)
English language proficiency	1.10	(0.08)	1.29***	(0.09)	1.28***	(0.09)
Age	1.05+	(0.03)	1.00	(0.02)	0.98	(0.03)
Age squared	1.00+	(0.00)	1.00	(0.00)	1.00	(0.00)
Years in the U.S.	0.98	(0.02)	0.99	(0.01)	0.99	(0.01)
Years in the U.S. squared	1.00	(0.00)	1.00	(0.00)	1.00	(0.00)
Household size	0.94*	(0.03)	1.03	(0.02)	1.05*	(0.02)
Household income						
Less than $25,000	1.03	(0.13)	0.84	(0.10)	0.82+	(0.09)
$25,000 to $49,999	1.33*	(0.19)	1.01	(0.14)	0.91	(0.12)
$50,000 to $75,000	1.29	(0.22)	0.89	(0.16)	0.90	(0.17)
More than $75,000	1.56*	(0.29)	1.18	(0.19)	1.08	(0.16)
Married	1.11	(0.13)	0.91	(0.09)	0.91	(0.09)
Gender (female=1)	0.37***	(0.04)	0.32***	(0.03)	0.38***	(0.03)
Race						
Asian	0.78	(0.12)	0.62**	(0.09)	0.64**	(0.09)
Black	0.73	(0.16)	0.41***	(0.09)	0.43***	(0.09)
White	1.98***	(0.30)	1.27+	(0.17)	1.05	(0.14)
Other	1.45	(1.36)	0.85	(0.44)	0.53	(0.25)
Religious organization attendance	0.75*	(0.09)	0.72**	(0.07)	0.77**	(0.07)
Religious organization membership	0.95	(0.12)	0.98	(0.13)	0.97	(0.12)
Religion						
Orthodox Christian	0.57**	(0.12)	0.82	(0.12)	0.96	(0.15)
Protestant	0.66*	(0.11)	0.65**	(0.11)	0.62**	(0.10)
Muslim	0.16***	(0.05)	0.33***	(0.09)	0.40***	(0.11)
Jewish	0.34***	(0.11)	0.72	(0.31)	0.94	(0.36)
Buddhist	0.51*	(0.15)	0.70	(0.21)	0.79	(0.25)
Hindu	0.40**	(0.11)	0.57*	(0.14)	0.67+	(0.16)
No Religion	0.92	(0.14)	0.92	(0.14)	0.84	(0.12)
Other	0.69	(0.34)	0.64	(0.20)	0.70	(0.23)
drinking frequency in 2003					1.40***	(0.04)
Observations	3014		3014		3014	
Pseudo R^2	0.088		0.080		0.106	

Note: coefficients are exponentiated; robust standard errors in parentheses
+ $p < .10$, * $p < .05$, ** $p < .01$ (two-tailed significance tests)

Table A21. OLS Regression Models of Dietary Change, NIS (2003-2007)

Variables	(1) b	se	(2) b	se	(3) b	se
Interethnic connectedness	0.27**	(0.08)	0.03	(0.09)	-0.01	(0.09)
Years of education	-0.05**	(0.02)	0.03	(0.02)	0.04*	(0.02)
English language proficiency	0.18+	(0.10)	-0.04	(0.11)	-0.07	(0.11)
Age	-0.04	(0.03)	-0.12***	(0.03)	-0.11***	(0.03)
Age squared	0.00	(0.00)	0.00**	(0.00)	0.00**	(0.00)
Years in the U.S.	0.07**	(0.02)	0.05*	(0.02)	0.04+	(0.02)
Years in the U.S. squared	-0.00***	(0.00)	-0.00***	(0.00)	-0.00**	(0.00)
Household size	0.03	(0.03)	0.08*	(0.03)	0.08*	(0.03)
Household income						
Less than $25,000	-0.52**	(0.17)	0.10	(0.17)	0.19	(0.17)
$25,000 to $49,999	-0.38+	(0.21)	0.17	(0.22)	0.24	(0.21)
$50,000 to $75,000	-0.28	(0.28)	0.26	(0.29)	0.32	(0.29)
More than $75,000	-0.82**	(0.27)	-0.26	(0.27)	-0.11	(0.26)
Married	0.03	(0.16)	0.00	(0.17)	-0.00	(0.16)
Gender (female=1)	0.04	(0.14)	0.11	(0.14)	0.10	(0.14)
Race						
Asian	-1.29***	(0.22)	-0.26	(0.23)	-0.03	(0.23)
Black	-0.80**	(0.29)	0.35	(0.30)	0.50+	(0.30)
White	-1.13***	(0.23)	-0.45+	(0.24)	-0.25	(0.23)
Other	-1.33*	(0.66)	-0.73	(0.59)	-0.49	(0.58)
Religious organization attendance	-0.04	(0.17)	0.03	(0.17)	0.04	(0.17)
Religious organization membership	-0.04	(0.19)	0.18	(0.19)	0.19	(0.18)
Religion						
Orthodox Christian	0.40	(0.26)	-0.20	(0.25)	-0.27	(0.25)
Protestant	0.13	(0.24)	-0.02	(0.23)	-0.05	(0.22)
Muslim	0.16	(0.31)	-0.37	(0.30)	-0.40	(0.29)
Jewish	0.01	(0.52)	0.32	(0.52)	0.32	(0.54)
Buddhist	0.06	(0.33)	1.12**	(0.43)	1.11**	(0.42)
Hindu	-0.79**	(0.29)	-0.63*	(0.29)	-0.48+	(0.29)
No Religion	0.28	(0.23)	0.29	(0.25)	0.23	(0.24)
Other	-0.54	(0.42)	-0.46	(0.47)	-0.36	(0.47)
dietary change in 2003					0.18***	(0.02)
Constant	6.86***	(0.70)	7.10***	(0.72)	5.85***	(0.72)
Observations	2935		2935		2935	
R^2	0.091		0.041		0.071	

