EMPLOYMENT STATUS, OCCUPATION AND HEALTH AMONG IMMIGRANTS IN THE U.S.

by

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ABSTRACT

The purpose of this dissertation is to investigate employment status, occupation and health among immigrants in the U.S. The U.S. receives a larger number of immigrants than any other country in the world. Immigrant health and immigrant labor market outcomes are among the significant outcomes of interest that warrant renewed attention and further investigation given the large streams of immigrants into the U.S. and ongoing debates on the supposed burden upon healthcare resources posed by immigrants. By focusing on key features of the migration experience, we are able to advance knowledge on how circumstances in the course of migration and incorporation affect the way immigrants participate in the U.S. labor market and the U.S. healthcare system. Using data from the 2003 New Immigrant Survey (NIS), this study assesses the relationship between employment status, self-rated health and use of health services. It also provides an assessment of the relationship between education-occupation match and self-rated health and the relationship between occupational mobility and use of health services. Having ascertained that relatively healthy immigrants are also more likely to be presently employed than unemployed or out of the labor force, analyses of the NIS further reveal that there is a positive relationship between having a job and using health services among immigrants in the U.S. Compared to immigrants with occupations that match well with their education, immigrants who experience education-occupation mismatch, both in terms of over-education and under-education, are more likely to report

negative self-rated health rather than positive self-rated health. Higher occupation status and upward occupational mobility are associated with increased use of health services. These results support the body of literature showing that employment status and health are mutually reinforcing. With regard to the relationship between education-occupation match and self-rated health, the findings suggest that status consistency is protective of health. Higher occupational status and upward occupational mobility are associated with increased use of health services.

I dedicate this dissertation to my mum, dad and sister, who first taught me the value of working hard and rising to the challenge.

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CHAPTER 1

INTRODUCTION

Employment status and occupational status have consistently shown to be strong predictors of health outcomes (Tausig 2012; Wilcock 2006). Occupational health researchers and sociologists alike have sought to disentangle the mechanisms through which occupation affects health. While the appeal of this research is widespread, it presents novel research challenges for the immigrant population in the United States (U.S.). The U.S. is a salient place to study immigrant employment status, occupation status and health for several reasons. First, the U.S. receives a larger number of immigrants than any other country in the world, such that 13.3% of the total U.S. population consists of immigrants (Zong and Batalova 2015). Second, the U.S. has been probed on why some of its health markers, such as life expectancy, lag behind other developed countries or even poorer countries despite its high expenditures on healthcare. It stands to reason to question how the immigrant population and the large second-generation population contribute to the mixed picture of health outcomes in the U.S. In addition, the association between labor market outcomes and health outcomes of immigrants in the U.S. requires special attention.

As outlined in the classic, 'A theory of migration,' the economic motive dominates migration decisions among many other push factors (Lee 1966). A sizeable

percentage of individuals who migrate to the United States are driven by a desire to seek better work opportunities. For instance, according to the U.S. Census Bureau and the American Community Survey, in 2013, the magnitude of the immigrant population was 41.3 million and approximately 24.2 million of these immigrants (59%) were employed, foreign-born workers ages 16 and older (Zong and Batalova 2015). In comparison, the native-born population in 2013 in the U.S. numbered approximately 269 million, of which 121 million (45%) were native-born workers (Brown and Stepler 2015; Bureau of Labor Statistics 2015). While the economic motive to migrate to the U.S. may be paramount, it does not encompass other impetuses to migrate such as refugee migration, education and family reunification among others. Inasmuch as the reasons to migrate are diverse, understanding the diverse immigrants' health as they seek employment or pursue occupations is important because employment and occupation status can exert both protective and damaging effects upon individual health (Mirowsky and Ross 2003; Ross and Mirowsky 1995).

This dissertation builds upon and enhances previous research by exploring the migration experience and investigating the employment status, occupation status and health of immigrants in the U.S. The empirical analyses presented in this study seek to explain the labor market participation of immigrants in the U.S. In addition, the analyses aim to disentangle the relationship between occupation and health. Examining the relationship between occupation and health within a sociological context will aid in broadening the scholarship on occupational health, which has tended to focus relatively narrowly upon workplace hazards, rather than the social contexts in which the occupation and health relationship is embedded. A richer understanding of the employment,

occupation and health outcomes of immigrants in the U.S. may inform respective policies targeted at this population and characterize the process of labor market participation and health attainment for a growing and diverse immigrant population.

A range of factors in destination and sending regions influence the labor market participation and health outcomes of immigrants in the United States (Ro 2014). Immigrant workers are selected in different ways from origin areas and they assimilate and contribute in distinctive ways in host nations' labor markets (Borjas 1989; Orrenius and Zavodny 2013). For some immigrants who secure employment before they leave their origin countries and migrate on employment visas, navigating the labor market in the U.S. may be easier than it is for immigrants who migrate through other visa categories, such as family reunification or refugee visas, among others. This results in varied labor market outcomes for immigrants, wherein some immigrants actively seek and secure employment while others may end up being voluntarily or involuntarily unemployed or out of the labor force as homemakers, retired workers or full time students.

Immigrants in the U.S. work in a range of occupations at different levels of the occupation hierarchy. They also convey innovative ideas and contribute immensely to the U.S. economy (Peri 2010). Even though immigrants are dispersed across the occupation hierarchy, there is immigrant occupation clustering in some low-level occupation sectors. Immigrants often face challenges that are a result of their occupational positions vis-à-vis native-born workers. For instance, Table 1.1 shows that immigrants are overrepresented in service occupations; natural resource, construction and maintenance occupations; and production, transportation and material moving occupations. Approximately 54% of

foreign-born workers are employed in these three low-level, physically demanding occupation sectors. Compared to U.S. natives, the areas of the economy in which immigrant work is concentrated have many physical risks (Orrenius and Zavodny 2013). Evidence from England (Lee and Wrench 1980), the Netherlands (Elders, Burdorf, and Ory 2004), Singapore (Collins 1959), Australia (Corvalan, Driscoll, and Harrison 1994), Canada (Premji et al. 2010) and the United States Fuentes 1974; Menendez and Havea 2011) suggests that immigrants involved in riskier occupations face elevated physical, psychological and emotional health risks (Salminen 2011).

Navigating a new labor market is often difficult for immigrants because they might have to learn a new language, adapt to demanding labor conditions, learn new skills and new labor laws, and learn to exist as a social minority (Birman, Trickett, and Vinokurov 2002). They may face workplace discrimination, work in hazardous occupations, be unaware of health and workers' rights, fail to access health insurance, and work in low-status and low-paying jobs that are occasionally shunned by Americans (Liebman et al. 2013; Orrenius and Zavodny 2013; Waldinger and Lichter 2003). In addition, immigrants often face job-related stressors that affect their psychological health (Ding and Hargraves 2009; Zeynep and Berry 1996), chronic health problems (DeCastro, Gee, and Takeuchi 2008), and healthcare utilization (Leclere, Jensen, and Biddlecom 1994). It is important to focus on the workplace and hierarchical occupational structure as milieus shaping health outcomes in immigrant populations because of immigrants' distinct employment status and occupational positions in the U.S. labor force, and because "Occupation is a potent social, environmental and socioeconomic determinant of health" (Chung-Bridges et al. 2008).

Immigrant Experiences in the Host Country Labor Market

Immigrant labor market status in host countries is determined by premigration and postmigration human capital, sector of employment, duration of residence and other acculturation factors. Chiswick, Cohen, and Zach (1997) analyzed the labor market status of immigrants in the U.S. using Current Population Survey data from 1979 to 1988. They found that recent immigrants faced high unemployment rates and lower employment rates than natives; however, their unemployment rates decreased and employment rates increased with duration of residence. This finding suggests that immigrants need time to acclimate to host country labor markets before they start to experience positive employment experiences and upward occupational mobility. It is consistent with other studies (Borjas, Bronars, and Trejo 1992; Chiswick 1978; Hum and Simpson 2000), which demonstrate the significance of duration of residence for a host of economic assimilation outcomes.

Imperfect human capital transferability between origin countries and host countries has been cited as one of the reasons why immigrants face unemployment or occupation downgrade in destination labor markets (Chiswick and Miller 2008). Imperfect human capital transferability occurs when immigrants are not able to use the education and skills they gained in their home country in the host country's labor market because of differences in educational systems and labor markets that exist between countries. While imperfect human capital transferability outcomes are involuntary, some immigrants elect to be employed in lower-level positions than the positions they had in their origin countries because the host nation may offer higher and relatively more stable income compared to the income the immigrants earned in their origin areas. These jobs

may not match the education, skills and experience the immigrants possess. This trend has been noted for maids (Hondagneu-Sotelo 2007; Margolis 1990; Parrenas 2001), taxi drivers (Xu 2012), food processing industry workers (Stull, Broadway, and Griffith 1995) and other lower-level positions that immigrants occupy as a result of occupation downgrades.

Some host countries, such as Spain, offer foreign-born workers job readiness programs that prepare them to explore the host country's labor market and secure employment (Garcia-Ramirez et al. 2005). Alternatively, immigrants may resort to enclave labor markets and social networks with whom they share a region of origin or ethnicity as they navigate and integrate into the destination country's labor market (Bailey 1987; Pfeffer and Parra 2009). The presence of immigrants in the host country labor market is a contentious issue within most host nations. Some scholars argue that immigrants compete with natives for lower-level positions and leave natives disadvantaged (Borjas 2003a) while other scholars contend that immigrants do not disadvantage natives in lower-level occupations (Reischauer 1989). Immigrant and native-born employment is dependent on the host country's economic position and the current forces of labor supply and labor demand in the host nation labor market. Exploring immigrant labor market experiences in host country labor markets will allow us to address the question of how employment status and occupation are related to immigrant health outcomes, an issue that we begin to explore below.

The Relationship Between Occupation and Health

Beyond migrating, assimilating and finding a job or pursuing a career in the United States, occupation plays a major, largely unexamined, role in the health of immigrants in the U.S. labor force. Occupation, together with education and income, are key elements of socioeconomic status and each of these constituent parts captures distinctive attributes of the concept of socioeconomic status (Blau and Duncan 1967). Education measures the human capital attributes of skills, abilities and psychological resources; income quantifies the monetary rewards awarded to an individual for participating in an occupation; and occupation is the primary determinant of labor market outcomes such as position on the occupation hierarchy, and occupational mobility because it stratifies individuals based on education and income (Smith and Frank 2005).

One's occupation signifies prestige and is defined by characteristics of the job, such as the demands of physical or mental labor (Ganzeboom, DeGraaf, and Treiman 1992; Hauser and Warren 1997; Hodge 1981); the extent to which one exercises autonomy or is controlled by others; and the terms of one's day-to-day work life (Mirowsky and Ross 2003). Additionally, given the time committed to working hours, occupation influences the environment, conditions and social relationships in which one is embedded on a daily basis. For these and other reasons, occupational mobility and occupational positions have a relevancy for health that, analyzed critically, can lend new insights into scholarship on the determinants of immigrant health.

Occupational downgrading provides one rich, but poorly understood, example of a dynamic process in immigrants' occupational careers that is relevant for health status and change in health over time. Immigrants usually face occupation downgrading and

they might be overqualified for the roles they undertake because human capital and skills may not be portable between their countries of origin and the U.S. (Chiswick and Miller 2009; Jasso, Rosenzweig, and Smith 2003). Discrepancies and inconsistencies in matching education and skills to occupation can be stressful and detrimental to immigrant worker health, more so in cases where immigrants take on jobs that they were not trained for (Abramson 1966; Al-Maskari 2011; House and Harkins 1975; Ro 2014).

Understanding the underlying mechanisms in the relationship between immigrant occupational status and health outcomes should be of elevated importance for sociologists. It is crucial to understand this relationship because, as presented in Table 1.1, immigrants constitute a large percentage, approximately 20%, of the working population in the United States, and they often face a range of occupation and health problems when they migrate. Even though research consistent with the Epidemiological Paradox often points to a health advantage for Hispanic immigrants (Markides and Eschbach 2005), there are limits and exceptions to this observation that need to be attended to by disentangling occupation and health associations for the general immigrant population. Furthermore, positive selection of immigrants and health protective effects arising through social support and culturally supported behaviors may be reinforced or eroded through occupation-related resources, contexts and dynamics. A greater understanding of the relationship between immigrant occupation and health in a sociological context is essential to maintaining a healthy immigrant worker population and economy.

Occupational Health and Occupational Contexts

Occupational health researchers emphasize the types of work individuals perform and the work related risks they are exposed to on the job as key mechanisms linking occupational status to health outcomes (Harrington and Gill 1983; Parmeggiani 1983). Accordingly, low-status, labor intensive and demanding jobs are regarded as posing unique occupational hazards to health (Lundberg 1999; McCauley 2005; Schenker 2010), while high status jobs pose health risks related to on-the job stressors and demanding responsibilities, such as long work hours, associated with these occupations (DeCastro, Gee, and Takeuchi 2008; Mirowsky and Ross 2003). Given the link between job status and health risks, it is particularly important to investigate this relationship for immigrants because they are often located at the margins – occupying some of the lowest level occupational positions in the labor market, and positions that are associated with particular health risks.

Several empirical studies have documented the risks associated with employment in low-level occupations. For example, a study of Hispanic immigrants' employment status, health and elevated risk of injury in construction, which used emergency room data from 1990 to 1998, showed that the majority of injured Hispanic workers within the construction industry worked in less-skilled trades (Anderson, Hunting, and Welch 2000). Similarly, Mexican immigrant farmworkers in the U.S. are found to suffer from persistent muscle and skeletal injuries, functional disabilities, and poor health-related quality of life because of the nature of their labor intensive, low-status jobs (Weigel, Armijos, and Beltran 2014). "These observations suggest that minority status is a predictor of trade and that trade is a predictor of injury risk" (Anderson, Hunting, and

Welch 2000: 176). While occupational health research is invaluable in providing a basis to understand the effects of workplace occupation on health, the field currently leaves unanswered questions about occupational contexts and socioeconomic and demographic settings as they impact upon immigrants' health. Studying the effects of occupational status on health beyond the workplace will lend clues to the sociodemographic and economic mechanisms that may lead to the observed outcomes.

Employment, Occupation Status and Health Among Immigrant Populations

Immigrant health and immigrant labor market outcomes are among the significant outcomes of interest that warrant renewed attention and further investigation given the large streams of immigrants into the U.S. and ongoing debates on the supposed burden upon healthcare resources posed by immigrants (DuBard and Massing 2007; Ku and Matani 2001; Ku 2009; Martin and Ruark 2010; Mohanty et al. 2005; Okie 2007). The size of the immigrant population in the U.S. in 1970 was 9.6 million, representing a 5% share of the U.S. population. By 2013, the U.S. immigrant population had grown to 41.3 million, or 13% of the total U.S population (Zong and Batalova 2015). Scholars have much to learn about the relevance of immigrants' employment experiences for their health outcomes. Although the appeal of immigrant work and health outcomes in the U.S. is not unique to this time period, the continued increase in the flow of immigrants, as well as the growing diversity of immigration flows to the U.S., elevates the importance of understanding the many diverse social determinants, such as experiences of employment and occupational mobility, that influence immigrant health (Brown 2015).

Healthcare expenditures in the U.S. are not uniform across all native-born and

immigrant populations. Evidence suggests that the expenditures for healthcare for U.S.-born citizens and naturalized immigrants are higher than the healthcare expenditures for noncitizen immigrants and undocumented immigrants (Goldman, Smith, and Sood 2006; Mohanty et al. 2005; Stimpson, Wilson, and Eschbach 2010). These observations call for inquiry into what accounts for the differences in healthcare expenditures for immigrant populations, differences which may arise through different experiences of health, illness and injury across the groups, as well as differences in their approaches to seeking and paying for healthcare. Research on the relationship between immigrant work and health is an important domain in the sociology of migration and its significance will increase as the population of immigrants continues to rise and the debate on expenditure for healthcare for immigrants ensues.

Most evidence on immigrant health outcomes in the U.S. comes from investigations guided by the Epidemiological Paradox. The Epidemiological Paradox contends that Hispanic immigrants to the U.S. experience relatively positive outcomes that contradict their relatively low socioeconomic status positions in some instances (Franzini, Ribble, and Keddle 2001; Markides and Eschbach 2005). Bostean (2013), Crimmins et al. (2007) and others, seeking to explain this contradiction with an emphasis on health selectivity before migration, have obtained mixed results for different health outcomes. In addition to the spirited debate over whether such a paradox exists (Crimmins et al. 2007; Smith and Bradshaw 2006), there has been further discussion regarding what sorts of individual characteristics or migration processes make Hispanic immigrants likely to enjoy the health benefits of the paradox. Some of the explanations lie in the salmon bias that predicts that sick immigrants return to their origin countries

(Abraido-Lanza et al. 1999), while 'healthy immigrant effect' explanations maintain that healthy individuals are selected to migrate in the first place. Other studies have obtained evidence, which contradicts the Epidemiological Paradox for specific health outcomes such as studies focusing on biological risk profiles for specific age groups (Crimmins et al. 2007) and body mass index (Abraido-Lanza, Chao, and Florez 2005).

Researchers are continually studying the Epidemiological Paradox but few studies have specifically explained the effects of the individual components of socioeconomic status of education, income and occupation on the health of immigrants. This is largely because the explanations for immigrant health outcomes in literature framed by the Epidemiological Paradox paradigm have highlighted immigrant selection from origin countries and immigrant acculturation in the U.S. (Abraido-Lanza, Chao, and Florez 2005), and they tend to ignore the structural contexts that shape socioeconomic status and labor market outcomes (Viruell-Fuentes 2007). To date, literature and research that examines the Epidemiological Paradox has barely addressed employment status and occupation status as important variables that can affect not just Hispanic immigrants, but the health of immigrant populations in general. Immigrant work and health outcomes cannot be fully understood by confining analysis to Hispanic immigrants because the immigrant population in the U.S. is diverse, spanning a wide range of socioeconomic positions, national origins and other features related to health. Although several scholars have expanded the field of inquiry beyond Hispanic immigrants and their second-generation children by studying the health of other immigrant populations such as Asians (Salant and Lauderdale 2003), Asian Americans and Latinos (Hong, Zhang, and Walton 2014), an examination of the health of a sample of immigrants that represents the entire

immigrant population in the U.S. is still relatively rare, but essential (Akresh 2009; Akresh and Frank 2008; Kagotho and Tan 2008; Quinn 2015).

We know that employment status and occupation status matter for health outcomes (Dooley, Fielding, and Levi 1996; Ferrie 2001; Mirowsky and Ross 2003; Ross and Mirowsky 1995; Winkleby et al. 1992). Employment status and occupational status are fundamental determinants for health outcomes for immigrants because they provide income and other benefits, such as health insurance, that encourage the adoption of healthy behaviors and permit access to and use health services (Phelan, Link, and Tehranifar 2010). Immigrants tend to be favorably selected based on education compared to those left behind (Chiswick 1999; Feliciano 2005), but not all immigrants are selected based on education. Despite individual migrant education and skills, some immigrants' origin country education and skills may not be perfectly transferable in the U.S. labor market (Chiswick, Lee, and Miller 2005; Chiswick and Miller 2009; Friedberg 2000). This leaves immigrants placed in a range of states of employment or occupation statuses either voluntarily or involuntarily.

Similar to the concept that immigrants who have better education are selected to migrate to the U.S. (Feliciano 2005), some scholars have studied and debated the concept of selectivity of immigrants based on health (Abraido-Lanza et al. 1999; Arrighi and Hertz-Picciotto 1994; Baillargeon et al. 1998; Bostean 2013; Gee et al. 2004; Jasso, Rosenzweig, and Smith 2003; MacDonald and Kennedy 2004; Newbold 2006). There is a strong positive relationship between selectivity of immigrants based on human capital attributes and selectivity of immigrants based on health (Jasso, Rosenzweig, and Smith 2003). But is this relationship always true? And if not, what explains the divergence?

Might positive health selection apply more so to particular groups of immigrants than others?

We can derive some explanations for immigrant human capital selectivity and health selectivity from the healthy worker effect (HWE) (McMichael, Spirats, and Kupper 1986). The premise behind the HWE is that individuals who have the skills and education to work are also healthy and fit to do so, otherwise they would not seek employment. Several studies have critically reviewed and tested the HWE and there is general consensus that workers are healthier than the general population, although differences in health outcomes may vary depending on key covariates such as age, gender and race among other factors (Howe, Chiarelli, and Lindsey 1988; Li and Sung 1999; Monson 1986; Wen and Gibson1983). Questions arise as to whether immigrant workers are also healthier than the general nonworker population in host countries as postulated by the HWE. Some variation may exist in the immigrant worker population because of immigrant experiences in the U.S. labor market where some may not be able to transfer their home country education and skills to the U.S. labor market (Chiswick, Lee, and Miller 2005; Constant and Massey 2005). Imperfect transferability of immigrant human capital in the U.S. labor market could negatively impact immigrant health. Additionally, immigrants may face stressful work conditions, costly endeavors to acquire more suitable host country education and skills and other structural barriers to employment and occupational mobility that can undermine their health (Cardanoa, Costab, and Demaria 2004; Eaton and Lasry 1978). Therefore, it is important to consider work and work contexts in analyzing immigrants' health and health disparities among immigrants.

In order to understand immigrant health selectivity and health acculturation in the

U.S., Jasso, Rosenzweig, and Smith (2003) discussed two theoretical models that provide some insights into the immigrant work and health relationship. The first was a migration model of initial health selectivity, which pointed out the importance of migration costs, environmental factors and personal factors in immigrant selection based on health. The theory posits that favorable health has the potential of boosting an immigrants' earning capacity because good health enables immigrants to work and fully utilize their education and skills.

The second theoretical model presented and adopted by Jasso, Rosenzweig, and Smith (2003) was the migration model of subsequent health trajectory. The model maintains that host country health outcomes for immigrants (H^m_t), are a function of an individuals' health before migrating, personal factors and other macro and micro level factors that affect health and which act in the origin and destination countries. It recognizes the importance of premigration health (H_{t-1}), the price of medical care (P_{mc}), the price of other inputs (P_o) – which could signify adoption of good health behaviors (good diet and exercise) and avoidance of bad ones (smoking, excessive drinking) –, individual education (ED), country specific environmental factors (E_t), household income (Y_t), family background and genetic factors (G_o).

$$H^m_t = H^* (H_{t-1}, P_{mc}, P_o, ED, E_t, Y_t, G_o),$$

Informed by this model, it is clear that both premigration and subsequent health outcomes are affected by individual occupation, because occupation determines individual income, which in turn determines whether an individual will be able to afford

the price of adopting healthy behaviors or accessing and using healthcare facilities. Country-specific environmental factors represent crucial structural environmental and socioeconomic contexts within which labor markets and employment outcomes for immigrants occur. Additionally education is an essential background socioeconomic variable that ultimately determines occupation status – perhaps in a limited way for immigrants who experience occupation downgrading – and it is also useful as a knowledge endowment that may foster immigrants' abilities to discern good health practices.

