Neighborhood Social Capital and the Health and Health Risk Behavior of Adolescent Immigrants and Non-Immigrants

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Professor David Hollister, Adviser

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Dedication

I dedicate this dissertation to the loving memory of my wife, Ashley Ruth Brooks-Danso, who passed away few years before the completion of this work. Ashley was my biggest support from the very beginning of this journey. It is therefore with pride and affection that I dedicate this dissertation to you.

Ashley Ruth Brooks-Danso

(1979–2011)

Abstract

With the growing waves of immigrants and children of immigrants globally, it is important that we understand their health and health risk behaviors. Generally, limited studies exist on neighborhood social capital and adolescents and more specifically a comparative analysis involving immigrants and non-immigrants. The present study examined the relationship between social capital and health and health risk behaviors of immigrant and non-immigrant adolescents. More importantly, this study expands empirical investigation on the relevance of social capital among adolescent immigrants and non-immigrants.

The study used Wave I (i.e., adolescents between ages 12–21 years) data of the National Longitudinal Study of Adolescent Health (Add Health), a national representative longitudinal survey of adolescents including immigrants and racial and ethnic groups in the United States. The data were collected on adolescents from Grades 7–12 since 1994/1995 and the same cohort was followed as they transitioned into young adulthood. *Chi*-square and *t*-tests were performed to compare the patterns of differences stratified by immigrant status, gender, and Hispanics status. Multivariate regression analyses were also conducted to identify health promoting and risk factors for adolescent engagement in health risk behaviors.

Major differences were found on the characteristics of adolescents, especially based on Hispanic status and gender. The multivariate analyses, such as logistic and OLS regression results, indicate that compared to older adolescents, younger adolescents are less likely to engage in risk behaviors such as alcohol consumption, smoking, and sexual

activity. Also, whereas certain components of social capital such as family connectedness and sense of neighborliness improve adolescent health and reduce their engagement in health risk behaviors, family involvement, knowing neighbors, talking to neighbors, and perception of neighborhood safety can have a risk-promoting effect on children. Adolescent religiosity, English language use, and parental employment were also significant predictors of health and risk behaviors such as sexual activity, smoking, and alcohol use. From the study, there is no evidence of an association between immigrant status and adolescent health and health risk behaviors. However, various factors influence immigrants and non-immigrants health and health risk behaviors differently, thereby contributing to disparities in health and risk behaviors among adolescents.

The results from the study suggest that social capital is an important predictor of adolescent health and health risk behaviors such as sexual activity, alcohol use, smoking, and drug injection. For example, family connectedness appears vital to adolescents' health and minimizes alcohol consumption, smoking, sexual debut, and drug use. However, family involvement improves adolescent health but does not necessarily reduce health risk behaviors. Therefore, we have to be aware that not all forms of social capital may be useful to adolescents' development. As a result, parents, families, and neighborhoods need to be supported to reduce risky adolescent behaviors. Thus, intervention programs that support quality parent-adolescent relationships and communication are essential for adolescent development and well-being.

Keywords: neighborhood social capital, adolescent health, risk behaviors, immigrants

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Chapter 1

INTRODUCTION

Global migration trends and human mobility have contributed to the continuous demographic transformation of most countries, including the United States (U.S.). Today, immigrants in the U.S. constitute a substantial proportion of the overall population. In 1994, there were approximately 23.3 million foreign-born individuals living in the U.S., accounting for 8.9% of the total U.S. population, compared to about 38 million in 2007 and 40 million in 2010, which constitutes about 13% of the overall population (Center for Immigration Studies, 2013; Grieco, 2009; Grieco et al., 2012). The immigrant population is expected to increase to about 81 million by 2050 (Passel & Cohn, 2008). This ongoing demographic transformation suggests that the health status and health risk behaviors of immigrants and their offspring may play a significant role in shaping the health outcomes of the American population. Immigrants are particularly considered a vulnerable population as a result of insufficient access to and utilization of health care, limited English proficiency, low socioeconomic status, immigrant status, stigmatization, marginalization, and increased risk for poor physical, psychological, and social health outcomes especially among the working poor (Aday, 2001; Derose, Escarce, & Lurie, 2007; Flaskerud & Winlow, 1998). These factors undoubtedly have detrimental effects on the health of immigrants and their children.

More importantly, the increasing number of children of immigrants or immigrant youths constitute a new generation of immigrants. First and second generation immigrants constitute about 60 million or 24% of the population (U.S. Census Bureau,

2003; Rumbaut, 2004). Among foreign-born children (under 18 years), about 31% of them live below the poverty line (Grieco et al., 2012). The surge in migration globally has also led to an increase in the number of children in immigrant families and the continuous transformation in the level of diversity among the American population. In the U.S., 1 in 5 children live in immigrant families with at least one U.S.-born parent (Hernandez, Denton, & Macartney, 2007). With the growing waves of immigrants and children of immigrants in the American population, understanding their health needs and their propensity to engage in certain health behaviors is extremely relevant for the health of the overall population. The growing ethnic diversity resulting from the increasing immigrant population in U.S. society offers a unique opportunity to explore the impact of social capital on such diverse groups of people (Arneil, 2006; Putnam, 2007), and specifically in adolescent socialization, development, and issues pertaining to their health and health risk behaviors.

Over the years, the U.S. and most developed nations have made tremendous advances in biomedical research which have contributed immensely to increased life expectancy and the development of cures for many illnesses, consequently improving the lives of many. However, biomedical research alone does not facilitate our understanding of the totality of the causes of diseases and therefore cannot eradicate the many health concerns of society today (Smedley & Syme, 2000). A major challenge of public health, which is fundamental to human progress and well-being, is combating risky behaviors or risk factors that lead to the decline of the health of individuals, families, communities, and the population in general. In other words, health outcomes are connected to social

conditions or the environment that people live in. Even though there are ongoing empirical investigations into these social determinants, more needs to be done. Information and knowledge about the social and behavioral consequences of the choices that individuals make and the resulting health and health risk behaviors impact of these choices are extremely beneficial. For social science research and social work in particular it facilitates our understanding of the social determinants of health behaviors, health, and well-being and for developing interventions to promote health and change adolescent behaviors.

One such social determinant connected to health outcomes and health behaviors is social capital. The concept of social capital, according to Dasgupta (2000), is a multifaceted phenomenon that can be considered a public good with the potential to positively influence health outcomes. Social capital itself is the quality and quantity of social interactions experienced by individuals in the family and neighborhood or community (Coleman, 1990; Putnam, 1993). The last two decades have witnessed an increase in research that investigates the connection between social capital and individuals' health and health risk behaviors. The interest, as a result of a series of works (Bourdieu, 1986; Coleman, 1990; Putnam, 1993, 1995, 2000), has also generated debates regarding conceptualization and measurement of the concept of social capital (Hawe & Shiell, 2000; Cartell, 2001). Therefore, further research investigation by scholars into social capital and its potential benefits is warranted. This interest has gradually entered into the lexicon of public health and social epidemiology. Most of the scholarly works reviewed in this dissertation demonstrate that social capital, to some extent, has proven to

have utility and is applicable to health behaviors and health outcomes. Generally, social work as a discipline is interested in the potential contributory role of the social environment on individuals, families, and groups, and the consequences of the interactions between and among these human systems. Therefore, research such as this, which explores the potential impact of family and neighborhood on adolescent health outcome and health risk behaviors, is an important addition to social work and public health. This research helps in our understanding of the issues relevant to the development of prevention and intervention in health and health risk related problems. As such, this study, which explores the impact of social environmental factors, is a complement to biomedical efforts at finding answers to causes of illnesses and diseases. Taking care of socio-environmental challenges helps to ensure that individuals and families who receive medical care are not placed in the same social environment that contributed to the health problem in the first place.

Therefore, this investigation has two main objectives: (a) to examine the influence of family (family connectedness and involvement) and neighborhood social capital on adolescent health and health risk behaviors (sexual activity, alcohol use, smoking, and illegal drug injection), and (b) to ascertain whether the effects of the dimensions of social capital vary with immigrant status (immigrant or non-immigrant) on adolescent health and health risk behaviors.

This dissertation is grouped into five main sections or chapters. Chapter One introduces the problem statement and the purpose of the study. Chapter Two explores the theoretical foundation of this study, previous studies on social capital, including the two

main dimensions such as family and neighborhood social capital, health and health risk behavior of immigrants and their non-immigrant counterparts. A broader explanation of the concept of social capital and its connection to health risk behaviors and health is presented and identifies some of the criticisms and gaps in the existing literature. Since social context may influence health behaviors and health in major ways, it is relevant that research is done to determine these social contexts and the direction of influence. The chapter ends with a conceptual framework upon which the study is based and the research questions and hypotheses used in the research investigation. Social capital is operationalized as accessible social ties with neighbors and the family members (i.e. neighborhood and the family social capital) including neighborhood attributes or characteristics, which may have either tangible or intangible consequences for adolescents. Chapter Three presents the methodology for the study including the research design, population and sample, and data analysis procedures. The dissertation concludes with findings from the data analyses with discussions and conclusions drawn from the findings, as well as the policy and practice implications for social work in public health and strengths and limitations of the study in Chapters Four and Five, respectively.

Statement of Problem

Regardless of country of origin, access to both social and economic resources is central to the protection and determination of health risk behaviors and health outcomes of individuals. Available empirical studies on heath disparities argue that race, ethnicity, class (socioeconomic status), and nativity influence the health risk behaviors, health, and

treatment of individuals and families, particularly in a multicultural society like the U.S. (Isaacs & Schroeder, 2004; Keppel, 2007; Lasser, Himmelstein, & Woolhandler, 2006; Smedley, Stith, & Nelson, 2002). However, less research has been conducted to fully understand the broad spectrum of social factors involved in the complex mix of social determinants related to adolescent health risk behaviors and health. Surprisingly, less is known about the influence of family and neighborhood social capital on subpopulations of adolescents, especially adolescent immigrants, compared to their American counterparts or native-born citizens. The paucity of research on the role of social capital on adolescent health and health risk behaviors of subpopulations (immigrants) is alarmingly surprising, given the increasing proportion of immigrants and children of immigrants currently in U.S. (Grieco, 2009; Grieco et al., 2012; Passel & Cohn, 2008).

Since social capital is relevant to immigrants who may become isolated due to loss of social networks and as a result may have less access to social support than their counterparts (Kao, 2004; Lassetter & Callister, 2009), it is vital that we understand how social capital impacts immigrants. Besides, most immigrants may not necessarily have families, friends, neighbors, and networks that they used to have, thereby increasing the tendency for isolation, coupled with the migration and acculturation stress. As a result, minority and immigrant population may have fewer obligations, expectations, information, and social norms associated with relationships and networks (Kao, 2004). More specifically, adolescent immigrants may face challenges and circumstances like assimilation, non-citizen or undocumented parents, limited English proficiency, economic hardship with lower use of benefits, etc., which has the potential of ensuring

closer family relationship or disintegration and consequently leading to engagement in risky behaviors (Capps, Fix, Ost, Reardon-Anderson, & Passel, 2004; Harris, 1999), which may not necessarily be encountered by their American counterparts. Even though social capital may be useful for any particular population, limited studies exist on social capital and immigrant health compared to the native-born counterpart (Zhao, Xue, & Gilkinson, 2010). Accordingly, Mendoza (2009) challenges scholars to focus future health disparities research on the potential contribution of cultural factors on the developmental outcomes among adolescent immigrants.

It is important that more research is done to investigate the effect of the social environment on health and health behaviors (Smedley & Syme, 2000). Recent research demonstrates that the social environment is a vital component in the determination of the health behaviors, health outcomes, and well-being of people (Berkman & Kawachi, 2000; Macintyre & Ellaway, 2000; McCulloch, 2001; Ståhl et al., 2001). However, most of the studies reviewed are limited to the socioeconomic context rather than the people to people interaction in neighborhoods or communities. Besides, fewer studies focus on youth and even less on immigrant youth.

This study's approach takes into consideration the ecological perspective of health behaviors and health. Various studies have investigated different aspects of the social environment and their impact on various facets of individual and family life (see Berkman & Kawachi, 2000). These studies are mostly geared towards attempts to unearth the social determinants of health outcomes. However, few studies exist that consider the role of social capital and the comparative patterns of health risk behaviors

and health among immigrants and non-immigrants simultaneously. Also, according to Carpiano (2006, 2007, and 2008) there is limited use of neighborhood social capital. The use of neighborhood social capital is grounded in the original conceptualization of social capital, health risk behaviors, and health based on Bourdieu's (1986) postulation of the relevance of neighborhoods or community as a source of social capital. Bourdieu (1986) conceives of social capital as a form of resources available to individuals as a result of their membership to a group or social networks.

Above all, the concept of social capital is fairly new in the social science literature and therefore needs rigorous empirical study to confirm some of the claims of its potency in improving the well-being of individuals. More importantly, adolescence is a period of vulnerability and involvement in risky behaviors and activities during this developmental stage with potentially detrimental health effects. For example, sedentary behavior and physical activity is found to be associated with health risk behaviors in adolescents and their health-related quality of life (Gopinath, Hardy, Baur, Burlutsky, & Mitchell, 2012; Nelson & Gordon-Larsen, 2006).

Purpose of the Study

Specifically, the health risk behaviors and health of immigrant youth is compared to that of non-immigrants (i.e. native-born Americans). Broadly speaking, the present study examines factors that influence the health and health behaviors of adolescent immigrants and non-immigrants. To have a better understanding of the factors that influence the health and health behavior of adolescents, the study is grounded in the

framework of a relationship between the dependent variable (i.e. health and health risk behaviors) and the independent variables (neighborhood social capital, socioeconomic and demographic, and family factors).

The data used for this secondary analysis are from Wave I (1994/1995) of the National Longitudinal Study of Adolescent Health (Add Health), a national representative longitudinal survey of adolescents including diverse racial and ethnic groups as well as immigrants living in the U.S. Add Health is a secondary dataset collected in 1994/1995, 1996, 2001/2002, and 2007/2008, which represents four different waves (I, II, III, and IV). However, the current study used data from only Wave I (i.e., Grades 7–12 with ages between 12 and 21 years) to explore the relationship between social capital and health risk behaviors, and the health outcomes of immigrant and non-immigrant adolescents and young adults for cross-sectional analysis. The study also examines the differences in the predictors of immigrant and non-immigrant health looking at individual, family, and community level factors. Generally, limited studies exist on neighborhood social capital and adolescents, and more specifically, involve a comparative analysis that involves immigrants and non-immigrants. This particular wave has data that allows the researcher to construct the social capital variables (neighborhood and family social capital) needed for this research, which the other waves do not have.

Chapter 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Social capital is a broad concept that encompasses social support, family, and neighborhood social capital. Social capital is reflected in the quality and quantity of social interactions experienced by individuals in families and neighborhood or community (Bourdieu, 1986; Coleman, 1990; Putnam, 1993). Broadly speaking, social capital consists of the resources that individuals and groups can access within the social structure that promotes cooperation, collective action, social cohesion, reciprocity, and the maintenance of norms.

According to Cohen and Syme (1985), social supports are the resources that are provided to others by family members and friends. It may be obtained from family, friends, and group members. Social support includes informational, emotional, and instrumental support (Dunkel-Schetter, Sagrestano, Feldman, & Killingsworth, 1996; Gottlieb & Bergen, 2010). Social support essentially results from personal and non-professional relationships.

Neighborhood social capital is essentially community-based. Neighborhood social capital has been acknowledged in early research on social capital by Coleman (1988), Bourdieu (1986), Putnam (1993a) and recently in the works of Carpiano (2007, 2008). According to Coleman (1988) and Carpiano (2007, 2008), community or neighborhood social capital resides outside of the family and exists in geographically bounded locations. The concept of neighborhood social capital is related to the ties or interrelations between individuals and families in a community. It has dimensions

associated with community supervision, social cohesion or community connectedness (i.e., either as very weak, somewhat weak, somewhat strong, and very strong), community participation, neighborhood attachment, neighborhood safety, reciprocity, and closure of network. It is also about individuals' "sense of community belonging" or how they describe their sense of belonging to the local community (Carpiano & Hystad, 2011; Wister & Wanless, 2007). In a nutshell, neighborhood social capital is viewed as resources that one can access as a result of membership in a community. It is a macro level form of social capital (Mohnen, Groenewegen, Völker, & Flap, 2011) with an ecologic characteristic.

Another dimension of social capital is family social capital. Again, Coleman (1988), in his analysis of the use of social capital to develop human capital, developed the concept of family social capital. It is simply explained as the social capital within the family. It usually involves relations between parents and children, including other members of the family. Some of the indicators used in Coleman's work are family structure, parent school involvement, parent-child interaction, and parent expectations. In broad terms, family social capital comprises of benefits accruing to individuals as a result of their membership and relationships with people in that family.

One can argue from the above brief discussion that, conceptually, family and neighborhood can provide social support, but they are not the same thing and cannot be used interchangeably. Broadly speaking, social capital is embedded in the society and is a feature of the social structure and not necessarily of the individual actors within it (Lochner, Kawachi, & Kennedy, 1999). Therefore, there is an overlap between family

social capital, neighborhood social capital, and social support. Social support is not necessarily interchangeable with social capital but rather is an aspect of it (Carpiano, 2008). Social support is a form of social capital that family members, friends, and residents can access to deal with daily problems (Briggs, 1998; Carpiano, 2008; Dominguez & Watkins, 2003). Social support is more of an output (i.e., material and psychological) than a process, but social capital is both a process (i.e., relationship, norm of reciprocity, trust, civic engagement/participation, network ties, social cohesion) and the output of a process and mostly perceptual in nature; therefore, making it a subjective measurement as demonstrated in most studies on social capital. Also, the use of the terms "family" and "neighborhood" in the categorization of the two dimension of social capital as used in this study is related to the source or location of the social capital. So, the use of family and neighborhood social capital as concepts suggests that social capital can be located in the family and neighborhood (contextual level), as emphasized in the work of Coleman (1988).

Social Capital Theory: An Overview

In order to explore adolescent health and the differences in the predictors of adolescent immigrant and non-immigrant health, social capital is used as the theoretical underpinning or framework for this research. In broad terms, social capital consists of the resources that individuals and groups can access within the social structure that promotes cooperation, collective action, and the maintenance of norms. The concept can be further conceptualized as both individual and communal or macro level attributes

(Ferlander, 2007; Mohnen, Groenewegen, Völker, & Flap, 2011). The exact origin of the theory of social capital is a bit contentious. Though some scholars trace it to the prominent sociologist Emile Durkheim, others believe that French sociologist Pierre Bourdieu first used the concept. In a historical review of the origin of social capital, Portes (1998) traces the concept to Emile Durkheim's sociological framework of social cohesion and social solidarity. Portes argues that Pierre Bourdieu then systematically and unambiguously examined the concept of social capital through his work. Since then, other scholars such as Loury (1992), Putnam (1993), and Coleman (1990) have added substantially to the theory of social capital and have helped to promote its use.

Bourdieu (1986), in his analysis of the various forms of capital, refers to social capital as the "aggregate of the actual or potential resources, which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 51). In contrast, Coleman (1990) refers to social capital by its function:

> It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence (p. 302).

Economists have also contributed to discussions on social capital. For example, an economist, Loury (1992) refers to social capital as, "naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits

valued in the marketplace" (p. 100). From this perspective, there is something economically valuable to be gained through our daily social interactions and the network ties that people form. Like the other definitions, there is emphasis on value in social relationships that may prove useful at some point with economic payoff and for economic development (Knack & Keefer, 1997; Woolcock, 1998; Zak & Knack, 2001), which is not entirely different from considering social capital as resource available to members of a group, family or community.

Through his seminal work, *Making democracy work: Civic traditions in modern Italy* (Putnam, 1993a) and later, *Bowling alone: The collapse and revival of American community* (2000) (on the decline of community participation and civic engagement and the rise of self-interestedness), Putnam has generated interest in the concept of social capital, especially in public health. In his opinion, "social capital… refers to features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions" (1993a, p. 167). Indicators used by Putnam (1993a, 2000) to measure social capital include levels of trust, perceived reciprocity, and density of membership in civic associations. The above historical overview suggests that scholarly work on the concept of social capital has interdisciplinary roots ranging from sociology, economics, political science, and most recently, public health and social epidemiology.

Broadly speaking, embedded in the various renditions of the definition of social capital are key elements such as: social relationships or networks; social structure or resources external to the individual and residing in the networks; associations,

neighborhoods or community; and enhancing the outcomes of actions. According to Berkman and Kawachi (2000), the main characteristics of social capital are that it is a social and a public good. Social capital is distinguishable from other forms of capital (i.e., human capital or physical capital) (Berkman & Kawachi, 2000; Bourdieu, 1986). Social capital encompasses the benefits that individuals and families accrue for having and building social ties with others. Portes's (1998) extensive review suggests a definitional formulation of social capital as postulated in the work of Bourdieu and Coleman that views social capital as a source of: (1) social control, (2) family-mediated benefits, and (3) resources mediated by non-family networks.

The above definitions and explanations depict social capital as derived from the community, individuals, families, friends, or any set of networks. Consequently, social capital is said to be either cognitive (i.e., individual level) or structural (i.e., community level). The cognitive aspects of social capital are measured by indicators of reciprocity and a sense of belonging and trust in a community that characterizes values or attitudes considered to be social support (Blanchard & Horan, 1998). Structural social capital relates to social networks or participation in networks. This form of social capital is also considered macro level social capital and consists of resources that can be accessed as a result of membership in a group or community (Mohnen, Groenewegen, Völker, & Flap, 2011). Fujiwara and Kawachi (2008) have also used the cognitive and structural forms of social capital in their study of social capital and the health of twins in the U.S., with cognitive social capital being more subjective compared to structural social capital. From these various explications, social capital has been measured in ways such as civic

participation, organizational membership, trust, social support, social cohesion, social networks, neighborhood safety, informal control, parental involvement and relations, etc. Social capital is considered at either the individual or community level and these conceptualizations are based predominantly on the work of Bourdieu (1986) and Putnam (1993a, 2000).

Other types of social capital are bonding and bridging. Bonding social capital is more inclusive and takes place among homogenous groups. This type of social capital is usually based on strong ties. An example is among family members. It is equally important to note that, due to the strength of the ties associated with bonding social capital, it could potentially be used for negative gains, such as in the case of a crime group (McKenzie & Harpham, 2006; Putnam, 2000). Bridging social capital, on the other hand, is more exclusive and refers to social capital as found among different groups (inter-group). Bridging social capital, however, tends to be weaker or more fragile; it facilitates common action and can hardly be used to attain negative consequences in society (McKenzie & Harpham, 2006; Putnam, 2000). Other authors have categorized social capital as horizontal and vertical (Lin, 2001). Horizontal social capital exists between individuals of similar social strata, whereas vertical social capital involves the integration of people of different strata. Overall, it is important to mention that social capital, unlike other forms of capital, is a public good, whereas other forms tend to be primarily considered private goods.

Social Capital and Health Outcomes

The nexus between social capital and health is still debated. Yet, there is burgeoning literature that has investigated the connection between social capital and health. The potential relationship between social capital and health is a theoretical proposition that has guided empirical investigations into social capital's impact on individuals and its potential to enhance outcomes when maximized through action (Lin, 2001). Kawachi, Kennedy, and Glass (1999) suggest three pathways in which social capital may influence health. First, individuals may benefit from the formal and informal social networks that facilitate people's ability to access information, address cultural practices that are harmful to their health, and advance prevention efforts. Additionally, social capital may influence collective action, which could ultimately promote better health care delivery and access. Third, the authors point out that support systems serve as pathways to social capital and act as a source of self-esteem and mutual respect.

Schultz, O'Brien, and Tadesse (2008) researched the extent of association between individual social capital and self-rated health using a social capital community survey in Duluth, Minnesota. The study found that, after controlling for individual and economic characteristics, social capital measures including levels of social trust, greater civic participation, volunteerism, and associational involvement predict the perception of stronger health. In addition, studies by Poortinga (2006) and Sirven (2006) similarly found strong associations between measures of social capital, such as higher levels of collective action, social networks, civic participation, social trust, and overall self-rated health. However, aggregate social capital at the national level did not show any

relationship with self-related health (Poortinga, 2006). Furthermore, Fujiwara and Kawachi (2008) showed in their study a significant association exists between forms of social capital (i.e., social trust, sense of belonging, and participation) and physical health status. In a fixed effects model, social trust was found to be significant to health outcome.

Social capital, like any other societal resource, is unevenly distributed; some have more social capital than others. It is mostly organized along the lines of social class: gender, age, ethnicity, locality, and across groups in a community (Briggs, 1998; Campbell & Wood, 1999; Ferlander & Timms, 2001; Lin, 2001). As Baum and Ziersch (2003) note, such an unequal distribution has the potential to contribute to health disparities. For example, well-educated people have the tendency to possess more social networks and, hence, higher social capital than less educated individuals (Field, 2003). Furthermore, Wuthnow (2002a) asserts that in the U.S., privileged people or individuals with higher income tend to have higher social capital than the socially and economically marginalized. Not surprisingly, however, well-educated and privileged individuals and the less educated and low income people have lower levels of bridging social capital with each other. That is, there is less connection between the rich and the poor but more connection among people of the same social and economic class. Likewise, poor people tend to have higher bonding social capital than bridging social capital. Such social inequalities resulting from the uneven accessibility to or possession of social capital among individuals and across groups (Lin, 2001) creates an opportunity for a research agenda that explores the impact of the differential distribution of social capital across

different groups. That said, recent research has limited the conceptualization of social capital to mostly Putman's formulation (1995, 2000), thereby limiting its relevance to public health (Carpiano, 2007, 2008; Lynch, Due, Muntaner, & Smith, 2000).

The current study focuses on two of the components or domains of social capital and their relationship with health risk behaviors and health outcomes and the potential moderating effect of another form of social capital. The domains to be used in this study are neighborhood social capital and family social capital. Neighborhood social capital is measured by the social ties in the neighborhood, neighborhood characteristics, and/or perception of the neighborhood conditions (see Table 2). Family social capital, on the other hand, is usually measured either as the extent of parental support and relationship, or as any form of social support or resources from family members that promote health and well-being. As social actors, individuals reside in a social environment (family and neighborhoods) that provides different degrees of social support and resources.

Neighborhood Social Capital and Health

Recognizing the growing interest in social determinants of health and health disparities (Macintyre & Ellaway, 2000), this section of the paper explores social capital in the form of neighborhood context, characteristics or residents' perceptions of their neighborhood (i.e., neighborhood safety), neighborhood or community connectedness, and reciprocity (also referred to as a "sense of community belonging" as used in the works of Carpiano and Hystad (2011) and Wiser and Wanless, (2007), neighborhood civic engagement, neighborhood trust, community supervision, and their potential impact

on health risk behaviors and health outcomes as used in prior studies. This research is grounded in the social environmental or ecological perspective espoused in social work practice. This perspective emphasizes the contributory role of the various influences within the social environment on human behavior (Haight & Taylor, 2006). This perspective suggests a relationship or interaction between individuals and the social system.

Community-based or neighborhood social capital is traceable to the early research on social capital by Coleman (1988), Bourdieu (1986), and Putnam (1993a, 2000). According to Coleman (1988) and Carpiano (2007, 2008), community or neighborhood social capital resides outside of the family and exits in geographically bounded locations. These are ties or interrelations between individuals and families in a community.

The consideration of neighborhood social capital suggests that in addition to community socio-economic and physical characteristics, the social conditions within which individuals and families live are equally important determinants of individual health and functioning (Carpiano et al., 2008; Halpern, 2005; House, Landis, & Umberson, 1988; Kawachi, Subramanian, & Kim, 2008; van Hooijdonk, Droomers, Deerenberg, Mackenbach, & Kunst, 2008). Empirical research grounded in Pierre Bourdieu's (1986) conceptualization of social capital demonstrates the importance of neighborhood social capital (i.e., network-based resources that neighborhood residents have access to). Consistent with this notion, other scholars (Carpiano, 2007, 2008; Mohnen, Groenewegen, Völker, & Flap, 2011) have studied neighborhood social capital and health. These scholars used specific forms of neighborhood social capital such as

neighborhood social support, social leverage, informal social control, neighborhood organization participation, and neighborhood safety in the operationalization of the concept of neighborhood social capital.

This perspective recognizes that the health of individuals cannot be understood only through the medical model, but should also incorporate a better understanding of the local context or social environment within which individuals live and the quality and quantity of social network interactions available to them. It is suggested that besides socio-economic and physical conditions, social conditions in the neighborhoods within which individuals and families live are important determinants of individual health and functioning (Fagg et al., 2008; Halpern, 2005; House, Landis, & Umberson, 1988; Kawachi, Subramanian, & Kim, 2008; van Hooijdonk, Droomers, Deerenberg, Mackenbach, & Kunst, 2008). Consequently, since the mid-1990s there has been renewed interest in the social sciences in the "neighborhood health effect" and particularly neighborhood social capital and health (see Kawachi & Berkman, 2003; Sampson, Morenoff, & Gannon-Rowley, 2002).

Research suggests that neighborhood characteristics influence individuals' ability to obtain medical care (Anderson & Davidson, 2001; Anderson, Rice, & Kominski, 2001; Kirby & Kenada, 2005). Such empirical research is grounded in Pierre Bourdieu's (1986) conceptualization of social capital, which demonstrates the importance of neighborhood social capital and takes into account resources that residents of a neighborhood have access to (i.e., network-based resources) and its relationship to health. Consistent with this notion, Carpiano (2006, 2007, and 2008) and a few other scholars

(Carpiano & Hystad, 2011; Lochner, Kawachi, Brennan, & Buka, 2003; Mohnen, Groenewegen, Völker, & Flap, 2011; van Hooijdonk, Droomers, Deerenberg, Mackenbach, & Kunst, 2008) have adopted the perspective of Bourdieu's postulation of social capital in studies associated with neighborhood social capital and health.