Note: robust standard errors in parentheses
+ $p < .10$, * $p < .05$, ** $p < .01$ (two-tailed significance tests)

Table A22. Tobit Regression Models of the Frequency of Physical Activity, NIS (2003-2007)

Variables	(1) b	(1) se	(2) b	(2) se	(3) b	(3) se
Interethnic connectedness	0.15	(0.13)	0.13	(0.13)	0.10	(0.12)
Years of education	0.05+	(0.03)	0.06*	(0.03)	0.06*	(0.03)
English language proficiency	0.35*	(0.18)	0.41**	(0.16)	0.34*	(0.15)
Age	-0.01	(0.05)	-0.02	(0.05)	-0.02	(0.04)
Age squared	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Years in the U.S.	-0.05	(0.03)	-0.02	(0.03)	-0.01	(0.03)
Years in the U.S. squared	0.00+	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Household size	0.02	(0.05)	-0.01	(0.05)	-0.01	(0.05)
Household income						
Less than $25,000	-0.19	(0.27)	-0.42	(0.26)	-0.39	(0.25)
$25,000 to $49,999	-0.12	(0.36)	-0.53+	(0.32)	-0.50	(0.31)
$50,000 to $75,000	-0.61	(0.50)	-0.18	(0.44)	-0.08	(0.44)
More than $75,000	0.21	(0.47)	-0.29	(0.41)	-0.33	(0.39)
Married	-0.10	(0.26)	-0.20	(0.23)	-0.18	(0.22)
Gender (female=1)	-0.49*	(0.23)	-0.27	(0.20)	-0.16	(0.20)
Race						
Asian	0.25	(0.40)	-0.83*	(0.37)	-0.84*	(0.36)
Black	1.11*	(0.47)	-0.73+	(0.41)	-0.92*	(0.40)
White	0.74+	(0.42)	-0.00	(0.34)	-0.14	(0.34)
Other	-0.80	(1.08)	-0.03	(0.82)	0.16	(0.86)
Religious organization attendance	0.56*	(0.27)	0.23	(0.25)	0.14	(0.24)
Religious organization membership	-0.25	(0.31)	0.02	(0.28)	0.06	(0.28)
Religion						
Orthodox Christian	0.37	(0.45)	0.05	(0.40)	-0.02	(0.39)
Protestant	-0.03	(0.37)	0.34	(0.35)	0.35	(0.34)
Muslim	-1.32*	(0.58)	0.14	(0.45)	0.37	(0.44)
Jewish	0.06	(0.85)	0.69	(0.68)	0.71	(0.70)
Buddhist	0.73	(0.64)	-0.89	(0.83)	-0.99	(0.79)
Hindu	-0.40	(0.53)	0.62	(0.49)	0.67	(0.46)
No Religion	0.83+	(0.45)	0.63	(0.41)	0.45	(0.38)
Other	0.24	(0.76)	0.01	(0.61)	-0.07	(0.60)
physical activity in 2003					0.25***	(0.03)
Constant	4.43***	(0.09)	4.08***	(0.09)	3.97***	(0.09)
Observations	2384		2384		2384	
Pseudo-R^2	0.010		0.009		0.018	