Immigrants undertake their journeys for diverse reasons, such as to reunify with family members, to flee political and economic conflict and persecution, or to pursue educational or work opportunities. Employment status, occupational attainment and health status, accordingly, are likely to diverge significantly across immigrants with different migration statuses (Jasso et al. 2000). The employment and occupation outcomes of refugees, asylum seekers, family members of U.S. citizens and diversity visa holders may differ from immigrants with employment visas. Immigrants with employment visas may face fewer difficulties in the labor market relative to immigrants with other visas who may need to learn English and acquire U.S. education before they secure a stable job. For example, having gone through hardship and persecution, refugees and asylum seekers may have encountered traumatic experiences or difficult migration journeys that might negatively impact their occupation trajectories and health relative to immigrant workers or immigrants with other types of visas (Beiser 2005; Carballo and Nerukar 2001). Evidence suggests heterogeneity in the labor market outcomes of immigrants depending on the type of visa they possess (Jasso and Rosenzweig 1995).

Regardless of human capital selection and health selection in origin countries and visa status, some immigrants experience worsening health outcomes compared to natives the longer they stay in a host country (Gordon-Larsen et al. 2003; Lee et al. 2013; Lopez-Gonzalez, Aravena, and Hummer 2005; Newbold and Danforth 2003). For instance, a study carried out in Canada comparing the health status of Canadian immigrants and Canadian natives found that Canadian immigrants experienced persistently poorer health status after controlling for sociodemographic factors compared to Canadians except for recent immigrant arrivals to Canada (Newbold 2005). The socioeconomic and sociodemographic factors that were related to unhealthy outcomes for immigrants in this study were lower levels of education and income and not participating in the labor force or being older. Since these variables are all related to employment, their significance in this study suggests that work is a crucial determinant of immigrant health (DeCastro, Gee, and Takeuchi 2008; Nicklett and Burgard 2009).

Using a comprehensive approach to study the relationship between immigrant labor market outcomes and self-rated health and use of health services will provide answers for questions of how employment status and occupational mobility affect immigrant health in the U.S. For instance, do immigrants find better occupations in the U.S.? The theory of cumulative advantage in health assumes that better economic opportunities lead to better health (Wilson, Shuey, and Elder 2007), but how does occupational mobility influence immigrant health? By which mechanisms does occupational status and occupational mobility influence health? A sociological perspective that attends closely to structure can advance research on immigrant occupation and health and inform broader migration and health policies, not just

workplace policies.

Study Aims

In attempting to answer questions of whether occupational mobility influences immigrant health and by which mechanisms occupational status and occupational mobility influence health, I will carry out three empirical studies. I will assemble and critically evaluate existing empirical studies that bear directly and indirectly on immigrant employment status, occupation experiences and health and place these studies in a framework that emphasizes employment status and occupation among the factors affecting immigrant health. My approach draws from extensive research in the field of occupational health, and also focuses on the links between immigrant employment status, occupation and health and the underlying mechanisms affecting this relationship. I aim to extend beyond a narrow focus on susceptibility to workplace injuries or hazards, suggesting theoretically and practically sound possibilities for future research on the social and contextual factors that influence immigrant health, employment status and occupational status.

Second, I will empirically investigate (1) whether there is a relationship between immigrant employment status and health and (2) whether there is an association between education-occupation match and self-rated health (3) whether immigrant occupational status and occupational mobility are positively or negatively related to health. Following approaches common within social science research, in particular Ganzeboom, DeGraaf, and Treiman (1992), I perceive of occupational status as a numerical measure of prestige associated with an individual's job. Occupational mobility refers to the upward or

downward shift in occupational status that is experienced by an individual between their first job abroad and their current occupation in the United States. I will combine these research premises by specifically exploring employment status, different states of occupational status, self-rated health and use of health services.

Organization of This Dissertation

The rest of this study consists of five chapters. Three empirical analyses are presented in Chapter 3, Chapter 4 and Chapter 5. This study employs New Immigrant Survey data, a probability sample of 8,573 new legal immigrants living in the U.S., to explore the relationship between immigrant labor market outcomes and health outcomes. Chapter 2 shows the data and description of studies. In each of the three empirical chapters, I discuss theoretical frameworks and literature reviews on health consequences of labor market outcomes specific to research questions for each study. Using these data, I predict that if immigrants experience negative setbacks in their employment or occupational status outcomes, these experiences will be mirrored with negative self-rated health and lower use of health services. The measures and statistical procedures I adopt for each study are described in detail in the respective chapters. The key results of the three empirical analyses are also discussed in Chapters 3, 4 and 5. Finally, Chapter 6 summarizes the study results, provides concluding remarks for the current study and suggests possible opportunities for future studies.

Table 1.1: Share of Immigrant and U.S.-Born Workers by Select Occupation, 2013

Civilian workers aged 16 and older	Foreign-born 24,230,010	U.S.-born 120,898,666
% Civilian workers employed in:		
Management, business, science and arts occupations	29.8%	37.7%
Service occupations	25.1%	17.0%
Sales and office occupations	17.1%	25.6%
Natural resource, construction and maintenance occupations	12.9%	8.1%
Production, transportation and material moving occupations	15.2%	11.6%

Source: Zong and Batalova (2015) Migration Policy Institute (MPI) tabulation of data from U.S. Census Bureau 2013 ACS *(does not include undocumented immigrants)*.

CHAPTER 2

DATA AND DESCRIPTION OF ANALYSES

The data for this investigation came from the New Immigrant Survey (NIS) project (see http://nis.princeton.edu). The purpose of the NIS was to provide a public use database on new legal immigrants to the United States and their children that would be useful for addressing scientific and policy questions about migration behavior and the impact of migration (Jasso, Rosenzweig, and Smith 1999). The survey was designed to provide information on immigrant social networks, citizenship status, assimilation, education, employment and health.

The NIS is a nationally representative multicohort longitudinal study of new legal immigrants and their children to the United States. The data are based on a nationally representative sample of the administrative records compiled by the U.S. Immigration and Naturalization Services, relating to immigrants newly admitted to permanent residence (Jasso et al. 2005). The first wave of the data was collected using in-person interviews between May and November 2003. The initial sampling frame of 289,478 individuals consisted of all immigrants aged 18 and older who were granted legal permanent residency status in the year prior to the NIS survey and had a 'green card' or proof of legal permanent residence. Immigrants from most countries were represented in the data because the survey subsampled 12,500 respondents using geographic sampling

techniques for 85 Metropolitan Statistical Areas (MSAs) and 38 counties in the U.S. From this subsample, 8,573 respondents completed in-person interviews in 2003, resulting in a 68.6% response rate that was 1.4% lower than the target response rate of 70% or 8,750 respondents (Jasso et al. 2005). Immigrants were located at the addresses where they requested to have their 'green cards' sent and they were interviewed in their preferred language.

Since immigrants are a highly mobile population, some immigrants could not be located for the interview in 2003 hence the discrepancy between the subsample of 12,500 and the 8,573 immigrants who were actually interviewed (Jasso et al. 2005). For these, and other reasons, only 4,363 respondents completed the follow up interviews for wave 2 data collection in 2007-2009. The survey's high attrition rate of approximately 50% between wave 1 and wave 2 data collections precluded the use of longitudinal data in this study.

Cross-sectional and retrospective wave 1 data of the NIS are suitable for the present analysis for several reasons. One of the strongest features of the dataset is that it is one of the largest and most recent studies of new immigrants admitted to permanent resident status in the United States. Undeniably, the NIS study captures a large number of diverse respondents of different age groups from different national origins and includes more recently collected data compared to earlier studies of immigrants. For instance, the Mexican Migration Project began data collection in 1982 with a sample of 162,293 Mexican immigrants implying that the data are more geographically focused on country of origin compared to the NIS, which samples immigrants irrespective of national origin. Another example is data gathered from the Children of Immigrants Longitudinal Study,

which were first collected in 1992 with a sample of 5,262 respondents, which only consisted of first-generation immigrants in Miami and San Diego. The Children of Immigrants Longitudinal Study has a restricted geographic reach in the U.S. focused on second-generation immigrants in Miami and San Diego only relative to the NIS, which samples all immigrants regardless of their region of residence in the U.S.

Data from immigrants with legal permanent residence status such as that obtained in the NIS have the advantage of removing the effect of confounding from legal status. Interviewing undocumented immigrants in a national survey could lead to biased responses or nonresponse if the undocumented immigrants are afraid of being tracked down or being deported (Cornelius 1982). In addition, the NIS contains detailed information on current and retrospective immigrant occupation, health and sociodemographic characteristics, the central variables in the current analyses.

While the NIS provides a rich source of data for legal immigrants in the U.S., it falls short because it may not necessarily represent the true picture of immigrants in the U.S. We know that the immigrant population consists of both legal and undocumented immigrants. Excluding undocumented immigrants and legal immigrants who do not qualify yet for permanent residence status from the survey could compromise the validity and generalizability of findings from studies that use the NIS data to a relatively narrow group given the large share of undocumented immigrants in the U.S. Undocumented immigrants are likely to have different health and occupation patterns and outcomes than those for legal immigrants interviewed in the NIS. Furthermore, the NIS was designed to be a source of longitudinal data for immigrants but it suffered from a low follow-up interview response rate of approximately 50% in wave 2 (2007-2009) data. This

shortcoming narrowed the scope of this study's methodology from an analysis of longitudinal data to cross-sectional analyses that incorporated some of the retrospective elements of the survey.

Description of the Analyses and Samples

This dissertation consists of three distinct studies, which come together to provide a picture of legal immigrant's occupation and health in the U.S. A brief background of the studies and sample sizes for each study is presented in this section. The studies in the dissertation are as follows:

1. Chapter 3 – Employment status and use of health services among immigrants in the U.S.
2. Chapter 4 – Education-occupation match and self-rated health: Exploring the migration experience.
3. Chapter 5 – The role of immigrant occupational status and occupational mobility in immigrants' use of health services.

The first study examines the relationship between use of health services and the different states of employment such as "employed", "unemployed" and "out of the labor force". The second and third studies consider use of health services and self-rated health as they relate to different states of education-occupation match, occupational status and occupational mobility for immigrants with occupations. The rationale behind distinguishing between occupation status and employment status was to examine the relationship between employment status and health first, before analyzing the effect of occupational status and occupational mobility on the health of immigrants. In addition,

separating employment status and occupational status provided insights into selection into current employment among permanent resident immigrants in order to examine occupation status for studies in Chapter 4 and Chapter 5.

The outcome variables, dependent variables and covariates for each of the three studies are presented in Table 2.1. Note that the sample sizes differ widely across the analyses presented in the three chapters. The first study in Chapter 3 is an investigation of whether employment status predicts use of health services. The sample size for the set of analyses in Chapter 3 is 7,297 respondents. The set of analyses in Chapter 3 includes immigrants who are employed, unemployed and out of the labor force.

In Chapter 4, the sample of 4,757 respondents includes immigrants who reported their level of education and current occupation, which I used to construct the education-occupation match variable. List-wise deletion for respondents with missing values on some of the variables greatly reduced the sample size. Finally, the sample size for the empirical analysis in Chapter 5 was 3,002 because this study considered immigrants who had a first occupation abroad and a current occupation in the U.S. to determine immigrant occupational mobility. For this reason, immigrants who did not report an occupation at both time periods were not included in the study. Therefore, the set of analyses in Chapter 5 had the smallest sample size.

Subsequent analyses in Chapters 3, 4 and 5 will describe the measures and construction of variables. Each chapter will also feature a description of the analytic plan including the descriptive analysis, bivariate analysis and multivariate analysis. A discussion of the results of each study will follow the respective statistical analyses.

Table 2.1: Outcome variables, dependent variables and covariates for each study

	Chapter 3	Chapter 4	Chapter 5
Sample size	7,297	4,757	3,002
Outcome variable/s	Doctor visits Dental visits	Self-rated health	Doctor visits Dental visits
Independent variable/s	Employment status	Education-occupation match	Occupational status Occupational mobility
Covariates	Age	Age	Age
	Gender	Gender	Gender
	Marital status	Marital status	Marital status
	Completed years of education	Completed years of education	–
	–	–	Years of education outside the U.S.
	Years of U.S. education	Years of U.S. education	Years of U.S. education
	–	Income	Income
	–	Medical insurance	Medical insurance

Table 2.1 continued

	Chapter 3	Chapter 4	Chapter 5
Sample size	7,297	4,757	3,002
	Self-rated health	–	Self-rated health
	Region of origin	Region of origin	Region of origin
	Visa category	Visa category	Visa category
	Length of stay in U.S.	Length of stay in U.S.	Length of stay in U.S.
	English proficiency	English proficiency	English proficiency

CHAPTER 3

EMPLOYMENT STATUS AND USE OF HEALTH SERVICES AMONG IMMIGRANTS IN THE U.S.

Introduction and Background

Understanding how immigrants navigate host country labor markets is important to understanding the mechanisms of the relationship between employment status and use of health services. For a long time, scholars have had an interest in the relationship between employment status and use of health services among immigrants (Derose, Escarce, and Lurie 2007; Dias, Severo, and Barros 2008; Ku and Matani 2001; Leclere, Jensen, and Biddlecom 1994; Ortega et al. 2007). Some scholars contend that immigrants face barriers in accessing and using health services such as immigrant status (Derose, Escarce, and Lurie 2007), cost of healthcare (Derose et al. 2009) and limited English proficiency (Ponce, Hays, and Cunningham 2006) among others. These studies generally find that immigrants face challenges in accessing and using health services but little is known about immigrants labor market and employment status outcomes as they relate to use of health services.

The relationship between employment status and use of health services varies depending on context and across subgroups of populations (Benach et al. 2009).

Immigrant populations, in particular, experience employment status and use of health services differently from native populations. Also, within the population of immigrants, undocumented immigrants face greater barriers to accessing and using health services relative to documented immigrants native-born populations (Nandi et al. 2008). Barriers to accessing and using healthcare can have negative impacts on immigrants' health. Access and use of health services is one of the pathways through which immigrant status, and potentially employment status, shape health.

In spite of burgeoning research on the relationship between employment status and use of health services, some questions still remain. It is unknown, for example, whether employment status has an effect on use of health services among immigrants admitted to permanent residence in the U.S. It is important to know how immigrants experience employment and use health services in host nations in order to formulate informed employment and health policies that promote use of health services.

To the extent that employment provides individuals with income to acquire resources to improve their lives, employment ought to predict access and use of health services. We expect employment to increase individual use of health services because it provides income and other benefits such as health insurance that enable individuals to use health services, while unemployment or being out of the labor force can result in reduced use of health services. We need to explore whether this expectation holds for the general immigrant population or for different subgroups of immigrants in the U.S. Immigrants are a unique population that may experience employment and health outcomes in host countries in different ways than natives of the host country. Accordingly, it is crucial to study their experiences in the host country labor market as they relate to their use of

health services and subsequent health outcomes.

This study will examine if there is variation in the use of health services based on new legal immigrants' employment status in the U.S. The goal of the analyses is to establish the association of use of health services based on different states of employment such as employed, unemployed and out of the labor force in this population of recent naturalized immigrants to the U.S. The Andersen model for use of health services can lend insights into these relationships, as we shall see in the discussion that follows.

Theoretical Perspectives

In this section, I review the Andersen model for use of health services as it provides framework for understanding the relationship between immigrant employment status and use of health services.

Andersen Model for the Use of Health Services

Andersen's behavioral model for use of health services (Andersen 1968) was created as a guiding framework to study inequalities in access to and use of health services in the U.S. This framework tries to address concerns that people in disadvantaged positions in society receive fewer healthcare services than the rest of the population (Andersen and Newman 1973). Access to health services is viewed as resulting from individual decisions that could be constrained by the individual's position in society and the availability of health services. This implies that the Andersen model for health services allows us to explore hypotheses regarding different states of employment and occupation and their relationship to use of health services in an immigrant population

in the U.S.

According to the Andersen model, use of health services takes place (1) where an individual is predisposed to receive medical care, (2) where conditions make health services available to the individual and (3) where the individual perceives a need for the services and responds to it. These features in the use of health services are also referred to as predisposing factors, enabling resources and need factors of use of health services, respectively. Predisposing factors consist of sociodemographic factors and health beliefs, enabling resources consist of personal or family and community resources, and need factors consist of perceived and evaluated health conditions such as self-rated health (Andersen 1995). Even though the original model was designed for families (Andersen 1968), it was later modified to focus on individuals as the units of analysis (Andersen 1995). The model has been applied to studies of a range of populations such as homeless persons (Gelberg, Andersen, and Leake 2000), homeless women (Stein, Andersen, and Gelberg 2007), the elderly (Wolinsky and Johnson 1991) and racially and ethnically diverse populations (Wallace et al. 1998; Weinick, Zuvekas, and Cohen 2000). Since the Andersen model is suitably flexible for application to various populations, it provides a valuable contribution towards a theoretical framework for analyzing patterns of employment status, occupation status and use of health services for immigrant populations in the U.S.

Some studies have applied the Andersen model for use of health services to study immigrant use of health services in the U.S. For instance, the model was applied to a study of the factors affecting use of preventative health services among Hispanics (Solis et al. 1990). Using Hispanic Health and Nutrition Examination Survey (HHANES) 1982-

1984 data, Solis et al. (1990) found a strong association between access to health services measured by routine place of care, health insurance and utilization of health services among Cuban Americans, Mexican Americans and Puerto Ricans. In addition, acculturation, particularly ability to speak English, was also positively related to the use of health services.

A separate study that incorporated the Andersen model for use of health services to study the immigrant population in the U.S. modified the model to include immigrant duration of residence in the U.S. and measures of assimilation (Leclere, Jensen, and Biddlecom 1994). Data for this study were obtained from the National Health Interview Survey. The researchers found that recent immigrants were less likely than native-born Americans or immigrants of longer duration to use health services. Findings from both studies imply that inadequate access to health services precludes use of health services within the immigrant population in the U.S. The findings also show that immigrants' length of stay in the U.S. plays a crucial role in use of health services. Informed by previous research and the Andersen model of health services, I expect favorable employment and occupation status outcomes to lead to better health outcomes among immigrants in the U.S. because positive employment and occupation status outcomes provide immigrants with resources such as income and health insurance that can improve their health.

Use of Health Services and Employment Status

This section discusses previous empirical research on migration, employment status and health. Employment status is related to a range of health outcomes, but this

study only focuses on use of health services. Use of health services has robust associations with socioeconomic status, particularly education, income, employment and occupation. This review of previous studies leads to several hypotheses and research questions on the relationship between employment status and use of health services among legal immigrants in the U.S. labor market.

When immigrants enter a host country labor market, they assume various employment status positions. Employment status refers to the position of an economically active person with respect to his or her employment (United Nations 1998). The labor force is made up of people who are employed and unemployed; people with jobs are employed, people who are jobless, looking for a job, and available for work are unemployed and people who are neither employed nor unemployed are not in the labor force (U. S. Bureau of Labor Statistics 2014). While most immigrants who come to the U.S. are motivated by employment prospects (Zong and Batalova 2015), some immigrants end up being unemployed or out of the labor force. Several individual, human capital, institutional and assimilation factors positively or negatively shape immigrants' employment status outcomes in the U.S. The question that needs to be answered is whether employment status is one of the factors that affect immigrant use of health services.

Research on the use of health services by immigrants has mainly focused on assimilation and immigrant healthcare patterns in host nations (Leclere, Jensen, and Biddlecom 1994), comparison of use of health services between immigrant populations and native populations (Laroche 2000) and comparison of use of health services between documented and undocumented immigrants (Chavez, Cornelius, and Jones 1985). This

focus leaves the relationship between immigrant employment status and use of health services in the U.S. unexplored. Employment is critical for immigrant health because it provides an income and healthcare benefits that will enable immigrants to use health services. However, not all employment provides healthcare benefits. For instance, some precarious labor positions such as part-time and seasonal employment do not always offer healthcare benefits.

In an attempt to ascertain whether use of health services was determined by need or unequal access, Virtanen (2006) studied physician visits in relation to employment status in Finland. Data for this study were collected using a postal survey. Service utilization was measured by visits to physicians in public primary healthcare, occupational healthcare, private health services, hospital outpatient clinics and dental care services. Participants were classified as employees having a permanent or fixed-term and full-time or part-time contract and as those experiencing short-term, prolonged or long-term unemployment. The results of this study showed that permanently employed participants visited a physician more often and that the strength of association for ability to access physician services was greater than the strength of association for the need to use physician services. In conclusion, the authors highlighted that the use of physician services varied according to labor market status, being relatively low among the nonpermanently employed and the unemployed.

Low levels of healthcare services utilization among immigrants are not necessarily due to lesser need for the services, but rather a combination of reasons such as cultural beliefs, immigrant undocumented status, fear of deportation and cost of care (Fadiman 1997; Laroche 2000; Leclere, Rogers, and Peters 1994; Richter et al. 2014).

Investigating differences in healthcare use among immigrants will enable us to understand the observed patterns of lower use of healthcare cited in previous studies. In addition, it will further develop and add nuance to the Andersen model of use of health services.

In general, recent immigrants use healthcare services in destination countries less frequently than natives (MacDonald and Kennedy 2004). In the U.S., approximately one third of immigrants (32%) are uninsured, compared to 12% of the native born population according to the 2013 American Community Survey (Zong and Batalova 2013). Results from a study carried out using the 1990 National Health Interview Survey to investigate immigrant healthcare utilization indicated that recent immigrants were less likely to have frequent physician contact than native-born Americans but the frequency of their visits converged to the level of Americans the longer they stayed in the U.S. (Leclere, Rogers, and Peters 1994). These results lead to the hypothesis that length of stay is likely to play a crucial role in stabilizing individuals economically, perhaps through acquisition of a stable occupation, which in turn enables such persons to earn an income and better afford healthcare services. Lengthier duration of stays may also result in the acquisition of employment positions, which offer benefits such as health insurance. I outline other hypotheses and research questions related to the relationship between employment status and healthcare use in the following section.

Hypotheses

The set of analyses in this chapter investigates the relationship between employment status and use of health services among immigrants in the U.S. The study

focuses on the relationship between employment status and health. I hypothesize that immigrants who are employed are more likely to use health services compared to immigrants who are out of the labor force and immigrants who are unemployed.