Using the Los Angeles Family and Neighborhood Survey for a study grounded in Bourdieu's formulation and theoretical foundation, Carpiano (2007, 2008) found that specific forms of social capital (i.e., neighborhood social support, social leverage, informal social control, and neighborhood organization participation) have different health behavior and health outcomes. For example, neighborhood social support and informal control were found to significantly correlate with daily smoking. Informal control was also found to be the only form of social capital that is associated with self-rated health, whereas neighborhood attachment is also found to significantly mediate the association between certain forms of social capital and perceived health (Carpiano, 2007, 2008). A similar cross-sectional investigation by Mohnen, Groenewegen, Völker, and Flap (2011) using the Housing and Living Survey (Netherlands) with a national representative sample found a positive association between neighborhood social capital and individual health. In this study, the relationship of social capital was particularly profound for individuals residing in urban neighborhoods. In a recent study, Carpiano and Hystad (2011) also demonstrated that though the measure of a sense of community is associated with measures of network-based social capital, neighborhood network-based social capital is significantly associated with the health and mental health of urban

residents as compared to rural residents. This is particularly the case when dealing with the number of people that individuals know in a community.

One of the elements considered as a function of social capital is neighborhood safety. Scholars have explored the usefulness of perceived neighborhood safety on health. A study of neighborhood life, social capital, and health found that neighborhood safety was related to physical and mental health (Ziersch, Baum, MacDougall, & Putland, 2005). A similar result was found in a study conducted by Baum, Ziersch, Zhang, and Osborne (2009). This study found that differences in place of residence contributed to health disparities of residents, especially based on residents' perception of neighborhood safety and cohesion.

Furthermore, in a cross-sectional study of the association between neighborhood social capital and mortality, Lochner, Kawachi, Brennan, and Buka (2003) found that factors such as trust, reciprocity, and civic participation were associated with lower neighborhood death rates after controlling for material deprivation. Diez Roux and colleagues (2001) also reported that residents of disadvantaged neighborhoods have a higher risk for coronary heart disease than those living in advantaged neighborhoods. In contrast, Stafford, De Silva, Stansfeld, and Marmot (2008) did a study with over 9,000 residents from several neighborhoods and found no main effect of social capital on individual health; however, there was a significant association between social capital and mental health disorders. This was especially true among people from deprived households or neighborhoods. Just as a low level of bridging social capital was found to have a negative influence on people in deprived neighborhoods; people with high

attachment to their neighborhood was associated with increased odds of mental health disorders. Another study found that neighborhood social capital was not related to all causes of mortality (van Hooijdonk, Droomers, Deerenberg, Mackenbach, & Kunst, 2008). However, the study also found that residents from neighborhoods with high social capital had a lower mortality risk of cancer and suicide. It is evident from these ongoing discussions that social capital in the form of neighborhood social capital has relevance to research on health, especially adults.

Few studies have explored social capital in the form of neighborhood social capital and health of adolescents. A recent study considers neighborhood social capital and adolescent well-being (Aminzadeh et al., 2013). The study found that adolescent participation in community organizations had a positive effect on well-being, especially for adolescents from low socio-economic backgrounds. Most of the studies on neighborhood social capital focus on adults' outcomes with little attention paid to adolescents and how social capital impacts their health risk behaviors and health (Waterson, Alperstein, & Stewart, 2004). A study of adolescents by Boyce, Davies, Gallupe, and Shelley (2008) found that respondents with low neighborhood social capital and those who engaged in higher levels of risk behaviors were more likely to report poor health. Also, being a youth from poor socio-economic background was directly related to poor health. The study also tested for the moderating effect of social capital and socio-economic status; however, the interaction was not found to be statistically significant.

Other studies have used elements of social capital located in the neighborhood and observed their impact on various aspects of adolescent life. For example, studies

have considered neighborhood cohesion and children's verbal ability and problem behavior (Kohen, Brooks-Gun, Leventhal, & Hertzman, 2002; Kohen, Leventhal, Dahinten, & McIntosh, 2008), neighborhood potential for community involvement and children's problem behavior (Caughy, Nettles & O'Campo, 2008), neighborhood social bonding, and collective efficacy and anti-social behavior among children (Karriker-Jaffe, Foshee, Ennett, & Suchindran, 2009). Obviously, there is limited research on the use of neighborhood social capital and health and health risk behaviors, even though neighborhood social capital is seen as relevant to adolescents. The limited number of studies involving neighborhood social capital and health, health risk behaviors among adolescents, and the contradictions in the findings of most of the studies thus far, suggest the need for more research into the potential impact of social capital on health. More specifically, the conceptualization and operationalization of social capital and its various dimensions need to be rigorously studied with conceptual clarification and the measures that are generally acceptable.

Family Social Capital or Social Support and Health

The role of the family in the lives of children and adolescent development is well noted by researchers (Cook, Herman, Phillips, & Settersten, 2002). Consequently, the parent-child relationship has been recognized as having social capital that may prove to be beneficial to a child (Widmer, 2004). The concept of family social capital was first introduced by Coleman (1988) in his analysis of the use of social capital to develop human capital. It is simply explained as the social capital within the family. It is found

in the relations between parents and children including other members of the family. Some of the indicators used in Coleman's work are family structure, parent-school involvement, parent-child interaction, and parent expectation. Broadly speaking, family social capital includes benefits accruing to individuals resulting from family relationships (Furstenberg & Hughes, 1995; Furstenberg & Kaplan, 2004). Earlier studies of family social capital relate it to educational outcomes, child development, and child behavior problems (Israel, Beaulieu, & Hartless, 2001; Parcel & Menaghan, 1994; 1993; Coleman, 1988), immigrant self-employment (Sanders & Nee, 1996), and delinquent involvement (Wright, Cullen, & Miller, 2001). Similarly, Goyette and Conchas (2002) considered family social capital as the interaction between parents and child, whereas McNeal (1999) referred to family involvement as family social capital. For example, family social capital from McNeal's perspective is measured by parent-child discussions, parental involvement in parent-teacher organizations, and the use of monitoring and educational support strategies (measured as parents attend school meetings, parents talk to teachers/counselors and parents visit classes) to improve a child's educational outcomes. From these explications, family social capital is mainly a product of the family: parents, siblings, and including other adult family members, as long as they contribute to a child or a younger family member's life.

A dimension of social support, specifically family relationships and support is operationally conceptualized as family social capital. Therefore, this aspect of social support is used interchangeably with family social capital. Besides the potential of neighborhood or community characteristics to impact health, social support or family

relationships have long been studied and shown to predict health and well-being through mental health (Uchino, 2004). Social support arises from personal and non-professional relationships and may vary depending on source and type of support. Family, friends, and neighbors constitute important sources of social support. Family or parental social support is especially important during adolescent years, due to the many developmental changes experienced during this period.

As Cohen and Syme (1985) stated, social supports are the resources that are provided to others by family and friends. Social support through family relations is an important concept in health research. Family social support is an important element that adolescents to use to manage their daily lives and behavior (Deković, 1999; Field, Diego, & Sanders, 2002; Wood, Mitchell, & Brand, 2004). This is especially true because during adolescence, parent-adolescent relations serve as a protective factor against risk (Hair, Moore, Garrett, Ling, & Cleveland, 2008). Prior research by House, Umberson, and Landis (1988) identified two elements of social support: (1) social integration, which is the existence and quantity of social relationships and (2) social network structure, which is the structural properties that characterize relationships.

As a multidimensional construct, social support encompasses informational, emotional, and instrumental support (Dunkel-Schetter, Sagrestano, Feldman, & Killingsworth, 1996; Gottlieb & Bergen, 2010). According to Cohen (2004), instrumental support involves the provision of material aid such as financial support or help with daily tasks, whereas informational support is related to providing relevant information to an individual to cope with current difficulties or problems in the form of

guidance or advice on issues. Emotional support, on the other hand, has to do with an expression of empathy, caring, reassurance, and trust that provides opportunities for emotional expression.

There is an expansive literature on social support as a buffer against health risk behaviors and health problems. For example, a study of female cancer patients revealed that elements of social support such as informational, emotional, and decision-making support were found to be useful (Arora, Rutten, Gustafson, Moser, & Hawkins, 2007). A cross-sectional study involving 851 randomly selected older adults revealed that social support correlated with self-rated health. However, this effect was non-significant after statistically controlling for physical functioning, medical conditions, and possible positive effect (Benyamini, Idler, Leventhal, & Leventhal, 2000).

Other scholars (Cohen, 2004; Thoits, 1995) contend that social support may have an indirect effect on health through improved mental health, as a result of reducing the impact of stress and/or promoting a sense of meaning and purpose in life. For example, closeness with parents is considered an important predictor of health among adolescents. As demonstrated in the work of Ackard, Neumark-Sztainer, Story, and Perry (2006), adolescents who received low parental care and a lack of communication had significant health, emotional, and behavioral problems. In a qualitative research study, Cattell and Herring (2002) also found that among young people, support from family and friends was vital to their everyday lives.

In a study investigating the role of family relationships, social support, and subjective life expectancy, respondents with family members such as parents and adult

children were found to have an increased potential life expectancy. However, even though having adult children increases life expectancy, young children do not. Also, marriage was found to have improved the years of life expected for older men (Ross & Mirowsky, 2002). Other research works point to the negative consequences of lack of social support on health. Unsupportive parents or social networks can potentially serve as barriers to positive health behaviors and outcomes. Many studies do, however, demonstrate that lower parental social support predicts an increased risk for substance use and could potentially serve as a moderator to self-medication and alcohol use, especially among adolescents (Piko, 2000; Reimuller, Shadur, & Hussong, 2011; Wills, Resko, Ainette, & Mendoza, 2004), which can clearly have negative health consequences. As emphasized by Wuthnow (2002a), social support from a close person or more homogeneous groups such as family members or a romantic partner, is considered to be *bonding*. This form of social support usually involves attentive listening, caregiving, and affection. On the other hand, social support from a more distant person or heterogeneous groups beyond one's inner circle is termed *bridging*. Unlike bridging, bonding is difficult to generate and sustain. These two forms of social support operate both at the individual and community levels. Another contrast is found in a study by Bolin, Lindgren, Lindstrom, and Nystedt (2003), which revealed differential benefits of social capital on health. They note that social capital declines with age and among married people. It is also lower for men than women. Although the general assumption is that social ties can promote healthy behavior and discourage risky health behaviors, there is also evidence to show that it could potentially lead to risky health behaviors (Christakis

& Fowler, 2007; Gaughan, 2006) and consequently impede health outcomes. These highlighted studies point to the unfortunate realization that social capital, like other resources, is unevenly distributed and could potentially help explain health disparities in a population.

Social Capital, Immigrant, and Non-immigrant Health

Nativity and race have become prominent domains in health disparities research. Recent research shows a substantial body of work that suggests favorable health and mortality for immigrants compared to their native-born counterparts, particularly upon arrival from their home countries (Antecol & Bedard, 2006; De Maio & Kemp, 2010; Jasso, Massey, Rosenzweig, & Smith, 2005; Newbolt, 2005; Singh & Siahpush, 2002). For example, studies suggest that immigrants are less likely to be overweight and/or obese compared to non-immigrants (Antecol & Bedard, 2006; Lauderdale & Rathouz, 2000). In a study conducted in the state of New York, Muennig and Fahs (2002) found that immigrants are less likely to be hospitalized due to chronic illness and therefore utilize fewer medical resources, which results in lower hospital-based costs and lower mortality than non-immigrants.

Additionally, a longitudinal study conducted by Singh and Siahpush (2001) using the National Longitudinal Mortality Study indicated variations in the mortality rates of immigrants and their native-born counterparts in the U.S. Using Cox regression, the authors estimated that immigrants have a lower mortality rate than native-born Americans from several major illnesses including cardiovascular disease, cirrhosis, lung and prostate cancer, pneumonia and influenza, unintentional injuries, chronic obstructive

pulmonary diseases, and suicide. However, they found higher mortality among immigrants related to illnesses such as stomach and brain cancer and infectious diseases, but greater life expectancy among Black and Hispanic immigrants compared with native-born Americans. Singh and Siahpush (2002) using two different sources of data, the National Health and Interview Survey and the National Longitudinal Mortality Study, found similar results (Singh & Hiatt, 2006; Singh & Siahpush, 2001). Similarly, in a recent study, Zhang, Hayward, and Lu (2012) used data from the 2006 Health and Retirement Study and its biomarker data to investigate the patterns of foreign-born Hispanics and other racial groups in the United States. The study concluded that after controlling for age and gender Hispanics have comparable or lower rates of blood pressure, heart diseases, cancer, arthritis, chronic lung diseases, and stroke. These results were found to be strong after controlling for socioeconomic and health behavior factors.

The phenomenon of immigrant health advantages has resulted in what most scholars refer to as the "healthy migrant effect" (see Fennelly, 2007; Kennedy & McDonald, 2004). Consequently, various research studies have been conducted to test this hypothesis on different immigrant groups and in different countries (Razum, Zeeb, Akgun, & Yilmaz, 1998; Rubalcava, Teruel, Thomas, & Goldman, 2008). The healthy migrant effect hypothesis is used by immigrant health researchers to explain the health advantage of immigrants during the early years of their arrival and stay, compared to native-born residents in a host country (Fennelly, 2007). The consistent research findings demonstrating health advantages of recent immigrants and lower mortality, especially

among Hispanic immigrants, has challenged researchers to come up with possible explanations.

One of the most common explanations postulates that the desire to migrate and the immigration experience generally is self-selective in nature, such that those who migrate outside of their country of origin are more likely to be the healthiest among their population and may also have the financial resources to migrate (Abraido-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Jasso, Massey, Rosenzweig, & Smith, 2005; Fennelly, 2007). In other words, people who are generally ill or have disease conditions or disabilities are less likely to travel to another country, and therefore, healthy individuals are more likely to be the population that migrates to other countries. Further, immigrants with poor health are more likely to return to their country of origin, as are older or unemployed immigrants (Abraido-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Palloni & Arias, 2004). Moreover, the return migration of less healthy individuals due to a preference to die in the country of origin rather than stay in a host country may influence the mortality rates of immigrants. This phenomenon is known as the "salmon bias" (Abraído-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Palloni & Arias, 2004). Jasso, Massey, Rosenzweig, and Smith (2005) argue that the proper way of determining the self-selection hypotheses is by comparing immigrants to their counterparts from the country of origin, rather than native-born Americans. Therefore, any attempt to assume that immigrants have superior health, compared to the rest of the population in the country of origin cannot be substantiated and is therefore without merit.

In a study conducted by Turra and Elo (2008) using data from the Social Security Administration, the Hispanic mortality advantage was found to be attributable to salmon bias. This raises questions about healthy immigrant and mortality advantage. In the view of Palloni and Arias (2004), the issue of data artifacts resulting from lack of ethnic identification, potential misreporting of ages and mismatching of immigrant records are relevant in the discussion and debate regarding healthy immigrant and mortality advantages. These authors suggest that data on immigrants may be inaccurate and therefore unreliable for analysis and comparison and generalizations.

Other researchers have explicitly tested the existence of the healthy migrant and salmon bias hypotheses. In their tests using a longitudinal study, Abraído-Lanza, Dohrenwend, Ng-Mak, and Turner (1999) found lower mortality rates among Cubans and Puerto Ricans than their American counterparts. However, the authors do not attribute such differences to the migrant health hypotheses or salmon bias. In addition, Akresh and Reanne (2008), caution against making generalizations about migrant health effects and health selection as the only explanations for immigrant health advantage. They remind us that there are many different immigrant groups and that socioeconomic status and English-language ability play a consequential role in immigrant health, compared to health selection.

Others have called the low mortality rates and superior health of immigrants an epidemiologic paradox (Abraído-Lanza, Chao, & Flórez, 2005; Franzini, Ribble, & Keddie, 2001; Markides & Coreil, 1986; Palloni & Arias, 2004), especially considering the fact that most immigrants have lower socioeconomic status, less education, limited

English proficiency, and are less likely to have health insurance (Beiser, Hou, Hyman, & Tousignant, 2002; Derose, Escarce, & Lurie, 2007; Falcón, Aguirre-Molina, & Molina, 2001; Ponce et al., 2006). On the contrary, other researchers have found mortality rates to be higher among immigrants as compared to native-born Americans. Rubia, Marcos, and Muennig (2002), using data from 1997 Multiple Cause of Death data file and the 1997 Current Population Survey, investigated female immigrants and native-born Americans and found higher mortality rates among foreign-born females resulting from stroke and heart diseases, as compared to a significantly lower mortality rate for native-born females from the same diseases.

Surprisingly, notwithstanding the immigrant health advantage, immigrant health declines over time and converges with that of the native-born population. Obviously, individual and post settlement factors contribute immensely to the decline in the initial immigrant health advantage (De Maio & Kemp, 2010; Derose, Bahney, Lurie, & Escarce, 2009; Newbold, 2009; Setia, Lynch, Abrahamowicz, Tousignant, & Quesnell-Vallee, 2011). One potential explanation for immigrant health decline in the United States is the differential use of preventative care by immigrants compared to natives. By implication, the provision of preventative services and care can save healthcare costs and at the same time preserve the long-term health of individuals. This is possible only if sufficient research is conducted that delves into the diverse social determinants that predict health and well-being. Other studies support the hypotheses that greater acculturation exacerbates immigrant health behaviors resulting in poor health outcomes, such as high alcohol intake, smoking, and high body mass index (BMI) (Abraído-Lanza, Chao, &

Flórez, 2005). Interestingly, the authors also found that acculturation was associated with higher levels of recent exercise.

Despite evidence that immigrants spend less on health services and have lower rates of health service utilization than their native counterparts (Goldman, Smith, & Sood, 2006; Mohanty et al., 2005), there has been a paucity of research on how this impacts their health, or how it relates to social determinants, such as neighborhood, family social capital, and health risk behaviors. Understanding these variables can enhance our understanding of disparities between immigrants and non-immigrants overtime. Nonetheless, whether or not this health advantage and its subsequent decline and convergence apply to adolescent immigrants and non-immigrants is not yet clear. Therefore, it is relevant to explore any health and health risk differentials that exist between immigrants and non-immigrants and to develop appropriate interventions to mitigate disparities.

Although there is extensive literature on social capital and health, there is limited research on the linkage between social capital and immigrant health and health risk behavior. Most of the research is concentrated on social capital and immigrant health service utilization patterns (Deri, 2005), social networks, immigrant economic adaptability, integration into the host country, and well-being (Van Kemenade, Roy, & Bouchard, 2006). For example, Newbold (2009) found that recent economic immigrants' health starts to decline two years after arrival though it is better than that of refugees. However, social group membership and having family and friends in close proximity was not found to be significant. Immigrants who engaged in monthly social interactions with

family and friends were less likely to report poor health, compared to diminished health for those whose contact was less than a monthly interval. This study certainly points to the fact that not all social interactions have positive health outcomes.

In two major studies using the Longitudinal Survey of Immigrants to Canada, Zhao (2007) and Zhao, Xue, and Gilkinson (2010) found that recent immigrants with a network and social support of friends had a decreased risk of health status decline. The findings of Zhao, Xue, and Gilkinson (2010) in particular indicate social capital such as friendship networks, density, ethnic diversity of friendship, membership in groups, and organizations, and existing family ties during the initial four years after arrival had significant positive relationships with the health of immigrants. Although these two studies are longitudinal and have important findings, they do not entail a comparison of immigrants and non-immigrants in the same cohort. Furthermore, the concept of social capital may be most relevant to immigrants and minorities, who tend to be isolated and have less access to social support than their counterparts (Kao, 2004). Understanding the effects of such isolation and lack of social support is useful for public policy and health.

Regardless of nativity, the health and well-being of individuals is not static. The health of adolescents and young adults, whether immigrants or not, presents unique challenges and opportunities especially during this critical period in their life span. The adolescent period is particularly important given that health outcomes in later life are attributable to early life experiences (Halfon & Hochstein, 2002; Kuh & Ben-Shlomo, 1997). Given that racial and ethnic health disparities continue to be a major public health concern, one of the primary goals of Healthy People 2010 was “eliminating health

disparities" among population subgroups (U.S. Department of Health and Human Services, 2000). These social, environmental, and behavioral occurrences or life experiences accumulate overtime to improve or jeopardize an individual's health (Kuh & Ben-Shlomo, 1997). Therefore, disentangling the extent to which social capital influences risk behavior and health outcomes on different sub-population groups based on socio-economic, race, and ethnicity is vital for understanding which groups should be targeted by interventions.

Immigrant and Non-immigrant Health Risk Behaviors and Social Capital

Adolescence is a developmental stage often characterized by involvement in behaviors that are harmful and negative (risky behaviors) (Steinberg, 2008). Broadly speaking, there are fewer studies that focus on a comparison of immigrants and non-immigrants adolescent risk behavior such as physical activity (Kandula, Kersey, & Lurie, 2004) just as there are limited studies on adolescent health risk behavior, health outcomes, and social capital. Overall, the pivotal role of parental support, involvement, expectation, communication, and monitoring have been found to be negatively associated with risk behaviors such as substance abuse, smoking, and alcohol since they serve as protective factors to these risky behaviors (Barnes et al., 2007; Leventhal & Brooks-Gunn, 2000; Otten et al., 2007; Simons-Morton, Chen, Abroms, & Haynie, 2004).

A study using a large survey from an emergency department in New York City comparing immigrants and native-born Americans, in regard to health behaviors demonstrates that immigrants are less likely to engage in physical activity compared to

native-born American counterparts (Jacobs et al., 2002). Using the 1991 Supplementary Drug and Alcohol Use Data File of the National Health Interview Survey of 1991 to examine drug use differentials between immigrants and non-immigrants in the United States, Johnson, VanGreest, and Choi (2002) concluded that immigrants had a lower usage rates of alcohol, illicit drugs, prescription drugs, and inhalants that their native-born counterparts. Possible explanations that can be offered for the lack of regular exercise among immigrants include the nature of jobs they do and how long they participate in work-related activities. Economic immigrants especially are more interested in making money and accumulating wealth. Most of these immigrants work seven days a week and under strenuous and hazardous occupational conditions and circumstances compared to their non-immigrant counterparts (Pérez et al., 2012), which make it close to impossible for them to get involved in regular physical activity. Besides, if one's network of friends and family are not engaged in physical activities or if facilities or opportunities do not exist, there may be less motivation for others to get involved in exercise.

Using the Youth Risk Behavior Survey, recent immigration is found to be associated with less marijuana and alcohol use among immigrant youths compared to their native-born counterpart (Blake, Ledsky, Goodenow, & O'Donnell, 2001). However, recent immigrants had a higher risk of peer pressures to engage in health risk behavior and less parental support for the avoidance of risk behavior. A similar study found social capital to influence adolescent sexual risk behavior in a major way (Crosby, Holtgrave, DiClemente, Wingood, & Gayle, 2003). The findings from the study suggest

a positive correlation between social capital (e.g., community organizational life, volunteerism, informal sociability, social trust) and protective sexual behavior and an inverse relation with sexual risk behavior. Jeltova, Fish, and Revenson (2005) found in their examination of acculturation processes through family and friends and its influence on risky health behavior such as pregnancy and HIV of recent Russian immigrants. The study concludes that a high level of acculturation to American culture is associated with higher health risk behavior among immigrants. In a similar study, O'Loughlin, Maximova, Fraser, and Gray-Donald (2010) found that increasing length of stay of immigrant children living in Canada was associated with increased risk of smoking.

Social capital is said to influence health behavior in tremendous ways. The dimensions of social capital such as family related variables such as parenting and family structure are dominant in determining adolescent outcomes (see Griffin, Botvin, Scheier, Diaz, & Miller, 2000). The study findings indicate that minority youth especially those from single parent families have the highest risk of problem behavior, whereas parental monitoring was associated with reduced delinquency rates and less smoking among girls and reduced drinking in boys. Also, neighborhood context variables such as neighborhood safety, social cohesion, trust, and social participation are considered to impact youth during their developmental stages (Roosa et al., 2005). For example, communities with high social capital are better able to exercise social control over health behaviors. Some authors (Kawachi & Berkman, 2000; Subramanian, Kim, & Kawachi, 2002) have suggested that health behaviors are effectively socially controlled in communities with high levels of social capital. In the same vein, various empirical

research works indicate that social capital is associated with health behaviors such as physical activity, consumption or dietary patterns, smoking and alcohol consumption (see Lindström, Hanson, & Ostergren, 2001; Lindström, 2003; Stahl et al., 2001; Addy et al., 2004; Weitzman & Chen, 2005).

The development of some health risk behaviors such as smoking, drug use, or alcohol use starts during adolescence (Atva & Spencer, 2002; Johnston, Malley, & Bachman, 2007) and has important ramifications for American youth over time. This implies that the adolescents' desire to gain autonomy means they tend to do things that deviate from the dominant culture (Jackson, 2002; Redmond, 2002; van der Rijt, D'Haenen, & Van Straten, 2002). Dimensions of social capital such as parental support and monitoring (family social capital and social capital from outside the family) have been found to predict lower adolescent alcohol misuse (Barnes, Reifman, Farrell, & Dintcheff, 2000). The study also highlights that females and Blacks have a lower propensity to engage in alcohol misuse compared to males and White adolescents. On the other hand, parental alcohol abuse did not influence adolescent alcohol abuse but rather it reduced parental support for adolescent.

Previous empirical investigations suggest that social capital is associated with health behaviors. Poortinga (2006), using the 2002 Health Survey for England, found social capital to be significantly associated with health behaviors such as smoking. This study uses neighborhood capital since it has the potential to discourage deviant behavior. Similarly, perceived neighborhood safety or a good place to live was negatively associated with smoking (Greiner, Li, Kawachi, Hunt, & Ahluwalia, 2004). Again,

Poortinga (2006), using 2002 Health Survey for England, found social capital (community level social capital) to be moderately positively associated with alcohol consumption. On the contrary, in an Australian study, Siahpush et al. (2006) found that lower levels of social capital, such as trust (i.e. most people can be trusted), lack of active social participation in the community, and neighborhood safety, had a significant relationship to the probability of smoking.

Social capital is also found to be related to drinking behavior (Lindström, 2003). Social capital measured as exchange of gifts, help, and participation in community work was also found to be related to other risk behavior such as weekly alcohol consumption (Godoy et al., 2006). In exploring gender disparities related to the influence of social capital on drinking and smoking, Chuang and Chuang (2008) concluded that social trust at the neighborhood level, an indicator of social capital, had a stronger effect on women than men, and social participation was found to have a similar positive effect on alcohol consumption for both women and men. Besides the direct association between social capital and health behaviors, health behaviors are also said to have a possible mediating role in the pathway between social capital and health. In a research study conducted by Mahan, Twigg, Barnard, and Jones (2005), health behaviors were found to mediate social capital and health. This suggests that social capital may influence health behaviors which consequently may impact the health outcomes of individuals. In a study using the World Health Organization's Health Behavior in School-Aged Children Survey to investigate neighborhood social capital of Canadian students, Boyce, Davies, Gallupe, and Shelley (2008) found health risk behavior, and neighborhood social capital and family affluence

were independently associated with the adolescents' perceptions of their health. In the study, respondents from lower socio-economic background, low neighborhood social capital, and engaged in higher levels of risk behaviors were more likely to report poor health. The study also tested for the moderating effects of social capital and socio-economic status; however, the interaction was not found to be statistically significant. Winstanley et al. (2008) found that social capital was inversely associated with alcohol and drug use among youth. Youth who reported medium or high levels of social capital in the form of civic participation in church, school, and community related activities were less likely to engage in alcohol and illicit drug use.

Despite the increasing popularity of conceptualizing and applying social capital in sociology, epidemiology, and public health, the concept has come under intense criticism. Besides research that suggests an association between social capital and health, few studies have found a positive relationship between social capital and better health *outcomes* (i.e., better or worse health including specific health conditions) (Harpham, Grant, & Rodriguez, 2004; Lynch, Due, Muntaner, & Smith, 2000).

However, a few scholars are of the opinion that the benefits of social capital to individuals, families, and communities are exaggerated, thereby making the concept too vague (Hawe & Shiell, 2000) and incorrectly presented as a panacea or catch-all concept capable of solving every societal problem (Macinko & Starfield, 2001; Portes, 1998). Others argue that it is unclear which aspect of social capital is of greatest significance to health (Cartell, 2001). Other authors argue that social capital may not always have a positive consequence on individuals as postulated in the work of Putnam (1993) and by

other proponents of the theory. Other works report some of the potentially negative impacts of social capital (Moore, Daniel, Gauvin, & Dubé, 2009). They found that individuals with higher social capital were associated with a low sense of mastery compared to those with low social capital. Interestingly, Caughy, O'Campo, and Muntaner (2003) found that in poor neighborhoods lower levels of neighborliness and social connections were associated with lower childhood behavioral problems. Others argue that social capital could have negative consequences and thereby limit individual actions and choices (Portes & Landolt, 1996). For example, group membership in gangs, crime groups, or other unhealthy cohorts may not necessarily help improve one's health. That apart, Carpiano (2007, 2008) has shown that higher social capital is positively associated with binge drinking and daily smoking.