Note: robust standard errors in parentheses

+ p < .10, * p < .05, ** p < .01 (two-tailed significance tests)

Figure A1. Native-immigrant Gaps in Predicted Probabilities of Having the Most Ethnically Diverse Social Network
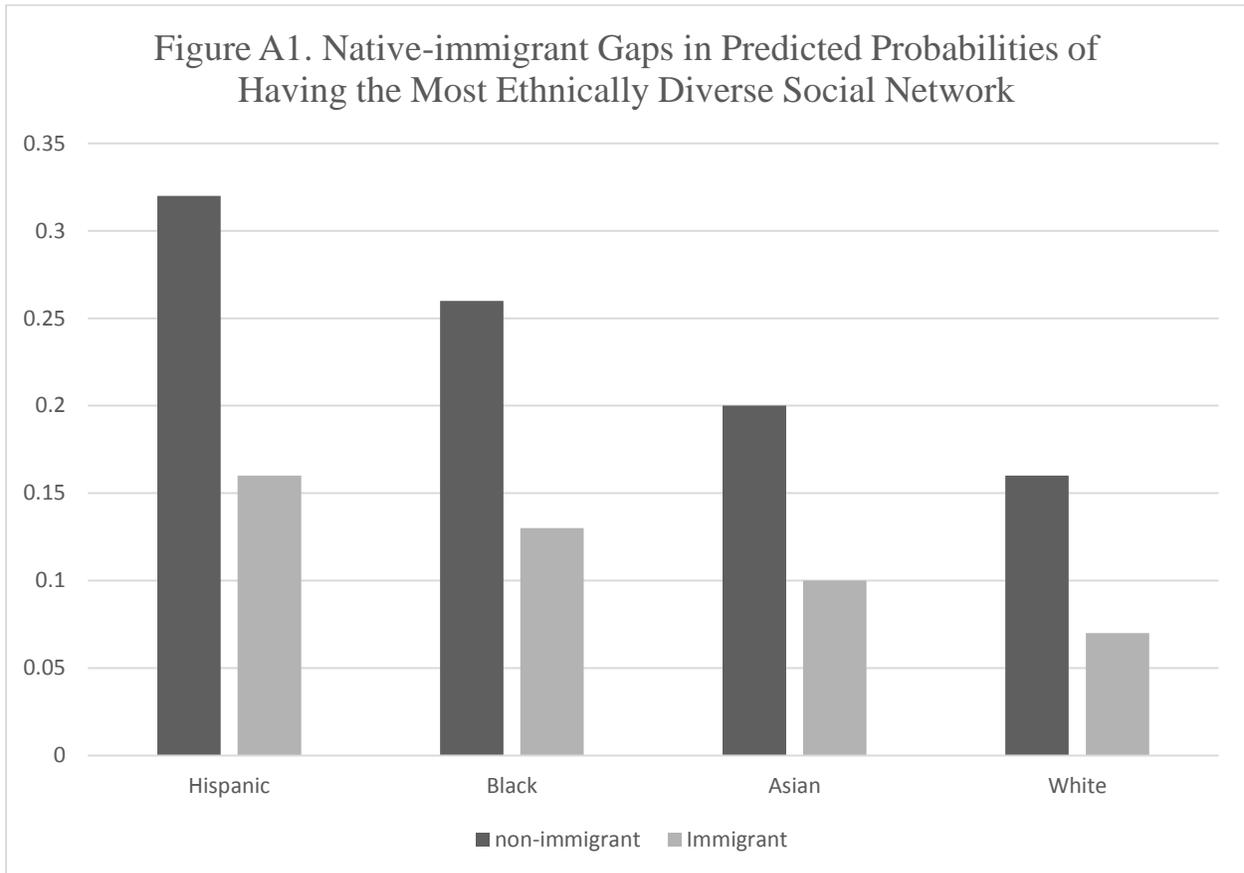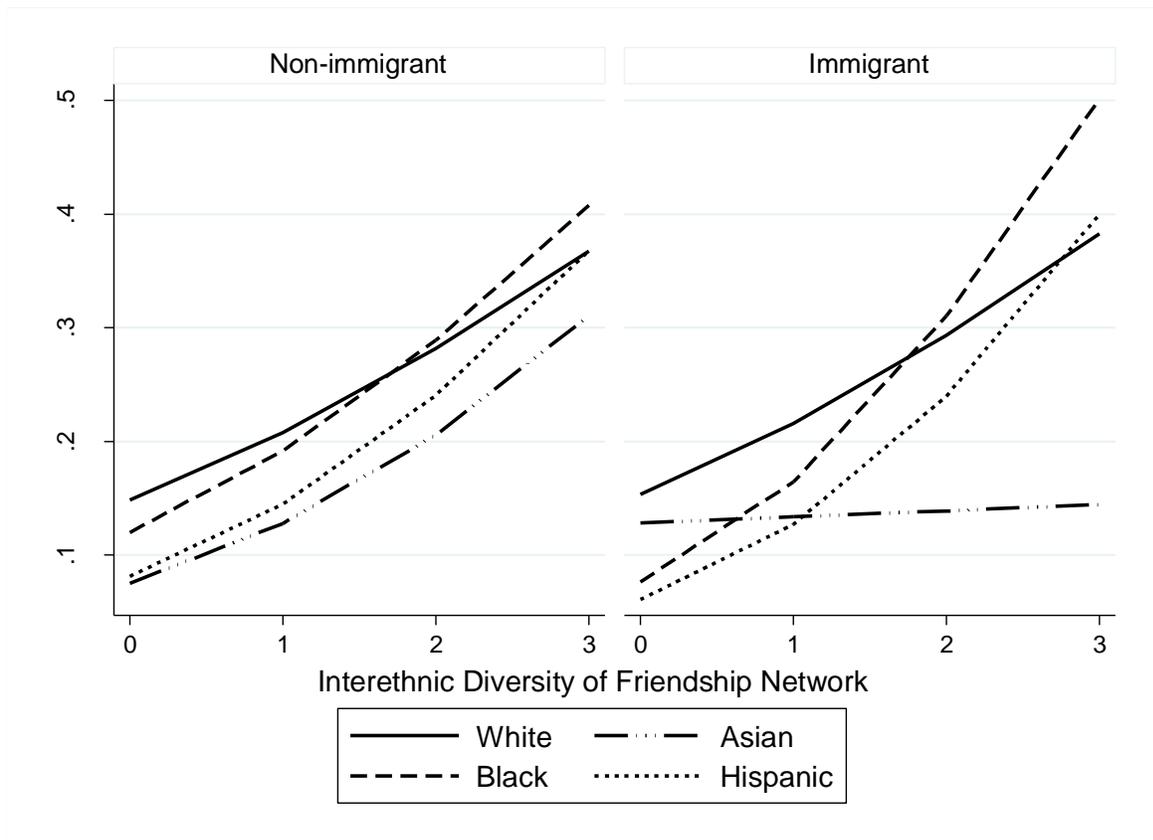
Figure A2. Returns to Network Ethnic Diversity (in Terms of Predicted Probability of Having the Highest Status Network), by Race and Immigration Status
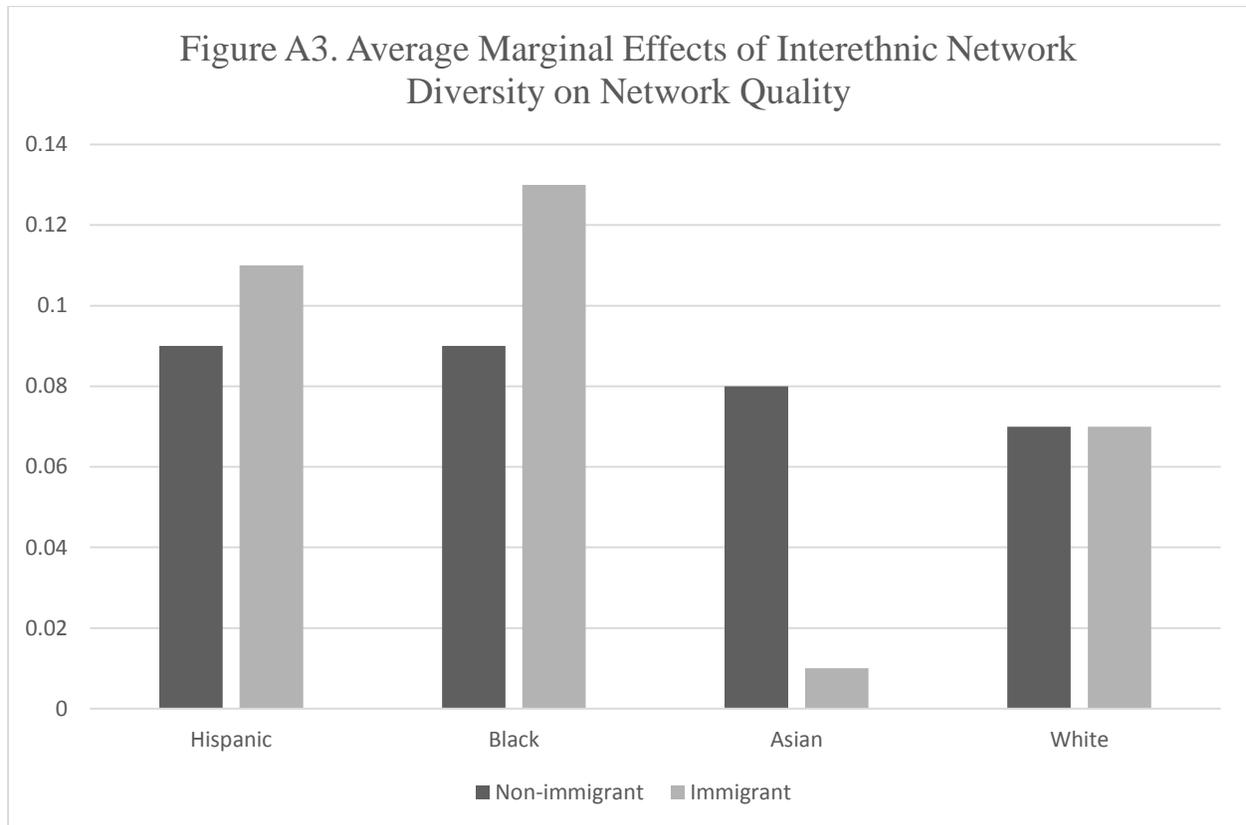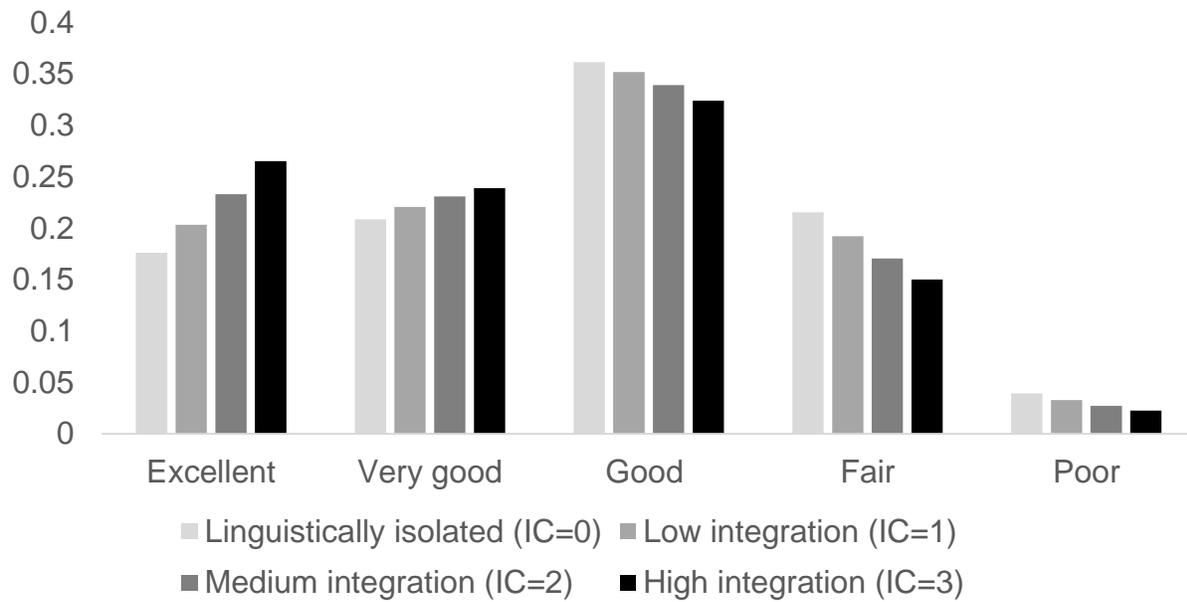
Figure A3. Average Marginal Effects of Interethnic Network Diversity on Network Quality

Figure A4. Predicted Probabilities of Self-rated Health Status, by Levels of Interethnic Connectednesss (IC)

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