Methods

This study examines whether a relationship exists between employment status and use of health services among immigrants in the U.S. using a nationally representative sample of new legal immigrants. The subsequent statistical models will incorporate variables that measure individual sociodemographic factors, economic variables and migration experiences. I explain the measures and analytic plan below.

Measures

Use of Health Services

The outcome under study is use of health services, specifically doctor visits and dental visits. Health services include all personal and nonpersonal services dealing with the diagnoses and treatment of disease, or the promotion, maintenance and restoration of health (World Health Organization 2015). In this study, I adopt two types of health services, that is, physician and dentist services, because annual physician and dental checks are recommended and they may contribute to longevity (Andersen 1968). There was no distinction made for the use of doctor and dental visits in the New Immigrant Survey (NIS) data as to whether the visits made were regular check-ups or visits initiated because of a health problem. I used doctor and dental visits as proxies for a measure of use of health services. I adopted these measures because the NIS data were limited with

respect to other measures of use of health services cited in the literature such as hospital visits, drugs and medication among others.

For doctor visits, the respondents were asked, 'Aside from any hospital stays, have you seen or talked to a medical doctor about your health, including emergency room or clinic visits in the last 12 months?' The question for dental visits was: 'In the last 12 months have you seen a dentist for dental care, including dentures?' I coded these variables as dichotomous variables for either a (1) – 'yes' or a (0) – 'no' response to either question.

Employment Status

Employment status is the central predictor variable in the set of analyses. Respondents were asked to indicate their current employment situation at the time of the interview by selecting from the following options: (a) working now, (b) unemployed and looking for work, (c) temporarily laid off, on sick or other leave, (d) disabled, (e) retired or (f) homemaker. The United Nations' definition of employment status encompasses employers, employees, own account workers, contributing family members, members of producers' cooperatives and persons not classifiable by status (United Nations 1998). I adopt this definition and measure employment status as a nominal variable with three broad categories: employed, unemployed and out of the labor force (U.S. Bureau of Labor Statistics 2014). According to this definition, the out of labor force category captures immigrants who did not have a job and who were not looking for one, including the disabled, on sick or other leave, the retired and homemakers.

Background Factors

A number of background factors have been acknowledged as influential correlates that affect the immigrant employment status and health relationship. Assimilation and acculturation factors such as a long duration of stay in an immigrants' host country, increased years of schooling in the host country and proficiency in the host country's language tend to lead to improved employment and health outcomes. On the contrary, a deficiency of these skills hampers both employment and utilization of health services among other factors (Dias, Severo, and Barras 2008; Espenshade and Fu 1997; Jaber et al. 2003; Kassoudji 1988; Lebrun 2012; Leduc and Proulx 2004; Miglietta and Tartaglia 2009; Shields and Price 2002).

Immigrant employment and health outcomes are not always positive and they do not always follow an expected linear pattern. Immigrants' experiences of negative health acculturation, where adoption of a host culture is associated with negative effects on health behaviors and outcomes, despite being healthy at arrival, have been well documented (Antecol and Bedard 2006; Jaber et al. 2003). Also, health outcomes that belie socioeconomic status for Hispanic immigrants have been highlighted with the Hispanic paradox (Bostean 2013; Crimmins et al. 2007; Franzini, Ribble, and Keddle 2001; Hummer et al. 2007; Markides and Coreil 1986). Some immigrants' experiences of facing an occupation downgrade before they can experience upward occupational mobility in the host country labor market have also been acknowledged (Akresh 2008; Chiswick and Miller 2008; Zeynep and Berry 1996). Additionally, some evidence suggests that visa type is also a crucial background factor that affects immigrant employment and health outcomes.

Based on previous analyses, this research will include socioeconomic and demographic controls for age, gender, marital status, completed years of education and years of education in the U.S. Other background factors, selection, assimilation and acculturation will be captured by controls for visa type, English language proficiency, length of stay in the U.S., region of origin and region of residence in the U.S. The variable English language proficiency included a category of 'missing information'. It was important to include this category in order to reduce the number of cases lost to list wise deletion and to maintain a reasonable sample size after cleaning the NIS data. In addition, maintaining respondents in the data despite their missing values on some variables increases efficiency, reduces complications in data handling and analysis and reduces bias due to differences between the observed and unobserved data (Cox et al. 1977; Horton and Lipsitz 2001). Further explanation of the background factors is detailed below.

Age. Age was calculated based on the respondents' birth year at the time of the survey. Respondents between the ages of 18 and 65 were included in this study because the U.S. Bureau of Labor Statistics (2014) defines this age group as the working age population.

Gender. The respondents were asked, 'Are you male or female?' I coded responses to this question as a dichotomous variable to indicate male and female respondents. Male respondents were the reference category in the statistical analyses.

Marital status. The selection of responses for the question of marital status comprised of married, living together in a marriage-like relationship, never married, separated, divorced, widowed, refused to answer and do not know. Marital status

indicates an individual's relationship status at the time of the survey. This variable was coded as a dummy variable for (0) married (1) never married and (2) other marital states. Married was the reference category for the dummy variable marital status.

Years of education in the U.S. The respondent's education attainment in the U.S. is a continuous measure and was assessed using the total number of years of schooling an individual had completed in the U.S. at the time of the interview. Years of education in the U.S. ranged from no U.S. education to 22 years of U.S. education.

Completed years of education. This measure reflects the total number of years of education that a respondent possessed at the time of the survey. It was a summation of years of education outside the U.S. and years of education in the U.S. The resultant variable was a continuous variable ranging from 1 year to 36 years of completed years of education.

Visa type. The visa type variable measured the type of visa that a respondent used to get admittance into permanent residency status under U.S. immigration law. The categories considered in this analysis include, employment, refugees/asylum, family, legalization and diversity visas.

English language proficiency. The respondents' answer to the question, 'How well would you say you speak English?' measured English fluency. The respondent's responses were coded as an ordinal variable with categories very well, well, not well, not at all and missing information.

Length of stay. This measure represents the total number of years a respondent had spent living in the U.S. at the time of the survey. Length of stay was measured as a continuous variable and it ranged from 1 year to 63 years.

Region of origin. In order to measure respondents' region of origin, the respondents were asked, 'In what country were you born?' The responses to this question were grouped into 5 groups representing continents, namely, Latin America, Asia, Africa, Europe and 'other' world regions. Other regions of the world include Australia and the Caribbean Islands among other places that could not be classified in the broad continental categories.

Region of residence in the U.S. The respondents were asked to identify their current state of residence at the time of the interview. The NIS recorded respondents' current region of residence in the U.S. and it was categorized as South, West, Midwest and Northeast.

Analytic Plan

This analysis will use descriptive statistics, bivariate analysis and multivariate analysis to explore the relationship between employment status and health. The multivariate analyses include logistic regression models to examine if employment status is a determinant of use of health services (Long and Freese 2006).

Results

Descriptive Statistics

Table 3.1 provides descriptive statistics for the set of analyses in this chapter, which analyzes employment status and the use of health services measured by doctor visits and dentist visits. It also includes ranges, sample percentages and means for covariates including self-rated health, sociodemographic, economic and assimilation

variables. In line with previous research that reports lower access to insurance and healthcare for immigrants in the U.S. (Ku and Matani 2001), the majority of the respondents in the sample did not use doctor services (62%) nor make dental visits (55%) in the year prior to the survey.

These results indicate that most respondents were employed (63%), with almost equal proportions being out of the labor force (20%) and unemployed (17%). Similar to survey data from other empirical research (Mackenbach et al. 1994), a disproportionate size of the analytical sample in this study reported excellent health (93%), which is an aggregate category comprising the categories excellent, very good and good self-rated health. By comparison, a relatively small share of respondents was categorized as reporting poor health (7%), which is an aggregate category comprising fair and poor self-rated health. The average respondent was 37 years old with an average of 13 years total of completed education, and 1 year of education on average obtained in the United States. Some respondents did not report their English language proficiency (5%), some did not speak English at all (14%), followed by respondents who spoke very well (24%), those who spoke well (27%) and respondents who did not speak well (30%). The sample was made up of immigrants from Asia (32%), Latin America (29%), Europe (17%), Africa (14%) and other regions (8%). There were similar numbers of men (49%) and women (51%) in the sample and while most respondents were married (69%), some were never married (22%) and the remainder was in other marital states (9%). Most respondents migrated to the U.S. on family visas (36%), followed by employment visas (21%), diversity visas (18%), legalization visas (18%) and refugee visas (7%). Very few respondents resided in the U.S. Midwest (5%), a sizeable number lived in the Northeast

(37%), followed by the U.S. West (36%) and U.S. South (22%).

Bivariate Analysis

Current Employment Status by Use of Health Services

Table 3.2 and Table 3.3 describe use of health services (doctor visits and dental visits) by employment status. In this analysis, I determined the relationship between employment status and each component of use of health services (doctor and dental visits). I used chi-square tests to identify the relationship between employment status and use of health services. If a relationship between employment status and use of health services existed, this analysis would highlight the need to carry out multivariate analysis to further explore this relationship.

Across all levels of employment status, a greater share of respondents reported using health services as compared to respondents who reported not using health services. For doctor visits, among the 4,580 respondents who were employed, 2,742 (60%) visited the doctor compared to 1,838 (40%) who did not, from a total of 1,257 respondents who were unemployed, 874 (70%) visited the doctor relative to 383 (30%) who did not visit the doctor and out of 1,460 respondents who were out of the labor force, 912 (62%) visited the doctor and 548 (38%) did not visit the doctor in the 12 months prior to the survey. I observed a similar pattern for dentist visits; out of 4,580 respondents who were employed, 2,398 (52%) saw the dentist compared to 2,182 (48%) who did not, among a total of 1,257 unemployed respondents, 760 (60%) saw the dentist and 497 (40%) did not see the dentist and from a total of 1,460 respondent who were out of the labor force, 888 (61%) saw the dentist and 572 (39%) respondents did not see the dentist in the 12 months

prior to the survey. The results of the chi-square test show that there is a statistically significant relationship between current employment status and doctor visits (chi-square with two degrees of freedom = 39.2316, $p = 0.000$). The relationship between current employment status and dentist visits was also statistically significant (chi-square with two degrees of freedom = 47.5586, $p = 0.000$).

Table 3.4 shows the distribution of respondents by doctor and dental visits. The distribution of use of health services by employment status showed almost similar patterns between the three categories of employment status. Immigrants who reported positive self-rated health were less likely to use both doctor and dental services while immigrants who reported negative self-rated health were more likely to use both doctor and dental services. The statistics also show that more women than men use health services. Immigrants with longer duration of stay in the U.S., an average of 8 to 9 years, are more likely to use doctor and dental services than immigrants who have been in the U.S. for an average of 7 years. Respondents who did not speak English at all were the least likely to use doctor and dental visits out of all the categories of English proficiency. Immigrants on employment visas were more likely to use health services compared to immigrants in other visa categories.

Multivariate Analyses

Employment Status and Use of Health Services

Table 3.5 summarizes the results of the logistic regression models for the relationship between employment status and use of health services. I measure use of health services using doctor visits and dental visits in the 12 months prior to the survey.

Model 1a and Model 1b examine the relationship between employment status and doctor visits and dental visits, respectively, in the 12 months prior to the survey. The odds ratios for employment status are statistically significant for both doctor and dental visits and they are less than 1. This means that unemployed immigrants (odds ratio = 0.65, $p < 0.001$) and immigrants out of the labor force (odds ratio = 0.90, $p < 0.10$) are less likely to visit the doctor relative to employed immigrants. Similarly unemployed immigrants (odds ratio = 0.72, $p < 0.001$) and immigrants out of the labor force (odds ratio = 0.71, $p < 0.01$) are less likely to visit the dentist relative to employed immigrants.

Model 2a and Model 2b incorporate self-rated health to control for individual health perceptions that may drive the need to use health services. There are slight changes in the size of the odds ratios for employment, but they all remain statistically significant and less than one, indicating that unemployed immigrants and immigrants out of the labor force are less likely to use health services compared to employed immigrants as noted in the previous model. The odds ratios for self-rated health are also statistically significant suggesting that, compared to immigrants who report positive self-rated health, immigrants who report negative self-rated health have higher odds of using doctor services (odds ratio = 1.86, $p < 0.01$) but lower odds of visiting the dentist (odds ratio = 0.84, $p < 0.10$).

Models 3a and 3b incorporate other socioeconomic, demographic and migration variables in the models estimating the association between employment status and use of healthcare services. Specifically, Models 3a and 3b include covariates of respondents' age, marital status, gender, education, years of U.S. residence, English language proficiency, region of origin, region of residence in the U.S. and visa category. Regarding

employment status, the odds ratio for doctor visits for unemployed immigrants remained statistically significant and less than 1 (odds ratio = 0.78, $p < 0.01$) in Model 3a. However, the odds ratio for doctor visits for immigrants out of the labor force shifted from being marginally statistically significant in Model 2a to being insignificant in Model 3a. Similarly, the odds ratio for dental visits for unemployed immigrants shifted from being statistically significant in Model 2b to being insignificant in Model 3b. The odds ratio for dental visits for immigrants out of the labor force remained statistically significant and less than 1 between Model 2b and Model 3b, implying low use of health services among immigrants out of the labor force relative to the currently employed category. The odds ratio for self-rated health for dentist visits is not significant but the odds ratio for self-rated health for doctor visits remains statistically significant ($p < 0.001$) and greater than 1. It changes from 1.86 in Model 2 to 2.36 in Model 3, suggesting that immigrants who report negative self-rated health use doctor visits to a greater extent than immigrants who report positive self-rated health and the effect is strengthened by adding the control variables in Model 3.

The odds ratios for age and age squared for doctor visits are not statistically significant, but they are statistically significant for dentist visits. For dental visits, this means that each additional year of a respondents' age results in a 7% increased odds of using health services (odds ratio = 1.07), but the effect of the age-squared variable is negligible (odds ratio = 1.00). The dummy variable for gender is statistically significant ($p < 0.01$) and it has an odds ratio greater than 1, for doctor visits the odds ratio is 1.42 and for dentist visits the odds ratio is 1.45, which indicates that relative to men, women are more likely to use health services. Marital status is not statistically significant in

determining use of health services. The odds ratio for completed years of education is statistically significant ($p < 0.001$) and greater than 1, implying that each additional year of completed education by immigrants results in increased use of health services. The odds ratio for U.S. education is marginally statistically significant ($p < 0.10$) and its magnitude has a negligible effect in determining immigrants' use of health services in the U.S; a 2% reduction of use of doctor services (odds ratio = 0.98) and a 3% increase in the use of dentist visits (odds ratio = 1.03).

The odds ratio for region of origin is statistically significant for African immigrants, European immigrants and immigrants from other regions of the world relative to Latin American immigrants, and all of the odds ratios are greater than 1, indicating that immigrants from these regions utilize health services to a greater extent relative to Latin American immigrants. The only exception is African immigrants, who use dentist services less than Latin American immigrants (odds ratio = 0.64, $p < 0.001$). Even though the odds ratios are not statistically significant or marginally significant, Asian immigrants use health services to a lesser extent than Latin American immigrants. The odds ratio for the variable used to indicate years of U.S. residence is statistically significant for doctor visits ($p < 0.001$), and greater than 1, suggesting that the probability of visiting the doctor increases with time spent in the U.S. However, years of U.S. residence are not significant in determining dentist visits. Living in the Midwest region of the U.S. is not statistically significant in determining use of health services. The odds ratios associated with living in the South and Northeast region of the U.S. are statistically significant and less than 1, suggesting that immigrants who reside in these regions use doctor and dental services to a lesser extent than immigrants who reside in the Western

region of the U.S.

Interestingly, the odds ratio for use of health services for employment visa immigrants is both statistically significant and greater than 1, suggesting that employment visa immigrants have a higher probability of using doctor (odds ratio = 1.34, $p < 0.001$) and dental (odds ratio = 1.44, $p < 0.001$) services relative to family visa immigrants. Legalization visa status is not statistically significant in determining immigrant use of health services.

Discussion

The main purpose of this chapter was to analyze the relationship between employment and health. The findings from the analyses provide us with a better understanding on immigrant employment status and use of health services in the following ways.

I observed that employment status determines use of health services. The results from the logistic regression analysis highlighted that employed immigrants are more likely to use health services compared to immigrants who are unemployed and out of the labor force. These results are in line with Andersen's model for use of health services, which underscore the importance of enabling factors in using health services. In this study, employment enables immigrants to use health services as it provides income to access health resources. Income is the apparent benefit of employment that is missing in other forms of nonemployment. Revenue from employment reduces household financial hardship and enables use of health services. In addition, employment enables use of health services through the provision of enabling factors such as health insurance that are

provided as benefits packages for some jobs. Adding covariates in Models 3a and 3b attenuates the effect of employment status on use of health services. This implies that, in addition to employment status, use of health services is also determined by other sociodemographic factors such as education and migration factors such as visa type.

The effect of other sociodemographic background factors on employment status and use of healthcare services are worth mentioning. Regarding use of health services, there is a gender difference in use of health services wherein women are more likely to visit the doctor and dentist than men. From the results of this study, self-rated health might be a proxy for actual health because poor self-rated health is related to more doctor visits. I observe significant differences and unclear patterns between region of origin, region of residence in the U.S. and use of health services. These findings display different patterns that may warrant further investigation into the relationship between region of origin and region of residence and use of health services among immigrants in the U.S. It would be worthwhile to find answers to whether barriers to use of health services exist for immigrants from different world regions who live in different regions of the U.S. and the mechanisms or some other factors at work in this relationship.

This study is not without limitations. First, using cross-sectional data in this study limited the analysis and discussion from making causal attributions in the relationship between employment status and health. In addition, the cross-sectional design is limited in handling changes in employment status and health over time. Immigrant experiences could vary depending on their assimilation and acculturation experiences and the length of time they spend in the U.S. Second, the use of self-reported health as a proxy measure for health may suffer from recall bias and other cultural artifacts associated with how

individuals talk about their own health. Third, since this study is based on a sample of recent legal immigrants admitted to permanent residence in the U.S., the results of the study should be generalized with caution, as they may not represent other immigrant populations in the U.S.

In spite of these limitations, this chapter adds to the discussion of immigrant employment and health outcomes by highlighting that employment affects use of health services. Employment influences health via different pathways, and one of these pathways is utilization of healthcare services. The association of employment and use of healthcare services diverges by employment status, migrant sociodemographic characteristics as well as characteristics of the migration incorporation experience.

Table 3.1: Frequencies, percentages and means for use of health services and current employment status (N = 7,297).

	Frequency	Percentage or mean
Use of health services:		
1. Doctor visits		
• No	4,528	62
• Yes	2,769	38
2. Dental visits		
• No	4,046	55
• Yes	3,251	45
Current employment status:		
• Employed	4,580	63
• Unemployed	1,257	17
• Out of labor force	1,460	20
Self rated health:		
• Positive	6,794	93
• Negative	503	7
Age *(range 18 – 65)*	7,297	37
Gender:		
• Men	3,610	49
• Women	3,687	51
Marital status:		
• Married	5,046	69
• Never married	1,620	22
• Other	631	9
Completed years of education *(range 1 – 36)*	7,297	13
Years of U.S. education *(range 0 – 22)*	7,297	1
Region of origin:		
• Latin America	2,095	29
• Asia	2,322	32
• Africa	1,028	14
• Europe	1,239	17
• Other	613	8
Years of U.S. residence *(range 1 – 63)*	7,297	8
English proficiency:		
• Very well	1,752	24
• Well	1,974	27
• Not well	2,179	30
• Not at all	1,014	14
• Missing information	378	5

Table 3.1 continued

	Frequency	Percentage or mean
U.S. region of residence:		
• West	2,624	36
• Northeast	2,689	37
• South	1,594	22
• Midwest	390	5
Visa category:		
• Family	2,614	36
• Employment	1,582	21
• Diversity	1,320	18
• Legalization	1,290	18
• Refugee/ Asylum	491	7

Table 3.2: Chi-square test for the relationship between current employment status and doctor visits.

	Employment status			
Doctor visits	Employed	Unemployed	Out of the labor force	Total
Yes	2,742	874	912	4,528
No	1,838	383	548	2,769
	4,580	1,257	1,460	7,297
Pearson chi2 (2) = 39.2316 Pr = 0.000				

Table 3.3: Chi-square test for the relationship between current employment status and dentist visits.

	Employment status			
Dentist visits	Employed	Unemployed	Out of the labor force	Total
Yes	2,398	760	888	4,046
No	2,182	497	572	3,251
	4,580	1,257	1,460	7,297

Pearson chi2 (2) = 47.5586 Pr = 0.000

Table 3.4: Distribution of current employment status and other variables by use of health services

	Doctor visits		Dental visits	
	Yes	No	Yes	No
Current employment status:				
• Employed	40%	60%	48%	52%
• Unemployed	30%	70%	40%	60%
• Out of labor force	38%	62%	39%	61%
Self-rated health:				
• Positive	37%	63%	45%	55%
• Negative	52%	48%	40%	60%
Age	37	37	36	37
Gender:				
• Men	35%	65%	42%	58%
• Women	41%	60%	47%	53%
Marital status:				
• Married	39%	61%	46%	54%
• Never married	34%	66%	41%	59%
• Other	40%	60%	42%	58%
Completed years of education	14	13	14	13
Years of U.S. education	1	0.7	1	0.7
Region of origin:				
• Latin America	36%	64%	41%	59%
• Asia	36%	64%	45%	55%
• Africa	38%	62%	30%	70%
• Europe	42%	58%	61%	39%
• Other	42%	58%	47%	53%
Years of U.S. residence	9	7	8	7
English proficiency:				
• Very well	46%	54%	53%	47%
• Well	41%	59%	48%	52%
• Not well	32%	68%	41%	59%
• Not at all	29%	71%	32%	68%
• Missing information	44%	56%	42%	58%
U.S. region of residence:				
• West	40%	60%	45%	55%
• Northeast	36%	64%	43%	57%
• South	37%	63%	43%	57%
• Midwest	45%	55%	56%	44%

Table 3.4 continued

	Doctor visits		Dental visits	
	Yes	No	Yes	No
Visa category:				
Family	37%	63%	41%	59%
Employment	49%	18%	58%	42%
Diversity	32%	20%	41%	59%
Legalization	35%	18%	43%	57%
Refugee/ Asylum	32%	7%	36%	64%
Total	4,528 (62%)	2,769 (38%)	4,046 (55%)	3,251 (45%)

Table 3.5: Logistic regression models for use of health services (doctor and dental visits), current employment status and other covariates – Odds ratios (N = 7,297).