Again, inasmuch as social capital may be beneficial to individuals and groups, Portes (2000) cautions about the tendency for the existence of social capital to have negative consequences, such as social exclusion. For example, the presence of a strong social ties or bonds can lead to social exclusion in society since members of a particular group may prevent others from joining the group; that is, the group becomes an exclusively for individuals with specific attributes.

Certainly, the argument remains that social capital as a resource means that access will be unevenly distributed and therefore, not all individuals may possess the same level of it. The increasing diversity within society has also put the concept of social capital to the test. Some scholars contend that social capital may have unique implications in a pluralistic or ethnically diverse society and therefore further research to understand this

dynamic is needed (Arneil, 2006; Putnam, 2007). For example, Putnam (2007) argues that ethnic diversity and immigration have the tendency to reduce social solidarity and social capital. Finally, the existence of various conceptualizations and operationalizations of the concept of social capital by different scholars makes it confusing and a complex construct without much specificity.

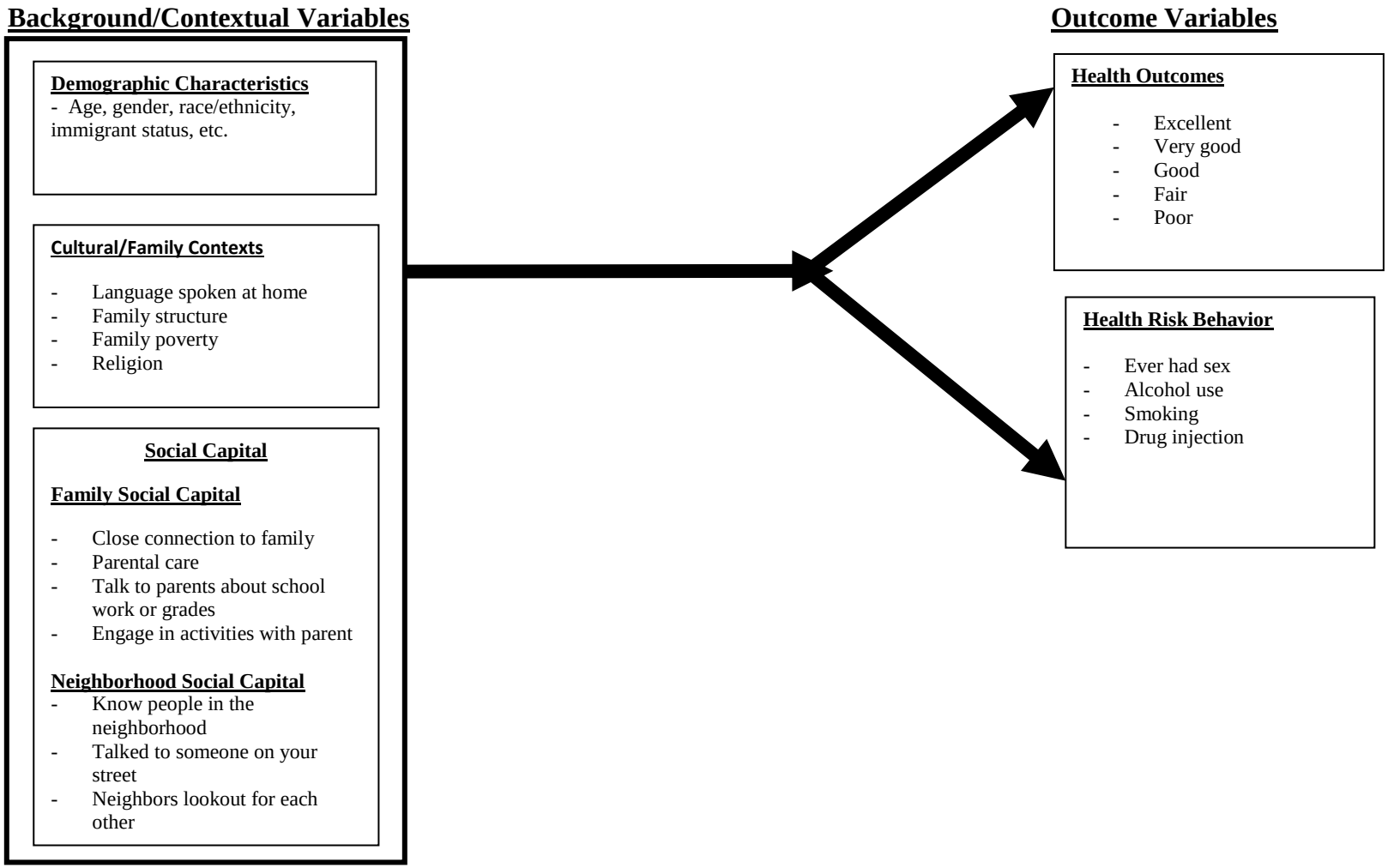
Clearly, these criticisms of social capital call for careful consideration of the concept and point to the need for more research to be conducted to untie some of the confusions and to delineate the forms of social capital that are relevant to the health behaviors and health, and the overall well-being of individuals. The use of social capital in empirical investigations to explain social phenomenon such as health and health risk behaviors requires additional refinement.

Conceptual Framework

Given the multifaceted nature of the concept social capital and findings that it accrues benefits to individuals through social connections and networks, it can be considered a protective factor in improving health behavior and health outcomes. In this context, social capital theory (i.e., family and neighborhood social capital) is used as a framework to examine how this theory and other factors promote or hinder positive health behaviors and health outcomes of immigrant and non-immigrant adolescents. Specifically, the framework suggests that, adolescents with lower or no social capital through their neighborhoods and families are more likely to engage in worse health risk behaviors and poor health outcomes. Since adolescence is a developmental period of

socialization through experimentation of risk, it is only reasonable to assume that there will be interplay of forces within the social environment including social interactions that may catalyze such risk-taking behaviors and overall health. This supposition or framework is grounded in the early conceptual formulations of Coleman (1988) and Bourdieu (1986) and the recent work of Carpiano (2007, 2008) of social capital as a resource available in the family and community or neighborhood. Indeed, according to Coleman (1988), if social capital can be used as a resource to achieve one's interest, then the theoretical assumption presupposes a probable connection between social capital and health behaviors and health outcomes. There is potential for community connections and quality of family social relationships to have protective and positive consequences over the life course regarding health behaviors, and health of individuals. These benefits are also likely to be cumulative. For example, the extent of any effect of social capital could be better observed as a long term issue rather than a one-time short term benefit. Therefore, immigrant health may likely be impacted the most, considering that immigrants may have left their families and friends in the country of origin.

Figure 1: **CONCEPTUAL FRAMEWORK OF THE STUDY**



In addition, the many challenges of migration may limit their social relationships in the host country. Immigrants who encounter hostility within their neighborhoods may not have access to the neighborhood networks that can be useful for them in the long run.

Over the years, available studies suggest that social capital can facilitate the health and well-being of people. From the previous theoretical discussion, this study uses a conceptual framework as illustrated in Figure 1. The framework shows the relationship between background/demographic characteristics and the outcome variables. That is, the framework details the influence that social capital, demographic characteristics, and other family factors exert either positively or negatively on adolescent health and health risk behaviors. Figure 1 indicates the main outcome variables: health outcome or status and health risk behaviors.

In this study, it is hypothesized that the two main outcome variables (i.e., health and health risk behaviors) are primarily affected by background/contextual variables, which include socio-demographic characteristics, and the main independent variable, social capital (i.e., family, and neighborhood social capital). Finally, the multivariate relationships among demographic variables, neighborhood social capital, moderating variables, and outcome variables are explored. Since this is a cross-sectional analysis, the conceptual framework is not a linear causal model but rather presents relationships among individual and family characteristics, social interactions or relationships, and outcome variables selected for this study.

In a nutshell, the dissertation draws on social capital theory to argue that the strengths of adolescents' familial or parental involvement and connectedness and

community ties are essential determinants of their engagement in health risk behaviors and increased likelihood of influencing their health outcomes.

Research Questions and Hypotheses

From an extensive review of recent empirical studies, it is evident that there is much more to be researched and understood regarding the relationship between social capital, health risk behaviors of both adolescent immigrants and non-immigrants. Only a few studies have investigated this issue among immigrants and non-immigrants in a single study. Most of the research conducted thus far does not specifically use neighborhood social capital and family social capital in the same study, does not use nationally representative data, and does not indicate how social capital influences health behaviors and health. The literature also demonstrates that, to date, there has been limited research conducted on social capital among immigrants. In addition, few studies have focused inclusively on social capital and adolescent immigrants' health behaviors and health outcomes. Therefore, this study is designed to explore the potential role of social capital in promoting differences in the health behaviors and health outcomes of immigrants and non-immigrants and the moderating role of immigrant status and neighborhood social capital. Considering the gaps and limitations in research and the theoretical underpinnings of social capital based on the works of Bourdieu (1986), Coleman (1988), Putnam (1993, 1995, and 2000), and recently Carpiano (2007, 2008), the following questions are addressed in this study:

- Does neighborhood social capital affect health behaviors and health of adolescents?
- Does family social capital affect the health and health behaviors of adolescents?
- Do family characteristics predict the health behaviors and health of adolescents?
- Are there differences in the predictors of health and health risk behaviors of immigrant and non-immigrant adolescents?

Hypotheses

Given the gaps in current research on social capital especially as it relates to adolescents and immigrants and the questions identified above, the following four main hypotheses are deduced for further research investigation and testing:

Hypothesis 1: The presence of neighborhood social capital is associated with better health outcomes and lower health risk behaviors for adolescents.

Hypothesis 2: Higher family social capital is associated with better health and lower health risk behaviors of adolescents.

Hypothesis 3: Higher family socio-economic status is associated with better adolescent health and lower health risk behaviors.

Hypothesis 4: Adolescent immigrants are more likely to have lower social capital and therefore lower health status and higher health risk behaviors compared to non-immigrant adolescents.

An exhaustive review of scholarly research indicates that there are limited empirical investigations that delve into the complex and difficult questions listed above.

Explicating the relationship between social capital and health and health risk behaviors among immigrant and non-immigrant adolescents is intended to lead to the development of more informed health promotional and prevention policies and programmatic activities. This study will contribute to existing literature in social work as it refocuses or situates the social science concept of social capital in the form of social interaction or relationship at both the family and community level (i.e., contextual level) as an important social environmental resource for health and well-being. This perspective or approach is in consonance with the person-in-environment (PIE) perspective espoused in social work research and practice.

Chapter 3

METHODOLOGY

Survey Design: This chapter of the dissertation presents information on (a) the type of research design, population, sample, and participants in the research, (b) data collection instruments and variables selected for the study, (c) potential data analysis procedures, and (d) the strengths and limitations of the study. To examine the relationship between social capital and the health risk behaviors and health outcomes of adolescent immigrants and non-immigrants, this study uses secondary data. The data are from the National Longitudinal Study of Adolescent Health (Add Health), a national representative longitudinal survey of adolescents that includes immigrants and racial and ethnic groups in the United States (U.S.). The Add Health study was designed to gather information on health risk behaviors and health outcomes in a socio-environmental context (Berkman & Kawachi, 2000). This makes it possible to investigate the relationship between social capital, health behaviors, and health outcomes. Even though Add Health is a longitudinal data set that allows for the dynamic interplay of variables over time, this study uses only one of the four waves for analysis (i.e., Wave I). The main reason for using Wave I is that it has a set of questions that make it possible to construct neighborhood social capital for this study. It also has information on immigration status (about 11% are adolescent immigrants) and information, that facilitates the development additional constructs such as first and second generations of immigrants for descriptive purposes.

The Add Health study was designed and carried out by researchers from the University of North Carolina, Chapel Hill in 1994/1995 and was continued in 1996, 2001/2002, and 2007/2008, representing Waves I, II, III, and IV, respectively. The dataset is currently deposited at the University of Michigan. The current study used data from Wave I to explore the relationship between social capital, health behaviors, and the health outcomes of immigrant and non-immigrant racial and ethnic adolescents and young adults. Data were originally collected on adolescents from Grades 7–12 (9–11 years of age) in 1994/1995, and the same cohort was followed from adolescence to young adulthood.

Population and Sample: Add Health uses a multistage, stratified, school-based, cluster sample design. The study uses a school-based design with a sampling frame derived from the Quality Education Database and collected through a stratified sampling of 132 high schools from 80 communities in the U.S. The stratification of schools was based on urbanicity, school type (private and public), region, ethnic mix, and size (Harris, 2007). The data collection system had in-school and in-home interview components. Interviews were conducted through audio-computer assisted self-interviews (audio-CASI). A random sample of adolescents and one of their parents was selected for in-home interviews during Wave I. Furthermore, there was an oversampling of various ethnic groups selected on the basis of in-school responses. As a result of high immigration to the U.S. during the 1990s, the Add Health design oversampled relatively rare ethnic groups (e.g., Cuban, Puerto Rican, and Chinese). Add Health contains a large

number of adolescent immigrants—1 out of 4 adolescents live in an immigrant family (i.e., first and second generation).

Of the adolescents selected for the in-home interviews in 1994/1995, over 15,000 Add Health respondents were re-interviewed at Wave IV (77.4% response rate) with longitudinal data over the various waves of in-home interviews collected in 2007 and 2008. During this time, most of the participants were in their young adulthood of between 24–32 years. Overall, the data collected in the Add Health design are a combination of social, behavioral, and biomedical information, which allows for an interdisciplinary research approach on the health, health behaviors, and well-being of the adolescents and young adults. The current study involves secondary data analysis of the 1994/1995 data (Wave I) and has a sample size of 20,745 respondents with ages between 12 and 21 years. Wave I also interviewed 17,670 parents. The study has received approval from the Institutional Review Board (IRB) of the University of Minnesota, Twin Cities.

Measures

In order to investigate the study questions and hypotheses, a number of dependent and independent variables were identified. Data on these variables were collected using both in-home and in-school data collection instruments. The principal variables used in this study include health outcomes, health risk behaviors, demographics, perceptions about the neighborhood and other neighborhood characteristics, and family-related

variables (see Tables 2). Detailed information regarding the variables in the study is provided in the section below.

Dependent Variables: In exploring the relationship between social capital, health, and health behaviors. Health risk behaviors such as sexual activity, smoking, alcohol consumption, and injection of an illegal drug were identified as the major dependent variables. For the purpose of this study, each health risk behavior is examined separately using multivariate analyses.

Self-rated health: The health variable is deduced from the self-reported health of respondents. Respondents were asked the question: "In general how is your health? Would you say excellent, very good, good, fair, or poor?" The response varies on a 5-point Likert-scale (1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, to 5 = *excellent*). Consistent with previous studies, the health outcome responses are dichotomized, resulting in a category of those who rated their health as good, very good, and excellent = 1, and those who rated their health as fair and poor = 0 for purposes of multivariable analysis (Carpiano & Hystad, 2011; Haas, Schaefer, & Kornienko, 2010; Wen, Fan, Jin, & Wang, 2010). Self-reported health as a measure of individual's general health has been validated to be reliable and valid in the determination of general health (Idler & Kasl, 1991).

Health risk behaviors: The other dependent variables are a set of adolescent health risk behaviors. Health and well-being are impacted by the behavioral choices that individuals, families, and communities make. Ultimately, personal health behaviors impact the individual who engages in that behavior. Considering that about half of all

causes of mortality in the U.S. are connected to social and behavioral factors such as smoking, diet, alcohol use, sedentary life-style, and accidents (McGinnis & Foege, 1993), it is important we take these variables into account in health matters. Besides, even though engagement in health risk behaviors can be considered normal and quite transitory in adolescent development and functioning (Steinberg & Morris, 2001), such engagement has the potential to continue into adulthood (Rohde, Lewinsohn, Kahler, Seeley, & Brown, 2001; Chen & Kandel, 1995). Consequently, health risk behaviors constitute a major source of public health concern.

In this study, variables that connote health risk behaviors such as ever had sexual intercourse, tobacco, drug/substance, and alcohol consumption are used for two purposes in the analysis: it is to check whether or not neighborhood social capital has a significant influence on each of the health risk behaviors and health, and to determine a causal sequence and strength between these independent and outcome variables based on the moderating variable, neighborhood social capital—neighborhood safety. This is especially the case when neighborhood safety transmits a causal effect on health risk behaviors and health. Even though these health risk behaviors are considered to be dichotomous variables (i.e., with either *yes = 1* or *no = 0* responses) for descriptive and multivariate analyses purposes to examine the association of the independent variables on each of them, a summative scale is constructed for a separate multivariate analysis as utilized in other studies (Boardman & Alexander, 2011; Jackson, Knight, & Rafferty, 2010). This captures the number of risky behaviors or bad health behaviors in which adolescents have engaged. The responses are added to indicate the respondent's level of

involvement in either more (i.e., higher score) or less risky behaviors. The combination of health risk behavior outcomes into a singular variable (a continuous variable ranging from 0 to 5) necessitates the use of multiple linear regressions or ordinary least squares analysis. Such an approach or model helps in determining the unique contributions of various factors to self-reported involvement in any of the potentially harmful behaviors. Table 1 below shows the two main dependent variables in the study and how they were measured:

Table 1: Dependent Variables in the Study

Health Outcomes			
Concept	**Measurement**	**Source**	**Level of Measurement**
Health Outcomes	General health (Self-Reported) • 5=Excellent • 4=Very good • 3=Good • 2=Fair • 1=Poor	Add Health Wave I	Ordinal Recoded as dummy variable
Health Risk Behaviors			
Health risk Behaviors	Sexual behavior • Ever had sex Smoking/tobacco use • Ever tried smoking • Smoke regularly Drinking/alcohol use • Drink alcohol 1 or more a month Drug/substance use • Ever use injected drugs	Add Health Wave I	Nominal but a summative scale is constructed for multivariate analyses. Also, each risk behavior is used in a separate logistic analysis

Questions related to health risk behaviors are: *Sexual behavior*: Have ever had sex? The responses for this question included, *yes = 1, no = 0*. *Smoking*: With regard to smoking respondents were asked: (1) "Have you ever tried cigarette smoking, even just 1 or 2 puffs?" (*yes = 1, no = 0*), (2) "Have you ever smoked cigarette regularly, that is, at

least 1 cigarette every day for 30 days?" The response to this question included *yes = 1, no = 0*. *Alcohol use*: Also respondents were asked about the alcohol use: (3) "Have you had a drink of beer, wine, or liquor-not just a sip or a taste of someone else's drink-more than 2 or 3 times in your life?" The responses were either yes = 1 or no = 0. *Drug injection or use*: Drug injection was considered as one of the health risk behaviors. It includes inhalants such as cocaine or illegal drugs that are injectable. The question was: "During your life how many times have you ever injected any illegal drugs such as heroin, or cocaine?" (i.e., *never = 0, one or more = 1*). Each of the drug use questions is dichotomized into never used = 0 and 1 or more times = 1. Also, a summative variable of negative health behaviors i.e. drug use variable was constructed for the four drugs listed above calculating the sum or count of the dichotomous variables (i.e., engaging in sex, illegal drugs, smoking, ever drink, and regular drinking) into a four-point scale (*0 = no in risk behavior engagement, 4 = engagement in all the risk behaviors*). In a separate analysis, each of the health risk behaviors was used in a logistic regression analysis to determine the factors that influence these specific risk behaviors. In this study, each of the dummy variables of the risk behavior will be used in separate regression analyses.

Independent Variables: Three sets of independent variables are used in this study and are all considered as important social determinants of health and health risk behavior. The independent variables are broadly categorized into individual characteristics, family socio-economic status, and social capital. Of these variables, 15 are subsequently selected and included in the multivariate analyses. Health service utilization variables such as doctor and dentist visits were omitted from the multivariate analyses because of

the possibility of confounding the effect of other independent variables on health and health risk behaviors.

Family Characteristics: The language spoken at home is considered one of the family characteristics in this study. It is constructed as binary. If English is the language spoken at home, then 1 is assigned and all other language spoken at home including Spanish is assigned 0. This enables an analysis of those who speak predominantly English at home and those who do not. Not only does language spoken at home or English proficiency serve as a measure of acculturation, it also may help to explain the individual's ability to seek or access preventive services for their health and health behavior needs (DuBard & Gizlice, 2008; Flores, Abreu, & Tomany-Korman, 2005). Certainly, the ability to speak the dominant language of the host country may help in understanding the ability of individuals to access resources such as health, economic, social networks, or community resources that may be useful or harmful for their well-being. It may also enhance social integration rather than social isolation, especially of immigrants.

Family structure: The role and value of family in adolescent life cannot be underestimated. As a result another independent variable related to family is family or household structure. This variable considers the number of parents in the respondent's home (see Table 2). The variable is considered to be relevant since it is reported that children and adolescents who live with single-parent families or social parents exhibit lower average levels of developmental outcomes such as education performance, depression, and marijuana use compared to those who live with two biological parents

(Amato, 2005; Brown, 2006; Cavanagh, 2008). Limited research on the examination of family structure on health and health risk behavior justifies its inclusion in this study. Family structure is created by using an adolescent self-reported household roster, indicating the number of parents at home. The responses are recoded (i.e., 1 = adolescent living with two biological parents, 0 = otherwise, representing other family arrangement, i.e., single parent).

Parental employment: Parental employment is observed to be a predictor of adolescent health (Bacikova-Sleskova, Geckova, van Dijk, Groothoff, & Reijneveld, 2011; Sleskova et al., 2006). The respondents were asked if parents (mother and father) had engaged in work for pay outside the home in the last four weeks (responses were *yes = 1, no = 0*). Therefore, the variable was constructed based on whether either one of the parents works for pay.

Family poverty: Also considered in this investigation is family poverty. This measure is based on questions related to household receipt of public assistance, aid to families with dependent children (AFDC), unemployment or worker's compensation, public housing or housing subsidy, public assistance such as welfare, and food stamps. These three specific indicators of family poverty are combined as shown in Appendix A (cronbach's $\alpha = .72$). A similar approach in the determination of family poverty was used in a study conducted by Wickrama and Wickrama (2010), who used these set of questions in constructing family poverty by summing up each of the dichotomous responses. For purposes of both descriptive and multiple regression analyses, a dichotomous variable is created from this variable by coding receiving public assistance

= 1, and never receiving any public assistance = 0. *Religiosity*: Another independent variable is adolescent religion. The question is related to how important religion is to adolescents. Since relatively little is known about the role of religion and its impact on adolescent development (Smith, Faris, Denton, & Regnerus, 2003) it may be useful to explore the extent of relationship between religiosity, health, and health risk behaviors. Sinha, Cnaan, and Gelles (2007) found a strong association between religiosity and reduced risk behaviors such as smoking, alcohol use, sexual activity, marijuana use, and truancy among adolescents.

Social Capital: The main independent variable included in this investigation is social capital. The measures of social capital are divided into neighborhood social capital and family social capital and constitute the social determinants of health and health risk behavior.

Neighborhood social capital: Neighborhood social capital is the social capital or resources and relationships perceived to be accessible in the neighborhood by individuals. The study is based on the assumption that neighborhood social capital provides a pathway to better health and health risk behaviors. Obviously the opposite is likely to be the case. That is, its availability can lead to poor health and a possible increase in adolescents' engagement in risk behaviors. For this study, neighborhood social capital is made up of a series of questions related to the neighborhood and the perception of adolescents about their neighborhood context such as perception of neighborhood safety, familiarity and association with neighbors, and neighborhood cohesiveness. Specifically, some of the questions related to neighborhood social capital are: (1) "You know most of

the people in your neighborhood." The responses were true or false (i.e., *true = 1, false = 0*). (2) "In the past month, you have stopped on the street to talk to someone who lives in your neighborhood." Respondents responded either true or false (i.e. *true = 1, false = 0*). Other questions were: (3) "People in this neighborhood look out for each other". Again, respondents chose either true or false (i.e., *true = 1, false = 0*). Respondents were also asked: (4) "Do you usually feel safe in your neighborhood?" Again, the response was either *yes* (1) or *no* (0). All these responses are recoded as *yes* = 1, *no* = 0.

An extensive review of the literature on how social capital is constructed (i.e., scale or index) suggests that while some researchers aggregate or a combine individual level responses to develop the concept of social capital (family or neighborhood), others use individual level questions (Carpiano & Hystad, 2011; Hanibuchi et al., 2012; Islam, Merlo, Kawachi, Lindström, & Gerdtham, 2006). These approaches certainly promote ongoing debates as to whether social capital is an individual attribute or collective characteristic (Macinko & Starfield, 2001; Kawachi, Kim, Courtts, & Subramanian, 2004) and in some cases, is a count variable by summing the number of questions that measure the various dimension of neighborhood social capital. For purposes of this study, the questions constituting neighborhood social capital are used individually to reflect the different dimensions of social capital used in other studies cited earlier. This is mostly due to the fact that an internal consistency test with six questions related to neighborhood social capital only gave a Cronbach's $\alpha = .59$, which is lower than $\alpha = .60$. This is considered as a poor reliability and cannot be used for the regression analysis accordingly, since it is lower than $\alpha = .70$ (Nunnally & Bernstein, 1994). As a result of

the low Cronbach's alpha the summation index was not used. Therefore, each of the questions related to neighborhood social capital was used as a separate variable in the multivariate analysis as in similar previous analysis.

Family social capital: In this study, family social capital is broadly categorized into parental or family connectedness and involvement in activities with the adolescent. Family social capital includes parental social support and relationship with the adolescent.

Family connectedness: In consonance with other previous studies (Henrich, Brookmeyer, & Shahar, 2005; Sieving et al., 2001) a subscale of family connectedness is measured with a 12-item question related to both the mother and the father of the respondent. Some of the questions related to family social capital and more specifically parental connectedness include the following: (1) Most of the time, your mother is warm and loving toward you; (2) You mother encourages you to be independent; (3) When you do something wrong that is important, your mother talks about it with you and helps you understand why it is wrong; (4) You are satisfied with the way you and your mother communicate with each other; (5) Overall, you are satisfied with your relationship with your mother; (6) Most of the time, your father is warm and loving toward you; (7) You are satisfied with the way your father and you communicate with each other; (8) Overall, you are satisfied with your relationship with your father. Responses: strongly agree = 1, agree = 2, neither agree nor disagree = 3, disagree = 4, strongly disagree = 5, refused, skip, don't know, missing = all coded as missing. The responses to these questions were

reverse coded from strongly agree = 5 as highest to strongly disagree = 1 (see Table 2 for details).

Additionally, questions were related to things that adolescents have done with their biological mother in the past four weeks? (9) How close do you feel to your (Mother/Adoptive mother/Stepmother/Foster mother/etc.)? (10) How much do you think she cares about you? (11) How close do you feel to your (Father/Adoptive father/Stepmother/Foster father/etc.)? (12) How much do you think he cares about you? Responses for these questions were: not at all = 1, very little = 2, somewhat = 3, quite a bit = 4, very much = 5, refused, legitimate skip, don't know, and not applicable were coded as missing. Each of these questions was in the form of a 5-point Likert scale. The Cronbach's alpha for this study was similar to those found in other studies that have used the same variables or set of questions for a subscale of family social capital which is family connectedness. The test showed a reliability with a Cronbach's $\alpha = .88$ (see Appendix B). Cronbach's alpha is used in the determination of the internal consistency reliability of the scale or the correlation of the items in the scale (Cronbach, 1951; Streiner, 2003). Therefore, this suggests that the summary of the measures had acceptable internal consistency, or that the items in the summative measure are related to each other. According to Nunnally and Bernstein (1994) alpha below .70 is an indication of poor reliability and predictive validity. As a result, a composite scale was developed through the summation of a 10-item question related to the mother and 10-item question related to father activities with the respondent.

Parental involvement: A parental involvement (parents spending time with adolescent on social activities) subscale for family social capital was also constructed using a 20-item parent-adolescent activity question. It measures the extent of parental involvement in the lives of the adolescent before the interview was administered. This approach is similar to prior studies (Prado et al., 2009; Sieving et al., 2001). The questions revolve around activities that adolescent engaged in with their parents (i.e., mother and father) such as going shopping, playing sports, attending religious or church services, conversation about dating or partying, going out for events (movie, museum, sports), talking about personal problems, arguments about behavior, talking about school grades, doing school project, and talking about other school related activities. Evidence suggests that parental participation in adolescent life and monitoring (Coleman, 1988), have the potential to affect adolescent behavior and development.

There were ten questions each regarding the mother and father. The summation (i.e. continuous variable) of the responses in the form of a single scale was used for purposes of regression analyses indicating no or low to high level participation in activities with adolescent on all the items in the set of questions. Examples of these questions are (1) "Do you talk to parents about school work or grades?" (2) "Do you talk to parents about serious problems you are having?" (3) "Do you talk to parents about other things you are doing in school?" (4) "Do you do any of the following activities with your parents: movies, museum, shopping, playing sports, and religious or church-related events?" Each question had dichotomized responses (i.e., *yes = 1 and no = 0*) to

indicate that either parent participated in a set of activities, discussions about life, and communication about behavior and school problems with the adolescent.

These are parental activities and involvement with the adolescent that have the potential to serve as protective factors for adolescent well-being. The combination of these multiple items or questions into a scale helps to capture the various dimensions or totality of the broader concept of parent-adolescent activities or involvement in the life of the adolescent in a way that a single question may not necessarily be able to denote. As a result, an internal consistency reliability was conducted on 20-item question with Cronbach's $\alpha = .71$ (see Appendix C). These two measures of family social capital such as family involvement and family connectedness with the adolescent are used in the study to capture family social capital. Again, mean scores were used for the regression analysis. Higher means indicate higher family involvement and connectedness, whereas lower scores indicate lower family involvement and connectedness or higher or lower family social capital generally as it relates to adolescent life and development.

Reference Groups: This study uses several adolescent socio-demographic characteristics as reference groups for purposes of comparisons due to the categorical nature of the variables as used in logistical analyses. These include age, race/ethnicity-Whites, non-immigrants and female. Age was measured in years and though a continuous variable that ranges from 12–21 years is categorized with 12–14 representing early adolescence, 15–17 middle adolescence, and 18–21 emerging adulthood. This age distribution is used for both descriptive and multivariate analyses.

Race and ethnicity: The demographic characteristics included race or ethnicity. This is measured categorically (dummy variables) and comparisons are made among White (reference group in regression analysis), African American, Asian, American Indian, and Hispanic.

Immigrant status: Immigrant status is measured by the adolescent's citizenship status and that of the parents' country of birth, consistent with other studies (Crosnoe, Riegle-Crumb, & Muller, 2007; Gordon-Larsen, McMurray, & Popkin, 2000; Harris, Perreira, & Lee, 2009) that use Add Health data. Currently, the Wave I of the Add Health provides information on whether a respondent was born in the U.S., or not as well as whether respondent's mother or father was born in the U.S. or another country. This allows for the categorization of respondents into groups such as either immigrants or non-immigrants.

For descriptive purposes, the immigrant group is further divided into first generation and second generation immigrants. The *first generation* consists of immigrants or individuals who were not born in the U.S. or not born in a foreign country with a U.S. citizenship, and the *second generation* are adolescents who were born in the U.S. or in a foreign country with a U.S. citizenship with at least one parent who is foreign-born. This is considered as the standard categorization of children of immigrants (see Harris, 1999; Hernandez, & Charney, 1998). It is based on the question: "Were you born in the United States?" Other questions that helped in determining the generation of the immigrant are related to whether any of the parents was born outside of the U.S., but are currently a U.S. citizen. Each of the generations is coded as dummy variables (*yes* =

1, no = 0). *Gender*: Gender was assessed with a binary variable which indicates whether respondent is male (1) or female (2) (recoded as dummy variable: *Male = 1, Female = 0* to allow for comparison between the two on the outcome variables).

The independent variables are provided in the Table 2 below:

Table 2: Independent Variables using Add Health - Wave I

Concept	**Measurement**	**Level of Measurement**
Neighborhood Social Capital	• You know most of the people in your neighborhood. • In the past month, you have stopped on the street to talk to someone who lives in your neighborhood. • People in this neighborhood look out for each other. • Do you usually feel safe in your neighborhood?	Categorical
Family Social Capital: Family involvement in activities	• How close do you feel to your parent? • How much do you think parent cares about you? • Do you talk to your parents about school work or grades? • Do you talk to your parents about serious problems you are having? • Do you talk to your parents about other things you are doing in school? • Do you do any of the following activities with your parents: movies, museum, shopping, playing sports, religious or church-related event?	Categorical Continuous (summation of activities engaged in with parents) Cronbach's alpha=.86
Family Social Capital: Family connectedness	• Most of the time, your mother is warm and loving toward you. • You mother encourages you to be independent. • When you do something wrong that is important, your mother talks about it with you and helps you understand why it is wrong. • You are satisfied with the way you and your mother communicate with each other. • Overall, you are satisfied with your relationship with your mother. • Most of the time, your father is warm and loving toward you. • You are satisfied with the way your father and you communicate with each other. • Overall, you are satisfied with your relationship with your father. • How close do you feel to your mom? • How much do you think she cares about you? • How close do you feel to your dad? • How much do you think he cares about you?	Continuous (summation of public assistance received Cronbach's alpha=.71
Age	• What is your birth date? (in years)	Continuous

Nativity Race and Ethnicity	Were you born in the United States? • Immigrants • Non-immigrants • Black, White, Asian, Latino, Indian, Pacific Islanders	 Categorical Categorical Categorical
Immigrant Generation	Are you born in the U.S.: • 1st Generation (not born in U.S.) • 2nd Generation (born in US but one parent not from U.S.)	Categorical
Gender	• Male (1), female (0)	Categorical
Employment	• Employed (1), unemployed=0	Categorical
Language spoken at home	What language is usually spoken in your home? • English (1) • Spanish and Other (0)	Categorical
Family Poverty	Receipt of: • Public assistance-welfare (yes=1, no=0) • Food stamps (yes=1, no=0) • unemployment (yes=1, no=0) • Aid to Families with Dependent Children (yes=1, no=0) • Housing subsidies (yes=1, no=0)	Continuous (summation of public assistance received Cronbach's alpha=.72
Family Structure	• One parent in the household (0) • Two parent in the household (1)	Categorical
Religion	• Very important (5) to not important (1)	Ordinal recoded into dichotomous

Data Analysis Procedures: The first part of the data analysis presented here involved descriptive and bivariate association between adolescent characteristics and the dependent variables. The descriptive analysis was conducted to understand the general outlook of the independent and dependent variables including their frequencies, percentages, means/median, and standard deviations (i.e., measures of central tendency and dispersion) where applicable. It is important to note that not all variables lend themselves to each of the specifics mentioned under descriptive statistics. The descriptive analysis facilitated our understanding of individual variables as well as the relationships among these variables in the study. Overall, the descriptive statistics presented a summary of a large dataset and helped in exploring the differences in health,

health risk behavior and other variables used in the study. Also, correlations were run to ensure avoidance of multicollinearity among predictor variables in various models. In addition, bivariate analyses such as two-sided *t*-tests (for continuous variables) and *chi*-square tests (for nominal variables) were performed to compare the pattern of differences stratified based on two groups: immigrants and non-immigrants regarding the variables examined in this research investigation. The entire adolescent sample was further divided into Hispanic and non-Hispanic and a *chi*-square test was conducted with the statistical significance set at $p = .05$. For a better understanding of the overall outlook of the data basic measures of central tendency or descriptive statistics were used.

The appropriateness of the utilization of the select statistical techniques such as correlation, *t*-test, and *chi*-square was based upon its ability to demonstrate differences between and among groups and the functional relationships or associations between the dependent and multiple independent variables of non-experimental data (Berry & Feldman, 1985). Correlations facilitate our understanding of the relationship between two variables. *Chi*-square is used when the variables involved in the analysis are nominal to determine whether one variable can predict the other or whether the two variables are dependent or independent on each other. For example the *chi*-square is used to determine differences between two groups (i.e., immigrants and non-immigrants). It helped in understanding whether the differences between the two groups are statistically significant especially between variables at the nominal or ordinal. Alternatively, in circumstances where the levels of measurement of the variables are continuous a *t*-test is used to determine associations between them. Descriptive analyses (i.e., univariate and bivariate

analyses) were generally helpful in having a broad picture of what the data look like. In this dissertation, it was possible to find the degree of difference between groups such as immigrants and non-immigrants, gender, Hispanic and non-Hispanic, etc., on a host of the variables.

Finally, multiple regression analyses such as logistic and ordinary least squares (OLS) regressions were conducted to identify factors uniquely associated with health and health risk behavior of adolescent immigrants and non-immigrants. More specifically, the study uses hierarchical regression. This allows for groups of independent variables to be entered in steps or stages. This approach helps in the determination of how well groups (as blocks) of specific independent variables predict the outcome variable (such as health and health risk behaviors), controlling for all other variables. The predictive value of each step in the regression equation becomes clear. Consequently, basic demographic and family socio-economic characteristics are introduced first, followed by the substantive variables such as family and neighborhood social capital. Using hierarchical regression also enables us to find out any changes in significance in each model and in the R^2, and direction and strength of the relationship in each model or step of the multiple regression analyses.

Additionally, multiple regression techniques such as logistic and linear regression (i.e., ordinary least squares) were conducted to establish the relationship between dependent and independent variables. Each of the analyses performed is presented in a separate table in the results section of this paper. Ordinary least squares (OLS) regression was performed to determine the relationship between social capital (i.e.,

family and neighborhood social capital) and multiple of other independent variables and health risk behavior. The ordinary least squares regression was appropriate because the dependent variable (i.e. health risk behavior) was a continuous variable. For example, the constructed health risk behavior index is a combination of all the risk behaviors and therefore, was considered as an interval measure with responses on a scale of 0 to 4 (from adolescents who reported not engaging in any health risk behavior to adolescents who reported engaging in one or multiple health risk behaviors). In addition, each of the health risk behaviors (i.e., ever had sex, smoke regularly, and ever smoked, alcohol consumption, and drug injection) was used as dependent variables independently in several separate multivariate analysis to determine the variables that influence specific health risk behavior identified in the study. This was especially important since different factors may influence different health risk behaviors. That is to say, different factors may influence adolescents engaging in multiple health risk behaviors (composite health risk behavior) compared to factors that affect each individual health risk behavior.

To better capture differences in the specific factors that influence immigrant and non-immigrants independently, additional regression analyses were conducted looking at these two groups separately on each of the dependent variables such as health, smoking behavior, sexual debut, alcohol consumption, and drug injection as well as an index for the combined health risk behaviors. This approach was used to determine whether there were differences in the predictors of health and health risk behaviors of immigrant compared to non-immigrant adolescents. Not many studies have employed this comparative approach in the determination of the predictors of health and health risk

behaviors of immigrants and non-immigrants. Furthermore, some of the regression analyses only considered the extent of influence of the various social capital dimensions (family and neighborhood social capital) alone on the outcome variables without including other independent variables in such analyses.

Logistic regression analysis on the other hand, was also used for outcome variables that were categorized as dichotomous or binary variable such as health outcome (coded as dummy, good/excellent = 1, fair/poor = 0), smoking behavior (coded yes = 1, no = 0), alcohol consumption (coded yes = 1, no = 0), sexual debut (coded yes = 1, no = 0), and drug use (coded yes = 1, no = 0). It supported analysis of the relationship between multiple independent variables such as demographic and familial variables and a single dependent variable, health outcome and was used in the multivariate analysis. Logistic regression is more effective in determining the probability or likelihood that an event will occur, given a set of conditions. It is used particularly when the outcome variable is dichotomous, coded 1 or 0, as mentioned earlier, and results are presented in terms of odd ratios (Jaccard, 2001). Similar to ordinary regression, logistic regression allows for the construction of multivariate models and the consideration of control variables to determine the predictors of a particular outcome variable. Also, to test for the unique contribution of each family of variables, regression analyses were conducted using a hierarchical approach to systematically test the contribution of each set of variables categorized under demographic, individual and family socio-economic characteristics, and family and neighborhood social capital.

Multiple regressions such as ordered logistic and ordinary least squares regression analyses helped to demonstrate the functional relationship between multiple independent variables (i.e., neighborhood social capital, demographics, family structure and other characteristics) simultaneously and the dependent variable (i.e., health outcomes and health risk behaviors). The former is used when the dependent variable is ordinal or the latter is an analytic tool for when the equation to be estimated has a dependent variable that is dichotomous. Generally, using multiple regression techniques enabled us to observe whether changes in the health outcome and health risk behavior of immigrants and non-immigrants were attributable to several factors (i.e., independent variables) concurrently. It also allowed for the explicit control of variables that have noticeable differences and have the possibility of impacting the regression models especially in non-experimental designs. Irrespective of the outcome of this study more research is needed in this area to clarify the relationship between social capital, risk behaviors, and health. Such an analysis helps to clarify health risk behaviors' role in influencing the health outcome of younger people.

From the above, regarding the procedure or statistical techniques used in this study, it is clear that the statistical analyses tools or methods that broadly included univariate, bivariate, and multivariate analyses and the choice of any of the analytic techniques were determined mostly by the levels of measurement of the data.

Chapter 4

RESULTS

Descriptive Analysis

This study examines the factors that contribute to health outcomes and health risk behavior. In particular the study explores the role of family and neighborhood social capital in influencing health outcomes and health risk behavior. More importantly, it investigates differences that exist between immigrant and non-immigrant adolescents' health and health risk behaviors and the specific predictors of these dependent variables. The first step in the analysis involves a presentation of the descriptive analysis of the characteristics of the respondents in the investigation. This includes the variables used in the study, their description and coding, frequencies, and percentages. These are mostly categorical variables. This is followed by bivariate analysis that explores whether significant differences exist between immigrants and non-immigrants, male and females, Hispanic and non-Hispanic in a *chi*-square (χ^2) analysis on multiple characteristics. *T*-tests were also performed on continuous variables such family and neighborhood social capital and family poverty by immigrant group, gender, and Hispanic status. By providing the beginning analysis, it provides a foundation for understanding details related to the prevalence of respondents' characteristics (i.e., health outcomes, health risk behaviors, social capital, and other socio-economic and demographic characteristics) and then facilitates determining whether any statistically significant differences between these nominal measures can be identified (i.e., immigrant status, gender, and Hispanic status).

In the second main analysis, multivariate logistic regression techniques were employed to determine the significant predictors of the likelihood of good to excellent or fair to poor health used as a dichotomous categorical variable. Similarly, logistic regression was performed to examine the factors that influence the involvement in each of the health risk behaviors such as ever had sex, use of alcohol, smoking, and injection of drugs, after controlling for confounding variables. The variables that were important in answering the research questions including those that have been proven to be relevant in predicting health and health risk behaviors in previous studies or are theoretically important to the study were retained in the regression equations regardless of their performance in the bivariate analysis. The multivariate regression (i.e., logistic and linear regressions) equation specification was done hierarchically based on respondent characteristics such as demographic, personal, and parental socio-economic characteristics, family and neighborhood social capital dimensions, and the interaction term is included in the final models. This approach requires an orderly entry of variables in groups or blocks to control for the effects of other independent variables.

In testing the first hypothesis, separate logistic regression analyses were performed on the outcome variables (i.e., health, sexual activity, smoking behavior, alcohol consumption, and injection or use of illegal drugs). Sets of variables are used in each model to determine the extent of the predictor variables, with the initial stage consisting of the full model and eliminating variables with lower or least significant coefficients in the prior model or equation during each step of the regression until

reaching the final model. A similar approach is used for each of the health risk behaviors.

Sample Characteristics

Table 3 below presents descriptive information on variables such as demographics, health outcomes, health risk behaviors, neighborhood and family social capital, and other familial (parental) characteristics for the 1994/1995 Add Health's nationally representative sample of 20,742 adolescents involved in the study. Overall, the sample is made up of 2,204 (11.1%) and 17,613 (88.9%) adolescent immigrants and non-immigrants, respectively, suggesting predominantly native-born adolescent respondents. A large proportion of the immigrant group is first-generation immigrants of about 1,794 adolescents (9.1%) and 410 (2.1%) classified as second-generation immigrants. The data also indicate that there are more White (50.4%) adolescents than any of the other racial groups such as African American (22.5%), Hispanic (17%), Asian (7.1%), American Indian (1.8%), and other racial group (1.1%) among the overall sample in the study. The data indicate an age distribution as follows: early adolescents (12–14 years) constitute 20%, middle adolescents (15–17 years) 54.3%, and with 25.7% late adolescents, (18–21 years). The minimum age of the participants was 12 years and the maximum age of 21 years with a mean age of 16.15 years (median age of 16 years). Approximately 49.5% of the respondents are males and 50.5% females. Among the adolescents, about 70% have family with two parents at home and 89% speak predominantly English at home compared to about 11% who speak languages other than

English at home. Almost half of the respondents (48.7%) consider religion as very important and 41% consider religion to be fairly important to them compared to 11% of adolescents who did not consider religion as important to them.

Table 3: Characteristics of the Sample (*n*=20,745).

Variable	Description and Coding	Frequency	Percent
Health Status			
Good to Excellent	1=reported good to excellent	19238	92.9
Fair to Poor	1=reported fair to poor	1481	7.1
Health Risk Behavior			
Smoking	1=smoked cigarette ever or regularly	11664	56.2
Drugs injection	1=ever injected drugs	114	0.5
Alcohol consumption	1=drink alcohol >2-4 times	11609	56.0
Sexual behavior	1=ever had sex	8274	39.1
Age (11–21)	Age at interview in years (mean, max, min)	20729	16.15/12/21
11–14	1=early adolescent from 12-14 years	4162	20.0
15–17	1=middle adolescent from 15-17 years	11247	54.3
18–21	1=late adolescent from 18-21 years	5320	25.7
Gender			
Male	1=male	10263	49.5
Female	1=female	10480	50.5
Race and Ethnicity			
Asian	1=Asian	1467	7.1
African American	1=African American	4669	22.5
American Indian	1=American Indian	382	1.8
Hispanic	1=Hispanic	3525	17.0
White	1=White	10455	50.4
Other Race	1=Other race	226	1.1
Non-immigrant/US Citizen	1=born in the U.S.	17613	88.9
Immigrant	1=immigrant	2204	11.1
1st Generation immigrant	1=respondent not born in the U.S.	1794	9.1
2nd Generation immigrant	1=2nd generation (one parent not born in US)	410	2.1
Religion	importance of religion to adolescent		
Very important	4=Very important	8667	48.7
Fairly important	3=Fairly important	7231	40.6
Fairly unimportant	2=Fairly unimportant	1273	7.2
Not important at all	1=Not important at all	628	3.5
Language Spoken at Home			
Speak English at home	1= speak English at home	18364	88.6
Non-English at home	1= speak non-English language at home	2371	11.4
Family Structure			
Married/Two parents at home	1= both parents at home	12310	69.9
Single parent at home	1= single parent	5307	30.1
Parent employment	1= either mom or dad work	18355	88.5
Parental employment (mom)	1= mom works for pay	10741	82.6
Parental employment (dad)	1= dad works for pay	10193	94.9
Family poverty	1= Receipt of welfare assistance	3306	19.3

The vast majority (92%) of adolescents in the sample reported good to excellent health (good 25.6%, very good 39.1%, and excellent 28.2%), whereas 7.1% reported fair to poor health. With regard to health risk behaviors, 56.2% reported ever smoked, 19.7% smoked regularly, 56% drunk alcohol 2–3 times a week, 5.9% used inhalant in the past 30 days, 0.5% ever injected drugs, and 39.9% ever had sex. Overall, 25.1% reported never engaging in any of the risk behaviors mentioned and majority (74.9%) engaged in between 1–5 risk behaviors highlighted in this study. Most of the parents (89%) of the adolescents in the study had paid employment and 19% of families received at least one public assistance.

The descriptive information on family and neighborhood social capital is shown in Table 4 above. With regard to the components of social capital, under neighborhood social capital, most of the adolescents in the study know most of the people in their neighborhood (70.2%), about 78% of the adolescents had stopped and talked to neighbors within 30 days preceding the interview. Also, 71.4% said people look out for each other in their neighborhood, whereas about 88.2% consider their neighborhood to be safe.

Family social capital was considered to consist of parental involvement and connectedness and each component is considered individually for purposes of descriptive analysis. An aspect of family social capital includes the involvement of both parents in social, behavioral, and educational activities with the adolescent. Separate information was collected on mothers and fathers regarding the extent of participation in the development of the adolescent's life.

Table 4: Characteristics of the Sample: Neighborhood and Family Social Capital.

Variable	**Description and Coding**	**Frequency**	**Percent**
Neighborhood social capital			
Know most people	1=know most people in the neighborhood	14482	70.2
Stop and talk to neighbors	1=in the past month stop & talk to a neighbor	16147	78.3
People look out for others	1=neighbors look out for each other	14485	71.4
Safe neighborhood	1=feel safe in the neighborhood	18182	88.2
Parental Involvement (Mother)	Mom involvement with respondent		
Shopping	1=gone shopping	14084	72.4
Played sports	1=played a sport	1649	8.5
Movies	1=gone to a movie/play/museum etc.	4935	25.4
Work on school project	1=worked on a project for school	2571	13.2
Religious service	1=gone to a religious service or church event	7325	37.6
Talk about dating	1=talk about dating, or a party you went to	9141	47.0
Talk about school grade	1=talked about your school work or grades	12302	63.2
Talk personal problems	1=talk about a personal problem	7570	38.9
Serious argument	1=had a serious argument about behavior	6503	33.4
School activities	1=talked about things you're doing in school	10459	53.7
Parental Involvement (Father)	Dad involvement with respondent		
Shopping	1=gone shopping	3893	27.0
Played sports	1=played a sport	4090	28.3
Movies	1=gone to a movie/play/museum etc.	3428	23.8
Work on school project	1=worked on a project for school	1571	10.9
Religious service	1=gone to a religious service or church event	4278	29.6
Talk about dating	1=talk about dating, or a party you went to	4055	28.1
Talk about school grade	1=talked about your school work or grades	7579	52.5
Talk personal problems	1=talk about a personal problem	2952	20.5
Serious argument	1=had a serious argument about behavior	3763	26.1
School activities	1=talked about things you're doing in school	6465	44.8

Family connectedness and Involvement

	Std. Deviation	Mean	Minimum	Maximum
Parental connectedness	4.107	33.23	14	60
Parental involvement	3.494	6.78	0	20

The activities included gone shopping; played a sport; gone to a movie; play or museum; worked on a project for school; gone to a religious service or church event; talked about dating; or a party they attended with the parents. Compared to dads (27%), more moms went shopping with the adolescent (72.4%). Also, more father (dads) (28.3%) played sports with respondents, with mothers doing less sports (8.5%) and 23.8% and 25.4% of adolescents had gone to a movie, play, or museum with dad and mom, respectively. Slightly fewer adolescents (10.9%) worked on a project for school with their fathers and

13.2% did so with their mothers. More adolescents (37.6%) had gone to a religious service or church event with mom compared to 29.6% adolescents who attended with their dads. Similarly, more adolescents (47%) had a conversation with their moms about dating, or party attendance than dads (28.1%), and 63.2% respondents talked about school work or grades with 52.5% talking to the dads. Likewise, more moms (38.9%) had conversation with adolescents about personal problems, had a serious argument about behavior (33.4%), and talked about things happening in school (53.7%) compared to fewer adolescents 20.5%, 26.1%, 44.8%, respectively, that had these kinds of conversations with dads.

Further descriptive analysis of social capital that is located in the family is provided in the Table 4 above. Since the questions related to family connectedness and involvement are on a Likert scale of 1–5, means, standard deviation, and minimum and maximum are provided in the table above. Family connectedness has a higher mean (33.23) compared to family involvement (6.78). Also, the standard deviations, minimums and maximums are 4.107, 14, 60 and 3.494, 0, 20 for family connectedness and involvement, respectively.

Differences: Immigrant Status, Hispanic Status, Age, and Gender

Several *chi*-square tests were conducted to test and compare whether respondent characteristics (health, health risk behaviors, demographics, family socioeconomics, and social capital) differ by gender (male and female), immigrant status (immigrant and non-immigrant), and Hispanic status (Hispanic and non-Hispanic). Basically, the null

hypothesis for the *chi*-square test is that respondents in any of the groups mentioned are not statistically different on the demographic category to which the respondent belongs.

Table 5: Immigrant Status Differences across Key Variables (*n*=20,745)

Variables	**Immigrant**		**Non-immigrant**		
Health	Number	Percent	Number	Percent	***P***
Fair or Worse	169	7.7	1244	7.1	
Good or Better	2030	92.3	16349	92.9	
Health Risk Behavior					
Smoking	1205	6.1	9967	50.3	
Drug injection	9	0.0	99	0.5	
Alcohol consumption	1240	6.3	9848	49.7	
Sexual activity	841	4.2	7086	35.8	
Age					**
12–14	492	22.3	3485	19.8	
15–17	1190	54.0	9523	54.1	
18–21	521	23.6	4591	26.1	
Gender					
Male	1075	48.8	8742	49.6	
Female	1129	51.2	8869	50.4	
Religion					
Very important	924	49.2	7340	48.6	
Fairly important	774	41.2	6129	40.6	
Fairly unimportant	123	6.5	1103	7.3	
Not important at all	57	3.0	542	3.2	
Language Spoken at Home					
Spoke English at home	1942	88.2	15595	88.6	
Family Structure					
Both parent	1337	69	10426	70	
Single parent	601	31	4462	30	
Parental Employment					
Parent work	1939	88.0	15582	88.5	
Family poverty	351	2.1	2821	17.2	
Neighborhood Social Capital					
Neighborhood is safe	1896	86.8	15470	88.4	*
Know most neighbors	1533	70.1	12306	70.3	
Talk to neighbors	1755	80.3	13686	78.1	*
Neighbors look out for each other	1533	71.3	12307	71.4	

Chi-square based on immigrant and non-immigrant category. *p<0.05, **p<0.01, ***p<0.001

The cross-tabulations give the descriptive statistics comparing a given group across all the variables in the study as demonstrated in Tables 5, 6, 7, 8 and 9. Table 5 illustrates a comparative overview for immigrants and non-immigrants by variables in the study. The results suggest that there were certainly slight differences in terms of the

percent between immigrants and non-immigrants on most of the variables in the study; however, these differences are statistically non-significant based on the findings from the results of the *chi*-square test.

In a nutshell, with the exception of age of respondent, ever smoked/smoke cigarette regularly, this showed moderate significance, whereas neighborhood social capital variables such as neighborhood safety and talk to neighbors (i.e., neighborliness) were marginally significant. However, notable here is the lack of statistically significant difference between immigrants and non-immigrants on the *chi*-square results on most of the variables in the study.

Table 6 below compares Hispanics to non-Hispanics. The patterns in the table illustrate remarkable differences between Hispanics and non-Hispanics on most of the variables used in the study based on *chi*-square test. As noted in Table 6, the results indicate that religion was found to be statistically significant related Hispanic status, χ^2 (3) = 36.40, $p < .001$. At the time of the interview, for example, 40.8% and 32.0% of non-Hispanic adolescents reported that religion was either very important or fairly important to them compared to 7.9% and 8.0% Hispanics, respectively. There is a significant difference between Hispanic status and the importance of religion to adolescents. With regard to language spoken at home about 9% of Hispanics and 79.7% of non-Hispanics spoke English at home and the relationship between the two variables was statistically significant, χ^2 (1) = 5479.03, $p < .001$.

Table 6: Chi-Square Results by Hispanic Status (n=20,745)

Variables	**Hispanic**		**Non-Hispanic**		
	Number	Percent	Number	Percent	*p*
Health					***
Fair or Worse	304	20.5	1176	79.5	
Good or Better	3216	16.7	16011	83.3	
Health Risk Behavior					
Smoking	1940	9.4	9718	46.9	
Drug injection/use	18	0.1	95	0.5	
Alcohol use	2087	10.1	9516	45.9	***
Sexual activity	1430	6.9	6839	33.0	
Age					***
12–14	537	2.6	3623	17.5	
15–17	1928	9.3	9315	45.0	
18–21	1058	5.1	42256	20.5	
Gender					
Male	1774	8.6	8482	40.9	
Female	1751	8.4	8717	42.1	
Language Spoken at Home					***
Spoke English at home	1847	8.9	16507	79.7	
Do not English at home	1676	8.1	692	3.3	
Religion					***
Very important	1411	7.9	7251	40.8	
Fairly important	1416	8.0	5812	32.7	
Fairly unimportant	195	1.1	1078	6.1	
Not important at all	124	0.7	503	2.8	
Family Structure					
Both parent	2131	12.1	10169	57.8	
Single parent	873	5.0	4427	25.2	
Parental Employment					***
Parent work	2988	14.4	15357	74.1	
Parent do not work	537	2.6	1842	8.9	
Family poverty	731	4.3	2571	15.0	***
Neighborhood Social Capital					
Neighborhood is safe	2840	13.8	15332	74.4	***
Neighborhood not safe	649	3.2	1774	8.6	
Neighbors look out for each other	2255	11.1	12226	60.3	***
Neighbors do not lookout	1196	5.9	4601	22.7	
Know most neighbors	2217	10.8	12258	59.5	***
Do not know most neighbors	1279	6.2	4861	23.6	
Talk to neighbors	2619	12.7	13518	65.6	***
Do not talk to neighbors	878	4.3	3599	17.5	

Chi-square based on Hispanic and non-Hispanic category. *p<0.05, **p<0.01, ***p<0.001

Family poverty and Hispanic status was significant, χ^2 (1) = 96.31, p < .001. The use of doctor and dentist office differed by Hispanic groups and were significantly related with χ^2 (1) = 59.32, p < .001 and χ^2 (1) = 105.83, p < .001, respectively. Similarly,

Hispanic status by self-reported health was found to be significant, χ^2 (1) = 14.17, p < .001. Among the various health risk behaviors, being Hispanic and alcohol use was the only relationship found to be significant, χ^2 (1) = 17.84, p < .001. However, the other risk behaviors, such as smoking, sexual activity, and injection or use of illegal drugs, are not statistically different between the two groups (i.e., Hispanics and non-Hispanics). In addition, significant differences exist between Hispanics and non-Hispanics on health service utilization variables. Thus, doctor and dental visits are statistically different for the two groups χ^2 (1) = 59.32, p < .001 and χ^2 (1) = 105.83, p < .001, respectively.

Again, Hispanic status and neighborhood social capital variables were also found to be statistically significant. For example, adolescents' perception of safe neighborhood and Hispanic status were significantly related χ^2 (1) = 189.12, p < .001, with 13.8% Hispanic and 74.4% non-Hispanic reporting of safe neighborhood, knowing most people in the neighborhood, χ^2 (1) = 93.10, p < .001 (10.8% for Hispanic and 59.5% non-Hispanic), talk to neighbors, χ^2 (1) = 28.45, p < .001 (12.7% for Hispanic and 65.6% for non-Hispanic). There were statistically significant differences between Hispanics and non-Hispanics with regard to the perception that neighbors look out for each other, χ^2 (1) = 75.78, p < .001 (10.8% for Hispanic and 59.5% non-Hispanic).