	Doctor visits			Dental visits		
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)
Employment status (Reference - Employed):						
Unemployed	0.65 (0.04)***	0.65 (0.04)***	0.78 (0.06)***	0.72 (0.05)***	0.72 (0.05)***	0.90 (0.06)
Out of labor force	0.90 (0.06)+	0.86 (0.05)*	0.91 (0.07)	0.71 (0.04)***	0.72 (0.04)***	0.79 (0.06)**
Negative self-rated health (Reference – Positive):		1.86 (0.17)***	2.36 (0.24)***		0.84 (0.08)+	1.06 (0.11)
Gender (Reference - Male)			1.42 (0.08)***			1.45 (0.08)***
Age			1.02 (0.02)			1.07 (0.02)***
Age squared			1.00 (0.00)			1.00 (0.00)***
Region of origin (Reference - Latin America):						
Asia			0.88 (0.07)			0.83 (0.06)*
Africa			1.43 (0.15)***			0.64 (0.07)***

Table 3.5 continued

	Doctor visits			Dental visits		
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)
Europe			1.41			2.15
			(0.13)***			(0.21)***
Other			1.65			1.56
			(0.18)***			(0.17)***
Years of school completed			1.04			1.06
			(0.01)***			(0.01)***
Years of U.S. education			0.98			1.03
			(0.01)+			(0.01)+
Marital status (Reference - Married):						
Never married			0.91			0.94
			(0.07)			(0.07)
Other			1.06			0.91
			(0.10)			(0.08)
Years of U.S. residence			1.03			1.00
			(0.00)***			(0.00)
English proficiency (Reference - Speak very well):						
Speak English well			1.00			0.99
			(0.07)			(0.07)

Table 3.5 continued

	Doctor visits			Dental visits		
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)
Speak English not well			0.74 (0.06)***			0.82 (0.07)*
Speak English not at all			0.73 (0.08)**			0.63 (0.07)***
Missing information			1.02 (0.13)			0.64 (0.08)***
U.S. region of residence (Reference - West):						
Northeast			0.78 (0.05)***			0.77 (0.05)***
South			0.79 (0.06)**			0.84 (0.06)*
Midwest			1.13 (0.13)			1.11 (0.13)
Visa category (Reference - Family visa):						
Employment			1.34 (0.11)***			1.44 (0.12)***
Diversity visa			0.74 (0.07)**			0.82 (0.08)*

Table 3.5 continued

	Doctor visits			Dental visits		
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)
Legalization			0.90			1.09
			(0.07)			(0.09)
Refugee/asylum visa			0.56			0.54
			(0.07)***			(0.06)***
N	7297	7297	7297	7297	7297	7297
Pseudo R-squared	0.004	0.009	0.051	0.005	0.005	0.069

+ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$"

CHAPTER 4

EDUCATION-OCCUPATION MATCH AND SELF-RATED HEALTH: EXPLORING THE MIGRATION EXPERIENCE

Introduction

The U.S. receives a larger proportion of immigrants than any other country in the world (Zong and Batalova 2015). While immigrants migrate to the U.S. for several reasons, the majority of the immigrant population participates and contributes to the U.S. labor force in various ways. The foreign-born working population in the U.S. is projected to increase from its current estimate of 24 million to 33 million by 2050 (Lowell, Gelatt, and Batalova 2006), making it the fastest growing segment of the immigrant population. This considerable growth makes the study of work, occupation, health and immigrant experiences increasingly important.

Education-occupation mismatches are a commonly observed phenomenon among foreign-born workers in the U.S. (Quinn and Rubb 2005) and they can be explained by differences in the education and occupation standards between immigrant sending countries and the U.S. An education-occupation match occurs when a worker's educational attainment is equal to the amount of education that is generally required in their occupation according to international labor standards (Quinn and Rubb 2005;

Rumberger 1981). If their education does not match their occupation, they experience an education-occupation mismatch. There are two types of education-occupation mismatches. The first is over-education, which arises when an individual possesses more education than is the average in their occupation. The second type of education-occupation mismatch is called under-education and it occurs when an individual has less education than is the average in their occupation.

Immigrants are more prone to experience education-occupation mismatches than native-born workers because their education may not be transferable between their origin country and host country. This implies that immigrants experience diverse education-occupation mismatch experiences in host countries, raising questions concerning the health and wellbeing implications of experiencing such inconsistency across one's status positions. The labor market experience can be challenging for immigrants if they fail to secure employment or if they take jobs that do not match their education or skills. Researchers have documented the physical and mental health effects of education-occupation mismatches on health (Murphy and Athanasou 1999; Wilson and Walker 1993). Since physical and mental health lie on a broad spectrum of definitions and can be measured in varied ways, studying the relationship between immigrant education-occupation match and self-rated health provides a glimpse into how education-occupation match affects immigrant health because self-rated health is a subjective proxy measure of individual health (Idler and Benyamini 1997; Quesnel-Vallee 2007; Rakowski et al. 1993). Few, if any, studies have explored the relationship between education-occupation and self-rated health. Investigating this relationship among immigrants will reveal whether education-occupation mismatches positively or negatively affect immigrants'

self-rated health.

Incorporating education-occupation match in the study of immigrant health, specifically as health is manifested in self-rated health, has several advantages. First, social scientists can use education-occupation matches to understand how sociodemographic and economic factors and the migration experience act together to produce health risks or protective effects on health. Second, some experiences of education-occupation mismatches may be indicative of individual mental and physical health because education-occupation mismatch is associated with loss of skills, low job satisfaction, reduced income among other factors that could be detrimental to health (Dean and Wilson 2009). Third, education-occupation match has the advantage of providing objective and quantifiable measures of status consistency that can be compared among different immigrant populations.

Although education-occupation match is associated with a number of positive and negative health outcomes, it is worth noting that some of the health outcomes that immigrants encounter as a result of education-occupation match or mismatch are unique to their migration experiences. Specifically, the individual migration push factors that influence the decision to migrate, assimilation into the host country society and adaptation to the host country labor market are among the numerous factors that can influence education-occupation match and self-rated health. The study of the relationship between education-occupation match in different populations and different settings is hardly a novel idea (Ro 2014). There are, however, gaps in research with regards education-occupation match and self-rated health among recent documented immigrants in the U.S. For instance, it is worthwhile to investigate how immigrant experiences with

education-occupation mismatches affect how they rate their own health.

This study will examine the relationship between education-occupation matches and mismatches and self-rated health among recent documented immigrants in the U.S. The study uses New Immigrant Survey cross-sectional data that were collected from recent documented immigrants to the U.S. in 2003. The goals of this study are to examine how self-rated health varies depending on individual immigrant education-occupation match status in the U.S. and to explore under education, which is often less studied, and observe how it might suggest a different set of issues that matter for health as compared to over education, and how it is a relevant experience in the migrant population.

Theoretical Framework

Status Inconsistency Theory

Status inconsistency theory provides a framework for explaining how social positions can be affected in both a positive and negative manner by social status (Lenski 1954). Social position is the position of an individual in society, for instance being a church pastor is a social position. Social status, on the other hand, is the rank of an individual in society. The two are distinct in that, on one hand, social positions are measured categorically and they group individuals based on the control they have over others. On the other hand, social status is linear and it stratifies individuals based on income or years of education for instance (Lenski 1954). The church pastor may have a social position that is highly regarded in society but he may have extremely low social status based on the income that he earns from his occupation. Status inconsistency theory posits that if an individual's social position is not consistent with his or her social status,

they will experience stress and they will be more unsatisfied compared to individuals whose statuses are consistent (Lenski 1956).

Along the same line of reasoning, status inconsistency theory posits that inconsistencies in the match across one's education, skills and occupation can have negative impacts on one's health if the social position is incongruent with the social status (Abramson 1966; Dressler 1988; Jackson 1962). Loss of status and income as a result of unemployment and underemployment tend to cause stress in workers and as a result, they report higher levels of mental and physical health problems (Dean and Wilson 2009), and higher levels of ischemic heart disease (Peter, Gassler, and Geyer 2007) among other health outcomes.

In a study that examined the relationship between occupational mobility and depression among immigrants in the U.S, Ro (2014) found support for status inconsistency theory for recent immigrants in the U.S. The study used cross-sectional data from the New Immigrant Survey. The respondents were asked questions about their health, previous occupations, current occupations, migration experiences and other sociodemographic and economic variables. Results from the study indicated that immigrants who experienced both upward occupational mobility and downward occupational mobility reported more distress relative to immigrants who did not experience a change in their occupational status. Women experienced more depression from downward and upward occupational mobility relative to men. Higher levels of distress for women were attributed to the double role of assimilation that women encounter in the employment and household spheres.

Previous research is enlightening for applying the status inconsistency theory in

the study of occupational mobility and health. However, it falls short in matching individual social position to social status. Applying the status inconsistency theory to study the relationship between education-occupation match and self-rated health in the U.S. immigrant population can fill this gap. According to the status inconsistency theory, we expect relatively positive health outcomes for immigrants who experience an education-occupation match and relatively negative health for immigrants who experience over-education and under-education.

Education-occupation Match and Self-rated Health

Education-occupation mismatches are common for natives and immigrants alike, but immigrants may face education-occupation mismatches more so than natives because they may not be able to perfectly transfer their home country education credentials to a host country labor market (Chiswick and Miller 2009). Self-rated health is a representation of individual health status and it captures aspects of the background within which individuals experience health outcomes such as a person's personality traits, socioeconomic factors and demographic factors that shape health (Bjorner et al. 1996; Fayers and Hays 2005; Singh-Manoux et al. 2006). The impact of education-occupation mismatches on self-rated health among recent immigrants in the U.S. is not well understood.

Dean and Wilson (2009) used in-depth interviews among skilled immigrants in Mississauga, Ontario, to examine immigrant employment experiences related to education-occupation match and subsequent health in Canada. The results of this study showed that over-education was associated with high levels of mental health issues due to

reduced income, loss of skill and loss of social status. In addition, immigrants' physical health was affected by education-occupation mismatches through high levels of stress and strenuous working conditions in low level occupations.

Using data from the National Latino and Asian American Study (2002-2003), Nicklett and Burgard (2009) examined the association between downward social mobility and the odds of depressive episodes among Latino and Asian-American immigrants in the U.S. The authors observed that a loss in subjective social status was associated with increased risk of depressive episodes. Results obtained from this study are consistent with status inconsistency theory and they could inform outcomes in the relationship between education-occupation match and self-rated health because downward social mobility and education-occupation mismatches are both forms of status inconsistency.

Scholars are continuously analyzing status inconsistencies using a variety of socioeconomic variables in different geographic settings. For instance, Pikhart et al. (2000) investigated the relationship between psychosocial work characteristics and self-rated health in four postcommunist communities, namely Poland, Czech Republic, Lithuania and Hungary. Psychosocial work characteristics were measured using an effort-reward ratio that was calculated using factors such as job control, job demand, job variety, social support, and effort and reward at work. The continuous measure of effort-reward imbalance at work was a powerful determinant of self-rated health in all of these postcommunist populations. Effort-reward imbalance is similar to education-mismatch because in both instances individuals experience status inconsistencies. This study reports consistent associations of adverse psychosocial characteristics with poor self-rated health in economically active populations from Central and Eastern Europe.

In another study of the relationship between education occupation match and health, Ro (2014) used the 2003 New Immigrant Survey to study the effect of education-occupation match on depression among immigrants in the U.S. In this study, both over-education and under-education were associated with higher levels of depression and the effect was higher for women than men. The elevated risk of depressive symptoms observed for women in relation to mismatches in their education and occupation could be as a result of additional work and family stresses. This prior research provides essential framing for the current study that also utilizes the New Immigrant Survey data and analyzes the relationship between education-occupation match and self-rated health.

These studies are informative for the different factors that affect education-occupation match or self-rated health among different populations. Few, if any, studies have examined the relationship between education-occupation match and self-rated health among recent immigrants in the U.S. It is important to consider this relationship because education-occupation mismatches can be stressful and negatively affect how individuals rate their own health.

Hypotheses

In this set of analyses, I examine immigrants' self-perceptions on health as they relate to education-occupation match. I consider immigrants' individual self-rated health and investigate whether, and how, education-occupation match is relevant in determining reports of self-rated health.

1. Over-education may lead to job-related stressors that respondents identify and report as negative self-rated health.

2. Immigrants who are under-educated and immigrants who experience an education-occupation match will report better self-rated health compared to immigrants who are over-educated.

Methods

By exploring the relationship between education-occupation match and self-rated health among recent immigrants in the U.S., this study will contribute to the growing body of literature on status inconsistency theory. The unique contribution of this study is that it explores the association of education-occupation match and self-rated health for recent immigrants over the migration process to the U.S.

Measures

Self-rated Health

Self-rated health is the outcome variable in this set of analyses and it is intended to measure a respondent's physical and mental health. Self-rated health is unique because it responds to eclectic explanatory variables related to an individual's socioeconomic status such as education and employment; personality traits such as optimism, anger and hostility; life events; social networks: family disposition for high mortality among other variables that shape health; and direct indicators of health such as health behaviors, medical diagnoses, mental symptoms, physical symptoms and physical function (Bjorner et al. 1996). The all-encompassing nature of self-rated health poses some reporting bias because it includes both perceived, undiagnosed health conditions and known health conditions that have been diagnosed. However, self-rated health is a subjective measure

of health that is generally accepted and widely used as an indicator of health status (Fayers and Hays 2005).

There is a strong correlation between results of self-rated health and objective measures of health such as a wide range of measures of illness, physician health measures (Farmer and Ferraro 1997), cancer survival (Shadbolt, Barresi, and Craft 2002) and mortality (Benyamini and Idler 1999; Mossey and Shapiro 1982). Although self-rated health can be adopted as a global measure of health in different populations, cultural variations may exist based on how people perceive their own health. For instance, after comparing self-rated health between population samples in Tampere, Finland and Florence, Italy using the European Longitudinal Study on Aging, Jylha et al. (1998) found that self-rated health was a useful summary of physical health but recommended that comparisons of self-rated health based on gender and culture should be treated with caution. For example, across different cultural and ethnic groups, health pessimism has been noted to affect self-reported health (Boardman 2004; Ferraro 1993; Spencer et al. 2009; Thomas et al. 2010). On the other hand, Mcgee et al. (1999) found no differences and a strong relation between self-rated health and mortality for Native Americans, Asian/Pacific Islanders, Blacks, Whites and Hispanics in the U.S. using National Health Interview Survey data from 1986-1994. Could there be differences between native-born and immigrant self-rated health? Newbold (2005) found that there were no significant differences between immigrant self-rated health and native-born Canadians' self-rated health in a study that was carried out using longitudinal data from the National Population Health Survey.

The methodological question of whether self-rated health should be measured as a

dichotomous or categorical variable is common among scholars. Manor, Matthews and Power (2000) investigated the relationship between occupation and self-rated health. In this study, they categorized self-rated health as both a dichotomous variable and a categorical variable to note any differences arising from how self-rated health was coded. They found that the results they obtained for the relationship between occupation and self-rated health were similar regardless of how self-rated health was coded. In this study, I measured self-rated health as a dichotomous variable for positive self-rated health and negative self-rated health.

The NIS asked respondents, "Would you say your health is excellent, very good, good, fair or poor?" Self-rated health is usually coded on an ordinal 5-category scale with the ratings excellent, very good, good, fair or poor. I merged the categories excellent, very good and good to make the binary code (1) – positive self-rated health and I merged the categories fair and poor to make the binary code (0) – negative self-rated health. I adopted this categorization because the majority of the immigrants interviewed in the NIS reported excellent health rather than poor health. According to the binary categorization that I adopted, at baseline, 91% of respondents reported positive health rather than negative health. This distribution of self-rated health may indicate support for the healthy immigrant effect and healthy immigrant selection and it is similar to that observed in other immigrant populations in Canada (Newboldb 2005), the U.S., the U.K., and Australia (Kennedy, McDonald, and Biddle 2006).

Education-occupation Match

The independent variable in this study was education-occupation match. Education-occupation match captured three possible outcomes, namely education-occupation match, over-education and under-education. Education-occupation match occurs when an individual's education is similar to what is required for their occupation. Over-education occurs when an individual has more education than what is required by an occupation and under-education occurs when an individual has less education than what is required by an occupation (Duncan and Hoffman 1981; Groot 1996). Chiswick and Miller (2009) propose theoretical explanations for why education-occupation mismatches may occur for immigrants. For instance, individuals may be under-educated because some occupations value an individual's work experience relative to their education and some may be over-educated because some employers may be reluctant to evaluate their foreign employee's education credentials and end up hiring immigrants with more education than what is required by an occupation.

Education-occupation match was calculated based on data provided by the International Labor Organization for entry-level educational qualifications required for specific occupations. The degrees required for the ten major occupation classifications are shown in Table 4.1. Based on current individual immigrant occupation, I compared these required levels of education with the highest degree each respondent attained to construct the education-occupation match variable.

The New Immigrant Survey data used U.S. Department of Labor, Bureau of Labor Statistics Standard Occupation Classifications (SOC) for coding occupations. The SOC does not match education and occupation but the International Labor Organization

(ILO)'s International Standard Classification of Occupations (ISCO) matches different occupations to the level of education required for the occupations as shown in Table 4.1 (International Labor Organization 2012). Using crosswalks provided on the U.S. Department of Labor, Bureau of Labor Statistics' website to convert SOC to ISCO codes, I matched the SOC codes to the ISCO codes and then matched the ISCO codes to their respective education levels based on ILO data. I then created the variable, education-occupation match, by finding the difference between the individual ISCO codes for the degree required for each occupation and the actual highest degree attained by each respondent. Figure 4.1 shows how I constructed the education-occupation match variable.

After matching education and occupation, the resultant education-occupation match variable had three categories, over-educated, education-occupation match and under-educated. In Table 4.2, from the sample, I extracted one example of a respondent who experienced over-education, one who experienced education-occupation match and one whose experience represents under-education in order to illustrate the three categories of the variable. From the subsequent education-occupation match variable, approximately 50% of the respondents had the same education required for their occupations, 26% were over-educated and 24% were under-educated.

Background Factors

Several of the background variables included in this analysis, that is, age, gender, marital status, completed years of education, years of U.S. education, region of origin, years of U.S. residence, English proficiency and visa category, were described in the

analyses in Chapter 3. The following is a description of additional control variables that feature in the subsequent analyses.

The three background variables that were not addressed in the analyses in Chapter 3 that I describe in this section are occupational status, individual income per annum and health insurance.

Occupational status. I measured the hierarchical ranking of respondents' current occupation at the time of the survey using the variable occupational status. Respondents answered the question, "What kind of work do you do in your current main job?" Their responses were captured using the Standard Occupation Classification (SOC), which assigns a nominal code to occupations. I converted the SOC codes that were reported in the New Immigrant Survey to International Standard of Occupation (ISCO) codes using "crosswalks for conversion" provided by the US Department of Labor, Bureau of Labor Statistics (U.S. Bureau of Labor Statistics 2014). This conversion was necessary to further convert the ISCO scores, which measure occupation prestige, into an International Socioeconomic Index (ISEI) that ranks the occupations in a continuous hierarchy (Ganzeboom, DeGraaf, and Treiman 1992). The ISEI is a continuous occupation index that ranges from 10-80; lower scores on the hierarchy indicate lower-level occupations such as those for subsistence farmers, fishers, hunters, gatherers and kitchen helpers while higher points on the hierarchy show high-level occupations such as those for general and specialist medical practitioners, medical doctors, dentists and judges.

Income. The respondent's annual income is assessed via a summation of his or her income from employment and other sources such as income from self-employment, income from wages and salaries, income from professional practice and income from

tips. Income was grouped into four categories of (1) less than $25,000, (2) $25,000-$50,000, (3) $50,000-$100,000 and (4) greater than $100,000. The reference category for the income measure in the multivariate analysis was the category less than $25,000.

Health insurance. The health insurance variable reflects the respondent's possession of some form of health insurance at the time of the interview. This variable was measured as a dummy variable for private health insurance, public health insurance including Medicare and Medicaid, no health insurance, and missing health insurance information. In the multivariate statistical analyses, private health insurance was the reference category.

Results

Descriptive Statistics

Table 4.3 shows the frequencies, means and percentages for the dependent variable, self-rated health, and the independent variable, education-occupation match. The descriptive statistics for the covariates such as sociodemographic characteristics, income, education, medical insurance, duration of residence in the U.S., visa type, English language proficiency and region of origin are also described.

Similar to the samples in the two sets of analyses in Chapter 3, the majority of the respondents in this sample reported positive self-rated health (94%) while only 6% reported negative self-rated health. The distribution of respondents based on education-occupation match was skewed in favor of respondents who had education that matched their occupation (50%), followed by the over-educated (26%) and the under-educated (24%). The average International Socioeconomic Index (ISEI) score or occupation score

for respondents in this sample was 36. The average age of respondents in this sample was 40 years old and on average, each respondent completed 13 years of education and 1 year of U.S. education. There were more men (60%) compared to women (40%) in the sample. Most respondents were married (69%), some were never married (22%), while the remainder (6%) were in other marital categories other than married and never married. More than half of the immigrants earned less than $25,000 (74%), followed by respondents who earned $25,000-50,000 (12%), then those who earned $50,000-$100,000 (9%) and only 5% of the sample earned more than $100,000. The disproportionate distribution of income in the lowest quintile category supports the statistical data we discussed in Chapter 1 from Zong and Batalova (2015), which highlights that most immigrants in the U.S. are employed in lower-level occupations (Arcury et al. 2014).

An equal proportion of immigrants came from each of Asia and Latin America (31%), followed by immigrants from Europe (18%), Africa (12%) and other regions of the world (8%). This immigrant sample resided in the U.S. for 8 years on average. The sample was made up of respondents who spoke English very well (29%), spoke English well (29%), did not speak English well (28%), do not speak English at all (10%) and respondents who had missing values for their English speaking abilities (4%). Since this study was focused on education-occupation match and specifically selected immigrants with an occupation, it was only natural that most of the immigrants had employment visas (29%), followed by family visas (28%), legalization (19%), diversity (17%) and refugee and asylum visas (8%). Slightly more than half of the immigrants did not have health insurance (51%), followed by those having private insurance (41%), public

insurance (5%) and those not indicating their insurance status (3%).

Bivariate Statistics

Education-occupation Match by Self-rated Health

Table 4.4 shows the Spearman rank-order correlation coefficients that measure the association between self-rated health and education-occupation match. In this analysis, I treated education-occupation match as an ordinal variable and I used Spearman's correlation to identify statistically significant associations between education-occupation match and self-rated health (Acock 2010). The purpose of this analysis was to determine the distribution of respondents' evaluations of their own health based on education-occupation match experiences. If, as prior research suggested, a considerable relationship between education-occupation match and self-rated health was observed, this analysis would speak to the differences that exist between each level of education-occupation match and self-rated health.