Similarly, differences and significant relationships were found between gender and other variables examined in this study. Details of gender-based differences from the *chi*-square results are shown in Table 7. Significant disparities are noticeable based on the various age groups in relation to most of the variables in the study. Adolescent health outcomes and gender were also significantly related, χ^2 (1) = 53.66, p < .001.

Table 7: Chi-Square Results for Key Variables by Gender Differences (*n*=20,745)

Variables	**Male**		**Female**		
	Number	Percent	Number	Percent	*P*
Health					
Fair/Worse	597	2.9	884	2.9	***
Good/Excellent	9655	46.6	9583	46.3	
Health Risk Behavior					
Smoking	5764	27.8	5900	28.4	
Drug injection	70	0.3	44	0.2	*
Alcohol consumption	5831	28.1	5778	27.9	*
Sexual activity	4286	20.7	3988	19.2	***
Age Group					***
12–14	1923	9.3	2239	10.8	
15–17	5567	26.7	5680	27.4	
18–21	2766	13.3	2554	12.3	
Race					**
White	5183	25.0	5272	25.4	
Black	2211	10.7	2458	11.9	
Asian	770	3.7	697	3.4	
Hispanic	1774	8.6	1751	8.4	
Native American	206	1.0	176	0.8	
Other Race	112	0.5	114	0.6	
Immigrant status					
Immigrant	1075	5.4	1129	5.7	
Native-Born	8742	44.1	8869	44.8	
Religion					***
Very important	3936	22.1	4731	26.6	
Fairly important	3666	20.6	3565	20.0	
Fairly unimportant	696	3.9	577	3.2	
Not important at all	360	2.0	268	1.5	
Language Spoken at Home					
Spoke English at home	9065	43.7	9299	44.8	
Do not English at home (other language)	1195	5.8	1176	5.7	
Family Structure					
Both parent	6110	34.7	6200	35.2	
Single parent	2622	14.9	2683	15.2	
Parental Employment					***
Parent work	9171	44.2	9184	44.3	
Parent do not work	1092	5.3	1296	6.2	
Family poverty	1571	9.2	1735	10.1	**
Neighborhood Social Capital					
Neighborhood is safe	9108	44.2	9074	44.0	***
Neighborhood not safe	1095	5.3	1330	6.5	
Know most neighbors	7346	35.6	7136	34.6	***
Do not know most neighbors	2866	13.9	3279	15.9	
Talk to neighbors	8302	40.3	7845	38.0	***
Do not talk to neighbors	1909	9.3	2570	12.5	
Neighbors look out	7297	36.0	7188	35.4	***
Neighbors not look out	2756	13.6	3043	15.0	

Chi-square based on male and female category *p<0.05, **p<0.01, ***p<0.001

More males 50.2% reported having good/excellent health compared to females of about 49.8%. When health risk is considered separately, sexual activity is significant by gender, χ^2 (1) = 29.74, $p < .001$, (38.1% females and 41.8% males responded in the affirmative). The responses on other variables were also significant, either ever smoked or smoke regularly, χ^2 (1) = 189.116, $p < .001$; alcohol consumption, χ^2 (1) = 5.95, $p < .05$ (55.1% among females vs. 56.8% among males); and drug injection or use, χ^2 (1) = 6.52, $p < .05$ (0.4% females vs. 0.7% males).

More adolescent females (99.6%) compared to 99.3% males in the study had never injected drugs and the relationship between gender and drug injection was moderately significant. Similar results can be found with gender, χ^2 (3) = 85.892, $p < .001$ with 26.6% females and 20.0% males, reporting that religion was very and fairly important to them. Also, more females visited the doctor and dentist (i.e., 49.3% and 49.4%) compared to males (48.5% and 48.0%), χ^2 (1) = 11.057, $p < .01$ and χ^2 (1) = 6.794, $p < .01$, respectively.

The age distribution by gender reflects that the category of middle adolescents (27.4%) had significantly higher females compared to the other age groups, χ^2 (2) = 31.308, $p < .001$. Family poverty was also significant, χ^2 (1) = 8.29, $p < .01$. Race by gender also has a significant difference. There were more female (25.4%) and male (25%) Whites than in any of the other racial groups, χ^2 (5) = 17.814, $p < .01$, followed by African Americans (11.9% female and 10.7% male). Gender and neighborhood social capital variables were found to be statistically significant. For example adolescents' perception of safe neighborhood is also significantly related χ^2 (1) = 20.88, $p < .001$, with

44.0% female and 44.2% male reporting of safe neighborhood; knowing most people in the neighborhood, χ^2 (1) = 28.81, $p < .001$ (35.6% male and 34.6% for female), talk to neighbors, χ^2 (1) = 108.48, $p < .001$ (38.0% for females and 40.3% for male reporting that they talk to their neighbors. Also, more males (72.6%) than females (70.3%) reported that neighbors look out for each other (neighborhood reciprocity or connectedness), χ^2 (1) = 13.46, $p < .001$.

Table 8 below also shows the age differences on the variables in the study. Notable differences in family and neighborhood social capital by age were observable at statistically significant levels as demonstrated in Table 7 above. There were moderate, statistically significant differences among the age distributions by health outcome. From the table, more middle age adolescents, 15–17 (50.3%), 18–21 (23.7%), with 12–14 (18.8%), reported good to excellent health, χ^2 (2) = 8.06, $p < .05$. With regard to health risk behaviors, ever had sex was significantly related to the different age distribution, χ^2 (2) = 2383.40, $p < .001$. Similarly, smoking, χ^2 (2) = 451.19, $p < .001$, alcohol consumption, χ^2 (2) = 1017.52, $p < .001$**,** and drug injection or use, χ^2 (2) = 7.559, $p < .05$, were found to be significant among the different age groups.

The relationship between the age distribution and race is found to be statistically significant, χ^2 (10) = 173.69, $p < .001$. Asians constitute about 7.1% of adolescents, their age distribution were as follows: 12–14(1%), 15–17(3.8%), and 2.3% within the age group of 18–21. Of the 22.5% African Americans, 4.9% were 12–14, 12.3% were 15–17, and 5.4% were 18–21.

Table 8: Age Differences across Key Variables (*n*=20,745)

Variables	12-14 years		15-17 years		18-21 years		
	Number	Percent	Number	Percent	Number	Percent	*P*
Health							*
Fair/Worse	258	1.2	815	3.9	408	2.0	
Good/Excellent	3902	18.8	10426	50.3	4904	23.7	
Health Risk Behavior							
Smoking	1740	8.4	6650	32.1	3274	15.8	***
Drug injection	13	0.1	62	0.3	39	0.2	*
Alcohol consumption	1468	7.1	6569	31.7	3569	17.2	***
Sexual activity/intercourse	519	2.5	4458	21.5	3295	15.9	***
Gender							***
Male	1923	9.3	5567	26.9	2766	13.3	***
Female	2239	10.8	5680	27.4	2554	12.3	
Race							***
White	2275	11.0	5642	27.2	2536	12.2	
Black	1013	4.9	2542	12.3	1111	5.4	
Asian	203	1.0	778	3.8	486	2.3	
Hispanic	537	2.6	1928	9.3	1058	5.1	
Native American	87	0.4	219	1.1	76	0.4	
Other Race	45	0.2	134	0.6	47	0.2	
Immigrant status							
Immigrant	492	2.5	1190	6.0	521	2.6	**
Native-Born	3485	17.6	9523	48.1	4591	23.2	
Religion							***
Very important	1971	11.1	4601	25.9	2089	11.7	
Fairly important	1372	7.7	3968	22.3	1891	10.6	
Fairly unimportant	201	1.1	730	4.1	342	1.9	
Not important at all	108	0.6	350	2.0	170	1.0	
Language Spoken at Home							***
Spoke English at home	3903	18.8	9977	48.1	4478	21.6	
Spoke non-English at home	258	1.2	1270	6.1	840	4.1	
Family Structure							
Both parent	2512	14.3	6633	37.7	3156	17.9	
Single parent	1059	6.0	2886	16.4	1357	7.7	
Parental Employment							***
Parent work	3769	18.2	10083	48.6	4499	21.7	
Parent do not work	393	1.9	1164	5.6	821	4.0	
Family poverty	714	4.2	1827	10.7	763	4.5	
Neighborhood Social Capital							
Neighborhood is safe	3680	17.9	9893	48.0	4603	22.3	*
Neighborhood not safe	464	2.3	1289	6.3	672	3.3	
Know most neighbors	3210	15.6	7903	38.3	3364	16.3	***
Do not know most neighbors	936	4.5	3294	16.0	1914	9.3	
Talk to neighbors	3346	16.2	8846	42.9	3951	19.2	***
Do not talk to neighbors	802	3.9	2351	11.4	1324	6.4	
Neighbors look out	3078	15.2	7854	38.7	3548	17.5	***
Neighbors not look out	994	4.9	3158	15.6	1646	8.1	

Chi-square based on age distribution of respondents. *$p<0.05$, **$p<0.01$, ***$p<0.001$

Out of the 17.0% Hispanic, 2.6 were 12–14, 9.3% were between 15–17 years, and 5.1% were between 18–21 years. Native Americans make up 1.8% of the adolescents in the study—0.4% were between 12 and 14, 1.1% were 15–17, and 0.4% were 18–21. Also, there were about 50% Whites divided into 11% between the ages of 12 and 14, 27.2% were 15–17, and 12.2% were 18–21, and other racial group (1.1%) had the lowest percent of adolescents in each of the age groups. There was significant difference between age and parental education χ^2 (6) = 76.57, $p < .001$ with 17.5%, 19.3%, 5.5% and 14.1% of 15–17 years adolescents having parents with less than high school education, some college, high school, and college degree respectively. Again, more parents (48.6%) with 15–17 year olds tend to be working χ^2 (2) = 112.99, $p < .001$. Similarly, significant age differences exist by neighborhood social capital variables such as, know most people in the neighborhood, χ^2 (2) = 209.64, $p < .001$, talk to neighbors, χ^2 (2) = 52.78, $p < .001$, neighbors look out for each other, χ^2 (2) = 59.33, $p < .001$, safe neighborhood, χ^2 (2) = 6.72, $p < .05$. Language spoken at home and age is also significant, χ^2 (2) = 212.80, $p < .001$.

T-test analyses were performed to determine the differences between the continuous variables such as family connectedness, family involvement by immigrant status, Hispanic status, gender, and age. Based on the results of the independent *t*-test in the table below, no statistically significant differences were found in the mean scores for immigrant adolescents (M = 4.2914, SD = .60156) and non-immigrant adolescents (M = 4.2761, SD = .62403) on family connectedness $t(19388) = -1.105$, $p > .269$), immigrant

(*M* = .3572, *SD* = .18759), and non-immigrant (*M* = .3604, *SD* = .19151) on family involvement *t*(19371) = .749, *p* = .447) as illustrated in Table 7 below.

Table 9: Group Difference by Immigrant Status (*t*-tests)

Variable	*Immigrant*	*N*	*M*	*SD*	*SE*	*df*	*t*	*P*
Family Social	Non-Immigrant	2149	4.2761	.62403	.01346	19388	-1.105	.269
Connectedness	Immigrant	17241	4.2914	.60156	.00458			
Family Involvement	Non-Immigrant	2145	.3604	.19151	.00413	19371	.761	.447
	Immigrant	17228	.3572	.18759	.00143			
Group Difference by Hispanic Status								
Variables	*Hispanic*	*N*	*M*	*SD*	*SE*	*df*	*t*	*P*
Family Social	Non-Hispanic	16855	4.3019	.59889	.00461	20286	6.262	.000
Connectedness	Hispanic	3433	4.2311	.62449	.01066			
Family Involvement	Non-Hispanic	16842	.3614	.18781	.00145	20267	6.735	.000
	Hispanic	3427	.3377	.18860	.00322			
Group Difference by Gender								
Variable	*Gender*	*N*	*M*	*SD*	*SE*	*df*	*T*	*P*
Family Social	Female	10216	4.2397	.65047	.00644	20286	-11.947	.000
Connectedness	Male	10084	4.3406	.54802	.00546			
Family Involvement	Female	10209	.3746	.18545	.00184	20267	13.217	.000
	Male	10072	.3399	.18928	.00189			

*p<.05, **p<.01, ***p<.001.

The data also suggest that significant difference exists between the different means for Hispanic and non-Hispanic groups. Hispanics had statistically significantly lower mean scores for family social connectedness and family involvement compared to non-Hispanic adolescents.

In looking at Hispanic status, family connectedness and family involvement had statistically significantly different mean scores for Hispanics compared to non-Hispanics. Hispanics had statistically significantly lower mean scores for family social connectedness (*M* = 4.2311, *SD* = .62449) compared to non-Hispanics (*M* = 4.3019, *SD* = .59889), *t* (20286) = 6.262, *p* < .001). For family involvement, Hispanics (*M* = .3377, *SD* = .18860) had statistically significantly lower mean scores compared to non-Hispanics (*M* = .3614, *SD* = .18781), *t* (20267) = 6.735, *p* < .001).

Gender was also found to differ by family social capital and poverty. Again, family connectedness and family involvement had statistically significantly different means for males compared to females. Among the respondents, males (M = .3399, SD = .18928) compared to females (M = .3746, SD = .18545) had lower mean score on family involvement t (17641) = 3.431, $p < .01$) but higher means score (M = 4.3406, SD = .54802) for family connectedness compared to females (M = 4.2397, SD = .65047), t (20286) = -11.947, $p < .001$).

In a nutshell, there were no statistically significant relationships between immigrant status and most of the other variables in the bivariate analysis with the exception of age, health risk behavior such as regularly smoking, and two of the neighborhood social capital components such as neighborhood safety and talking to neighbors.

Multivariate Analyses: Health and Health Risk Behavior

In this section of the analysis, multivariate logistic regression models are employed to find out the independent variables considered to have statistically significant influence on adolescent health outcomes. Furthermore, a series of logistic regressions are used to examine the predictors of adolescent of health risk behaviors (i.e., sexual activity or intercourse, alcohol use, smoking, and drug injection or use). The study tested for the main effect models of the different groups of variables (demographic, individual and family characteristics, family social capital, and neighborhood social capital). Hierarchical regression models are used as presented in the regression results shown in

all the models of the multivariate analyses. The direction and strength of association, along with the level of statistical significance and statistical test (model χ^2) for each estimated model are presented in each logistic and linear regression table. Also indicated in the tables reporting regression results for each of the dependent variables are odd ratios along with 95% confidence intervals (CIs), which assist in determining the magnitude of a variable's impact on the likelihood of the occurrence of an event. The models also help in comparing membership in a group to that of a reference group (in the case where dummy or categorical variables were constructed) or the result of a unit difference for continuous variables (Fox, 2008; Jaccard, 2001). That is, for categorical predictors, an odds ratio (OR) greater than one indicates an increased chance of an outcome occurring, whereas variables with less than one odds ratio indicate a decreased chance of the event occurring. An OR of one means the independent variable has no effect on the dependent variable.

The multivariate analyses and tables below present analytical results from logistic regression models of health and each of the health risk behaviors such as sexual activity or intercourse, alcohol use, smoking (ever smoked and smoke regularly), and drug injection. These analyses were conducted on individual health risk behaviors since the findings for each can be different. In addition, a separate analysis was conducted using the health risk behavior index. These analyses were conducted in the form of hierarchical binary/logistic regression models. Consequently, for each of the outcome variables (health outcome, sexual activity, smoking, alcohol use, and drug injection), four regression models were fitted with the baseline model that includes only demographic

characteristics such as age, gender, race, and immigrant status. A series of models were estimated which entered the explanatory factors as sets beginning with the baseline, adolescent socio-demographic variables containing age group, race, immigrant status (immigrant and non-immigrant). Based on the baseline model, a second model was added which includes family socio-economic factors such as family structure, family poverty, parental employment, primary language spoken at home (English as primary language spoken at home vs. non-English primary language spoken at home), and adolescent religiosity (importance of religion to adolescent). This was followed by a model that incorporates social capital variables such as family social capital (i.e., family connectedness and family involvement) and neighborhood social capital (i.e., talking to neighbors, know neighbors, neighbors look out for each other, and neighborhood safety). Entering sets of variables in stages allows us to determine the degree to which each set of variables explains the outcome variable under consideration in each model or stage and to observe any possible changes or otherwise as result of using this approach.

Social Capital, Health and Health Risk Behaviors

The main hypothesis that was initially tested was about social capital and health and health risk behaviors. The hypothesis was:

Hypothesis 1: The presence of neighborhood social capital is associated with better health outcomes and lower health risk behaviors for adolescents.

An initial examination of the association between social capital and health and each of the individual health risk behaviors using logistic regression analysis is done to

determine the direct effects of social capital variables on health, sexual activity, alcohol consumption, smoking, and drug injection, while controlling for adolescent socio-demographic and family characteristics. Table 10 below examined the effects of family and neighborhood social capital on the five dependent variables stated earlier. The logistic regression analyses suggest that family connectedness aspect of family social capital was statistically significant for all the dependent variables such as health, sexual activity, alcohol consumption, smoking, and drug injection. For example, an increased average family connectedness (1.5 times, $p < .001$) with adolescent was associated with better health. Likewise, participants with a perception of neighborhood safety are estimated to have better health by 1.6 times ($p < .001$) greater than those who live in an unsafe neighborhood. This indicates that neighborhood condition has the potential to either impede or promote better health. Similarly, adolescents reporting that neighbors look out for each (neighborliness or sense of community) had increased odds of better health by 1.3 times ($p < .001$). On the other hand, adolescent involvement in an additional activity with parent was found to improve their health by 1.5 times ($p < .01$). Surprisingly, adolescent alcohol consumption increased by 1.3 times ($p < .01$) for an additional engagement in activity with adolescent. However, family involvement was not significantly associated with other adolescent health risk behaviors such as smoking, sexual activity, and drug injection.

Neighborhood social capital components such as knowing people in the neighborhood was found to be a statistically significant predictor of adolescent smoking and ever engaging in sexual activity. The perception of neighborhood looking out for

other neighbors was also found to be a significant predictor of the health, sexual activity, alcohol consumption, and smoking, with the exception of adolescent injection of drugs. Adolescents stopping and talking to neighbor(s) is also found to be a predictor of smoking, ever engaging in sexual intercourse, and potential drug injection. Thus, family connectedness and neighbors looking out for each other have the odds of reducing smoking behavior (OR = 0.55, $p < .001$), alcohol consumption (OR = 0.53, $p < .001$), ever injecting drugs (OR = 0.48, $p < .001$), and ever engaging in sex (OR = 0.59, $p < .001$) among adolescents. Also, adolescent perception of safe neighborhood is also a statistically significant predictor of each of the outcome variables in the study: health, sexual activity, alcohol consumption, smoking, and drug injection or use.

The perception of living in a safe neighborhood increases the odds of better adolescent health (1.6 times) smoking (1.2 times), alcohol consumption (1.3 times); however, it reduces the odds of drug injection and reports of ever having sexual intercourse among adolescents. Overall, each of the models is significant χ^2 (5) = 14.23, $p < .001$, χ^2 (5) = 14.23, $p < .001$, χ^2 (5) = 14.23, $p < .001$, and χ^2 (5) = 14.23, $p < .001$ for models 1 to 4, respectively.

Table 10: Logistic Regression Models of Social Capital on Outcome Variables (*n*=19855)

	Health Outcome	**Smoking**	**Sexual Activity**	**Drug Injection**	**Alcohol Use**
Variable	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)
Family Social Capital					
Connectedness	1.52***	0.55***	0.59***	0.48***	0.53***
	(1.40-1.65)	(0.52-0.58)	(0.56-0.62)	(0.37-0.63)	(0.50-0.56)
Involvement	1.54**	1.12	1.05	1.11	1.30**
	(1.13-2.09)	(0.96-1.31)	(0.89-1.23)	(0.37-3.31)	(1.11-1.52)
Neighborhood Social Capital					
Know neighbors	0.95	1.09*	1.20***	1.58	0.99
	(0.83-1.09)	(1.02-1.17)	(1.12-1.29)	(0.94-2.68)	(0.92-1.06)
Talk to neighbors	1.03	1.31***	1.34***	1.41	1.30***
	(0.89-1.19)	(1.22-1.42)	(1.24-1.45)	(0.78-2.54)	(1.21-1.41)
Lookout for neighbors	1.27***	0.85***	0.84***	1.02	0.84***
	(1.12-1.44)	(0.79-0.91)	(0.78-0.90)	(0.64-1.63)	(0.78-0.90)
Safe neighborhood	1.60***	1.15**	0.83***	0.59*	1.27***
	(1.39-1.86)	(1.05-1.26)	(0.76-0.91)	(0.36-0.99)	(1.16-1.39)
-2 Log-likelihood	9966.573	26572.014	26019.965	1261.552	26554.562
Pseudo R-square					
Cox & Snell	.011	.032	.030	.002	.034
Nagelkerke	.027	.043	.040	.030	.045
Model χ^2	214.50***	642.09***	601.22***	38.32***	677.52***

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

Also, each of the models demonstrate a good fit (Hosmer-Lemeshow), χ^2 (5) = 14.23, $p < .05$) in general, the χ^2 statistics in Table 10 above indicate that the social capital variables taken together are significantly associated with health and health risk behaviors such as smoking, sexual activity, drug injection, and alcohol use.

Social Capital and Adolescent Health

Several demographic, family socio-economic characteristics, and variables that fall under two of the main social capital dimensions are estimated to be associated with the odds of better adolescent health and reduced health risk behaviors as presented in Table 11 with odd ratios (ORs) and 95% confident intervals (CIs). Model 1 of Table 11 illustrates the baseline model which considers the socio-demographic characteristics such as age, race, and immigrant status.

From the results, Black ($p < .001$), Native ($p < .05$), Asian ($p < .05$), and Hispanic ($p < .001$) all indicate a statistically significant relationship with health and a lower likelihood of reporting a good/excellent self-rated health outcome than their White adolescent counterpart, controlling for family characteristics and various dimensions of social capital. Also, adolescent immigrant status is not significantly associated with health. Males are estimated to be less likely than their female counterparts to report better health ($p < .001$).

In Model 2, with the inclusion of family socio-economic characteristics to the base model, the results show that characteristics such as male, Black, Native, Asian, and Hispanic indicate a lower likelihood of reporting a good/excellent self-rated health outcome compared to the respective reference group of being female and White adolescent. From this model, family poverty, parental employment, and adolescent religiosity are significant and positively associated with individual self-rated adolescent health. Again, immigrant status is not found to be statistically significant in relation to adolescent health. In Model 3, the results also indicate that, in general, social capital in a

variety of forms is positively associated with adolescent health. Family connectedness (i.e. this represents the mean number of attributes related to connectedness with parents–mother and father) aspect of family social capital is found to be significantly associated with health outcome.

Also, neighborhood social capital dimensions such as sense of community (neighbors looking out for each other) and neighborhood safety have the strongest statistically significant association with health outcome. Consequently, respondents' increased sense of community and neighborhood safety result in better or excellent health outcomes.

However, family involvement (average activities engaged in with adolescent), knowing people in the neighborhood, and talking to neighbors are the social capital variables which did not have statistically significant estimates when examined with other predictors. Again, the χ^2 statistics in the table below indicates that the demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with health.

Table 11: Results of Logistic Regression Models Predicting Health (*n*=11,587)

	Model 1	**Model 2**	**Model 3**
Demographic Variables	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	1.16(0.92-1.45)	1.14(0.91-1.43)	1.02(0.81-1.28)
Age 15–17	1.03(0.86-1.23)	1.03(0.86-1.24)	0.99(0.82-1.19)
Age 18–21 (ref.)			
Gender – Male	1.62(1.39-1.88)***	1.65(1.42-1.92)***	1.55(1.33-1.81)***
Female (ref.)			
Black	0.72(0.60-0.86)***	0.71(0.59-0.86)**	0.75(0.62-.92)**
Native	0.53(0.32-0.87)*	0.55(0.33-0.91)*	0.57(0.34-0.94)*
Asian	0.72(0.53-0.99)*	0.66(0.48-0.91)*	0.71(0.51-0.98)*
Hispanic	0.67(0.55-0.81)***	0.66(0.52-0.83)***	0.72(0.56-0.91)**
Other Race	1.02(0.44-2.33)	1.06(0.46-2.44)	1.17(0.50-2.70)
White (ref.)			
Immigrant status	0.94(0.75-1.18)	0.93(0.74-1.16)	0.95(0.76-1.20)
Family Characteristics			
Family poverty		0.80(0.66-0.96)*	0.85(0.70-1.03)
Family structure		1.06(0.91-1.25)	1.07(0.91-1.25)
Parental employment		1.69(1.34-2.14)***	1.70(1.34-2.14)***
Speak English at home		0.86(0.64-1.14)	0.81(0.61-1.08)
Religiosity		1.26(1.15-1.39)***	1.18(1.07-1.30)**
Family Social Capital			
Family connectedness			1.44(1.28-1.62)***
Family involvement			1.33(0.87-2.02)
Neighborhood Social Capital			
Know neighbors			1.00(0.83-1.20)
Talk to neighbor			1.01(0.82-1.23)
Lookout for neighbors			1.25(1.05-1.48)*
Safe neighborhood			1.58(1.28-1.93)***
-2 Log-likelihood	5557.956	5499.683	5417.396
Pseudo R-square			
Cox & Snell	.015	.011	.018
Nagelkerke	.006	.028	.046
Model χ^2	67.96***	126.23***	208.52***

*p < .05, **p < .01, ***p < .001. 95% Confidence Intervals in parentheses

Social Capital and Adolescent Smoking Behaviors

Table 12 shows the odd ratios and the confidence intervals of the independent variables on adolescent smoking behavior. In Model 1, younger adolescents (12–14 and 15–17 years) are less likely to engage in smoking (OR = 0.43, $p < .001$ and OR = 0.89, $p < .01$ respectively). Blacks (OR = 0.52, $p < .001$), Asians (OR = 0.59, $p < .001$), and Hispanics (OR = 0.75, $p < .001$) are also less likely to have ever smoked or smoke regularly compared to White adolescents. With the addition of family characteristics in Model 2, similar demographic variables with statistically significant association to smoking in Model 1 are found to be significant in Model 2.

Furthermore, variables such as family poverty (OR = 1.30, $p < .001$), English language use at home (OR = 1.71, $p < .001$), and religiosity (OR = 0.72, $p < .001$) are statistically significant. Family poverty and English language usage at home increase the likelihood of smoking behavior. Adolescent religiosity, on the other hand, reduces the likelihood of smoking among adolescents. Similar results as found in Models 1 and 2 are observable in Model 3.

Social capital variables included in Model 4 also indicate a statistically significant relationship between family connectedness and smoking. A unit increase in the average family connectedness (OR = 0.60, $p < .001$) minimizes the likelihood of smoking among adolescents. However, the relationship between family involvement and smoking is not statistically significant.

Table 12: Results of Logistic Regression Models Predicting Smoking Behavior (n=11,587)

	Model 1	Model 2	Model 3
Demographic Variables	OR 95% C.I.	OR 95% C.I.	OR 95% C.I.
Age 12–14	0.43(0.39-0.49)***	0.43(0.39-0.49)***	0.47(0.42-0.53)***
Age 15–17	0.89(0.81-0.98)*	0.90(0.80-0.49)**	0.89(0.81-0.99)*
Age 18–21 (ref.)			
Gender – Male	1.00(0.92-1.07)	0.97(0.90-1.04)	1.01(0.94-1.09)
Female (ref.)			
Black	0.52(0.47-0.57)***	0.55(0.50-0.61)***	0.53(0.48-0.59)***
Native	1.33(0.97-1.82)	1.31(0.96-1.80)	1.28(0.93-1.76)
Asian	0.59(0.50-0.70)***	0.71(0.59-0.84)***	0.71(0.59-0.84)***
Hispanic	0.75(0.68-0.84)***	0.94(0.83-1.07)	0.92(0.81-1.05)
Other Race	0.91(0.62-1.35)	0.99(0.67-1.46)	0.96(0.64-1.43)
White (ref.)			
Immigrant status	0.95(0.84-1.07)	0.96(0.86-1.08)	0.93(0.83-1.05)
Family Characteristics			
Family poverty		1.27(1.14-1.41)***	1.24(1.12-1.39)***
Family structure		0.94(0.86-1.02)	0.93(0.86-1.01)
Parental employed		0.92(0.80-1.06)	0.92(0.79-1.06)
Speak English at home		1.71(1.46-1.99)***	1.71(1.46-2.00)***
Religiosity		0.72(0.69-0.76)***	0.77(0.73-0.81)***
Family Social Capital			
Family connectedness			0.60(0.55-0.64)***
Family involvement			1.09(0.88-1.35)
Neighborhood Social Capital			
Know neighbors			1.15(1.04-1.26)**
Talk to neighbor			1.32(1.19-1.47)***
Lookout for neighbors			0.83(0.76-0.92)***
Safe neighborhood			1.03(0.90-1.17)
-2 Log-likelihood	15429.271	15204.548	14945.088
Nagelkerke	.055	.059	.107
Model χ^2	483.25***	707.97***	967.43***

*p < .05, **p < .01, ***p < .001. 95% Confidence Intervals in parentheses

For neighborhood social capital, knowing most of the people in the neighborhood, talking to neighbors and neighbors looking out for each other are associated with

smoking. The results suggest that the odds of smoking are more likely when adolescents know most of the people in the neighborhood (OR = 1.12, $p < .001$) and talk to neighbors (OR = 1.32, $p < .001$). When neighbors are perceived to look out for each other, smoking behavior does not seem to increase or be prevalent (OR = 0.83, $p < .001$). The perception of a safe neighborhood does not have a relationship with smoking. With the exception of Model 1 being Hispanic was not associated with smoking. The χ^2 statistics in the table below indicate that the demographic, individual and family socioeconomic characteristics and social capital variables are significantly correlated with smoking behavior.

Social Capital and Injection or Use of Illegal Drug

Table 13 above considers the factors that predict adolescent's injection of illegal drugs. The main findings from the baseline results (Model 1) show that younger adolescents are less likely to inject illegal drugs compared to older adolescents (18–21 years old). Models 2 and 3 show that young age (12–14 years old), religiosity, family poverty (receipt of public assistance), and family connectedness are strong predictors of adolescent use of illegal drug injection. Adolescents from poor families have higher odds (2 times) of injecting illegal drugs. On the contrary, religiosity and family connectedness have the opposite effects; thus, these factors reduce the odds of adolescent engagement in drug injection.

Table 13: Results of Logistic Regression Models Predicting Drug Use (*n*=11,587)

	Model 1	Model 2	Model 3
Demographic Variables	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.30(0.11-0.81)*	0.31(0.11-0.85)*	0.33(0.12-0.91)*
Age 15–17	0.84(0.47-1.50)	0.82(0.46-1.48)	0.82(0.46-1.48)
Age 18–21 (ref.)			
Gender – Male	1.57(0.92-2.69)	1.46(0.85-2.50)	1.63(0.94-2.81)
Female (ref.)			
Black	0.57(0.28-1.19)	0.64(0.30-1.38)	0.61(0.28-1.33)
Native	0.00(.000)	0.00(0.00)	0.00(0.00)
Asian	0.71(0.22-2.32)	0.95(0.15-1.54)	1.03(0.31-3.44)
Hispanic	0.63(0.29-1.35)	0.69(0.28-1.71)	0.68(0.27-1.71)
Other Race	0.00(0.00)	0.00(.000)	0.00(0.00)
White (ref.)			
Immigrant status	0.44(0.14-1.42)	0.48(0.15-1.54)	0.47(0.15-1.50)
Family Characteristics			
Family poverty		2.04(1.07-3.87)*	1.98(1.04-3.78)*
Family structure		1.50(0.80-2.79)	1.47(0.79-2.73)
Parental employed		0.77(0.32-1.82)	0.79(0.33-1.88)
Speak English at home		1.52(0.45-5.13)	1.35(0.40-4.59)
Religiosity		0.54(0.41-0.71)***	0.57(0.43-0.75)***
Family Social Capital			
Family connectedness			0.54(0.36-0.79)**
Family involvement			3.55(0.83-15.14)
Neighborhood Social Capital			
Know neighbors			1.26(0.63-2.54)
Talk to neighbor			1.98(0.80-4.91)
Lookout for neighbors			0.99(0.52-1.89)
Safe neighborhood			0.87(0.38-2.01)
-2 Log-likelihood	700.071	674.729	660.404
Nagelkerke	.028	.064	.085
Model χ^2	19.51*	44.85***	59.18***

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

Again, the χ^2 statistics in the table below indicate that the demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with drug injection or use.

Social Capital and Adolescent Alcohol Consumption

Age and race are strong predictors of alcohol consumption among adolescents. Model 1 of Table 14 below indicates that compared to older participants (18–21 years), younger participants (12–17 years) were less likely to engage in alcohol consumption. Also Blacks, Asians, and Hispanics were less likely to consume alcohol compared to White adolescents. Immigrant status is not statistically related to alcohol use. Models 2–4 introduce family characteristics and social capital variables. Model 2 introduces family characteristics, indicating that age continues to be a factor. Thus, the younger the respondents, the less likely they are to report alcohol consumption. The estimates remain fairly unchanged from Model 1. Also, English language usage at home and religion were significant contributory factors to alcohol consumption in Models 2, and 3. Adolescents who use English language at home were more likely to use alcohol (1.5 times) however adolescent religiosity reduces the odds of alcohol use. When all the social capital variables are simultaneously entered into the same model, the results indicate that family connectedness and family involvement are observed to be statistically significant predictors, but the direction of each effect is different. Unlike family involvement (1.4 times), family connectedness reduces the odds of alcohol use in Model 3.

Also, neighborhood social capital variables such as talking to neighbors, neighbors looking out for each other, and perceived neighborhood safety have statistically significant associations with alcohol consumption. Increased odds of alcohol use were found for adolescents who talk to neighbors (1.3 times), and those who perceived their neighborhood to be safe (1.2 times).

Table 14: Logistic Regression Models Predicting Alcohol Consumption (*n*=11,587)

	Model 1	Model 2	Model 3
Demographics	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.27(0.24-0.30)***	0.27(0.24-0.30)***	0.29(0.26-0.33)***
Age 15–17	0.68(0.62-0.75)***	0.67(0.61-0.74)***	0.68(0.61-0.75)***
Age 18–21 (ref.)			
Gender – Male	1.03(0.96-1.12)	1.00(0.92-1.07)	1.05(0.97-1.14)
Female (ref.)			
Black	0.60(0.55-0.66)***	0.69(0.62-0.76)***	0.68(0.61-0.75)***
Native	1.34(0.98-1.83)	1.36(0.58-0.82)	1.34(0.97-1.83)
Asian	0.59(0.50-0.70)***	0.69(0.58-0.82)***	0.69(0.58-0.83)***
Hispanic	0.89(0.80-0.70)*	1.11(0.97-1.26)	1.10(0.96-1.25)
Other Race	0.88(0.60-1.30)	0.95(0.64-1.40)	0.93(0.62-1.38)
White (ref.)			
Immigrant status	1.04(0.93-1.18)	1.07(0.95-1.20)	1.03(0.92-1.17)
Family Characteristics			
Family poverty		1.07(0.96-1.19)	1.06(0.95-1.18)
Family structure		0.99(0.91-1.08)	0.99(0.91-1.08)
Parent employed		1.15(0.99-1.33)	1.15(0.99-1.33)
Speak English at home		1.53(1.30-1.78)***	1.50(1.28-1.76)***
Religiosity		0.69(0.65-0.73)***	0.73(0.69-0.77)***
Family Social Capital			
Family connectedness			0.59(0.55-0.64)***
Family involvement			1.43(1.16-1.78)**
Neighborhood Social Capital			
Know neighbors			1.06(0.96-1.17)
Talk to neighbor			1.34(1.21-1.50)***
Lookout for neighbors			0.85(0.77-0.93)**
Safe neighborhood			1.18(1.03-1.34)*
-2 Log-likelihood	15264.561	15035.795	14785.686
Nagelkerke	.078	.103	.129
Model χ^2	697.43***	926.20***	1176.31***

*p < .05, **p < .01, ***p < .001. 95% Confidence Intervals in parentheses

Conversely, those who perceived neighbors as looking out for each other have reduced odds of alcohol consumption. The overall χ^2 statistics in the table below

indicates that the demographic, individual and family socioeconomic characteristics and social capital variables are significantly related with alcohol consumption among adolescents.

Social Capital and Adolescent Sexual Activity

Table 15 below shows the ORs and 95% CIs for predictors of adolescent acknowledgment of ever having sexual intercourse. In all the models, compared to females, male adolescents were more likely to have ever engaged in sexual activity.

Also, adolescents between 12–17 years are less likely to engage in sexual intercourse compared to those aged 18–21. In other words, the odds of having had sex increase with age and are lower for Asians; however, the results suggest that Blacks (between 2.5 times and almost 3 times), Natives (1.9 times and reducing as more variables in added to model), and Hispanics (1.3 to 1.4 times) are more likely to be sexually active compared to Whites as shown in all the three Models in Table 15.

In Models 2 and 3, family poverty, parental employment, English language usage, and religion are found to be strong predictors of sexual activity among adolescents. An increase in family poverty and English language usage at home are associated with a corresponding increase in sexual activity; however, an increase in religiosity and parental employment are associated with a lower likelihood of ever engaging in sexual activity.

Table 15: Results of Logistic Regression Models Predicting Sexual Activity (*n*=11,587)

	Model 1	Model 2	Model 3
Demographics	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.08(0.07-0.10)***	0.08(0.07-0.09)***	0.08(0.07-0.09)***
Age 15–17	0.39(0.35-0.43)***	0.38(0.34-0.41)***	0.37(0.33-0.41)***
Age 18–21 (ref.)			
Gender – Male	1.16(1.07-1.26)***	1.13(1.04-1.23)**	1.19(1.10-1.30)***
Female (ref.)			
Black	2.51(2.26-2.77)***	2.68(2.41-2.98)***	2.65(2.38-2.96)***
Native	1.86(1.36-2.55)***	1.81(1.32-2.49)***	1.80(1.30-2.48)***
Asian	0.64(0.52-0.77)***	0.78(0.64-0.95)*	0.79(0.65-0.97)*
Hispanic	1.13(1.01-1.27)*	1.43(1.25-1.64)***	1.42(1.23-1.63)***
Other Race	0.82(0.53-1.27)	0.88(0.56-1.37)	0.83(0.53-1.31)
White (ref.)			
Immigrant status	1.00(0.88-1.14)	1.02(0.90-116)	1.00(0.87-1.14)
Family Characteristics			
Family poverty		1.43(1.27-1.60)***	1.39(1.24-1.56)***
Family structure		0.99(0.90-1.08)	0.98(0.90-1.08)
Parent employed		0.80(0.68-0.93)**	0.80(0.68-0.94)**
Speak English at home		1.80(1.52-2.14)***	1.78(1.49-2.12)***
Religiosity		0.72(0.68-0.76)***	0.76(0.72-0.80)***
Family Social Capital			
Family connectedness			0.63(0.58-0.67)***
Family involvement			1.38(1.09-1.74)**
Neighborhood Social Capital			
Know neighbors			1.31(1.18-1.45)***
Talk to neighbor			1.20(1.07-1.34)**
Lookout for neighbors			0.85(0.77-0.94)**
Safe neighborhood			0.93(0.81-1.07)
-2 Log-likelihood	13466.791	13227.844	13024.027
Negelkerke	.195	.219	.239
Model χ^2	1780.05***	2018.99***	2222.81***

*p < .05, **p < .01, ***p < .001. 95% Confidence Intervals in parentheses

Adding family and neighborhood social capital variables in Models 3 and 4 demonstrate that all the social capital variables become significant predictors of

adolescent response of ever engaging in sexual activity with the exception of neighborhood safety. That is, family connectedness and neighbors looking out for each other decrease the likelihood of adolescent involvement in sexual activity. Interestingly, the results also suggest that family involvement in multiple activities such as shopping, attending movies and church among others (1.4 times), with adolescent, as well as knowing neighbors (1.4 times), and taking to neighbors (1.2 times) rather increase the likelihood of adolescent ever engaging in sexual activity. Again, the χ^2 statistics in the Table 15 below indicate that the demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with adolescent sexual initiation.

Social Capital and Health Risk Behavior Index

In a separate analysis, four measures of health risk behaviors were added in the form of health risk behavior index (sexual intercourse, smoking-ever smoked or smoke regularly, alcohol consumption, and injection of illegal drug). The health risk behavior index ranges from 0–4 indicating reported use or engagement in a number of particular risk behaviors (sexual intercourse, smoking-ever smoked or smoke regularly, alcohol consumption, and injection of illegal drug). It is therefore an aggregate of all the risk behaviors that the adolescent ever engaged in before or was engaged in at the time of the interview. This approach of using combined health risk behaviors is to further our understanding of the predictors of adolescent participation in multiple risk behaviors compared to just one, as in the previous analyses.

From the theoretical assumption that various dimensions of social capital have significant health and health risk behavior benefits, the direct impact of social capital on the health risk behavior index was tested, controlling for all other variables such as adolescent demographic (age, gender, race, and immigrant status) and family characteristics (adolescent religiosity, family poverty, parental employment, and family structure). On the basis of this analysis, family connectedness, talking to neighbors, neighbors looking out for each other, knowing people in the neighborhood, and neighborhood safety are all found to be statistically significant predictors of health risk behaviors.

Table 16: Results of OLS Regression Model for Health Risk Behaviors

Descriptive Statistics			**Coefficient**	***SE***	**CI**
Variables	**Mean**	**Std. Dev.**			
Family connectedness	4.291	.603	-0.228***	0.016	-0.219- 0.218
Family involvement	.358	.188	0.010	0.051	0.009-0.009
Know most people	.71	.452	0.024***	0.023	0.022-0.021
Talk to neighbors	.79	.407	0.069***	0.025	0.064-0.063
Neighbors look out for others	.72	.451	-0.049***	0.023	-0.101-0.045
Safe neighborhood	.88	.332	0.018**	0.030	0.019-0.135
Number of observations			19859		
F statistics			200.87		
Prob > *F*			0.000		
R^2			0.057		

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals (CI)

However, family involvement in activities with adolescent is not found to have a significant relationship with health risk behaviors. Each additional attribute (increase) in average family connectedness is negatively associated ($\beta = -0.228$; $p < .001$) with health

risk behaviors. This means that adolescents are less likely to engage in more risk behaviors as they perceive their parents to be more connected or related with them in a caring and loving manner. Another social capital variable that surprisingly had a negative association ($\beta = -0.049$; $p < .001$) with health risk behaviors was adolescent report that neighbors look out for each other.

The rest of the social capital dimensions have positive association with the health risk behavior index. For example, adolescents who know most of the people in the neighborhood have less attraction to risk behaviors ($\beta = 0.024$; $p < .001$), adolescents who talk to neighbors also have a similar positive relationship with health risk behaviors ($\beta = 0.069$; $p < .001$), and those who perceive their neighborhood to be safe also have the propensity to engage in less risky behaviors ($\beta = 0.018$; $p < .01$) compared to those who had the opposite view about the neighbors and neighborhood. The analysis shown in the above table does not include additional explanatory variables with the exception of social capital variables.

However, this analysis can be extended using the alternative health risk behavior index and including multiple explanatory variables as illustrated in Table 17. Again, hierarchical regression was used to investigate the significant contribution of each of the variables in stages to the health risk behavior index.

Age, gender, immigrant status, and language spoken were entered as independent variables in step 1. In step 2, family socio-economic characteristics–parental employment, family structure, and family poverty were entered into the regression model followed by social capital–family and neighborhood social capital variables in step 3.

Table 17: Results of OLS Regression Models for Health Risk Behavior (n=11,587)

	Model 1	**Model 2**	**Model 3**
Demographic Variables	Coefficient (*SE*)	Coefficient (*SE*)	Coefficient (*SE*)
Age 12–14	(0.035)***	(0.035)***	(0.035)***
Age 15–17	(0.030)***	(0.029)***	(0.029)***
(Age 18–21-ref.)			
Gender – Male	(0.024)	(0.023)	(0.023)
(Female-ref.)			
Black	(0.030)***	(0.030)***	(0.030)***
Native	(0.094)***	(0.092)**	(0.090)**
Asian	(0.053)***	(0.053)***	(0.052)***
Hispanic	(0.033)***	(0.039)	(0.039)
Other Race	(0.122)	(0.120)	
(White-ref.)			
Immigrant status	(0.037)	(0.036)	(0.036)
Family Characteristics			
Family poverty		(0.033)***	(0.045)***
Family structure		(0.025)	(0.025)
Parental employed		(0.044)	(0.043)
Speak English at home		(0.048)***	(0.047)***
Religiosity		(0.016)***	(0.016)***
Family Social Capital			
Family connectedness			(0.021)***
Family involvement			(0.063)*
Neighborhood Social Capital			
Know neighbors			(0.029)***
Talk to neighbor			(0.031)***
Lookout for neighbors			(0.028)***
Safe neighborhood			(0.038)
F statistics	143.41	128.70	117.45
Prob > *F*	0.000	0.000	0.000
R^2	0.100	0.135	0.169

Note: Reference variable in parentheses. *p < .05, **p < .01, ***p < .001.

Again, analyses were two-tailed; p < .05 is considered statistically significant.

Table 17 shows the results from hierarchical OLS regression on a composite health risk

behavior index. Model 1 consisted mostly of adolescent demographic characteristics as the explanatory variables. One result that was consistent across all of the model specifications was that age, race, family poverty, adolescent religiosity, and social capital were associated with the risk behavior index.

Age is statistically significantly associated with the health risk behavior index. The health risk behaviors of adolescents aged 18–21 on the average is higher than adolescents aged 12–14 ($\beta = -0.362$; $p < .001$), and those 15–17 years of age ($\beta = -0.140$; $p < .001$). That is, younger respondents engaged less in risky behaviors compared to older adolescents. Race is also significantly correlated with health risk behaviors. African American ($\beta = -.083$; $p < .001$), Native American ($\beta = .031$; $p < .001$), Asian ($\beta = -.078$; $p < .001$), and Hispanic ($\beta = -.052$; $p < .001$) youth all have reduced health risk behaviors compared to their White counterparts. Again, it is observable in all the models that especially Black, Asian, and Native adolescents have a reduced likelihood of combined risk behaviors compared to Whites, whereas Hispanic is associated with health risk behavior only in the baseline model.

In Model 2 of Table 17, after adding family characteristics to the earlier model, the results for the adolescent demographics are similar to that in Model 1. Family poverty, English as the primary language spoken at home and adolescent religiosity are associated with health risk behaviors. Adolescents with families receiving public assistance engaged less in risk behaviors ($\beta = .051$; $p < .001$) compared to families that do not receive public assistance. Adolescents who use English as the predominant language at home do have lower risk behaviors than adolescents who use other languages

as the primary means of communication at home ($\beta = .098$; $p < .001$). Another important determinant of adolescent risk behavior is religiosity. Across three models we find that an improvement in adolescent religiosity may significantly reduce the number of risk behaviors by adolescents ($\beta = -.162$; $p < .001$). Gender is only marginally significant. Again, immigrant status is not statistically significantly associated with health risk behaviors in any of the models.

Additionally, the analysis also suggests that social capital on health risk behaviors matters. Family connectedness is statistically significantly associated with health risk behaviors. Close connection with parents has the tendency to lower adolescent risk behaviors by 0.02% in Model 3. Surprisingly, parental involvement in activities with their adolescent is only marginally significant in reducing risk behaviors among adolescents. Also, the result of estimated effect of neighborhood social capital on health risk behaviors is consistent with the hypothesis. Adolescents' knowing neighbors, talking to neighbors, and the perception of neighbors looking out for each other (i.e., neighborhood reciprocity) results in a decreased adolescent involvement in risk behaviors.

Nativity Differences in Predictors of Health and Health Risk Behaviors

This study also explores inter-group differences in the predictors of health and health risk behaviors between adolescent immigrants and non-immigrants. The hypothesis below was tested:

Hypothesis 4: Adolescent immigrants are more likely to have lower social capital and therefore lower health status and higher health risk behaviors compared to non-immigrants.

Next, to better understand the specific predictors of immigrant and non-immigrant health and health risk behaviors for comparative purposes, the two groups are considered separately using hierarchical logistic regression and OLS analyses. This section of the analyses explores such differences if any between adolescent immigrants and non-immigrants on health and health risk behaviors.

Nativity and Adolescent Health

Separate regression results on better/excellent health indicate major differences in the factors that contribute to immigrant and non-immigrant health. In Model 1 of Table 18, for immigrants group, gender and Blacks are moderately significant predictors of health outcome. Compared to females, male immigrants (0R = 2.08, $p < .05$) are twice more likely to rate their health status as good/excellent.

Black immigrants (0R = 0.50, $p < .05$) are less likely to report good/excellent health compared to White counterparts. The same variables are still significant to the health of immigrants in Model 2 and 3 after individual and family socioeconomic and social capital variables are included to the initial model. Also parental employment and family poverty (i.e., receipt of public assistance used as a proxy for family poverty) are found to be significant contributors to immigrant health. Adolescents with parents who

work for pay have a higher likelihood (0R = 2.36, $p < .01$) of reporting good/excellent health compared to adolescents with parents who do not work for pay.

Immigrant youth whose family receives public assistance (0R = 0.57, $p < .05$) are less likely to report good/excellent health compared to adolescents whose families do not receive public assistance. Among the social capital variables, family connectedness is the only variable that is found to be a moderately significant contributor to the health of adolescent immigrants. In other words, adolescents who describe their parents as loving, caring, etc. were more likely (0R = 1.61, $p < .01$) to have good/excellent health compared with those who express negative attributes regarding their relationship with their parents. None of the neighborhood social capital variables including family involvement was found to be significant for adolescent immigrant health in this study.

Table 18: Results of Logistic Regression Models Predicting Health

	Immigrants			Non-immigrants		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Demographic Variables	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.81(0.42-1.57)	0.77(0.40-1.50)	0.66(0.34-1.31)	1.21(0.95-1.54)	1.19(0.94-1.52)	1.07(0.84-1.37)
Age 15–17	0.91(0.51-1.62)	0.91(0.50-1.63)	0.88(0.49-1.59)	1.04(0.86-1.26)	1.04(0.86-1.27)	1.01(0.83-1.22)
Age 18–21 (ref)						
Gender – Male	2.08(1.32-3.27)**	2.07(1.30-3.29)**	1.95(1.22-3.14)**	1.57(1.33-1.84)***	1.60(1.36-1.88)***	1.50(1.27-1.77)***
Female (ref)						
Black	0.50(0.30-0.83)**	0.54(0.31-0.93)*	0.55(0.32-0.95)*	0.75(0.62-0.92)**	0.74(0.60-0.91)**	0.79(0.64-0.97)*
Native	0.69(0.09-5.44)	0.88(0.11-7.15)	1.15(0.13-10.11)	0.52(0.31-0.88)*	0.53(0.32-0.89)*	0.54(0.32-0.90)*
Asian	0.69(0.26-1.82)	0.71(0.26-1.95)	0.82(0.29-2.32)	0.72(0.52-1.01)	0.66(0.47-0.93)*	0.70(0.50-0.99)*
Hispanic	0.63(0.35-1.14)	0.85(0.40-1.79)	0.95(0.45-2.01)	0.67(0.54-0.82)***	0.63(0.49-0.81)***	0.69(0.54-0.89)**
Other Race	0.24(0.05-1.19)	0.35(0.06-1.90)	0.47(0.08-2.64)	1.40(0.51-3.84)	1.41(0.51-3.87)	1.53(0.55-4.22)
White (ref)						
Family Characteristics						
Family poverty		0.56(0.33-0.93)*	0.57(0.34-0.96)*		0.85(0.69-1.04)	0.90(0.73-1.12)
Family structure		0.73(0.44-1.20)	0.71(0.43-1.18)		1.12(0.94-1.32)	1.12(0.95-1.33)
Parental employment		2.17(1.16-4.05)*	2.36(1.26-4.44)**		1.64(1.28-2.11)***	1.64(1.28-2.12)***
Speak English at home		1.40(0.61-3.25)	1.37(0.58-3.21)		0.81(0.59-1.10)	0.76(0.56-1.03)
Religiosity		1.34(0.98-1.82)	1.25(0.91-1.72)		1.25(1.14-1.39)***	1.17(1.06-1.29)**
Family Social Capital						
Family connectedness			1.61(1.16-2.24)**			1.43(1.26-1.62)***
Family involvement			1.60(0.48-5.40)			1.29(0.82-2.03)
Neighborhood Social Capital						
Know neighbors			1.03(0.60-1.78)			0.99(0.81-1.20)
Talk to neighbor			1.23(0.67-2.29)			0.99(0.80-1.22)
Lookout for neighbors			0.83(0.48-1.42)			1.31(1.09-1.58)**
Safe neighborhood			1.57(0.87-2.84)			1.58(1.27-1.97)***
-2 Log-likelihood	641.543	620.916	607.352	4908.631	4862.909	4789.756
Pseudo R-square						
Cox & Snell	0.015	0.031	0.041	0.005	0.010	0.017
Nagelkerke	0.039	0.078	0.103	0.014	0.025	0.044
Model χ^2	20.369**	40.996***	54.561***	55.123***	100.845***	173.998***

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

In contrast, for native-born Americans, gender, Blacks, Natives, and Hispanics are important explanatory factors of adolescent health. Compared to native-born females, males (OR = 1.57, $p < .001$) are more likely to report good/excellent health. In Models 1 through 3, racial groups continued to be statistically positively associated with the health of native-born adolescents. Among native-born Americans, more Blacks (0R = 0.75, $p < .01$) reported bad health, and so did Hispanic adolescents (0R = 0.67, $p < .001$) compared to their White counterparts. Parental employment and adolescent religiosity are important among the individual and family socioeconomic characteristics that influence health. Unlike adolescent immigrants, native-born adolescent health was also influenced significantly by social capital. Family connectedness (0R = 1.43, $p < .001$), community reciprocity (neighbors look out for each other) (0R = 1.31, $p < .01$), and neighborhood safety (0R = 1.58, $p < .001$) are found to be significant determinants of adolescent health. These factors promote better health for native-born adolescents. The analysis suggests that the χ^2 statistics for the demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with health. Age is not a significant predictor for immigrant and non-immigrants.

Adolescent Sexual Activity

Table 19 shows the odds for adolescent initiation of sexual intercourse as predicted by demographic, individual and family socioeconomic characteristics and social capital variables. Compared to adolescents aged 18–21, younger immigrants (12–14 and 15–17 years old) are less likely (0R = 0.07, $p < .001$ and 0R = 0.42, $p < .001$

respectively) to initiate sexual intercourse. The results are similar for younger native-born adolescents aged 12–14 and 15–17 years (0R = 0.08, $p < .001$ and 0R = 0.38, $p < .001$ respectively). Male adolescent immigrants (0R = 1.40, $p < .05$) and non-immigrants (0R = 1.17, $p < .01$) are more likely to report engaging in sexual behavior compared to their female counterparts. Also, Blacks are more likely than Whites to engage in sexual activity for both immigrants (0R = 2.55, $p < .001$) and non-immigrants (0R = 2.67, $p < .001$). Specifically, for adolescent non-immigrants, Natives (0R = 1.81, $p < .01$) and Hispanics (0R = 1.47, $p < .001$) are more likely to engage in sexual activity compared to White, whereas and Asians (0R = 0.79, $p < .05$) are less likely to report initiating sexual activity compared to their Whites counterparts. The results also indicate that among individual and family characteristics such as adolescent religiosity, family poverty, family structure, parental employment, and language spoken at home only family poverty and importance of religion to the adolescent are found to be statistically significant for immigrants (see Model 2). That is, among immigrants, a unit increase in family poverty (0R = 1.41, $p < .05$) is associated with an increase in engagement in sexual activity by adolescent immigrants, however, increased importance religion for adolescent is associated with the less likelihood of engaging in sexual activity (0R = 0.78, $p < .01$). However, for young immigrants, variables such as family structure, parental employment, English spoken at home are not statistically significant at the .05 level as evidenced in Models 2 and 3. For non-immigrant adolescents, on the other hand, family poverty, parental employment, English spoken at home and religiosity are statistically significant predictors of sexual initiation in this study. For example, an increase in family

poverty (0R = 1.43, $p < .001$), English spoken at home (0R = 1.86, $p < .001$) are associated with the likelihood of sexual debut.

Parental employment (0R = 0.79, $p < .01$), and religiosity (0R=0.72, $p < .001$) are statistically significant predictors and reduce the likelihood of sexual initiation for non-immigrant youth. Family connectedness is also found to reduce the likelihood of sexual activity among both immigrants (0R = 0.67, $p < .001$) and non-immigrants (0R = 0.62, $p < .001$). Also, family involvement (0R = 1.44, $p < .01$) is significantly related to non-immigrant sexual activity but not a significant predictor for immigrant sexual debut. The final models for both immigrant and non-immigrant sub-populations involve the addition of neighborhood social capital variables. For immigrant youth, knowing neighbors (0R = 1.85, $p < .001$) has a positive effect but the perception that neighbors look out for each other (0R = 0.67, $p < .05$) has a negative effect on adolescent sexual activity. The findings suggest that immigrant youth who reported knowing neighbors are almost two times more likely to engage in sexual activity. However, when they reported of perception of neighborhood reciprocity (i.e. neighbors look out for each other) they are less likely to engage in sexual activity. Similarly, for non-immigrant youth who report knowing neighbors (0R = 1.25, $p < .001$) and talking to neighbors (0R = 1.22, $p < .01$) had positive effect on sexual activity.