The majority of the respondents reported positive self-rated health compared to negative self-rated health. A total of 2,357 respondents had a match in their education and occupation at the time of the survey and 2,257 (96%) of them reported positive self-rated health while only 100 (4%) reported negative self-rated health. Among the 1,237 respondents who experienced over-education, 1,177 (95%) reported positive self-rated health and 60 (5%) reported negative self-rated health. There were 1,163 immigrants who were under-educated and 1,050 (90%) reported positive self-rated health while 113 (10%) reported negative self-rated health. The results of the Spearman's correlation test between self-rated health and education-occupation match also show that there was a statistically

significant positive correlation between self-rated health and education-occupation match (Spearman correlation coefficient = 0.0851, $p = 0.000$).

Table 4.5 shows the distribution of education-occupation match and other covariates by self-rated health. The goal of this analysis was to observe differences in self-rated health based on a range of background demographic and socioeconomic variables that were included in the multivariate analysis. Similar to the statistics we observed for the full sample, 96% of the respondents who had experienced an education-occupation match reported positive self-rated health and 4% reported negative self-rated health. The trend was almost similar for respondents who were over-educated where 95% reported positive self-rated health and 5% reported negative self-rated health. The majority of respondents who were under-educated reported positive self-rated health (90%), rather than negative self-rated health (10%). Among immigrants who report positive self-rated health, most immigrants experience education-occupation match. On the contrary, among immigrants who report negative self-rated health, most immigrants were under-educated. This sample distribution resonates with the status inconsistency theory, which posits that if an individual's social position is not consistent with their social status, they will experience stress and they will be more frustrated compared to individuals whose statuses are consistent (Lenski 1956).

In this sample, more men (95%) than women (93%) reported positive self-rated health and fewer men (5%) than women (7%) reported negative self-rated health. More men than women report positive self-rated health while more women than men report negative self-rated health. This distribution could be supported by studies that have found that men are more likely to be selected based on health compared to women (Akresh and

Frank 2008). Or perhaps women face dual stressors from the roles they take at home and at the workplace in addition to the migration experience (Purdie-Vaughns and Eibach 2008; Qiu, Bures, and Shehan 2012; Schoeni 1998).

Immigrants who reported positive self-rated health had 14 years of completed education on average compared to 10 years for immigrants who reported negative self-rated health. In addition, respondents who reported positive self-rated health had completed 12 months of U.S. education on average relative to 10 months of U.S. education on average completed by respondents who reported negative self-rated health. With regards to education, immigrants who report positive self-rated health possess more completed years of education and more years of U.S. education on average compared to immigrants who report negative self-rated health. Knowledge could play a positive role in influencing use of health services by enabling immigrants to be employed, to earn an income and to afford health insurance or other services that improve health.

The largest proportion of respondents who reported positive self-rated health was from Asia (97%) and Africa (97%), respectively, and the largest proportion of respondents who reported negative self-rated health was from Latin America (11%). While individual reports of self-rated health could be proxies for true health indicators (Idler and Benyamini 1997), the regional variations in reporting self-rated health that we observe in this sample could be an artifact of culture (Jylha et al. 1998) or selectivity of immigrants based on education (Feliciano 2005) and health (Abraido-Lanza et al. 1999; Bostean 2013; Jasso et al. 2003). Among immigrants who report positive self-rated health, most of them are from Asia, while the majority of respondents who report negative self-rated health are from Latin America. This is a somewhat surprising finding

considering the popularity of the epidemiologic paradox, which highlights the relatively positive health among immigrants from Latin America in spite of their low socioeconomic status (Markides and Eschbach 2005).

Immigrants who reported negative self-rated health had stayed in the U.S. for an average of 11 years, but immigrants who reported positive self-rated health had a shorter average length of stay of 8 years. Some scholars have documented the convergence of immigrant health to negative health behaviors and outcomes of natives in a host country (Dean and Wilson 2009). While this convergence might not be true of all immigrant populations, it could help us explain why immigrants in our sample who have stayed longer in the U.S. show a greater tendency to report negative self-rated health and immigrants who have stayed for a relatively shorter time more frequently report positive self-rated health.

Speaking English very well was associated with positive self-rated health because the largest proportion of respondents who reported positive self-rated health spoke English very well (98%). Of the respondents who reported negative self-rated health, the largest proportion (11%) did not speak English at all. We notice that a large proportion of immigrants who have better English proficiency in this sample report positive self-rated health, on the contrary, a large proportion of immigrants who have some level of difficulty with the English language report negative self-rated health. This implies that the ability to communicate in a common language could be a catalyst to access and use of health services in a host country (Fadiman 1997).

The distributions of health insurance for immigrants who report both positive and negative self-rated health do not present a clear pattern. One distinct observation is that

among immigrants with public health insurance, 87% reported positive self-rated health while 13% reported negative self-rated health. These statistics are different for all other categories of health insurance where more than 90% of immigrants report positive self-rated health and less than 10% report negative self-rated health in each category. This highlights the crucial need to address public health insurance issues that plague the U.S. for both the native population and immigrant population alike (Borjas 2003b; Lucas et al. 2003).

Multivariate Analysis

Education-occupation Match and Self-rated Health

We know from the analyses in Chapter 3 that employment status shapes use of healthcare resources because employed immigrants are more likely to use health services in comparison to immigrants who are unemployed and out of the labor force. In order to explore immigrant selection into employment based on health, I conducted multinomial logistic regression shown in Appendix A. The analyses were an investigation of the association between self-rated health and employment status. Results from this set of analyses show that there is positive health selection into employment status based on self-rated health; immigrants who reported negative self-rated health have a higher probability of being out of the labor force relative to being employed. This implies that the current analysis of occupation-education match and self-rated health, by nature of the positive selection into employment, necessarily focuses on a relatively healthy subset of all immigrants in the New Immigrant Survey.

Table 4.6 shows the results from the multivariate logistic regression models for

the relationship between self-rated health and education-occupation match. Because I measured self-rated health as a dichotomous variable (0=positive, 1=negative), I applied binary logistic regression to model the prediction of self-rated health and education-occupation match. In this case, coefficients are estimated to describe the difference in log odds of negative health for the different levels of education-occupation match. There are three models in this analysis. Model 1 shows the relationship between self-rated health and education-occupation match. Model 2 regresses self-rated health on education-occupation match and occupational status. Model 3 shows the relationship between self-rated health education-occupation match, occupational status and other covariates.

Model 1 examines the association between self-rated health and education-occupation match before adding occupational status and other covariates. Since education-occupation match is measured as an ordinal variable with three categories, namely over-educated, education-occupation match and under-educated, I adopt education-occupation match as the reference category in all the analyses because approximately 50% of the respondents reported an education-occupation match. In Model 1, being over-educated has a positive association with self-rated health (odds ratio = 1.15), but said association is not statistically significant. However, being under-educated has a positive and statistically significant relationship with self-rated health (odds ratio = 2.43, $p < 0.001$), suggesting that relative to having an education-occupation match under-education is associated with higher odds of reporting negative self-rated health rather than positive self-rated.

Model 2 examines the relationship between self-rated health and education-occupation match. In addition to the education-occupation variable, Model 2 introduces

occupational status as a covariate. Using education-occupation match as a reference category, being over-educated is not statistically significant in determining self-rated health and this outcome is similar to what we observe in Model 1. The odds ratio for reporting negative self-rated health rather than positive self-rated health for under-educated immigrants remains statistically significant ($p < 0.001$), but its size shifts from 2.43 in Model 1 to 1.72 in Model 2. Being under-educated in one's occupation is still associated with higher odds of reporting negative self-rated health relative to working in an occupation that is well matched with one's education level. Each additional unit increase in immigrants' occupational status leads to a 3% decrease in the odds of reporting negative self-rated health (odds ratio = 0.97, $p < 0.001$) relative to positive self-rated health.

Model 3 includes additional explanatory variables in the relationship between self-rated health and education-occupation-match. Adding the other covariates in this model changes the category over-educated from being statistically insignificant in Models 1 and 2 to being statistically significant in Model 3. In this model, both categories of education-occupation mismatch are statistically significant in determining self-rated health. Compared to an education-occupation match, over-education is associated with a 61% increased odds of reporting negative self-rated health rather than positive self-rated health (odds ratio = 1.61, $p < 0.05$) and under-education is associated with a 36% increased odds of reporting negative self-rated rather than positive self-rated health (odds ratio = 1.36, $p < 0.10$). Occupational status shows no significant association with self-rated health in this model.

The odds ratio for gender is statistically significant ($p < 0.05$) implying that,

compared to men, women are more likely to report negative self-rated health rather than positive self-rated health compared to men. Regarding age, neither age nor age-squared are statistically significant in determining self-rated health.

The odds ratio for completed years of education is statistically significant ($p < 0.001$) and less than 1, which means more years of education reduce the odds of reporting negative self-rated health rather than positive self-rated health for immigrants. On the contrary, more U.S. education is associated with increased odds of reporting negative self-rated health (odds ratio = 1.07, $p < 0.01$) relative to positive self-rated health. Overall income is not statistically significant in determining self-rated health except for the $50,000-$100,000 category which is statistically significant. Compared to immigrants who earn less than $25,000 per annum, immigrants who earn an income between $50,000 and $100,000 have reduced odds of reporting negative self-rated health relative to reporting positive self-rated health by 69% (odds ratio = 0.31, $p < 0.05$). Compared to private health insurance, public health insurance is statistically significant ($p < 0.05$) in determining immigrants' self-rated health and it is associated with a 69% increased odds of reporting negative self-rated health relative to reporting positive self-rated health. Not having insurance is not statistically significant in determining immigrants' self-rated health.

The odds ratios for immigrants who do not speak English well (odds ratio = 2.80, $p < 0.001$) and for immigrants who do not speak English at all (odds ratio = 2.50, $p < 0.001$) are statistically significant, implying that immigrants who do not speak English well or who do not speak English at all have higher odds of reporting negative self-rated health relative to reporting positive self-rated health. The categories of speaking English

well and missing information are not statistically significant in determining self-rated health. Region of origin is mostly not statistically significant in determining self-rated health except for immigrants who come from other regions of the world. The odds ratio for immigrants from 'other' regions of the world shows that these immigrants have lower odds of reporting negative self-rated health relative to reporting positive self-rated health in comparison to Latin American immigrants though the odds ratios are barely statistically significant (odds ratio = 0.57, $p < 0.10$). Employment visa is not statistically significant in determining self-rated health. Compared to immigrants who migrated on a family visa, immigrants on a diversity visa have a 63% reduced odds of reporting negative self-rated health rather than reporting positive self-rated health (odds ratio = 0.37, $p < 0.05$). Relative to immigrants on family visas, both legalization and refugee visas are statistically significant and associated with higher odds of reporting negative self-rated health rather than positive self-rated health (odds ratio = 1.35, $p < 0.10$ and odds ratio = 2.47, $p < 0.001$, respectively).

Discussion

In this analysis, half of the sample experienced an education-occupation match while the other half was almost equally divided between being over-educated and being under-educated. The sample in this study is in good health overall (see Table 4.3). This finding together with the average number of completed years of education, which indicate that on average, the immigrant sample is highly educated, could lend support to two premises that we discussed in earlier chapters, namely, selectivity of immigrants on health and selectivity of immigrants on education. Immigrant clustering in the lowest

level of income of less than $25,000 per annum also corresponds with the evidence we outlined in Chapter 1, which states that immigrants are overrepresented in lower-level occupations in the U.S. More than 50% of immigrants in the analytical sample do not have health insurance. This could be a result of being unable to afford health insurance or other factors that need to be further investigated. In line with previous research (Portes and Rumbaut 2006), Latin America and Asia are the largest sending countries for immigrants to the U.S. In this section, I discuss major findings from the multivariate analysis, their significance and other limitations of this study.

These results from the logistic regression models for self-rated health and education-occupation match in Table 4.5 show that mismatches in education-occupation match are associated with negative self-rated, as other scholars have documented for the relationship between other health outcomes and education-occupation mismatch (Ro 2014). The magnitude of the effect of reporting negative self-rated health for over-educated and under-educated immigrants is attenuated in Model 2 and Model 3 of the logistic regression analyses, which incorporate demographic and socioeconomic covariates. One possible way of explaining this effect is that some covariates included in these models such as income and health insurance could be protective of immigrant health. The results also support the status inconsistency theory which posits that inconsistencies in the match across one's education, skills and occupation can have negative impacts on one's health if the social position is incongruent with the social status (Abramson 1966; Dressler 1988; Jackson 1962). The results also highlight that improved occupational status is associated with reporting positive self-rated health. Again, improved occupation status could be protective of health because of other intrinsic

benefits that come with a better occupation that are supportive of health such as income, health insurance and other factors that improve use of health services and adoption of healthy behaviors and a healthy lifestyle.

Of interest is the association between gender and self-rated health wherein women report worse self-rated health compared to men. As we have noted earlier, women may report worse self-rated health because of the migration stressors that they may face (Donato 1993) in addition to work and household responsibilities. In addition, even though both men and women could be selected to migrate from origin countries based on good health, Akresh and Frank (2008) have noted that men are more likely to be positively selected based on health compared to women.

Another important finding is that more years of completed education are associated with positive self-rated health while more years of U.S. education are associated with negative self-rated health. It is unexpected that U.S. education could be associated with negative self-rated health, but theories that state that cultural assimilation could be bad for your health may provide a plausible explanation for this result (Hyman and Dussault 2000; Lara et al. 2005). As expected, higher income was associated with reporting positive self-rated health relative to negative self-rated health even though the association was not too strong.

It is worthy to note that public health insurance is associated with reporting negative self-rated health, suggesting that public health insurance might be inadequate or lacking in providing healthcare coverage as previously outlined by other scholars (Aizer 2007; Thamer et al. 1997). This calls for improvements in the provision and delivery of public health programs, more so for immigrants in the U.S. Inadequate or lack of English

proficiency is associated with negative self-rated health for recent documented immigrants in the U.S. This finding underscores the need for improved communication to reduce language barriers with immigrants in health delivery. Used as a proxy for level of adaptation and assimilation to a host nation culture, inadequate English proficiency could imply that immigrants have not settled well into the host country labor market and health system, hence they face problems in using health services and report negative self-rated health as a result.

Another crucial finding has to do with the type of visa that enabled immigrants to migrate to the U.S. before they obtained their permanent residence status. Immigrants holding employment visas, diversity visas and family reunification visas report relatively positive self-rated health in comparison to refugees and immigrants on legalization visas. This finding could be interpreted as an indication of the unique migration struggles that refugees and legalization immigrants may face in their migration journeys to the U.S. (Simich, Beiser, and Mawani 2003).

It is important at this point to highlight several limitations that we should consider in order to understand the results of this study. First, the health outcome that I adopted in this study, self-rated health, is subjective. While self-rated health may not be considered a true representative of true health measures, some scholars concede of self-rated health as a proxy for several health outcomes and a true measure of health (Idler and Benyamini 1997). In this regard, I adopted self-rated health as a measure of health in this study. Second, the data used in this study are cross-sectional. This means that the relationships outlined in the discussion cannot be interpreted as causal relationships. Longitudinal data would be required in order to make causal inferences between education-occupation

match and self-rated health. Also, health and occupation are measured at single time points, though we might expect some important degree of variation over time. Finally, adopting a measure such as education-occupation match may be a subject of debate because measures of education and occupation vary widely in different countries. I adopted international measures and standards to measure both education and occupation in this study to ensure that I could compare immigrants' education and occupation from different regions of the world on a similar scale.

Despite these limitations, this study provides detailed analysis of the relationship between self-rated health and education-occupation match. It also contributes to literature on the association between self-rated health and education-occupation match informed by the status inconsistency theory. The major contribution from this study is that inconsistencies in education-occupation match are associated with reports of negative self-rated health. Last, but not least, this study demonstrates important findings about health based on individual characteristics such as education, marital status, income, English proficiency and visa status. Overall, it is noteworthy to highlight that education-occupation inconsistencies may not be protective of immigrant health.

Table 4.1: Mapping International Standard of Occupation Classifications (ISCO) to levels of education (Adapted with modification from: International Labor Organization. 2012 ISCO-08 Volume 1).

ISCO major occupation groups	Education level
1 Managers	Tertiary education (Bachelors, Masters, PhD)
2 Professionals	Tertiary education (Bachelors, Masters, PhD)
3 Technicians and Associate Professionals	Tertiary education (Bachelors, Masters)
4 Clerical Support Workers	Postsecondary nontertiary education/ secondary education
5 Services and Sales Workers	Postsecondary nontertiary education/ secondary education
6 Skilled Agricultural, Forestry and Fishery Workers	Postsecondary nontertiary education/ secondary education
7 Crafts and Related Trade Workers	Postsecondary nontertiary education/ secondary education
8 Plant and Machine Operators, and Assemblers	Postsecondary nontertiary education/ secondary education
9 Elementary Occupations	Primary level education
0 Armed Forces Occupations	Primary, secondary and tertiary education depending on rank

Table 4.2: A single illustration of each of the categories of the education-occupation match categories

ID	Education required	Respondents education	Education-occupation match	Notes
1	Primary level education	Bachelors degree	Over-educated	Respondent working as a plant and machine operator (ISCO code 7340) but they are qualified to be Technicians and Associate Professionals
8	Masters education	Masters education	Education-occupation match	Qualified professional working as a manager in their profession (ISCO code 1760)
74	Bachelors degree	Postsecondary nontertiary education/ secondary education	Under-educated	Respondent working as Technicians and Associate Professionals but qualified to be Services and Sales Workers

Table 4.3: Frequencies, percentages and means for education-occupation match and self-rated health ($N = 4,757$).

	Frequency	Percentage or mean
Self-rated health:		
• Positive	4,484	94
• Negative	273	6
Education-occupation match:		
• Education-occupation match	2,357	50
• Over-educated	1,237	26
• Under-educated	1,163	24
Occupational status	4,757	35
Age *(range 18 – 65)*	4,757	36
Gender:		
• Men	2,845	60
• Women	1,912	40
Marital status:		
• Married	3,268	69
• Never married	1,067	22
• Other	422	9
Income per annum:		
• < $25,000	3,537	74
• $25,000- $50,000	569	12
• $50,000-$100,000	436	9
• >$100,000	215	5
Completed years of education *(range 1-36)*	4,757	13
Years of U.S. education *(range 0 – 18)*	4,757	1
Region of origin:		
• Latin America	1,455	31
• Asia	1,469	31
• Africa	590	12
• Europe	865	18
• Other	378	8
Years of U.S. residence *(range 0 – 57)*	4,757	8
English proficiency:		
• Very well	1,391	29
• Well	1,361	29
• Not well	1,327	28
• Not at all	466	10
• Missing information	212	4

Table 4.3 continued

	Frequency	Percentage or mean
Visa category:		
• Family	1,338	28
• Employment	1,360	29
• Diversity	792	17
• Legalization	880	19
• Refugee/Asylum	387	8
Medical insurance:		
• Private	1,971	41
• Public (Medicare + Medicaid)	217	5
• None	2,418	51
• Missing information	151	3

Table 4.4: Spearman's correlation coefficient between self-rated health and education-occupation match.

	Education-occupation match			
Self-rated health	Overeducated	Same	Undereducated	Total
Positive	1,177	2,257	1,050	4,484
Negative	60	100	113	273
	1,237	2,357	1,163	4,757

Spearman's correlation coefficient (2) = 0.0851 Pr = 0.05

Table 4.5: Distribution of education-occupation match and covariates by self-rated health

	Self-rated health	
	Positive	Negative
Education-occupation match:		
• Education-occupation match	96%	4%
• Over-educated	95%	5%
• Under-educated	90%	10%
Occupational status	37	33
Age	36	40
Gender:		
• Men	95%	5%
• Women	93%	7%
Marital status:		
• Married	94%	6%
• Never married	96%	4%
• Other	91%	9%
Income per annum:		
• < $25,000	93%	7%
• $25,000- $50,000	95%	5%
• $50,000-$100,000	99%	1%
• >$100,000	99%	1%
Completed years of education	14	10
Years of U.S. education	1	0.8
Region of origin:		
• Latin America	89%	11%
• Asia	97%	3%
• Africa	97%	3%
• Europe	96%	4%
• Other	95%	5%
Years of U.S. residence	8	11
English proficiency:		
• Very well	98%	2%
• Well	96%	4%
• Not well	90%	10%
• Not at all	87%	11%
• Missing information	97%	3%

Table 4.5 continued

	Self-rated health	
	Positive	Negative
Visa category:		
• Family	93%	7%
• Employment	98%	2%
• Diversity	99%	1%
• Legalization	89%	11%
• Refugee/Asylum	89%	11%
Medical insurance:		
• Private	95%	5%
• Public (Medicare and Medicaid)	87%	13%
• None	94%	6%
• Missing information	95%	5%
Total	4,484 (94%)	273 (6%)

Table 4.6: Logistic regression models for self-rated health and education-occupation match – Odds ratios (N = 4,757)

	Model 1 O.R. (s.e)	Model 2 O.R. (s.e)	Model 3 O.R. (s.e)
Education-occupation match (Reference - Match):			
Over-educated	1.15 (0.19)	0.80 (0.14)	1.61 (0.31)*
Under-educated	2.43 (0.35)***	1.72 (0.25)***	1.36 (0.21)+
Occupational status		0.97 (0.00)***	1.01 (0.01)
Age			1.01 (0.05)
Age squared			1.00 (0.00)
Gender (Reference - Male)			1.46 (0.21)*
Marital status (Reference - Married):			
• Never married			0.68 (0.14)+
• Other			0.69 (0.14)+
Income categories (Reference - <25,000):			
• $25,000-$50,000			0.70 (0.16)
• $50,000-$100,000			0.31 (0.16)*
• >$100,000			0.31 (0.23)
Completed years of education			0.90 (0.02)***
Years of U.S. education			1.07 (0.04)**
Region of origin (Reference - Latin America):			
• Asia			0.71 (0.15)
• Africa			0.67 (0.22)
• Europe			0.71 (0.20)
• Other			0.57 (0.17)+
Years of U.S. residence			1.03 (0.01)***
English proficiency (Reference - Speak very well):			
• Speak English well			1.47 (0.37)
• Speak English not well			2.80 (0.74)***
• Speak English not at all			2.50 (0.79)**
• Missing information			1.41 (0.64)
Health insurance (Reference - Private insurance):			
• Public insurance			1.69 (0.43)*
• No insurance			0.84 (0.13)
• Missing information			0.96 (0.40)

Table 4.6 continued

	Model 1 O.R. (s.e)	Model 2 O.R. (s.e)	Model 3 O.R. (s.e)
Visa category (Reference - Family visa):			
Employment			0.75 (0.19)
Diversity visa			0.37 (0.15)*
Legalization			1.35 (0.24)+
Refugee/asylum visa			2.47 (0.63)***
N	4757	4757	4757
Pseudo R-squared	0.006	0.033	0.097

+ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$"

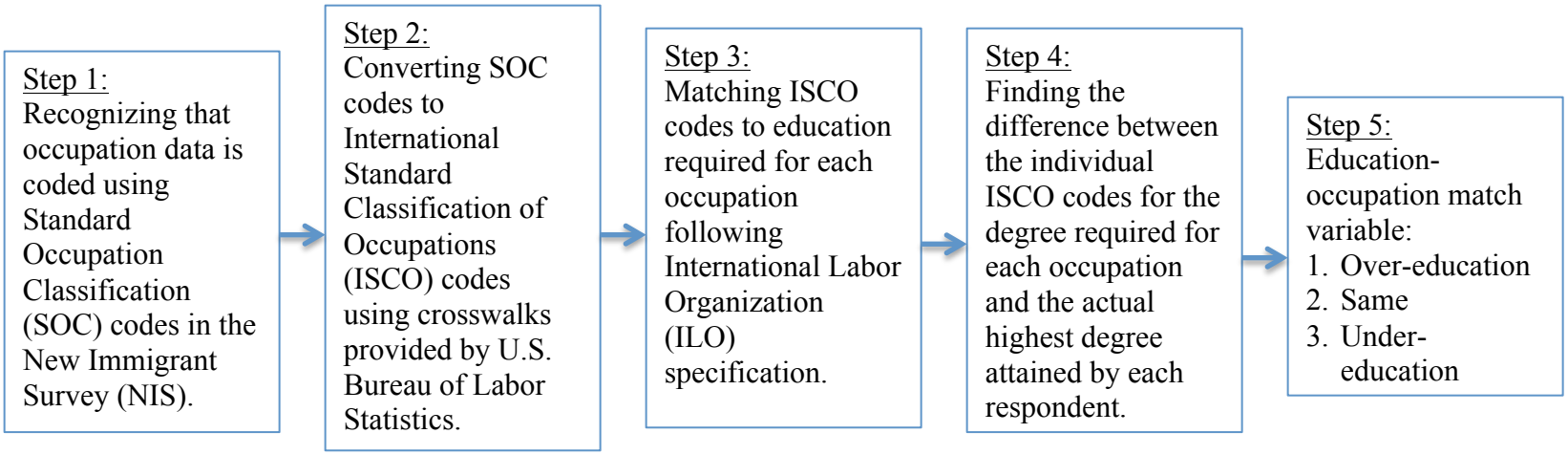


Figure 4.1 Steps in creating the education-occupation match variable

CHAPTER 5

THE ROLE OF IMMIGRANT OCCUPATIONAL STATUS AND OCCUPATIONAL MOBILITY IN IMMIGRANTS' USE OF HEALTH SERVICES

Background

The U.S is experiencing rapidly accelerating streams of immigrant workers from different regions of the world (Brown 2015). Along with this influx of immigrants, there are growing concerns among scholars and policy makers of the burden of immigrants on the U.S. healthcare system (Martin and Ruark 2010; Okie 2007). These trends suggest that an important relationship exists between labor market outcomes and health outcomes among immigrants in the U.S. Occupation, employment and income are the quintessential measures of labor market outcomes (Allmendinger 1989; Bound and Holzer 2000; Fasih 2008; Frattini 2014; Hawthorne 2006). While there is certainly variability in the relationship between occupation, employment, income and health, there is also wide variation in the relationship between different states of occupational status, occupational mobility and health.

Occupation signifies a state of employment and it is the medium trough which individuals earn an income (Fujishiro, Xu, and Gong 2010). Occupational status is a hierarchical ranking of individual occupations and it measures the relative status of

occupations. Occupational mobility measures changes in occupational status between two or more jobs and it generally includes three categories that measure an occupation upgrade, no occupation changes, or an occupation downgrade (Akresh 2006; Chiswick, Lee, and Miller 2005). Occupational status and occupational mobility influence a wide range of outcomes such as income, social status, and health among other outcomes. Understanding how immigrants experience changes in occupational status is essential to understanding how they navigate host country healthcare systems, specifically how they use health services (Wilcock 2006; Wilkinson, Shipee, and Ferraro 2012). But how does the migration experience shape occupation status, occupational mobility and use of health services?

Some scholars have documented that the occupation trajectories of recent legal U.S. immigrants follow a U shaped pattern of initial occupation downgrade with the first job in the U.S. followed by upward occupational mobility with subsequent jobs (Akresh 2008). One possible explanation for why such occupation trends are noticeable in the U.S. is because the education, skills and experience that immigrants earn in foreign countries are often valued less than the human capital attributes that they attain in the host countries (Friedberg 2000). Even though burgeoning strands of research on the portability of immigrant human capital exist, few studies have explored the relationship of occupational status, occupational mobility and use of health services among immigrants.

It is worthwhile to investigate immigrants' use of health services as it relates to changes in immigrant occupational status upon migration to the U.S. because of the current debates on whether immigrants burden the U.S. healthcare system (Stimpson et

al. 2010). While there is no consensus among scholars on the magnitude of the burden of immigrants on healthcare in the U.S., exploring whether immigrants are able to use health services based on their occupation will shed more light on the current debate. In addition, if this study reveals that immigrants do not use health services because of constraints in occupational status and occupational mobility, the results could contribute to literature that might improve policies directed towards immigrant labor market experiences and immigrant experiences with U.S. healthcare. Studying occupational status, occupational mobility and use of health services is particularly important for immigrants in the U.S. because immigrants may have unique migration experiences that could either be protective or expose them to difficulties in navigating the U.S. labor market and healthcare system.

The current study contributes to literature on immigrant occupational status, occupational mobility and use of health services in three ways. First, most studies fail to incorporate changes in occupation in their research methodology so I consider occupational status and occupational mobility to measure changes in occupation that immigrants experience. Second, I measure occupational mobility in a different way than most studies that measure change between two consecutive jobs by considering immigrants' first job abroad and current job in the U.S. Measuring occupational mobility in this way has the advantage of leaving a range of time between the first job abroad and the current job in the U.S. to observe individual immigrant occupation transitions. Third, I evaluate occupational status and occupational mobility as they relate to use of health services. Few, if any, other studies have explored this relationship among recent immigrants to the U.S. The following section is a discussion of the Fundamental Social

Causes theory, which lays the necessary theoretical groundwork that we need to understand the relationship between occupational status, occupational mobility and use of health services.

Theoretical Framework

Fundamental Social Causes Theory

Social conditions in which disease risks exist are as important in determining health outcomes as individual risk factors related to health behaviors that cause diseases. Understanding social conditions, such as contexts, that affect health outcomes is important for medical sociologists and social epidemiologists alike in narrowing the gap that exists in utilization of health services based on social resources that place populations at 'risk of risks' that cause diseases. Theorists Link and Phelan (1995) proposed a theory of Fundamental Social Causes (FSC), which provides a guide in understanding why health disparities have persisted over time based on socioeconomic status (SES), despite the reduction, and in some instances elimination, of infectious diseases and other conditions that were considered as causes of morbidity and mortality among individuals with low SES (Link and Phelan 2000; Marmot et al. 1978; McKeown, Record, and Turner 1975; Omran 1971).

According to the FSC theory, an individual's ability to benefit from the capability to minimize risk and to avoid emergent disease and death is shaped by, but not limited to, resources of knowledge, money, power, prestige and beneficial social connections (Link and Phelan 1995). Those who have more of these resources have an advantage to seek, access and utilize healthcare services and adopt healthy behaviors, while people of low

SES lack these crucial resources to avoid health risks and to adopt health-protective behaviors and strategies.

Link and Phelan (1995) outlined four specific conditions for which a social factor can qualify to be a FSC of disease. First, FSC should influence multiple disease outcomes through multiple mechanisms. Second, a FSC involves access to resources—knowledge, money, power, prestige and beneficial social connections— that can be used to avoid risks or to minimize the consequences of disease once it occurs. Third, the cause involves access to resources that can assist in avoiding health risks or to minimize the development of disease once it occurs, and fourth, "The association between a fundamental cause and health is reproduced over time via the replacement of intervening mechanisms" (Link and Phelan 1995). Some of these conditions are illustrated in the conceptual framework in Figure 5.1 because resources of knowledge, money, power, prestige and beneficial social connections are all linked to employment and occupations.

FSC of diseases involve resources that determine the extent to which people are able to avoid risks for health outcomes such as morbidity and mortality. Using the four criteria outlined above, the implication is that SES, which encompasses education, occupation and financial resources, is a FSC for healthcare disparities (Ross and Mirowsky 2003). FSC acts through proximate determinants of health or individual health behaviors such as diet, exercise, smoking, alcohol or drug use that affect individual biological processes to cause illness. Diseases emerge over time and once they are detected, treatment options or control options become available to individuals but those who command resources are at an advantage of accessing and using these services compared to those who do not have resources.

Several scholars have tested the theory of FSC or its components as they relate to pap smear tests and mammography (Link et al. 1998), SES and mortality (Phelan et al. 2004), SES and clinic visits for diabetes (Luftey and Freese 2005), SES and intelligence (Link et al. 2008), race and ethnicity (Phelan and Link 2006), stigma (Hatzenbuehler, Phelan, and Link 2013) and other stratifying inequalities. Collectively, these and other investigations point to FSCs as important determinants of health. The FSC theory emphasizes persistent socioeconomic inequalities as they widen the gap in knowledge, access and utilization of health based on contexts of socioeconomic status, gender, race and ethnicity.

Extending from the FSC theory and associated empirical findings, the framework can be aptly applied to the study of immigrant occupation and health outcomes. No empirical study has applied or tested the FSC theory in the immigrant population in the U.S. to date even though Castaneda et al. (2015) points out that immigration in its own right is a key social determinant of health. The FSC theory can help us to explain the patterns of individual immigrant experiences in the relationship between occupational status, occupational mobility and use of health services. On one hand, I expect that immigrants with higher occupational status positions and immigrants who experience upward occupational mobility will be able to use health services and improve their health outcomes. On the other hand, I anticipate that immigrants who occupy lower occupational status positions and immigrants who experience an occupation downgrade will experience some difficulty in using health services. I discuss the context of these premises with the aid of a conceptual framework that I present in the subsequent section.

Conceptual Framework for Immigrant Occupation and Health

One of the key socioeconomic factors at the individual level that is determined by human capital and occupation is income. The income that an individual earns determines the health resources that they can purchase, ranging from health insurance, to accessing and using health services and adopting a healthy lifestyle (Mirowsky and Ross 2003). Beyond the relatively straightforward linkages among occupation, income and health, immigrants' status and their unique experiences of mobility, as well as their particular economic and social positions in host societies, generate additional factors for consideration in the occupation-health relationship. Figure 5.1, which is informed by joint consideration of previous research on occupation and immigrant health, provides a conceptual model for investigating the varied pathways via which characteristics of occupational status and occupational mobility shape health among immigrants.

Immigrant occupation and health outcomes are affected by mechanisms operating before an immigrant gets a job in the destination country such as migration status, individual human capital attributes and the labor markets of both sending and receiving nations as shown in Figure 5.1. These factors are crucial in determining immigrant occupation, occupational status and occupational mobility. However, in the process of securing a job, immigrants usually face stressors related to migration, assimilation, transferability of human capital and education-occupation match in destination countries because it takes time to adjust to a new environment and a new labor market (Abramson 1966; Akresh 2008). These obstacles to a smooth transition and assimilation to a host country labor market could negatively impact immigrant worker occupational mobility and use of health services.

The model suggests that there is a direct association via which occupation affects health outcomes. This direct association attributes health outcomes to direct, physical, chemical and other on-the-job hazards, injuries or stressors that influence health status (Ahonen, Fernando, and Benach 2007). For instance, factors that are directly related to the work environment like the demands of manual work in construction, loud noise and vibration in factory settings, exposure to minerals and metals such as lead, mercury and asbestos in mining, or exposure to dangerous machinery and harmful chemicals and solvents in farming could be directly detrimental to immigrant health on the job and they could have damaging effects for health (Al-Maskari et al. 2011).

The indirect association through which occupation affects immigrant health acts through income and other intervening socioeconomic variables and health behaviors to affect health outcomes. Income determines immigrant health exposures, health provisions, health behaviors and resources for coping, and subsequently affects health outcomes. If income allows immigrants to access health provisions, afford resources for coping, avoid negative health exposures and adopt healthy behaviors, immigrants with high status occupation and high incomes are likely to have positive health outcomes. On the other hand, low-status occupation and low income might constrain immigrants from using services that are favorable to their health and result in negative health outcomes.

This study conceives of the major linkages in the relationship between immigrant occupational mobility and health outcomes presented in the conceptual framework in Figure 5.1, as a comprehensive approach, even though these mechanisms are not exhaustive and they may not necessarily apply to all immigrant workers. The conceptual framework provides a basis for studying immigrant occupation and health. It is not

possible to provide a detailed evaluation of how each mechanism affects the occupation-health relationship for immigrants in this study, but I will present evidence of some of these main associations using empirical findings presented in past research. Some reciprocal relationships or relationships of reverse causation, where for instance, the type of occupation that an individual performs is determined by their health, are not shown in the conceptual framework and these reciprocal relationships could be foundations for future research.

Occupational Status, Occupational Mobility and Use of Health Services

This section discusses empirical studies on the relationship between occupational status, occupational mobility and use of health services. Occupation is an important component of socioeconomic status together with income and education but its role is often overlooked in studies that examine the relationship between socioeconomic status and health (Fujishiro, Xu, and Gong 2010). A probable reason for this exclusion is that occupation is an intricate measure that can be both subjective and objective (Wilkinson, Shipee, and Ferraro 2012). Occupational status is a hierarchical ranking of individual occupations and it measures the relative status of occupations. Occupational mobility measures changes in occupational status between two or more jobs over time (Chiswick, Lee, and Miller 2005).

According to the Fundamental Social Causes theory, we expect a positive relationship between high occupational status and use of health services because the labor market rewards high status occupations with high income, which can be used to acquire resources that are favorable to health. Whether the positive relationship between

occupational status and use of health services health holds, and maintains, a similar pattern across all populations is debatable (Bostean 2013; Crimmins et al. 2007; Franzini, Ribble, and Keddle 2001; Hummer et al. 2007; Markides and Coreil 1986). More research is needed to explore the relationship between occupational status and occupational mobility and use of health services particularly for immigrants who experience unique occupation experiences in the U.S. labor market when they migrate.

The labor market in most developed nations is divided into the primary sector (high-paying, high-skill jobs) and the secondary sector (low-paying, low-skill jobs). Typically, fewer individuals in the developed nations are willing to work in the secondary sector (Hudson 2007; Piore 1970; Sakamoto and Meichu 1991). Consequently, immigrants in advanced industrial economies seek and are recruited to fill many secondary sector jobs that some scholars have referred to as 'dead end jobs' (Allensworth 1997; Jelin 1977) because they are usually dirty, demeaning and dangerous – 3D jobs (Akresh 2006). Immigrant worker protection in the secondary sector is limited and enforcement of regulations guiding workers health is also inadequate (Liebman et al. 2013). Additionally, restrictions upon and challenges to unionization at the bottom mean that occupants of secondary sector positions are weakly protected; they often labor under difficult and dangerous conditions, such as for long, irregular hours and in hazardous conditions with low wages and benefits. It is widely assumed that individuals in low-status occupations have jobs with low autonomy, low sense of control and high job strain, each of which are associated with poor health (Mirowsky and Ross 2003). Low-status jobs are also associated with poor health because the limited benefits and low compensation associated with these jobs deter individuals from practicing healthy

behaviors and seeking healthcare (Adler and Ostrove 1999; Marmot et al. 1978; Marmot et al. 1991).

The landmark Whitehall study of British male civil servants is especially useful and illustrative of early work connecting occupation and health outcomes (Marmot et al. 1978). The study investigated the social determinants of health with an emphasis on individual class of occupation as it related to cardiovascular diseases. Marmot and colleagues found that higher status occupations were linked to better health outcomes; male employees in higher ranks were better able to seek healthcare and manage illnesses like heart disease than low-ranking employees. The conclusions suggest that men who had higher-level occupations had the resources to prevent and treat illness compared to those with lower-level occupations. This work set the stage for further investigation of the relationship between occupation and heath in other populations and in different settings, such as Europe (Siegrist et al. 2004), South Asia (McKeigue, Shah, and Marmot 2003), India (Subramanian 2013; Zaman et al. 2011), the U.K. and U.S. (Stranges et al. 2008), Canada (Raphael 2003), Denmark (Moller, Kristensen, and Hollnagel 1991), Lithuania and Sweden (Kristenson et al. 2001), Japan (Tsutsumi et al. 2001), Ghana (Addo, Smeeth, and Leon 2009) among others. The Whitehall study of British male civil servants could be a useful departure point in the study of the relationship between occupational status, occupational mobility and use of health services among immigrants in the U.S.

Some research (e.g., Abraido-Lanza, Chao, and Florez 2005; Biddle, Kennedy, and McDonald 2007) has examined immigrant health as a phenomenon largely removed from questions of immigrant occupation (e.g. Akresh 2006; Buzdugan, and Halli 2009;

Chiswick, Liang and Miller 2003; Friedberg 2000). Fujishiro, Xu, and Gong (2010) noted that among the socioeconomic status triad of education, occupation and income, occupation does not get the significance it deserves in disentangling health outcomes. Using data from the U.S. General Social Survey from 2002 and 2006, Fujishiro, Xu, and Gong (2010) investigated the relationship between occupation status and self-rated health. The results of this study showed that higher occupational status was associated with lower odds of reporting poor self-rated health. Merging immigrant occupation research with health research will provide more comprehensive approaches to understanding the factors that promote and disadvantage immigrant health. Additionally, such research may yield novel insights into the role that occupational status and dynamic occupational mobility play in shaping immigrant use of health services.

In their study of the relationship between occupational mobility and mental health, Eaton and Lasry (1978) interviewed a sample of North African Jewish immigrants in Montreal, Canada in 1972. The results of their study revealed that downward occupational mobility was linked to schizophrenia while upward occupational mobility was linked to mild psychiatric symptoms. They also found a weak association between upward occupational mobility and psychiatric symptoms but the strength of association was greater for immigrants who had recently changed jobs. This implies that experiencing changes in occupational status could have an effect on health because changes in occupation could mean changes in work responsibilities and changes in incomes or other resources that enable ease of use of health services.

Using Russia Longitudinal Monitoring Survey data (1994-2005), Billingsley (2009) tested the effect of downward occupational mobility and unemployment on the

risk of death in Russia. In this study, men who experienced downward occupational mobility were at greater risk of mortality compared to men who did not experience downward occupational mobility. However, women's mortality risk was not linked to downward occupational mobility, but both men and women experienced elevated mortality risks if they were unemployed. Similarly, Wilkinson, Shipee and Ferraro (2012) investigated the effect of occupational mobility on working women's health in the U.S. Using data collected over 36 years from the National Longitudinal Survey of Mature Women (1967-2003), they found that downward occupational mobility in middle age had adverse effects on women's health in later life. These studies reveal the importance of occupational status and occupational mobility as determinants of health outcomes in the general population. Whether occupational status and occupational mobility are determinants of health status and use of health services among immigrants in the U.S. is an important question that needs to be answered.

Most studies that explore use of health services focus on predisposing factors (age, marital status, gender, education and ethnicity), enabling factors (having a usual source of healthcare), need factors (health status and self-reported health) and a variety of diseases (Babitsch, Gohl, and Lengerke 2012). The current study brings a unique contribution to research on use of health services by incorporating occupational status and occupational mobility as determinants of use of health services among immigrant in the U.S.

Hypotheses and Research Questions

In this study, I determine how occupational status and occupational mobility affect immigrant workers' use of health services. I am interested in answering one overarching question. I ask a question of changes in occupation: How do immigrants experience occupational mobility between their first job abroad and their current occupation when they leave their origin countries? With changes occurring in occupation between the first job abroad and the current occupation in the U.S., I am interested in investigating whether certain experiences of occupational mobility relate to individual use of health services.

I also investigate patterns of use of health services for immigrants with different occupation rankings along the occupation hierarchy. Use of health facilities is a proximate determinant of health outcomes. I therefore take an interest in various contextual factors that enable and deter immigrants from using healthcare facilities in the U.S. Informed by past research, I formulate several research questions and hypotheses as follows.

Hypotheses

1. Improvements in occupational status will increase use of health services.
2. Occupation downgrade will be associated with fewer resources such as income that enable use of health services but occupation upgrade will enable immigrants to use health services.
3. Immigrants with high-level occupations will use health facilities more than immigrants with lower-level occupations.

Methods

In order to be concise, variables that I have used in previous analysis such as age, gender, marital status, income and use of health services, to name a few, are not included in this section. The dependent variable in this set of analyses was use of health services, measured by doctor and dental visits. The independent variables were occupational status and occupational mobility. I detail the variables that I have not used in previous studies below.

Measures

Occupational mobility

In this study, occupational mobility compared an immigrant's first job abroad and their current occupation during the survey. This comparison measured whether immigrants experienced an occupation upgrade, an occupation downgrade or remained at the same occupation level. For immigrants who were currently employed when the survey was conducted, I constructed this variable by assigning occupation status scores to the respondents' first occupation abroad and the current occupation in the U.S. I measured occupation status using the International Socioeconomic Index (ISEI), an internationally standardized measure of occupation status (Ganzeboom, DeGraaf, and Treiman 1992). I then subtracted the occupation status score for the first occupation abroad from the current occupation's status score to determine whether an individual had experienced an occupation upgrade, occupation downgrade or remained on the same level of occupation status. Instead of adopting the category same as the difference of zero between occupation status scores, I carried out a +/-5 point sensitivity analysis on the

category ‘same’ for occupational mobility in the multivariate analyses and the results were robust.

I measured occupational mobility at two time points, that is, first occupation abroad and current occupation, because the NIS data had complete information about immigrant occupation status at these two time points only. This limits the measure of occupational mobility in this study because it does not consider immigrants’ first occupation, occupation prior to the first job abroad and any intermediate occupations. In addition, measuring occupational mobility in this way only considers immigrants with widely different years of labor force participation between the measured jobs. Despite these limitations, I utilized immigrant occupation data that were complete for the two time points to approximate a snapshot of immigrant occupational mobility. I excluded immigrants who did not report a first occupation abroad and a current occupation in the U.S. at the time of the survey. This implies that this study did not consider patterns of occupational mobility as they relate to use of health services for immigrants who experienced occupation trajectories and occupational mobility patterns outside of the two time points I considered in this study. The implication for sample selection into these analyses is that the study results should be generalized with care to the general immigrant population.