Table 19: Results of Logistic Regression Models Predicting Sexual Intercourse

	Immigrants			Non-immigrants		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Demographic Variables	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.07(0.05-0.11)***	0.07(0.05-0.11)***	0.08(0.05-0.12)***	0.08(0.07-0.10)***	0.08(0.07-0.09)***	0.08(0.07-010)***
Age 15–17	0.42(0.31-0.56)***	0.41(0.31-0.55)***	0.42(0.31-0.57)***	0.38(0.35-0.43)***	0.37(0.33-0.41)***	0.36(0.33-0.40)***
Age 18–21 (ref.)						
Gender – Male	1.31(1.03-1.68)*	1.31(1.02-1.68)*	1.40(1.08-1.81)*	1.14(1.05-1.24)**	1.11(1.02-1.21)*	1.17(1.07-1.28)**
Female (ref.)						
Black (White-ref.)	2.59(1.90-3.49)***	2.64(1.92-3.63)***	2.55(1.84-3.53)***	2.50(2.24-2.78)***	2.69(2.40-3.01)***	2.67(2.38-3.00)***
Native	2.31(0.74-7.17)	2.07(0.65-6.66)	1.75(0.54-5.69)	1.82(1.31-2.53)***	1.80(1.29-2.51)**	1.81(1.30-2.54)**
Asian	0.72(0.40-1.30)	0.78(0.43-1.41)	0.77(0.42-1.42)	0.63(0.51-0.77)***	0.78(0.63-0.96)*	0.79(0.64-0.98)*
Hispanic	1.00(0.71-1.38)	1.09(0.72-1.65)	1.06(0.69-1.61)	1.15(1.02-1.30)*	1.48(1.28-1.72)***	1.47(1.27-1.71)***
Other Race	1.23(0.33-4.53)	1.05(0.28-3.90)	0.93(0.26-3.39)	0.78(0.49-1.25)	0.87(0.54-1.39)	0.83(0.51-1.35)
Family Characteristics						
Family poverty		1.41(1.01-1.97)*	1.38(0.98-1.94)		1.43(1.27-1.61)***	1.39(1.23-1.58)***
Family structure		1.18(0.90-1.54)	1.18(0.90-1.55)		0.96(0.88-1.06)	0.96(0.87-1.06)
Parental employment		0.82(0.52-1.30)	0.86(0.54-1.37)		0.79(0.67-0.94)**	079(0.67-0.94)**
Speak English at home		1.35(0.81-2.27)	1.29(0.77-2.18)		1.86(1.55-2.24)***	1.84(1.53-2.22)***
Religiosity		0.78(0.66-0.94)**	0.81(0.68-0.98)*		0.72(0.68-0.76)***	0.75(0.71-0.80)***
Family Social Capital						
Family connectedness			0.67(0.53-0.83)***			0.62(0.57-0.67)***
Family involvement			1.03(0.51-2.05)			1.44(1.12-1.85)**
Neighborhood Social Capital						
Know neighbors			1.85(1.34-2.55)***			1.25(1.12-1.40)***
Talk to neighbor			1.01(0.70-1.45)			1.22(1.07-1.38)**
Lookout for neighbors			0.67(0.49-0.92)*			0.88(0.79-0.98)*
Safe neighborhood			0.90(0.60-1.34)			0.94(0.81-1.08)
-2 Log-likelihood	1499.912	1484.577	1450.338	11962.846	11735.710	11557.617
Nagelkerke	0.210	0.223	0.253	0.193	0.219	0.238
Model χ^2	218.738***	234.072***	268.311***	1564.739***	1791.875***	1969.968***

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

But when adolescents reported a perception of neighborhood reciprocity (neighbors look out for each other) (0R = 0.88, $p < .05$), there was an inverse relationship with sexual activity. Here, the sense of neighborhood reciprocity can be considered as serving as a protective factor against sexual debut. Again, the perception of neighborhood safety is not statistically significant predictor of sexual activity for either immigrant or non-immigrant youth. The χ^2 statistics for the regression on adolescent sexual risk behavior as indicated in Table 18 for both immigrants and non-immigrants in each of the models taken together are statistically significant.

Adolescent Alcohol Consumption

The factors that predicted alcohol consumption among adolescent sub-samples of immigrants and non-immigrants was explored using a hierarchical logistic regression. The initial model has adolescent demographic characteristics to estimate the likelihood of alcohol use separately for each population subgroup. Subsequent models included groups of variables that control for adolescent and family socioeconomic characteristics. For demographic variables age and race are independently negatively associated with alcohol consumption among adolescents (immigrants and non-immigrants). The regression analysis is shown in Table 20 below.

Similar to immigrants (0R = 0.24, $p < .001$), younger native-born Americans (0R = 0.30, $p < .001$) are less likely to engage in alcohol use compared to older adolescents (18–21). Black Immigrants were (0R=0.59, $p < .01$) and native-born Black youth are less likely (0R = 0.69, $p < .001$) to use alcohol than White immigrants, so are Asian

immigrants (0R = 0.57, $p < .05$) and non-immigrants (0R = 0.71, $p < .001$). For non-immigrants, Native American youth were more likely to use alcohol (0R = 1.45, $p <.05$) compared to their White counterparts (see Model 3). With the addition of family socioeconomic variables, the results show that for adolescent immigrants only religiosity is a significant predictor of alcohol use (0R = 0.72, $p < .01$).

Another interesting finding is that whereas neighborhood social capital variables such as talking to neighbors, neighbors look out for each other and neighborhood safety are significant predictors of alcohol use among native-born youth, the results are not statistically significant for immigrant youth. Family connectedness is found to be influential positive predictor of alcohol use among adolescents (both immigrants and non-immigrants). An increase in family connectedness reduces the tendency for both immigrants (0R = 0.55, $p < .001$) and non-immigrant (0R = 0.60, $p < .001$) adolescents to use alcohol. Even though family involvement is not statistically significant in predicting alcohol use among immigrant the reverse is the case for native-born. That is, an increase in the level of family involvement among native-born Americans rather increases their likelihood of alcohol use (0R = 1.42, $p < .01$).

Table 20: Results of Logistic Regression Models Predicting Alcohol Consumption

	Immigrants			Non-immigrants		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Demographic Variables	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.22(0.15-0.31)***	0.21(0.15-0.31)***	0.24(0.17-0.35)***	0.28(0.25-0.32)***	0.28(0.25-0.31)***	0.30(0.26-0.34)***
Age 15–17	0.61(0.45-0.83)**	0.661(0.45-0.83)**	0.64(0.47-0.87)**	0.69(0.62-0.76)***	0.68(0.61-0.75)***	0.68(0.61-0.76)***
Age 18–21 (reference)						
Gender – Male	1.02(0.81-1.28)	0.98(0.78-1.24)	1.06(0.84-1.35)	1.04(0.96-1.12)	1.00(0.92-1.08)	1.05(0.97-1.14)
Female (reference)						
Black (White-reference)	0.54(0.41-0.72)***	0.61(0.45-0.82)**	0.59(0.44-0.80)**	0.61(0.55-0.67)***	0.70(0.63-0.78)***	0.69(0.62-0.77)***
Native	0.74(0.26-2.13)	0.72(0.24-2.13)	0.57(0.19-1.73)	1.42(1.03-1.98)*	1.45(1.05-2.02)*	1.45(1.04-2.02)*
Asian	0.55(0.33-0.92)*	0.60(0.35-1.01)	0.57(0.33-0.97)*	0.60(0.50-0.71)***	0.70(0.58-0.84)***	0.71(0.59-0.85)***
Hispanic	0.75(0.55-1.03)	0.88(0.60-1.30)	0.87(0.59-1.29)	0.91(0.81-1.01)	1.14(0.99-1.30)	1.12(0.98-1.29)
Other Race	6.91(0.86-55.79)	6.32(0.77-51.59)	5.69(0.69-46.92)	0.75(0.50-1.13)	0.83(0.55-1.25)	0.81(0.53-1.24)
Family Characteristics						
Family poverty		1.21(0.88-1.66)	1.24(0.90-1.71)		1.05(0.94-1.18)	1.03(0.92-1.16)
Family structure		1.03(0.80-1.32)	1.03(0.80-1.32)		0.99(0.90-1.08)	0.98(0.99-1.08)
Parental employment		1.35(0.88-2.08)	1.37(0.89-2.13)		1.12(0.96-1.31)	1.12(0.95-1.30)
Speak English at home		1.36(0.85-2.19)	1.30(0.80-2.10)		1.54(1.31-1.82)***	1.52(1.28-1.80)***
Religiosity		0.68(0.58-0.81)***	0.72(0.60-0.86)***		0.69(0.65-0.73)***	0.73(0.69-0.77)***
Family Social Capital						
Family connectedness			0.55(0.44-0.68)***			0.60(0.55-0.65)***
Family involvement			1.52(0.81-2.87)			1.42(1.13-1.79)**
Neighborhood Social Capital						
Know neighbors			1.15(0.86-1.54)			1.05(0.95-1.17)
Talk to neighbor			1.11(0.80-1.55)			1.37(1.23-1.54)***
Lookout for neighbors			0.88(0.66-1.18)			0.84(0.76-0.93)**
Safe neighborhood			1.23(0.84-1.81)			1.18(1.03-1.35)*
-2 Log-likelihood	1700.979	1677.803	1644.182	13552.206	13346.017	13127.028
Nagelkerke	0.110	0.131	0.162	0.075	0.100	0.127
Model χ^2	112.889***	136.065***	169.686***	595.917***	802.106***	1021.095***

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

Neighborhood social capital components such as talking to neighbors (0R = 1.37, $p < .001$) and the perception of neighborhood safety (0R = 1.18, $p < .05$) increase the likelihood of adolescents engaging in alcohol consumption. Interestingly, a sense of neighborliness and reciprocity (looking out for each other) minimized the likelihood of alcohol use (0R = 0.84, $p < .01$) among native-born adolescents. The results in each of the models indicate a χ^2 statistics in the table below indicates that the demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with alcohol consumption among adolescents (both immigrants and non-immigrants).

Adolescent Smoking Behavior

Again, using hierarchical regression analysis, three models are formulated to assess separately smoking behavior (ever smoked/currently smoke) among immigrant and non-immigrant adolescents. Clearly, the findings from these analyses as shown in Table 21 indicate that different factors predicted smoking behaviors among immigrants in comparison with non-immigrant adolescents. This is in addition to the fact that younger adolescent immigrants are less likely to smoke (0R = 0.39, $p < .001$) compared to older adolescents. Also, Black (0R = 0.58, $p < .001$) and Hispanic (0R = 0.63, $p < .05$) adolescent immigrants are less likely to engage in smoking behavior compared to White immigrants, as shown in Model 3.

Table 21: Results of Logistic Regression Models Predicting Smoking

	Immigrants			Non-immigrants		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Demographic Variables	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)	OR (95% C.I.)
Age 12–14	0.34(0.24-0.48)***	0.34(0.24-0.48)***	0.39(0.27-0.55)***	0.45(0.40-0.50)***	0.45(0.93-0.50)***	0.48(0.42-0.54)***
Age 15–17	0.80(0.60-1.07)	0.78(0.58-1.05)	0.83(0.62-1.13)	0.90(0.82-1.00)*	0.89(0.81-0.99)*	0.90(0.81-1.00)*
Age 18–21 (ref.)						
Gender – Male	0.93(0.74-1.16)	0.90(0.72-1.13)	0.96(0.76-1.21)	1.00(0.93-1.00)	0.97(0.90-1.06)	1.02(0.94-1.11)
Female (ref.)						
Black (White-ref.)	0.57(0.43-0.75)***	0.60(0.45-0.81)**	0.58(0.43-0.78)***	0.51(0.46-0.56)***	0.55(0.49-0.61)***	0.53(0.47-0.59)***
Native	0.91(0.32-2.59)	0.82(0.28-2.40)	0.65(0.21-1.98)	1.39(1.00-1.92)	1.38(0.99-1.92)	1.37(0.98-1.91)
Asian	0.72(0.43-1.18)	0.81(0.48-1.36)	0.77(0.45-1.30)	0.58(0.49-0.69)***	0.70(0.58-0.83)***	0.70(0.58-0.84)
Hispanic	0.54(0.40-0.73)***	0.66(0.46-0.97)*	0.63(0.43-0.93)*	0.79(0.70-0.88)***	0.99(0.86-1.13)	0.97(0.84-1.11)***
Other Race	1.10(0.31-3.90)	0.96(0.27-3.42)	0.82(0.22-2.99)	0.89(0.59-1.35)	0.99(0.65-1.50)	0.98(0.64-1.49)
Family Characteristics						
Family poverty		1.07(0.79-1.46)	1.07(0.78-1.48)		1.29(1.15-1.45)***	1.26(1.12-1.42)***
Family structure		1.05(0.83-1.34)	1.04(0.82-1.34)		0.92(0.84-1.00)	0.92(0.84-1.00)
Parental employment		0.76(0.50-1.17)	0.77(0.50-1.19)		0.94(0.80-1.09)	0.93(0.80-1.09)
Speak English at home		1.64(1.03-2.62)*	1.60(1.00-2.57)		1.72(1.46-2.02)***	1.72(1.45-2.03)***
Religiosity		0.77(0.65-0.92)**	0.83(0.70-0.99)*		0.72(0.68-0.76)***	0.76(0.72-0.81)***
Family Social Capital						
Family connectedness			0.54(0.44-0.67)***			0.60(0.56-0.65)***
Family involvement			1.05(0.56-1.95)			1.09(0.87-1.37)
Neighborhood Social Capital						
Know neighbors			1.15(0.86-1.52)			1.14(1.03-1.27)*
Talk to neighbor			1.20(0.87-1.66)			1.33(1.19-1.49)***
Lookout for neighbors			0.84(0.63-1.12)			0.83(0.75-0.92)***
Safe neighborhood			1.20(0.75-1.59)			1.02(0.89-1.16)
-2 Log-likelihood	1747.881	1732.145	1692.743	13670.636	13458.219	13237.110
Nagelkerke	0.069	0.084	0.121	0.054	0.080	0.107
Model χ^2	69.488***	85.225***	124.627***	422.766***	635.183***	856.292***

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

However, for family social capital, family connectedness (0R = 0.54, $p < .001$), and adolescent religiosity (0R = 0.83, $p < .05$) reduce the likelihood of smoking among immigrant adolescents and the relationships were statistically significant. On the contrary, family involvement is not statistically significant.

Gender, family poverty, family structure, and parental employment are not statistically significant in predicting immigrant smoking behavior. None of the neighborhood variables are also statistically significant. Similarly, the table reveals a relationship between age, race, family social capital, neighborhood social capital, and smoking among native-born adolescents. For example, adolescents who are between the ages of 12 and 14 (0R = 0.48, $p < .001$) and 15 and 17 (0R = 0.90, $p < .05$) are less likely to engage in smoking behavior compared to adolescents 18 and older.

Also, Blacks (0R = 0.53, $p < .001$) and Hispanics (0R = 0.97, $p < .001$) are less likely to smoke compared to Whites. Family poverty (0R = 1.26, $p < .001$) and English usage at home (0R = 1.72, $p < .001$) increase the odds of smoking among native-born adolescents.

Among the various dimensions of social capital, family connectedness (0R = 0.60, $p < .001$) and neighborhood sense of reciprocity (0R = 0.83, $p < .001$) reduce the likelihood of adolescent smoking. The results also show that for non-immigrant adolescents certain dimensions of neighborhood social capital such as knowing neighbors (0R = 1.14, $p < .05$) and talking (0R = 1.33, $p < .001$) to them increase the chances of adolescents smoking. Again, the χ^2 statistics in the table below indicates that the

demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with smoking.

Health Risk Behavior Index

A single index made up of all the health risk behaviors is constructed and regressed with independent variables that included demographic, individual and family characteristics and social capital in several hierarchical regression models. The demographic variables that predicted a combined health risk behavior are as indicated in all the models in Table 20 for immigrant and non-immigrant adolescents included ages 12–14 and 15–17. Compared to older adolescents (18–21 years), younger adolescents (12–17 years) are less likely to engage in risk behaviors.

However, whereas the 12–14 adolescents' age group is strongly related to the engagement in health risk behavior (i.e., composite risk behaviors such as smoking, alcohol use, sexual debut, and drug injection) for immigrants, that of ages 15–17 was moderately significantly related. On the other hand, both ages were significantly related to involvement in health risk behaviors for non-immigrants.

Racial groupings among immigrant adolescents were not significant; however, Blacks, Native Americans, and Asians were found to be statistically significantly related to health risk behaviors. Compared to White adolescents, Blacks and Asians are less likely to engage in multiple health risk behaviors. Native Americans are more likely to engage in risk behaviors compared to Whites.

Table 22: Results of OLS Regression Models Predicting Health Risk Behavior Index

	Immigrants			Non-immigrants		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Demographic Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Age 12–14	-0.395(0.169)***	-0.407(0.166)***	-0.352(0.165)***	-0.355(0.038)***	-0.351(0.037)***	-0.329(0.037)***
Age 15–17	-0.122(0.144)*	-0.137(0.141)*	-0.128(0.138)*	-0.138(0.031)***	-0.142(0.031)***	-0.139(0.030)***
Age 18–21 (ref.)						
Male – Female (ref.)	0.036(0.105)	0.033(0.104)	0.056(0.104)	0.015(0.025)	0.005(0.025)	0.020(0.025)*
Black	-0.075(0.136)	-0.059(0.138)	-0.059(0.136)	-0.084(0.032)***	-0.060(0.032)***	-0.065(0.032)***
Native	0.030(0.290)	0.023(0.283)	0.023(0.276)	0.033(0.098)***	0.032(0.096)***	0.032(0.094)***
Asian	-0.001(0.271)	0.026(0.269)	0.008(0.267)	-0.081(0.056)***	-0.053(0.056)***	-0.050(0.055)***
Hispanic	-0.008(0.148)	0.079(0.173)	0.072(0.169)	-0.046(0.035)***	0.008(0.042)	0.004(0.041)
Other Race	-0.025(0.469)	0.020(0.476)	0.018(0.465)	-0.018(0.129)	-0.012(0.127)	-0.013(0.124)
White (ref.)						
Family Characteristics						
Family poverty		0.068(0.150)	0.049(0.147)		0.053(0.035)***	0.046(0.034)***
Family structure		0.020(0.112)	0.028(0.109)		-0.009(0.027)	-0.010(0.026)
Parental employment		-0.021(0.203)	-0.016(0.198)		-0.013(0.047)	-0.013(0.046)
Speak English at home		0.164(0.217)**	0.146(0.212)**		0.100(0.051)***	0.097(0.050)***
Religiosity		-0.172(0.071)***	-0.148(0.070)***		-0.166(0.016)***	-0.137(0.016)***
Family Social Capital						
Family connectedness			-0.211(0.097)***			-0.173(0.022)***
Family involvement			-0.025(0.273)			0.023(0.068)*
Neighborhood Social Capital						
Know neighbors			-0.050(0.128)			0.032(0.031)**
Talk to neighbor			0.107(0.135)*			0.065(0.033)***
Lookout for neighbors			-0.007(0.126)			-0.043(0.030)***
Safe neighborhood			0.046(0.178)			0.003(0.040)
F statistics	23.31	16.96	15.90	139.28	122.44	108.51
Prob > F	.000	.000	.000	.000	.000	.000
R^2	0.125	0.145	0.189	0.098	0.134	0.167

*$p < .05$, **$p < .01$, ***$p < .001$. 95% Confidence Intervals in parentheses

In using only demographic characteristics of non-immigrants as in Model 1 of Table 22, Hispanics are also less likely to engage in risk behaviors compared to Whites. When individual and family socioeconomic variables, such as family poverty, family structure, parental employment, English language use at home, and adolescent religiosity are then added to the initial model (Model 2), the results suggest that for immigrant adolescents English language use and adolescent religiosity are important predictors of adolescent engagement in health risk behaviors. English language use at home is positively associated with risk behaviors; however immigrant adolescents' religiosity is negatively related to engagement in health risk behaviors. In the case of non-immigrant adolescents, family poverty, English language use, and adolescent religiosity are found to be statistically significant.

Also, family connectedness is significantly related to the combined health risk behaviors for both immigrant and non-immigrants. A unit increase in family connectedness is negatively associated with risk behaviors. However, family involvement is not a significant predictor of immigrant risk behavior, but is positively and statistically related to non-immigrant adolescent risk behaviors. With regard to neighborhood social capital, only the variable of talking to neighbors was found to be statistically positively related to risk behaviors. On the other hand, non-immigrant adolescents who report knowing neighbors, talking to neighbors, and with the perception that neighbors look out for each other are statistically related to health risk behaviors. With the exception of the perception of neighbors looking out for each other, which had a negative relationship with risk behaviors, the rest of the neighborhood social capital

variables are positively related to health risk behaviors. Overall, Model 3 accounted for about 19% of the variance regarding factors that predict immigrants' engagement in risk behaviors. Similarly, for non-immigrants Model 3 has a higher variance of about 17% compared to Models 1 and 2. Again, the *F*-statistics indicates that the demographic, individual and family socioeconomic characteristics and social capital variables taken together are significantly associated with health risk behaviors.

Chapter 5

DISCUSSION AND CONCLUSION

This study is one of few empirical studies that attempt to compare the health inequalities and health risk behaviors of adolescents in the United States (U.S.) classified as immigrants or non-immigrants and the important role of social capital. This investigation begins with the assumption that there are nativity differences in health and health risk behaviors of adolescents or that immigrant status makes a difference in adolescents' health and health risk behavior in the U.S.

This study, contrary to most other studies using adult samples (Antecol & Bedard, 2006; De Maio & Kemp, 2010; Jasso, Massey, Rosenzweig, & Smith, 2005; Newbolt, 2005; Singh & Siahpush, 2002), has found that adolescent immigrant status was not statistically associated with health or any of the health risk behaviors used such as alcohol consumption, smoking, and sexual debut. In fact, most of the immigrants reported good/excellent health (92%) similar to non-immigrant adolescents of about 93%. Thus, the lack of variability may in part explain some of the non-significant results found in this study. For example, in the case of health risk behaviors there was limited number of immigrants who reported having engaged in any of the health risk behaviors, making it impossible to observe variability in their response.

Age, race, and gender are also major predictors of adolescent health and health risk behaviors. Perhaps not surprisingly, adolescents' engagement in health risk behaviors is negatively associated with age, and gender was not found to be significant. Younger respondents were less likely to engage in risk behaviors. Racial minorities such

as Black, Hispanic, and Native American adolescents have worse health outcomes compared to Whites, which is an indication of racial disparity in health. Contrary to studies that involve adults, in this study, Hispanic adolescents were found to not have better health outcomes compared to White adolescents. This was particularly true for non-immigrants.

Consistent with Hypotheses 1 and 2, some aspects of family and neighborhood social capital have significant association with better health outcomes and lower health risk behaviors for both immigrants and non-immigrant adolescents. It is evident from the various analyses, that social capital in the form of family connectedness and involvement (parental time spent with adolescent on social activities) and neighborhood social capital contribute in one way or another to health and health risk behaviors. However, it is important to note that the results of such a contributory role of social capital are somehow mixed. With the exception of drug injection or use as a risk behavior, social capital is the most important predictor of health and health risk behaviors. Specific dimensions of social capital contribute differently to adolescent development (i.e., positively or negatively). More specifically, family connectedness is positively associated with adolescent health. That is, they both help to improve adolescent health. Family involvement is only significantly associated with health, independent of all other factors. However, when factors such as adolescent demographic and family characteristics are included in the model, then the impact on health becomes less significant. With regard to health risk behaviors, the results indicate that family connectedness reduces drug use, alcohol consumption, and sexual activity among adolescents. Again, similar results were

found when the health risk behaviors were combined into a single index. In other words, family connectedness was negatively associated with engagement in multiple risk behaviors. It is clear that the various components of family connectedness may have a protective effect on adolescents. In a nutshell, an improvement in family connectedness may be instrumental in facilitating adolescent health. This current study emphasizes the importance of social environmental factors or neighborhood social capital and parental connectedness, as they play a unique role in influencing adolescent health and health risk behaviors in general.

However, a major surprising aspect of the results is the positive association between family involvement and adolescent sexual behaviors. This is contrary to the assumption that family involvement would minimize adolescent sexual risk behaviors. A plausible explanation could be that family members may expose adolescents to environments that facilitate engagement in risk behaviors. This could increase the chances of the child associating with negative influences within such an environment. Also, family involvement may occur after the adolescent has already engaged in risky behaviors and may also have resulted in a negative consequence before the parents intercede to rectify the situation to assist the adolescent to refrain from such risky behaviors. Family connectedness, on the other hand, deals with quality of parent-child relationships and the adolescents' attitudes about the relationship with regard to communication, care, and love from the parents. Family connectedness, on the other hand, is a protective factor of sexual activity among adolescents depicting positive relationship as demonstrated in other studies (Coley, Votruba-Drzl, & Schindler, 2009).

The mixed findings on family social capital give credence to the complexity of the interplay between parenting and adolescent sexual risk behavior and health.

Adolescents' relationships with people in the community influence the risk behaviors they engage in. Among neighborhood social capital variables, adolescent knowledge of most of the people in the neighborhood is associated with a variety of health risk behaviors, including smoking, initiation of sexual intercourse, and the combined health risk behaviors examined in this investigation. The relationship between knowing neighbors and the initiation of sexual intercourse is stronger but is marginally significant for smoking behavior. However, knowing most neighbors is not associated with improvement in adolescent health. The results indicate that, adolescents' propensity to engage in risk behaviors (i.e., smoking and sexual intercourse) increase with knowing more neighbors. This may be due in part to the concentration in the neighborhood of adolescents with nothing to do or unoccupied or having a lack of adult supervision and monitoring. Peers exert influence on each other in a way that contribute to negative outcomes such as willingness to engage in sexual activity, smoking, illegal drug use, and/or alcohol use among others evidenced in the literature (Adamczyk & Palmer, 2008; Cook, Herman, Phillips, & Settersten, 2002; Deković, 1999; Field, Diego, & Sanders, 2002).

Surprisingly, talking to neighbors was found to positively impact adolescent health, but had a negative effect on health risk behaviors. That is, talking to neighbors seems to be particularly important in improving adolescent health. A plausible explanation for this finding is that talking to neighbors serves an emotional and

psychological purpose, which is may be good for health. Alternatively, neighbors may serve as a source of health promoting information. With regard to health risk behavior, this investigation suggests that adolescent talking to neighbors is strongly associated with smoking, alcohol consumption, and sexual activity. Similar to previous results, these health risk behaviors are more frequent for adolescents who have communication with members of their neighborhood compared with those who do not talk to neighbors. In contrast, the effect of talking to neighbors is negative on health risk behavior. Consequently, it increases the likelihood of smoking, sexual activity, and alcohol use among adolescents. Again, the perception of neighbors looking out for other neighbors is found to have a positive association with health and health risk behaviors. It marginally improves adolescent health, while at the same time moderately to strongly minimizes adolescent tendency to engage in smoking, sexual activity, and alcohol use, serving as a protective factor in the neighborhood. In this case, neighbors looking out for each other, probably facilitates a sense of community and reciprocity, which may end up constituting an informal social control and community supervisory mechanism for adolescents thereby preventing them from engaging in the specific risk behaviors of smoking, sexual activity, and alcohol use.

An important correlate of health and health risk behaviors found in this study is neighborhood safety. Compared to adolescents who perceived their neighborhood to be unsafe, those who perceived their neighborhood to be safe have better health. This finding is also consistent with other studies (Macintyre & Ellaway, 2000), which emphasize the importance of neighborhood safety on the health of not only adults but

also adolescents. From this empirical investigation neighborhood social capital, which is associated with social interaction and relationships among community members, is a function of neighborhood safety seems to serve an important health purpose. Interestingly, whereas neighborhood safety reduces sexual activity and injection of illegal drugs, on the other hand, it increases smoking and alcohol consumption among adolescents.

Undoubtedly, the relevance of understanding childhood and adolescent health stems from the principles of the "long arm of childhood health" on adult health (Haas, 2008, 2007; Hayward & Gorman, 2004), resulting from early life experiences and socio-economic status. As a result, disadvantaged socioeconomic status and poor health during childhood and adolescence, which could impede developmental process, also have potentially detrimental health and socioeconomic effects in later life or adulthood. As a result of this cumulative disadvantage from childhood and the future effect of health inequalities, it is necessary to create public policy that is geared toward understanding the health needs of children and adolescents and determine the best ways to intervene in dealing with health disparities among other factors at an earlier age. By doing so, there is the potential to decrease eventual negative consequence of adolescent health and health risk behaviors. More importantly, it calls for a closer look at health disparities based on gender, race, and age, among others.

Family socioeconomic factors constitute one of the most important factors that impact health and health risk behavior of adolescents. Adolescents in families receiving public assistance (family poverty) were more likely to have poor health compared to

those who did not receive any public assistance. In this study, however, the relationship between family poverty and health is marginally significant. This is based on hypothesis 3. However, this study suggests that family poverty increases adolescents' chances of engaging in smoking behavior, illegal drug use, and sexual activity, but not necessarily alcohol consumption. This study does not confirm an association between two-parent families and health and health risk behaviors. Similarly, adolescents living in families that receive public assistance have the likelihood of being involved in more risky behaviors, as indicated in the analysis using the composite health behavior. The study also found that when either of the parents work for pay, the reported health of the adolescent is likely to be better to excellent compared to adolescents whose parents do not work. One could speculate from this finding that individuals who are employed are more likely to have health insurance and are therefore able to afford health insurance for other members of the household including the children. In addition, parental employment is connected to household financial strain or family socioeconomic status, stress, and conflict (Harland, Reijneveld, Brugman, Verloove-Vanhorick, & Verhulst, 2002; Sleskova et al., 2006). Consequently, parents are less likely to afford proper maternal care and other healthcare needs for their children. This may not necessarily be the case for parents who are not working for pay. Also, previous empirical studies suggest that childhood poverty has long term health effects in later adult life. Therefore, since our study suggests that family poverty is related to health and health risk behaviors, it is useful to pay attention to this important factor to minimize future bad health.

The findings also demonstrate a strong positive correlation between the use of English as the primary language at home and health risk behaviors such as smoking, drug use, alcohol consumption and sexual activity among adolescents, compared to the predominant use of other languages besides English at home. As stated earlier English language proficiency is considered as a measure of acculturation and the extent to which a culture influences the behavior of adolescents. Therefore, English language proficiency can be speculated to increase the possibility of adolescents' ability to adopt behaviors including negative behaviors such as smoking, alcohol use, sexual debut and engagement in illegal drugs. However, the finding from this study suggests that English as the primary language used at home is not a predictor of adolescent health. Also, religion was found to be significant in minimizing some health risk behaviors while improving adolescent health. This result is consistent with the findings from other studies (Adamczyk & Palmer, 2008; Piko & Fitzpatrick, 2004; Sinha, Cnaan, and Gelles, 2007) that suggest a strong negative relationship between adolescent religiosity and health risk behaviors such as alcohol consumption, smoking, and sexual activity. Religious adherence serves as a protective factor for adolescents in the developmental processes, as demonstrated in this study.

For hypothesis 4, there were differences based on nativity. When considering the results reported on the health and health risk behaviors of immigrants and non-immigrants, strong differences in the factors that predict these outcomes for the two groups as presented in Tables 18–22. Among immigrants, however, Black adolescents have worse health compared to their European-American counterparts. The results also

indicate that, overall, immigrants and non-immigrant boys are more likely to be healthier than girls. Age is not significantly related to health in this study. Results from the multivariate analyses suggest that sexual initiation among youth is more prevalent among individuals who are 18–21 years old compared to younger adolescents. Also, noticeable from the results is gender differences in the initiation of sexual intercourse. In this study, boys are more likely to initiate sexual activity compared to girls. With regard to race, Black, Native, and Hispanic adolescents are more likely to engage in sexual behavior than their White counterparts. However, Asian adolescents are less likely to engage in sexual risk behaviors compared to Whites. It is important to note that the use of "ever had sex" question is a quite limited measure. Perhaps "ever had unprotected sex' would be a better measure for risky sexual behavior.

In a nutshell, considering that fewer studies have investigated multiple dimensions of social capital such as family and neighborhood social capital, the results of this study not only complement but also extend previous studies about the social determinants of adolescent health and health risk behaviors. The study confirms the relevance of social capital in the health and health risk behaviors of adolescent immigrants and non-immigrants. It also demonstrates that the health and health risk behaviors of immigrants and non-immigrants groups are impacted differently by various factors. Family social capital, for example, impacts adolescent immigrants' health more than the various dimensions of neighborhood social capital, whereas the two dimensions of social capital have some relevance for native-born adolescents.

Strengths and Limitations of the Study

This study has strengths and limitations that should be noted. There are benefits to using a large nationally representative dataset on adolescent respondents such as Add Health. It enhances the ability to generalize the results and helps to make national or federal policy recommendations and changes possible. Another major strength of the study is that data collection procedures and the research design have been carefully and rigorously designed, resulting in a high degree of data accuracy and the possibility of identifying and constructing indices that are a reflection of the construct at hand. For example, the concepts of family and neighborhood social capital have much relevance and their construction is made possible due to the availability of data for this empirical inquiry. Clearly, the sample size and the representativeness of the data make it possible to generalize results to a broader national population of adolescents, including immigrants and various ethnic and racial groups in the United States.

The use of neighborhood social capital speaks directly to the person-in-environment perspective of social work and its impact on health and health risk behaviors of individual. It illustrates the various influences from within the environment and their impact on adolescents' health and overall development. This is beyond the biomedical model of diagnosing health and resorting to medical and technical treatment. By using social capital, we are able to explore the social interactions within the family and the neighborhood and their potential effects on health disparities and health behaviors. Evidently, the concept of social capital has proven to be useful for health as demonstrated in this and other studies so far. It is equally important to further investigate whether or

not young adults can benefit from social capital and whether such benefits, if any, are different among immigrants and non-immigrants. With the limited research on social capital and health risk behaviors, this study adds to the empirical literature in providing a better understanding of the potentialities of social capital, especially as it relates to adolescents and young immigrants in particular, in American communities.

That said, this study has some limitations. This current study, which uses a single wave in a cross-sectional investigation, can only establish relationships among social capital, health, and health risk behaviors but not causality. From this study, we are only able to demonstrate differences in the impact of social capital, health, and health risk behaviors and other major variables in the study that may exist between generations of immigrants and native-born Americans and more importantly between immigrant and non-immigrant adolescents. Finally, a longitudinal study is recommended to demonstrate the trajectory of health and health risk behaviors over time and the role social capital plays in facilitating changes over time which is not possible in this current study.

Even though the use of secondary data is beneficial, a likely challenge is that data collected for one purpose by a different researcher or group of researchers may not necessarily fit well with or be appropriate in answering specific research questions in a secondary analysis. The construction of social capital variables such as family connectedness and involvement as well as neighborhood social capital may need to be better refined. This adds to the complexities in the conceptualization and operationalization of social capital for empirical research. Also, connected to the data is the fact that the current study uses the 1994/1995 Add Health data which could be

problematic as far interpretation of the findings and possible recommendation. It is important to caution that things may have changed in the last twenty or so years with respect to adolescent health and health risk behavior issues. Since the study uses 1990s dataset some of disadvantages since some of the findings may not necessarily reflect what is happening today. For example, there are some positive changes in the lives of adolescents over years regarding reduction in their involvement in some risky behaviors such as drunk driving and having unprotected sex (Center for Disease Control and Prevention, 2006) and the general burden of disease has shifted in favor of children compared to adolescents (Viner, Coffey, Mathers, et al, 2011). Adolescents continue to engage in risky behaviors. Smoking among adolescents for example increased between 1991 and 1997 but reduced during 1997-2011, it remained stable between 2009 and 2011 (Center for Disease Control and Prevention, 2011). This was similar to sexual intercourse among adolescents. Even though there was a significant reduction in sexual activities among adolescents between 1991 and 2001, no change was observed between 2001 and 2011 and between 2009 and 2011.

The use of subjective, self-reported measures in data collection has become commonplace in social science and in behavioral research in particular. Inasmuch as the use of such measures is extremely beneficial in facilitating our ability to engage in social science research, its use could pose potential challenges. The Add Health data used in this study has similar challenges. Some of the main issues regarding the use of self-reported data are the introspective ability of the respondent, reliance on the honesty of the respondent, respondent understanding of questions, response bias, social desirability etc.

These challenges may affect the validity and reliability of the measures collected. It is preferable to have objective measures of information related to adolescents.

Also, the lack of a large sample size for each of the ethnic or immigrant groups makes it impossible to observe the differences in health and health risk behaviors that exist among these different immigrant groups (i.e., based on country of origin). Therefore, it is impossible to speculate that different immigrant groups, for example, may have different health behaviors and health outcomes. This study is not able to unearth such differences, if any. As a result, lumping immigrant adolescents from different regions of the world or nationalities into a single category of immigrant group does not tell the entire story of health risk behaviors and health disparities that may exist among the different immigrant groups.

Another major limitation of the study is associated with the dichotomization of outcome variable, health. Even though health, a dependent variable, was initially in the form of a continuous and rank ordered variable, with response categories as excellent, very good, good, fair, and poor, it was dichotomized to allow for the use of logistic regression. However, this approach presupposes equivalence of responses which can lead to losing vital measurement information (MacCallum, Zhang, Preacher, & Rucker, 2002). For example, the assumption that responses “very good health” and “good health” are equivalent is problematic. Scholars argue that dichotomization can reduce the strength of association between variables as a result of loss of statistical power. Similarly, dichotomization is said to diminish the possibility of detecting variability within groups (Altman & Royston, 2006; Cohen, 1983).

Last but not least, the construction of the index and its association with immigrants and non-immigrants adolescents is challenging. This is because there are cultural differences between immigrants and non-immigrants. For example, the elements in the construct, family involvement such as parent-child participation in sport, shopping, movie, etc., may not necessarily be a true reflection of the activities that immigrants may engage in with their parents. As a result, even though the construct may be applicable and useful for non-immigrants, the same cannot be said about immigrants.

Implications for Policy, Practice, and Research

Despite the limitations highlighted above, the present study has a number of findings relevant for illuminating our general understanding of the adolescent–social environment nexus and for shaping the development of policies and program interventions to minimize health disadvantage and adolescents' engagement in health risky behaviors. Empirical studies suggest that childhood health plays a major role in health and well-being in later years. That is to say, children's' health challenges today could serve as a source of health disadvantage in adulthood. Therefore, to ensure a generation of healthy individuals, children's health must be a priority to policy makers and practitioners alike in ensuring future productive citizenry. More importantly, social workers in public health must be concerned about preventative interventions to promote public health. Indeed, adolescent place of birth (immigrants or U.S. citizens) should not be a criterion in determining who is attended to with respect to health and health behavior policies and programmatic interventions. However, the disproportionality of the burden

of disease among racial and ethnic minority groups requires specific health policy prescriptions, health education and general disease prevention programs that incorporate a comprehensive strategy that is culturally specific, family-oriented, and neighborhood or place-based. Understanding the factors that significantly impact the health outcomes and health risk behaviors especially among adolescents are crucial for the development of health promotional policies/strategies and risk prevention or intervention strategies to counteract the negative health behaviors that have the potential to lead to the decline of the health of individuals, families, and communities. The embeddedness of health and health risk behaviors in social interactions and networks is pertinent to social work and has important implications for public health policy, practice, and research.

Policy: Inasmuch as there is nonequivalence in the distribution of health among the adolescent population, there are differences in the factors that promote or jeopardize their adolescents' health and their engagement in risky behaviors. Clearly, this has important policy implications for the future health of young Americans. For example, public policy restrictions that hinder the ability of racial and ethnic minority groups, especially immigrants, to access health care and social services play a major role not only in creating health disparities but also in widening the already existing differences. There are many complexities and uncertainties associated with some of the current policies intended to support low income children and families. For instance, the reauthorization of federal policies such as State Children's Health Insurance Program (CHIP) to provide medical services for low-income children leaves such policies at the mercy of politicians and the majority in Congress. A possible alternative to this arrangement could entail the

Department of Human Services giving the States the authority to re-valuate specific programs and make policy changes accordingly to the benefit of children. Unfortunately, states can also restrict immigrant children and pregnant women who have been in the country for less than five years, similar to Medicaid eligibility. The situation for program eligibility is even worse with undocumented immigrants. Also, as local, state, and federal governments continue to tighten their financial belt with cuts in programs and services, they make it virtually impossible for families to pay for the exorbitant price of health care in addition to the many restrictions that are in place which disallow most immigrants to have access to health care.

Unfortunately, the budget crisis limits the ability of local and state governments that hitherto offered programs to immigrants without strict adherence to certain federal requirements may now choose to impose restrictions, making it virtually impossible for low income and undocumented immigrant families to access healthcare services. Besides, states that are not "immigrant-friendly" do not even offer health care services in the first place. The Personal Responsibility and Work Opportunity Act (PRWORA) should be amended to have a federal mandate that requires states to make health services available to all low income individuals irrespective of immigrant status or duration of stay in the U.S. to reduce health disparities among the population. Health concerns affect everyone, and therefore it is important that government policies do not deliberately discriminate and marginalize one group. As a society, we have to realize that today's immigrant could become tomorrow's citizen, and with cumulative health disadvantages resulting from higher health care costs and a lack of insurance it may be difficult to deal

with health disparities created by governmental actions or inactions. In conjunction with PRWORA is immigration policy at the federal level. Undocumented immigrants and other immigrants who do not have green cards or citizenship may be hesitant to enroll for public assistance including health care for low income families for fear of disqualification from obtaining their permanent residence/green cards or future citizenship or even deportation. Again, this immigration law requirement serves as an enrollment deterrent for immigrants who may pursue changing their status. A policy change in this regard will help to avoid the cumulative health disadvantage likely to develop among low income immigrants and their children and promote better health and well-being.

The disproportionality of poverty on children has an alarming consequence for the future health of the population. Therefore, improving services for and conditions of poor families is vital for counteracting the harmful effect of poor socio-economic status on health and health risk behaviors. As expected, this study has unearthed health behaviors and health differentials between and within groups (i.e., racial and ethnic groups) requiring that drastic public health policy measures are taken to bridge or reduce health inequalities among groups. This is consistent with previous research that has found health disparities among racial or minority groups in the U.S. using different variables (Jackson, 2003). Unfortunately, many members of our society are not even aware of the existence of such disparities among the population (Benz, Espinosa, Welsh, & Fontes, 2011), let alone be inclined to take appropriate action toward resolving the problem.

Though the recent enactment of the Affordable Care Act of 2010 is a welcome start in reducing the number of uninsured, there are still a large number of poor

individuals and families without health insurance coverage. Provisions are made in the Act to increase access to healthcare for many insured low income Americans and children through subsidies, as well as individuals with preexisting health conditions, but there are still restrictions with regard to undocumented immigrants including children. Consequently, even after the implementation of the Patient Protection and Affordable Health Care Act (ACA, P.L. 111-148), which mandates health care coverage, a segment of the immigrant population will only be able to meet their health care needs through emergency care. The question that remains unanswered is: Why do we deny people preventative care only to pay for their emergency needs, which are much more expensive? That is, unfortunately the policy does not guarantee access to health care for all. One way to promote health of the population is through universal healthcare for all children irrespective of immigration status or socioeconomic status. This would give everyone a similar start at health care provision rather than a medical system that is only accessible to those who can afford it and which alienates low-income individuals and families. A fair and just society is impossible when there is prolonged unequal distribution of health among the population based on race, socio-economic status, national origin or gender. For immigrants, the situation becomes complex since their health outcomes are intermingled not only with health insurance coverage, poverty, social isolation, and welfare among others, but also with the prevailing immigration policy of the host country. Therefore, any effort at influencing government policy should be considered in tandem with these issues. Policy decisions must also consider the role of families and communities as a source of social capital in ways to maximize the unique

resources that may be beneficial in promoting better health and reducing risk behaviors among adolescents. For example, the U.S., recognizing the importance of family as source of social capital for immigrants, developed the family reunification law in 1965, which subsequently resulted in a larger percentage of visas to immigrant families. However, family reunification has seen a major decline since 1990, to the detriment of many immigrant families (Jasso & Rosenzweig, 1995) and with potential health consequences. Family social support is essential for immigrants. Immigration policies that prevent family members from reuniting can facilitate isolation and social exclusion among immigrants.

Universal health coverage may be the way forward for the U.S. This is especially important since the U.S. spends more on healthcare than any developed nation in the world. However, this higher expenditure does not translate into better health (Cutler, Rosen, & Vijan, 2006; Swinburn & Davis, 2013). Universal health insurance has the potential of reducing deductibles, co-pays, and premiums for individuals and families, due to the large pool of people who will be insured, including the health care needs of immigrants.

Practice: Changing health and health risk behaviors through effective intervention is a vital component of social work public health, and therefore understanding the full spectrum of influences is important. From a practice perspective, one can argue that programs and services for the promotion of health and reduction of risk behaviors among adolescents have to be directed at population groups with the most need, while at the same time they need to reinforce the protective factors that contribute

to the betterment of their health conditions. More importantly, family and neighborhood social capital should be maximized in the process of the development of health education and promotion programs, and interventions for adolescent behavioral change. The findings from this investigation suggest that family connectedness is vital in predicting health and risk behaviors among adolescents. Therefore, health promotional activities and interventions should incorporate parents to bolster parental or family ties and possibly reduce adolescent involvement in risk behaviors. In doing so, parents or family members could serve as protective factors to minimize negative health behaviors of adolescent. Equally important is addressing interpersonal factors within neighborhoods known to influence risky behaviors such as sexual activity, alcohol consumption, smoking, and drug injection among adolescents and health outcomes need to be addressed. Since peers and other environmental factors have a tendency to influence adolescents about healthy choices and risky behaviors, there is need for parents (and others) to provide supervision and monitoring of adolescent interactions in the neighborhood and to develop effective communication and bonding between parents and adolescents. For example, parents with children who participate in civic or community activities should show interest in such activities by either visiting or initiating communication with group or program leaders about the performance or participation of their children.

In summary, any approach intended to modify adolescent behavior through social interventions and programs should take into consideration of the social environment. This is in consonance with the ecological model, which presupposes that health

disparities can be attributed not only to biological and genetic functioning and predispositions but also to behavior and the environment, thereby impacting the health of individuals, families, and communities. Consequently, development of community-based interventions or place-based approaches to program development is vital for specific health promotional activities. Tapping into the social capital of families and neighborhoods can contribute to minimizing the health risk behaviors, thereby improving health outcomes, health service utilization, and reducing the incidence of disease and illness. From this study, family involvement seems to either have a negative impact on health risk behavior or no impact at all. It is possible that such negative association is suggestive of parental involvement after the adolescent has encountered challenges or exhibited problem behaviors. Consequently, the timing of parents interceding may be crucial. Parental involvement in the form of supervision, and monitoring may be vital at the early stages of engagement in risk behaviors before they become difficult to deal with.

Even though this study did not find that immigrant status made any difference with regard to health and health risk behaviors, it is important to highlight that any public health educational activities on diseases and health should also be intensified in immigrant communities to promote behavior change for better overall health outcomes among adolescents. Such educational activities should target health improvement and reduce the rate of health risk behaviors such as smoking, alcohol consumption, drug and substance abuse, poor nutrition and exercise among others. Public health campaigns against health risk behaviors have been demonstrated to work (Farrelly et al., 2002;

Schroeder, 2004, 2005). Public health education should help improve the flow of and access to information and resources. These efforts must be grounded in cultural competency, especially for adolescent immigrants to avoid cross-cultural miscommunication. There should also be programs and services to improve the socio-economic conditions of families.

***Research*:** Unique to this research is the composition of a family social capital measure using mother and father connectedness and involvement. Consistent with previous studies which explore parental involvement and adolescent developmental processes (Bronstein, Ginsburg, & Herrera, 2005; Hill et al., 2004), this study demonstrates that parental involvement has mixed impacts on adolescent health and health risk behaviors. The current study suggests that parental involvement is positively associated with adolescent health and alcohol consumption only when social capital variables are considered and all other factors are controlled. When other variables are included in the model, an increase in parental involvement leads to better health outcomes and the likelihood of adolescent alcohol use and sexual debut. However, the effect diminishes when the analyses are done separately with immigrant and non-immigrant adolescent groups. Nevertheless, family connectedness shows a consistent result of having a positive effect on health and reducing health risk behaviors. An important aspect of the analyses that has research implications is the use of either mother or father involvement and connectedness as constituting family social capital. It is not clear from the analyses exactly whose support and participation among the parents is making an impact in adolescent life. Future research should clearly distinguish or

separate out the potential effects of activities and connectedness of each parent (mother and father) on adolescent development processes and on health and health risk behavior. Thus, future studies in this area should look at the independent effect of father involvement and connectedness and mother involvement and connectedness on adolescent developmental outcomes. Another issue for future study is not only individual parent involvement in the life of the child but also the joint participation of the parents (family culture or cohesiveness) in activities with the adolescent and the potential health and health risk behavior consequences. Other factors that may have an effect on health and engagement in risky behaviors should also be explored.

Another important implication of this study for future research is related to the use of neighborhood social capital. Compared to most studies, this study uses neighborhood social capital that is constructed based on the perception of individual respondents. In the past, most community measures or indicators are aggregates of census or neighborhood-level data. The results from this investigation demonstrate the importance of a person's perceptions of neighborhood level relationship on health and health risk behaviors. Further research should explore the objective and subjective components neighborhood social capital.

This study is cross-sectional and is not able to show the trajectory of health and health risk behaviors resulting from the long term impact of social capital from childhood to later life. As a result a longitudinal study is needed to demonstrate the connection between short-term and long-term social capital and more specifically, to determine

differences if any in social capital acquired during childhood and that acquired during adulthood.

Different variables must be explored regarding their moderation and mediation effect on the health outcomes and health risk behaviors of both immigrant and non-immigrant adolescents. This is especially important since similar studies of adolescents health support the "immigrant paradox" which suggest that immigrants have more favorable health and are less likely to engage in risky behaviors compared to their native-born American counterparts (Antecol & Bedard, 2006; De Maio & Kemp, 2010; Jasso, Massey, Rosenzweig, & Smith, 2005; Newbolt, 2005; Singh & Siahpush, 2002). These studies suggest that immigrant status is relevant with regard to health. Information about these relationships can be used to inform the development of health promotion and risk prevention programs and policies.

CONCLUSION

Despite the growing attention and studies that have burgeoned over the last two decades on the relationship between social capital, health risk behaviors, and health, there are still gaps in the literature. A major limitation is that there is little empirical work comparing different types of social connections to health and health risk behaviors and particularly, how parents or family and community-level support differentially affect health (Wen, Cagney, & Christakis, 2005). Most studies have not considered simultaneously family and neighborhood resources in the conceptualization of social capital. Understanding the importance of the neighborhood social environment and its contribution to positive youth development is vital as we continue to explore the link between people and their environment. Most previous studies of social capital and health and health risk behaviors are limited to a particular racial or ethnic group (McKenzie, Whitley, & Weich, 2002). In addition, the limited application of social capital theory to immigrant groups leaves a gap in the literature of how immigrants access the different dimensions of social capital and its consequences on their health and well-being. This makes it almost impossible to compare differences that may exist among these groups.

This study was conducted using a nationally representative sample to examine how various dimensions of social capital such as family and neighborhood social capital, adolescent demographic, individual and family socio-economic characteristics predict the health risk behaviors and health on adolescent immigrants and non-immigrants. The finding that social capital influences adolescent health and health risk behaviors is important to the development of programs to effectively intervene at points in adolescent

developmental stages to prevent the onset of health challenges. Interventions can be developed and implemented for identifying and preventing the risk of engaging in smoking, initiating sexual activities, alcohol consumption, and drug use. In this study, findings on the various dimensions of neighborhood social capital were mixed with regard to their relationships with health and health risk behaviors among adolescents. For example, whereas adolescents' perceptions of neighbors as looking out for each other and of neighborhoods as safe are health protectors, knowing and talking to neighbors has a negative impact on sexual activity, smoking, and alcohol consumption. Adolescents are more likely to engage in risk behaviors such as sexual activity, smoking, and alcohol use with others they know and talk to in the neighborhood. This highlights the complexity of social interaction and relationships through activities in the neighborhoods and the possibility of social interaction resulting in contradictory outcomes. Inasmuch as adolescent engagement in collective activities in neighborhoods or communities may serve an important purpose by increasing adolescent network ties and social capital, not all such social interactions may necessarily be helpful to them. Consequently, parents need to be aware of the neighborhood activities that their children engage in and the kinds of social interactions or friends they make in the process. Likewise, leaders of community organizations or groups for youth should not only be aware about the potential benefits of social capital or the protective role of these groups, but also be mindful of the potential sources of negative influences on adolescents either through activities of the organization or other individuals in the group.

The results from the study suggest that social capital is an important predictor of adolescent health risk behaviors such as sexual activity, alcohol use, smoking, and drug injection. If so, developing programs that support parents, families and neighborhoods to reduce these risky adolescent behaviors is relevant. We also have to be cautious to not assume that social capital of any form is useful to adolescents' developmental processes. Family connectedness appears vital to adolescents' health and minimizes alcohol consumption, smoking, sexual debut, and drug use. Thus, ensuring quality parent-adolescent relationships and communication is recommended. However, there is an inverse relationship between family involvement and risk behaviors such as alcohol use and sexual activity. This needs to be further explored. Likewise, it was found that when the language spoken at home was English, poverty (using receipt of welfare as proxy for poverty), and adolescent religiosity strongly predicted smoking behavior, alcohol consumption, and initiation of sexual activity. This needs further exploration.

It is incumbent upon researchers, policy makers, practitioners to continue the call for early intervention and preventive measures that promote better health and help counteract the negative pathways to adolescent engagement in risky behaviors such as smoking, alcohol consumption, sexual activity, and drug injection. In general, effective action or preventative measures against childhood health problems and risk behaviors can potentially curtail the ravages of smoking, alcohol use, and drug injection that can lead to manifold other problems such as unsafe sex, rape, teenage pregnancy, lung diseases, mental illness, automobile fatalities, suicide, death among others, and above all, unproductive future life as adults.

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Appendix A: RELIABILITY ESTIMATE: FAMILY POVERTY

Case Processing Summary

		N	%
Cases	Valid	17122	82.5
	Excluded[a]	3623	17.5
	Total	20745	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.716	.680	5

Item Statistics

	Mean	Std. Deviation	N
Receive AFDC-PQ	.08	.267	17122
Receive Food Stamps	.13	.334	17122
Receive unemployment	.05	.210	17122
Receive Housing Subsidy	.04	.188	17122
Receiving Public Assistance	.09	.292	17122

Inter-Item Correlation Matrix

	Receive AFDC	Receive Food Stamps	Receive unemployment	Receiving Housing Subsidy	Receiving Public Assistance
Receive AFDC	1.000	.629	.010	.271	.681
Receive Food Stamps	.629	1.000	.012	.333	.720
Receive unemployment	.010	.012	1.000	.007	.000
Receive Housing Subsidy	.271	.333	.007	1.000	.319
Receiving Public Assistance	.681	.720	.000	.319	1.000

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.076	.037	.128	.091	3.463	.001	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Receive AFDC	.30	.496	.656	.504	.591
Receive Food Stamps	.25	.407	.696	.564	.559
Receive unemployment	.34	.767	.009	.000	.805
Receiving Housing Subsidy	.35	.674	.339	.125	.716
Receiving Public Assistance	.29	.447	.722	.608	.551

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
.38	.814	.902	5

Appendix B: RELIABILITY ESTIMATE: FAMILY CONNECTEDNESS

Case Processing Summary

		N	%
Cases	Valid	13545	65.3
	Excluded[a]	7200	34.7
	Total	20745	100.0

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	.881	12

Item Statistics

	Mean	SD	N
Mom is warm and loving	4.38	.784	13545
Mom encourages independence	4.16	.876	13545
Mom discusses ethics	4.10	.902	13545
Mom-Good communication	4.05	1.002	13545
Mom-Good relationship	4.31	.867	13545
Dad warm and loving	4.12	.926	13545
Dad-Good communication	3.92	1.052	13545
Dad-Good relationship	4.09	.978	13545
Close to Mom	4.52	.792	13545
Mom-How much does she care	4.86	.469	13545
Close to Dad	4.24	.975	13545
Dad-How much does he care	4.73	.644	13545

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Max/ Min	Variance	N of Items
Item Means	4.290	3.917	4.861	.944	1.241	.082	12
Item Variances	.757	.220	1.107	.887	5.029	.065	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Mom is warm and loving	47.10	40.717	.591	.476	.871
Mom encourages independence	47.32	41.829	.410	.253	.881
Mom discusses ethics	47.38	40.205	.545	.374	.874
Mom –Good communication	47.43	38.227	.647	.656	.867
Mom-Good relationship	47.17	39.066	.685	.695	.865
Dad is warm and loving	47.36	38.845	.653	.603	.867
Dad-Good communication	47.56	38.002	.627	.721	.869
Dad-Good relationship	47.39	38.185	.671	.754	.866
Close to Mom	46.96	40.673	.589	.577	.871
Mom-How much does she care	46.62	44.421	.416	.409	.880
Close to Dad	47.24	38.640	.631	.650	.868
Dad-How much does he care	46.75	42.726	.488	.503	.877

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
51.48	47.245	6.874	12

Appendix C: RELIABILITY ESTIMATE: FAMILY INVOLVEMENT

Case Processing Summary			
		N	%
Cases	Valid	13607	65.6
	Excluded[a]	7138	34.4
	Total	20745	100.0

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.714	.714	20

Summary Item Statistics

	Mean	Min	Max	Range	Maxi / Min	Variance	N of Items
Item Means	.339	.087	.727	.640	8.376	.029	20

Item Statistics

MOM and DAD	Mean	Std. D	N
MOM -Went shopping	.73	.446	13607
Played a sport	.09	.282	13607
Attend religious service	.40	.490	13607
Talked about life	.46	.498	13607
Went to movie/ETC	.25	.434	13607
Discuss personal problems	.37	.482	13607
Argued about behavior	.32	.467	13607
Talked School Grades	.63	.484	13607
Worked on school project	.13	.334	13607
Talked about school-OTHER	.53	.499	13607
DAD-Went shopping	.26	.437	13607
Played a sport	.29	.452	13607
Attend religious service	.30	.460	13607
Talked about life	.27	.445	13607
Went to movie/ETC	.24	.424	13607
Discuss personal problems	.20	.396	13607
Argued about behavior	.26	.437	13607
Talked about school grades	.52	.500	13607
Worked on school project	.11	.312	13607
Talked about school-OTHER	.45	.497	13607

Item Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
MOM-Went shopping	6.05	11.296	.237	.707
Played a sport	6.69	11.765	.187	.710
Attend religious service	6.38	11.246	.219	.710
Talked about life	6.32	11.110	.255	.706
Went to movie/ETC	6.53	11.168	.292	.702
Discuss personal problems	6.41	11.017	.299	.702
Argued about behavior	6.46	11.517	.149	.716
Talked about school grades	6.16	10.741	.388	.693
Worked on school project	6.65	11.385	.315	.702
Talked about school-Other	6.25	10.599	.418	.689
DAD-Went shopping	6.52	11.488	.178	.712
Played a sport	6.49	11.271	.241	.707
Attend religious service	6.48	11.279	.232	.708
Talked about life	6.51	11.174	.281	.703
Went to movie/ETC	6.55	11.145	.311	.701
Discuss personal problems	6.59	11.327	.271	.704
Argued about behavior	6.52	11.457	.189	.711
Talked about school grades	6.26	10.628	.408	.690
Worked on school project	6.67	11.456	.308	.703
Talked about school issues	6.34	10.562	.432	.688

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
6.78	12.206	3.494	20

Summary Item Statistics

	Mean	Min	Max	Range	Max / Min	Variance	N of Items
Item Means	.339	.087	.727	.640	8.376	.029	20
Item Variances	.196	.079	.250	.170	3.148	.003	20
Inter-Item Covariances	.022	-.008	.157	.165	-19.365	.001	20
Inter-Item Correlations	.111	-.037	.698	.735	-18.731	.013	20