Background Factors

I described all the background variables that I included in this set of analyses in Chapter 3 and Chapter 4. The background variables include age, gender, marital status, self-rated health, individual income per annum, years of U.S. education, region of origin,

years of U.S. residence, English proficiency, medical insurance and visa category.

Results

Descriptive Statistics

Table 5.1 shows the frequencies, means and percentage distributions of respondents in this analysis, which examined the relationship between use of health services, occupational status and occupational mobility. The table shows the descriptive statistics for the dependent variables, use of health services, measured by doctor visits and dentist visits, and the two independent variables, occupational status and occupational mobility. The frequencies, means and percentages for age, marital status, gender and education, health insurance, self-rated health and other correlates are also included in the table. More than half of the respondents did not visit the doctor (57%) or the dentist (51%) while the remainder visited the doctor (43%) and the dentist (49%), respectively. The average occupational status for immigrants in this sample was an ISEI measure of 35. A large proportion of the respondents did not experience any changes in their occupation status (38%), followed by respondents who experienced an occupation downgrade (36%) and a select few who experienced an occupation upgrade (26%). The average age in this sample was 37 years old. On average, respondents acquired 13 years of education outside the U.S. and only 1 year of education in the U.S.

There were more men (64%) than women (36%) in the sample. More than half of the respondents were married (74%), followed by never married (18%) and other marital states (8%). The majority of the respondents reported positive self-rated health (94%) compared to negative self-rated health (6%). Most respondents earned less than $25,000

(73%), followed by $25,000-$50,000 (12%), then $50,000 - $100,000 (10%) and 5% of the respondents earned more than $100,000.

The sample comprised of respondents from Asia (33%), Latin America (26%), Europe (21%), Africa (13%) and other regions of the world (8%). On average, the duration of residence in the U.S. for the respondents was 7 years. The respondents had varying levels of English speaking proficiency; 30% did not speak well, 28% spoke well, 27% spoke very well, 10% did not speak English at all and 5% of the respondents had missing information regarding their English speaking abilities. More than half of the respondents in this sample did not have health insurance (51%), followed by respondents with private health insurance (43%), public health insurance (4%) and missing information (1%). A large number of immigrants in this sample migrated on employment visas (32%), followed by family visas (26%), diversity visas (18%), legalization (16%) and refugee and asylum visas (8%).

Bivariate Statistics

Occupational Mobility by Use of Health Services

Table 5.2 shows the distribution of occupational status and occupational mobility by use of health services. Respondents who did not use doctor and dental services had low average occupation status (ISEI=33) compared to respondents who used both dental and doctor services who had a higher average occupation status (ISEI=37). With regards to the distribution of respondents based on doctor and dental visits, 42% of the respondents who experienced an occupation downgrade visited the doctor, 41% of the respondents with the same occupation visited the doctor and 49% of the respondents who

experienced an occupation upgrade visited the doctor while 58%, 59% and 51% of respondents who experienced an occupation downgrade, same occupation and an occupation upgrade visited the dentist, respectively. It is worth noting that a large proportion of immigrants without health insurance did not use health services. However, there were no distinct variations observed for the distribution of descriptive statistics for other covariates between Table 5.1 described above and the statistics in Table 5.2.

Figure 5.2 is an illustration of the two independent sample *t*-tests for occupational status by use of health services (mean occupational status and 95% confidence interval). I performed this test to explore whether there were differences in mean occupational status for respondents who used health services and respondents who did not use health services. The results for doctor visits (*t*-statistic = -5.85, $p < 0.05$) and dental visits (*t*-statistic = -8.16, $p < 0.05$) show that there is strong evidence that the mean occupational status for immigrants who use doctor services and dental services is different. Higher occupation status is associated with using doctor and dental visits.

Table 5.3 shows the Wilcoxon rank-sum tests for the relationship between occupational mobility and use of health services. It also displays the observed and expected rank sum for doctor and dental visits by occupational mobility. I used the Wilcoxon rank-sum (Mann-Whitney) test to identify the relationship between occupational mobility and use of health services (Wilcoxon 1945). The Wilcoxon rank-sum (Mann-Whitney) test is a nonparametric analog to the independent samples *t*-test (Fagerland and Sandvik 2009; Mann and Whitney 1947). I adopted this test for this analysis because I measured occupational mobility as an ordinal variable. In the end, this analysis allowed me to assess the difference between occupational mobility for

respondents who had doctor visits and respondents who did not have doctor visits. The results show that there are no statistically significant differences between the underlying distributions in different categories of occupational mobility between respondents who visited the doctor and respondents who did not visit the doctor ($z = 0.666$, $p = 0.5054$) and between respondents who visited the dentist and respondents who did not visit the dentist ($z = 2.098$, $p = 0.0359$).

Occupational status, Occupational Mobility and Use of Health Services

The final analysis summarized in Table 5.4 presents the results of the test of association between occupational status, occupational mobility and use of health services (doctor and dental visits) using logistic regression analysis. I measured doctor and dental visits as binary outcome variables and I used logistic regression analysis to model use of health services. This analysis estimates the effects of occupational status, occupational mobility and other predictor variables on the log odds of using doctor or dental visits. There are four models for doctor visits and four models for dental visits. Models 1a and 1b show the relationship between occupational status and use of health services. Models 2a and 2b show the relationship between occupational mobility and use of health services. Models 3a and 3b regress use of health services on both occupational status and occupational mobility. The final models, Models 4a and 4b, present the results of the relationship between use of health services, occupational status, occupational mobility and other covariates. The purpose of introducing the independent variables and covariates at different stages in each model was to observe the statistics for the main independent variables and also to note the differences and changes in statistics after

controlling for the covariates. This also aided in assessing possible confounding variables in the association between occupational status, occupational mobility and use of health services.

Models 1a and Model 1b, which examine the relationship between use of health services and occupational status, show a significant positive association between occupation status and use of doctor and dental services. In other words, higher occupation status increases the odds of using doctor services (odds ratio = 1.01, $p < 0.001$) and dental services (odds ratio = 1.02, $p < 0.001$).

The relationship between occupational mobility and use of health services is tested in Model 2a and Model 2b using the category of same occupation as the reference category. Compared to experiencing same occupation status between jobs, an occupation upgrade is associated with a 32% increased odds of using doctor services (odds ratio = 1.32, $p < 0.001$). Occupation upgrade is not statistically significant in determining use of dental services. On the other hand, relative to experiencing the same occupation status between jobs, an occupation downgrade is associated with a 17% decrease in the use of dental services (odds ratio = 0.83, $p < 0.05$), but it is not statistically significant in determining use of doctor services.

Model 3a and Model 3b include both occupational status and occupational mobility as predictors of use of health services. I did not observe any change from Model 1a and Model 1b in significance or magnitude of odds ratios for the effect of occupational status on use of health services. The odds ratios for occupational status are statistically significant ($p < 0.001$) and they remained 1.01 for doctor visits and 1.02 for dental visits. Again, they show that higher employment status is associated with increased odds of

using both doctor and dental visits. Occupational mobility is not statistically significant in determining use of health services in Models 3a and 3b.

Occupational status, occupational mobility, migration variables, demographic variables and socioeconomic covariates comprise the variables tested in the final models, Model 4a and Model 4b, for doctor and dental visits, respectively. Adding other covariates in this model renders occupational status and occupational mobility not significant in determining use of health services for both doctor and dental visits. The only exception is, the statistically significant ($p < 0.05$) odds ratio for occupational status in determining doctor visits in Model 4a. The odds ratio of 0.99 suggests that higher occupational status is associated with 1% reduced odds of using doctor visits. In Model 4a, the odds ratio for self-rated health for doctor visits is positive and statistically significant ($p < 0.001$), suggesting that immigrants who report negative self-rated health are more likely to use doctor services (odds ratio = 2.18). Self-rated health is not statistically significant in determining use of dental services.

Age is not statistically significant in determining use of health services for both doctor and dental visits in Models 4a and 4b. The odds ratio for gender is positive and statistically significant ($p < 0.001$), indicating that women have 37% and 52% higher odds of using doctor and dental services, respectively (odds ratios = 1.37 and 1.52, respectively) compared to men. The covariates marital status and years of schooling in the U.S are not significant in determining either doctor visits or dental visits. However, the odds ratio of years of schooling outside the U.S is positive and statistically significant ($p < 0.001$). This means that the more years of schooling outside the U.S. that an immigrant possesses, the higher their odds of using both doctor services and dental

services (odds ratios =1.05 and 1.06, respectively). The odds ratio for years of U.S. residence is positive and statistically significant for doctor visits (odds ratio = 1.02, $p <$ 0.001), which indicates that each additional year an immigrants stays in the U.S. increases their odds of using doctor services by 2%. By comparison, the variable years of U.S. residence is not statistically significant in determining use of dentist services.

For doctor visits in Model 4a, using <$25000 as the reference category, earning $25,000-$50,000 is not statistically significant in determining doctor visits but the odds ratios for immigrants who earn income in the categories $50,000-$100,000 and >$100,000 are statistically significant ($p < 0.05$ and $p < 0.001$, respectively) in determining doctor visits. This implies that immigrants who earn within these income ranges have higher odds of using doctor services. The statistics in Model 4b show that overall income is not significant in determining dental visits for immigrants in the U.S. Relative to private health insurance, public health insurance and missing health insurance is not statistically significant in determining use of health services among immigrants. Not having health insurance is statistically significant ($p < 0.001$); immigrants without health insurance are less likely to use both doctor and dental services by 60% and 38%, respectively (odds ratio for doctor visits = 0.40, odds ratio for dentist visits = 0.62), relative to immigrants with private health insurance.

Most of the odds ratios for English language proficiency are not statistically significant in determining use of both doctor and dental visits except for the positive statistically significant ($p < 0.001$) odds ratio for speaking English well for doctor visits. This means that immigrants who speak English well have 37% increased probability of

using doctor services (odds ratio=1.37) compared to respondents who speak English very well.

Regarding region of origin, Asians have lower odds of using both doctor and dental visits but the odds ratio for doctor visits is not statistically significant. Visiting the dentist is associated with statistically significant odds of 0.77 ($p < 0.05$), which implies that Asian immigrants have 23% reduced odds of using dental services compared to Latin American immigrants. The odds ratios for use of doctor and dental visits for African immigrants are statistically significant indicating that Africans have 43% increased odds of using doctor services (odds ratio = 1.43, $p < 0.05$), but they have 26% reduced odds of using dental services (odds ratio = 0.74, $p < 0.10$) compared to Latin American immigrants. European immigrants and immigrants from other regions of the world have positive and statistically significant odds of using both doctor and dental services. European immigrants have 35% increased odds of using doctor services (odds ratio = 1.35, $p < 0.05$) and 86% increased odds of using dental services (odds ratio = 1.86, $p < 0.001$). Immigrants from other regions of the world have 68% (odds ratio = 1.68, $p < 0.05$) increased odds of using doctor services and 67% (odds ratio = 1.67, $p < 0.05$) increased odds of using dental services relative to Latin American immigrants.

Using family visa as the reference category, an examination of visa categories reveals noteworthy findings. Immigrants on refugee visas are associated with lower odds of using both doctor and dental services (odds ratio = 0.41, $p < 0.001$ and odds ratio = 0.52, $p < 0.001$, respectively) relative to immigrants on family visas. A similar pattern of reduced odds for using both doctor and dental visits is observed for diversity visas but the odds ratios are only statistically significant for doctor services (odds ratio = 0.73, $p <$

0.05). Employment visa is associated with increased odds of using both doctor and dental services but the odds are statistically significant for dental services only (odds ratio = 1.23, $p < 0.10$). Legalization visa is not statistically significant in determining use of health services among immigrants in the U.S.

Discussion

This chapter set out to answer three essential questions related to occupation, use of health services and the migration experience for recent documented immigrants to the U.S. First, I sought to disentangle the effect of occupational mobility on the use of health services among immigrants in the U.S. Second, I investigated whether differences exist between different states of occupational mobility as they relate to use of health services. Finally, I explored whether differences exist in use of health services based on immigrant placement on the occupation hierarchy using immigrant occupation status. Within this analysis, I tested independent variables in different models and I introduced covariates in the final model to see if the results I observed in the initial models would persist after controlling for the background variables. The following paragraphs highlight some key findings from this study and they also address some implications of the findings and limitations of the study.

This study shows that occupational status matters for use of health services. The higher one is on the occupation status hierarchy, the more they will use both doctor and dental services. These results were somewhat expected because they are in line with previous research on the relationship between occupation and health. Studies such as that by Eaton and Lasry (1978) and Fujishiro, Xu, and Gong (2010) suggest that occupation is

a fundamental determinant of health. This finding also supports the Fundamental Social Causes theory because occupation may provide resources such as income and health insurance that can enable immigrants to use health services.

Also of interest is the association between occupational mobility and use of health services. As we postulated, an occupation upgrade promotes use of health services while an occupation downgrade reduces the use of health services. The relationship is that of increased use of doctor visits with an occupation upgrade and reduced use of dental visits with an occupation downgrade. One possible way of interpreting this finding is by thinking of immigrants as rational beings who prioritize essential health services and sacrifice nonessential health services such as dental visits when their socioeconomic status is not favorable. This finding also shows that as expected, there are differences in using health services among immigrants based on whether an immigrant experienced an occupation upgrade or an occupation downgrade.

Another finding worthy to note is that negative self-rated health is associated with increased use of health services. The purpose of including self-rated health in the analysis was to control for immigrants who are often sick and have to use health services more than other immigrants. From previous chapters, we noted that self-rated health is a close proxy of objective measures of health. The findings in the current analysis are in line with the previous observations and in the current analysis we observe that sicker immigrants use health services more that immigrants who report positive self-rated health.

Like occupation status, gender has a positive association with both doctor and dental visits. Women use doctor and dental services more than men. One possible

explanation for these results is that women are more cautious and they take care of their health better than do men (Arcury 2014; Centers for Disease Control 2001; Wilkinson, Tetyana, and Ferraro 2012). At this point, it is useful to note that there were disproportionately fewer women in this sample. However, descriptive statistics showed us that a large proportion of immigrants earn less that $25,000. This observation could help us to derive an alternative explain for the gender differences in use of health services. There are more men in the sample who probably work in lower-status occupations and earn a low income that might not afford them use of health services.

Regarding education, years of residence in the U.S., income, English language proficiency and health insurance, favorable outcomes for these control variables promote the use of health services. Given the Fundamental Social Causes theory, which states that an individual's ability to benefit from the capability to minimize risk and to avoid emergent disease and death is shaped by, but not limited to, resources of knowledge, money, power, prestige and beneficial social connections (Link and Phelan 1995) that enable individuals to access and use health services, it is not surprising that the current analysis yielded these findings. These results imply that social context and the migration experience are fundamental to the study of immigrant occupation and health outcomes.

Finally, there were inconclusive pattern of association between immigrant region of origin and use of health services. However, immigrant visa status showed some association with use of health services. Refugees and diversity visa immigrants used health services less while employment visa immigrants used health services more. Again, the unique migration experiences which immigrants on different visas experience are reflected in their use of health services. Refugees and immigrants on legalization visas

may face struggles in their migration journey such as language barriers, employment in low-status occupations among other challenges that could impede their adaptation and assimilation, hence reducing use of health services. It is somewhat expected that immigrants on employment visas use health services more.

These results should be understood in the context of several limitations. First, use of health services is driven by a need to use the services such as that for persons who have long-term illnesses. The sample of immigrants in the New Immigrant Survey was generally in good health, but I controlled for people who are often sick using self-rated health in the regression models. Second, the nature of the cross-sectional data from the New Immigrant Survey limits the establishment of causal connections in the relationship described in this study. However, the associations that we observed lend insights into the relationship between immigrant occupational status, occupational mobility and use of health services. Finally, the nature of the cross-sectional data from the New Immigrant Survey posed some difficulties in creating an occupational mobility variable using an individual's two consecutive occupations because of missing data on consecutive occupations. I addressed this shortcoming by using retrospective occupation data at two time points, namely, first occupation abroad and current occupation, to calculate changes in occupation. Despite these limitations, this study offered insights into the relationship between occupation status, occupational mobility and use of health services among recent immigrants to the U.S.

Table 5.1: Frequencies, percentages and means for occupational status, occupational mobility and use of health services (N = 3,002).

	Frequency	Percentage or mean
Use of health services:		
1. Doctor visits		
• No	1,705	57
• Yes	1,297	43
2. Dental visits		
• No	1,524	51
• Yes	1,478	49
Occupational status *(range 10 – 80)*	3,002	35
Occupational mobility:		
• Downgrade	1,097	36
• Upgrade	771	26
• Same	1,134	38
Age *(range 18 – 65)*	3,002	37
Gender:		
• Men	1,929	64
• Women	1,073	36
Marital status:		
• Married	2,211	74
• Never married	539	18
• Other	252	8
Self-rated health:		
• Positive	2,839	94
• Negative	167	6
Income per annum:		
• < $25,000	2,186	73
• $25,000- $50,000	350	12
• $50,000-$100,000	312	10
• >$100,000	154	5
Years of schooling outside the U.S. *(range 0 – 20)*	3,002	13
Years of U.S. education *(range 0 – 14)*	3,002	1
Region of origin:		
• Latin America	783	26
• Asia	978	33
• Africa	387	13
• Europe	629	21
• Other	225	8
Years of U.S. residence *(1-63)*	3,002	7

Table 5.1 continued

	Frequency	Percentage or mean
English proficiency:		
Very well	814	27
Well	850	28
Not well	896	30
Not at all	303	10
Missing information	139	5
Medical insurance:		
Private	1,301	43
Public (Medicare + Medicaid)	135	4
None	1,534	51
Missing information	32	1
Visa status:		
Family	786	26
Employment	963	32
Diversity	536	18
Legalization	483	16
Refugee/asylum	234	8

Table 5.2: Distribution of occupational mobility and other variables by use of health services.

	Doctor visits		Dentist Visits	
	Yes	No	Yes	No
Occupational status	37	33	37	33
Occupational mobility:				
• Occupation upgrade	49%	51%	52%	48%
• Same occupation status	41%	59%	46%	54%
• Occupation downgrade	42%	58%	50%	50%
Age	37	38	37	37
Gender:				
• Male	40%	60%	46%	54%
• Female	48%	52%	56%	44%
Marital status:				
• Married	43%	57%	49%	51%
• Never married	44%	56%	49%	51%
• Other	45%	55%	48%	52%
Years of schooling outside the U.S.	14	13	14	13
Years of school in the U.S.	0.7	0.5	0.6	0.5
Income category:				
• <$25,000	40%	60%	47%	53%
• $25,000-$50,000	48%	52%	49%	51%
• $50,000-$100,000	55%	45%	60%	40%
• >$100,000	56%	40%	56%	44%
Region of origin:				
• Latin America	41%	59%	44%	56%
• Asia	43%	57%	49%	51%
• Africa	42%	58%	36%	64%
• Europe	45%	55%	61%	39%
• Other	53%	47%	57%	43%
Years of U.S. residence	8	7	8	7
English proficiency:				
• Very well	47%	53%	55%	%
• Speak English well	48%	52%	52%	48%
• Speak English not well	36%	64%	44%	56%
• Speak English not at all	35%	65%	40%	60%
• Missing information	53%	47%	50%	50%

Table 5.2 continued

	Doctor visits		Dental visits	
	Yes	No	Yes	No
Health insurance:				
• Private insurance	56%	44%	59%	41%
• Public insurance	47%	53%	44%	56%
• No insurance	32%	68%	42%	58%
• Missing information	41%	59%	50%	50%
Self-rated health:				
• Negative	55%	45%	47%	53%
• Positive	43%	57%	49%	51%
Visa category:				
• Family visa	44%	56%	46%	54%
• Employment	51%	49%	58%	42%
• Diversity visa	36%	64%	47%	53%
• Legalization	41%	59%	45%	55%
• Refugee/asylum visa	32%	68%	38%	62%
Total	1,297 (57%)	1,705 (43%)	1,478 (51%)	1,524 (49%)

Table 5.3: Wilcoxon rank-sum (Mann-Whitney) test for the relationship between occupational mobility and use of health services.

Doctor visits				Dentist visits			
	Observations	Rank sum	Expected rank sum		Observations	Rank sum	Expected rank sum
No	1,705	2,574,757	2,560,057.5	No	1,524	2,335,018.5	2,288,286
Yes	1,297	1,932,746	1,947,445.5	Yes	1,478	2,172,484.5	2,219,217
Combined	3,002	4,507,503	4507503	Combined	3,002	4,507,503	4,507,503
Unadjusted variance		553,400,000		Unadjusted variance		563,700,000	
Adjustment for ties		- 66,208,264		Adjustment for ties		- 67,438,398	
Adjusted variance		487,200,000		Adjusted variance		496,200,000	

H_0: There is no difference between occupational mobility for respondents who had doctor visits and respondents who did not have doctor visits
$z = 0.666$
prob > $|z| = 0.5054$

H_0: There is no difference between occupational mobility for respondents who had dentist visits and respondents who did not have dentist visits
$z = 2.098$
prob > $|z| = 0.0359$

Table 5.4: Logistic regression models for use of health services, occupational status, occupational mobility and other covariates – Odds ratios (N = 3,002).

	Doctor visits				Dental visits			
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 4a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)	Model 4b O.R. (s.e.)
Occupational status	1.01***		1.01***	0.99*	1.02***		1.02***	1.01
	(0.00)		(0.00)	(0.00)	(0.00)		(0.00)	(0.00)
Occupational mobility (Reference - Same):								
Occupation upgrade		1.32***	1.17	1.15		1.09	0.88	0.87
		(0.12)	(0.11)	(0.12)		(0.10)	(0.09)	(0.09)
Occupation downgrade		0.94	1.06	0.99		0.83*	1.02	0.91
		(0.08)	(0.10)	(0.10)		(0.07)	(0.09)	(0.09)
Age				0.99				1.00
				(0.00)				(0.00)
Female				1.37***				1.52***
				(0.12)				(0.13)
Marital status (Reference - Married)								
Never married				1.16				1.08
				(0.13)				(0.12)
Other				1.13				0.98
				(0.17)				(0.15)
Years of schooling outside the U.S.				1.05***				1.06***
				(0.01)				(0.01)

Table 5.4 continued

	Doctor visits				Dental visits			
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 4a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)	Model 4b O.R. (s.e.)
Income category (Reference - <$25,000):								
$25,000-$50,000				1.20				0.97
				(0.15)				(0.12)
$50,000-$100,000				1.41*				1.12
				(0.20)				(0.16)
>$100,000				2.11***				1.15
				(0.37)				(0.21)
Region of origin (Reference - Latin America):								
Asia				0.92				0.77*
				(0.12)				(0.09)
Africa				1.43*				0.74+
				(0.17)				(0.09)
Europe				1.35*				1.86***
				(0.14)				(0.19)
Other				1.68*				1.67*
				(0.26)				(0.25)
Years of U.S. residence				1.02**				1.00
				(0.01)				(0.01)

Table 5.4 continued

	Doctor visits				Dental visits			
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 4a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)	Model 4b O.R. (s.e.)
English proficiency (Reference – Speak very well):								
Speak English well				1.37**				1.17
				(0.15)				(0.13)
Speak English not well				1.17				1.10
				(0.15)				(0.14)
Speak English not at all				1.35+				1.04
				(0.24)				(0.18)
Missing information				1.31				0.72
				(0.28)				(0.15)
Negative self-rated health				2.18***				1.21
Reference – Positive				(0.39)				(0.21)
Health insurance (Reference - Private insurance):								
Public insurance				0.80				0.75
				(0.16)				(0.15)
No insurance				0.40***				0.62***
				(0.04)				(0.06)

Table 5.4 continued

	Doctor visits				Dental visits			
	Model 1a O.R. (s.e.)	Model 2a O.R. (s.e.)	Model 3a O.R. (s.e.)	Model 4a O.R. (s.e.)	Model 1b O.R. (s.e.)	Model 2b O.R. (s.e.)	Model 3b O.R. (s.e.)	Model 4b O.R. (s.e.)
Missing information				0.62				0.88
				(0.23)				(0.33)
Visa category (Reference - Family visa):								
Employment				1.05				1.23+
				(0.13)				(0.15)
Diversity visa				0.73*				0.96
				(0.11)				(0.14)
Legalization				0.89				1.13
				(0.12)				(0.15)
Refugee/asylum visa				0.41***				0.52***
				(0.07)				(0.09)
N	3002	3002	3002	3002	3002	3002	3002	3002
Pseudo R-squared	0.008	0.003	0.009	0.075	0.016	0.002	0.016	0.065

+ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$"

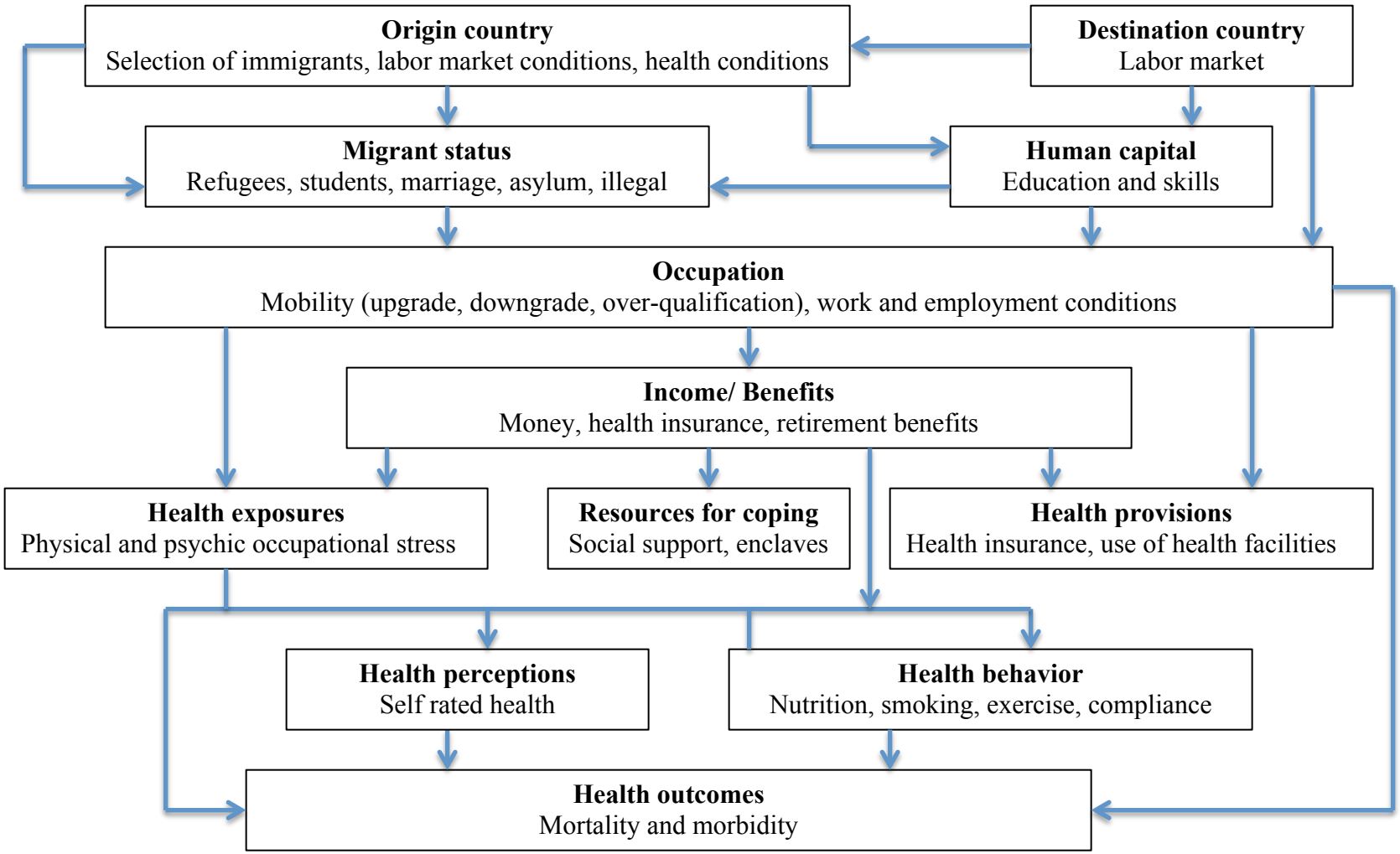
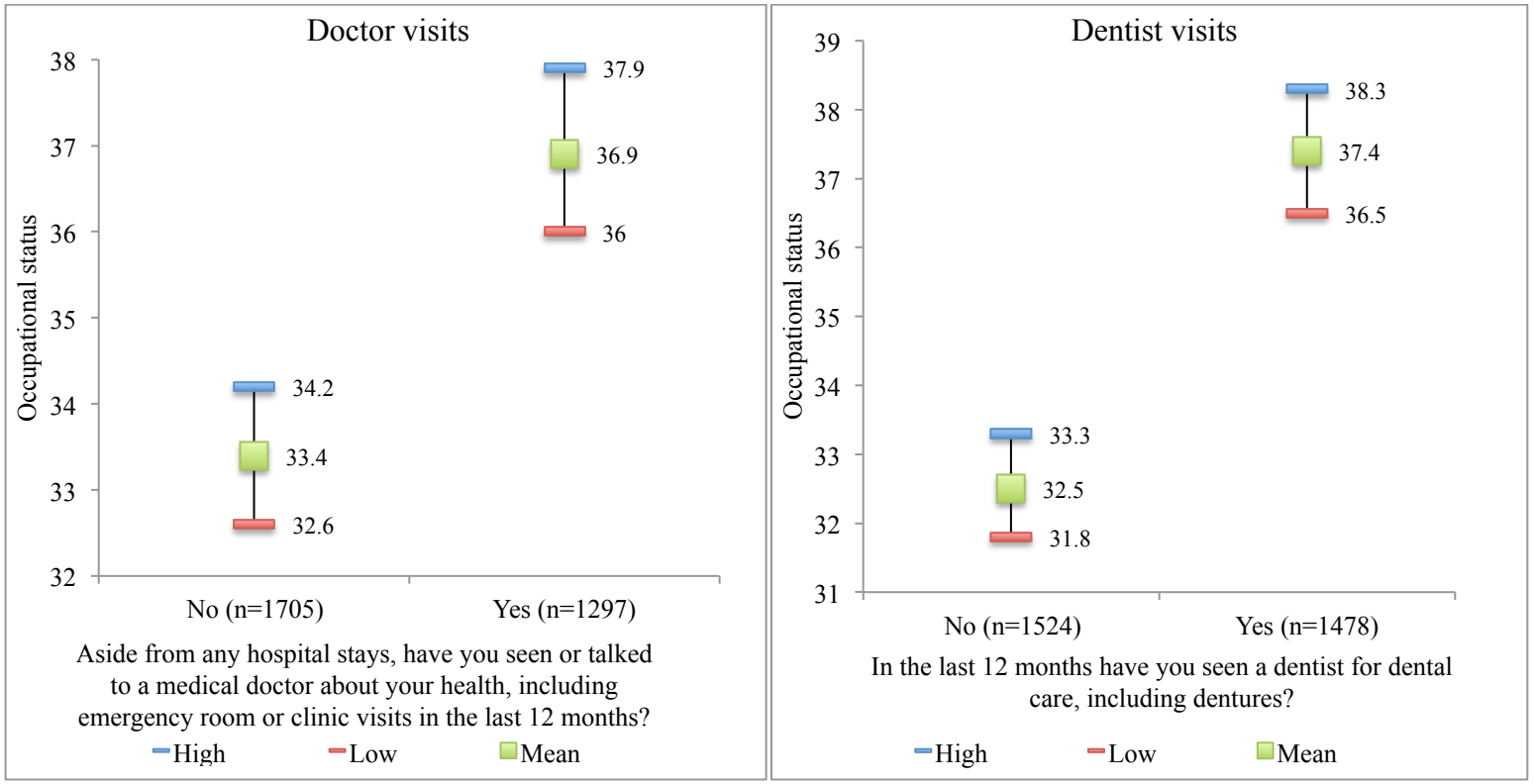


Figure 5.1: Immigrant occupational mobility and health



t-statistic = -5.85*
degrees of freedom = 3,000
* $p < 0.05$

t-statistic = -8.16*
degrees of freedom = 3,000
* $p < 0.05$

Figure 5.2: Two independent sample *t*-test for occupational status by use of health services (mean occupational status and 95% confidence interval).

CHAPTER 6

CONCLUSION

The primary aim of this study was to examine health outcomes in relation to labor market experiences for recent immigrants to the U.S. With this aim in mind, I used data on new legal immigrants to the U.S. from the 2003 New Immigrant Survey. I investigated the relationships between employment status and use of health services, education-occupation match and self-rated health and finally, occupational status, occupational mobility and use of health services. In this final chapter, I summarize and discuss the results of the study, discuss the strengths and limitations of the study and suggest a few recommendations and possible avenues for future research.

Review of Study Results

The set of analyses in Chapter 3 sought to empirically determine whether there is an association between employment status and use of healthcare services among documented immigrants recently accepted to permanent residence status in the U.S. It was important to explore the relationship between employment status and use of healthcare services among immigrants in the U.S. because in addition to the migration experience, immigrants often face challenges in navigating host country labor markets and healthcare systems (Derose, Escarce, and Lurie 2007). The results from the empirical

analyses showed a positive relationship between employment and use of health services. Immigrants who are employed are more likely to use health services compared to immigrants who are unemployed or out of the labor force. Employment could provide resources that allow immigrants to use health services and these results provided support for the Andersen model for the use of health services.

The second analytical section in Chapter 4 turned to investigating the association between education-occupation match and self-rated health. Seeking to disentangle relationships between over-education, under-education and self-rated health. I found that individuals experiencing mismatch in their education qualifications and occupational status are more likely to experience negative self-rated health than their counterparts with closely aligned education and occupation, as other researchers have noted (Ro 2014). These results provide validation for status inconsistency theory, which posits that inconsistencies in the match across one's education, skills and occupation can have negative impacts on one's health. These results highlight the importance of recognizing immigrants' educational qualifications in the U.S. labor market in order for immigrants to experience education-occupation match thereby improving their health.

The final set of analyses in Chapter 5 aimed to explore the relationship between occupational status, occupational mobility and use of health services. Results from these analyses suggest that upward occupation trajectories enable immigrants to use health services while downward occupation trajectories lead to reduced use of health services among immigrants. The results also show that high occupational status is associated with increased use of health services. Both findings support the Fundamental Social Causes theory, which states that an individual's ability to benefit from the capability to minimize

risk and to avoid emergent disease, and death, is shaped by, but not limited to, resources of knowledge, money, power, prestige and beneficial social connections (Link and Phelan 1995). Upward occupational mobility and higher occupational status could provide resources such as income and health insurance that immigrants need to use health services while downward occupational mobility and lower-occupational status may not provide adequate resources to use health services.

The main theme that emerges from this dissertation is that employment and occupation matter for immigrant health in the U.S. If immigrants occupy higher-level occupations on the occupation hierarchy, experience education-occupation match and upward occupation mobility in the labor market they are more likely to use health services and they tend to rate their health more positively. These findings indicate that acknowledging immigrant foreign education in the U.S. labor market could aid immigrants who have been accepted to permanent residence in their transitions of employment and occupation in the U.S. so that they can also enjoy positive health outcomes. However, this study is not without limitations. I discuss some of the limitations in the following section.

Study Limitations

The key limitation of this study lies in its focus on immigrants who were granted permanent residence status prior to the New Immigrant Survey. This study sample provides a limited view of immigrant employment and health in the U.S. The U.S. immigrant population consists of documented immigrants and undocumented immigrants; focusing on immigrants with permanent residence status that was granted in

the year prior to the survey only limits the generalizability of the study findings to this specific cohort of permanent residents and excludes other immigrants. Despite this limited focus on U.S. permanent residents, this study provides a glimpse into immigrant employment and health outcomes in the U.S. The findings from this study could be a foundation for future research, which extends questions on employment, occupation and health outcomes into the undocumented immigrant population and the population of documented immigrants who do not yet qualify for permanent residence status.

Another limitation of this study is with regards to the cross-sectional nature of the data. An investigation of phenomena such as employment, occupation and health requires longitudinal data to document changes in individual experiences. Longitudinal data also aid in establishing causal relationships between variables. Approximately 50% of the New Immigrant Survey study respondents were lost to follow-up between wave 1 data collection and wave 2 data collection. This precluded the analyses in the current studies from exploring research questions using longitudinal data. For instance, we cannot make causal inferences on whether individual immigrant health determines their employment status from cross-sectional data. Relatedly, the effect of long-term changes in occupation cannot be assessed. Essentially, the point-in-time estimates of the variables considered in the analyses do not allow us to analyze changes in employment, occupation and health through time.

The current analyses also do not account for all occupation transitions that the immigrants experienced. I used retrospective data on an immigrants' first occupation abroad and their current occupation at the time of the survey to measure occupation mobility. Data for the immigrants' most recent occupation preceding their current

occupation were not complete in the dataset. This leaves open additional wider gaps in other occupational transitions such as an immigrant's job placements in their home country, subsequent employment after the first job abroad and other jobs that the immigrants held before the current occupation in the U.S. Despite this shortfall, using immigrants' first job abroad and current occupation provided a measure of occupational mobility that provides an indication of the changes that immigrants might experience in their occupation trajectories. Data, which delineates in greater detail the complexity, and potential nonlinearity, in occupational trajectories would greatly enhance our ability to analyze the course and determinants of occupational mobility.

Another data limitation in this study is related to the health outcome measures of self-rated health and use of health services that I adopted. Even though these two measures were available with complete data in the New Immigrant Survey, they do not necessarily fully capture immigrant health status across multiple dimensions. Additionally, subjective assessments of self-rated health may diverge across cultures and other lines of stratification among immigrants in the New Immigrant Survey sample (Boardman 2004; Jylha et al. 1998). Although the measures of self-rated health and use of health services used in this study are valid assessments of health outcomes (Idler and Benyamini 1997), they leave other diagnosed physical and mental health outcomes unexplored. It is preferable to examine other diagnosed health outcomes because they consist of actual health conditions. However, many individuals in the New Immigrant Survey data were missing data on the diagnosed health conditions queried in the survey. Of course it would have been informative to compare and assess the correlation between self-rated health and specific health conditions such as diabetes, cancer or high blood

pressure. Nonetheless the current study continues the line of inquiry on immigrant employment, occupation and health with the hopes that future studies will address some of these limitations.

Future Research

Future studies can benefit from incorporating a sample of immigrants that includes U.S. permanent residents, documented immigrants and undocumented immigrants. Focusing on a representative sample of the U.S. immigrant population might shed more light on the association between immigrant employment, occupation and health outcomes with results that can be generalized to the immigrant population. Since the New Immigrant Survey sample focused on permanent residents in the U.S., the sample did not widely vary on the self-rated health outcome variable – most immigrants were in good or very good health. Including a wider sample of immigrants, in particular the undocumented, who may be less positively selected on health and whose occupational positions may be more precarious, stressful and injurious, would likely capture a sample encompassing a fuller distribution across the self-rated health continuum.

There should also be a thorough analysis of gender differences in the association between employment, occupation and health outcomes among immigrants in the U.S. Past research has shown that there are gender differences in the association between experiences of depression and occupation status between men and women among immigrants in the U.S. (Ro 2014). Further research should explore these gender differences for the association between employment status, occupation and health. Such studies will reveal if gender inequalities exist in the labor market and in the healthcare

system for immigrants in the U.S. This could be useful to tailoring labor market and healthcare policies that address gender biases in employment, occupation and health among immigrants in the U.S.

Regarding the nature of the data, longitudinal data would allow an observation of changes over time. Presently, the cross-sectional nature of the New Immigrant Survey data does not give us a clear sense of how use of health services and health outcomes change as employment status and occupation change through time. The question that results from this data inadequacy is, how do immigrants' experiences of employment occupation and health change the longer they stay in the U.S. after they are granted permanent residence status? Investigation into these patterns could provide more elaboration on immigrants' long-term experiences with the U.S. health system and the labor market. Furthermore, longitudinal data would allow for analytical approaches that could better illuminate causal direction in the associations between employment status, occupation and health. Longitudinal data would also facilitate definitive discussions on whether social causation or social selection is at work in the employment and health relationship for immigrants.

Another promising future direction for the study of immigrant employment, occupation and health is to assess and compare immigrant experiences of education-occupation match at lower levels of the occupation hierarchy and at higher levels of the occupation hierarchy. For instance, given the differences in rewards and job stressors at different levels of the occupation hierarchy, immigrants are likely to have varied access to health services and disparate health outcomes. Thus, exploring these differences will improve our current knowledge of health outcomes at different occupation levels and aid

in formulation of targeted health programs that allow ease of use of health services for immigrants despite their position in the occupational hierarchy.

Further research should investigate other health outcomes beyond self-rated health. The major drawback of relying on self-rated health, more so among immigrants, is that there are cultural variations on reporting self-rated health for immigrants from different countries. Even though self-rated health is a valid measure of health outcomes (Idler and Benyamini 1997), an evaluation of biomarkers and diagnosed health conditions will provide a clearer picture of the association of employment, occupation and health among immigrants.

A gendered perspective on the association of employment status, occupation and health will enhance our understanding of the ways that immigrant men and women experience the U.S. labor market and health system. Specifically, how do health outcomes differ for men and women in the different states of employment and how do their health outcomes change as they experience different trajectories of occupational mobility? Arguably, such research will contribute to informed social policy decisions for fairer access to and use of health services between the genders.

Conclusion

This study considers the relationship between employment, occupation and health in the context of migration for recent documented immigrants to the U.S. The study highlights that a positive relationship exists between occupation status and use of health services. High status occupations could provide resources to use health services or resources to avoid emergent health risks for immigrants in the U.S. The findings also

show that occupation upgrades are associated with increased use of health services. This implies that policies that aid in enhancing occupational mobility such as on the job training, job search assistance and continuing education programs might have the indirect effect of enhancing the health of permanent resident immigrants in the U.S.

APPENDIX

MULTINOMIAL LOGISTIC REGRESSION MODELS FOR CURRENT EMPLOYMENT STATUS, SELF-RATED HEALTH AND OTHER COVARIATES

Table A.1: Multinomial logistic regression models for current employment status, self-rated health (SRH) and other covariates – Relative risk ratios (N = 7,494).

	Model 1 R.R.R. (s.e.)	Model 2 R.R.R. (s.e.)
Unemployed (Reference - Employed):		
Negative self-rated health (Reference - Positive)	0.93 (0.13)	0.93 (0.14)
Gender (Reference - Male)		1.82 (0.13)***
Age		0.93 (0.02)**
Age squared		1.00 (0.00)***
Region of origin (Reference - Latin America):		
Asia		2.90 (0.32)***
Africa		3.39 (0.47)***
Europe		1.94 (0.27)***
Other		1.99 (0.30)***
Years of school completed		1.00 (0.01)
Years of U.S. education		0.99 (0.02)
Marital status (Reference - Married):		
Never married		1.27 (0.12)**
Other		0.82 (0.11)
Years of U.S. residence		0.96 (0.01)***
English proficiency (Reference - Speak English very well):		
Speak English well		1.30 (0.13)*
Speak English not well		1.36 (0.15)**
Speak English not at all		1.78 (0.25)***
Missing information		2.39 (0.41)***
U.S. region of residence (Reference - West):		
Northeast		0.97 (0.08)
South		1.13 (0.11)
Midwest		0.95 (0.15)
Visa category (Reference - Family visa):		
Employment		0.17 (0.02)***
Diversity visa		1.16 (0.13)
Legalization		1.06 (0.11)
Refugee/asylum visa		0.25 (0.05)***

Table A.1 continued

	Model 1 R.R.R. (s.e.)	Model 2 R.R.R. (s.e.)
Out of labor force (Reference - Employed):		
Negative self-rated health (Reference - Positive)	2.33 (0.23)***	1.58 (0.19)***
Gender (Reference - Male)		6.23 (0.48)***
Age		0.77 (0.02)***
Age squared		1.00 (0.00)***
Region of origin (Reference - Latin America):		
Asia		1.55 (0.16)***
Africa		2.28 (0.30)***
Europe		1.29 (0.17)+
Other		1.29 (0.20)+
Years of school completed		0.99 (0.01)
Years of U.S. education		0.99 (0.02)
Marital status (Reference - Married):		
Never married		0.60 (0.06)***
Other		0.53 (0.06)***
Years of U.S. residence		0.99 (0.00)**
English proficiency (Reference - Speak English very well):		
Speak English well		1.54 (0.17)***
Speak English not well		2.31 (0.27)***
Speak English not at all		3.13 (0.45)***
Missing information		2.97 (0.55)***
U.S. region of residence (Reference - West):		
Northeast		0.97 (0.08)
South		0.94 (0.09)
Midwest		1.02 (0.16)
Visa category (Reference - Family visa):		
Employment		0.42 (0.05)***
Diversity visa		0.55 (0.07)***
Legalization		0.63 (0.07)***
Refugee/asylum visa		0.30 (0.05)***
N	7494	7494
Pseudo R-squared	0.005	0.170

+ $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$"

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