

THREE ESSAYS ON IMMIGRANT ASSIMILATION

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## ABSTRACT

YUYING TONG: Three Essays on Immigrant Assimilation  
(Under the direction of Barbara Entwisle)

Plenty of researches have studied immigrant assimilation in recent decades, and they can be divided into two main streams: one is adaptation of children of immigrants and the other is adult economic assimilation. This dissertation studies both, but focuses on positive behavior for children and gender disparity of earnings for adults. For immigrant youth studies, the main contribution is incorporating the positive social behavior of volunteering in assimilation literature. For adult study, it reexamines the earnings assimilation and gender disparity using repeated measures for same individuals for a particular group of scientists and engineers.

I chose volunteering as a positive social behavior to distinguish it from the common health and risky behaviors analyzed in previous assimilation studies. In this three-article format dissertation, my first article examined whether exposure as measured by the duration of residence in the U.S. increases volunteering among youth. I assess duration of residence in two ways: intergenerationally and intragenerationally. The dataset is from the National Longitudinal Study of Adolescent Health (Add Health). The result shows that second generation immigrants actually participate more in volunteering than the third generation immigrants, though this difference disappears in adulthood. This suggests a temporary accommodation by second generation adolescents. The second

article also studies youth assimilation on volunteering, which conceptualizes exposure based not only on duration of residence but also neighborhood-level exposure to native-born people. The regression shows different pattern for advantaged and disadvantaged neighborhoods. In advantaged neighborhoods, when the proportion of foreign-born immigrants living in the same neighborhood increases, the initial positive effect of time exposure on volunteering weakens and changes direction to become a negative effect. This findings add to the segmented assimilation theory that exposure to natives at neighborhood is also needed to be considered in empirical tests.

The third article examines the “displacement” and “discrimination” perspectives using the Scientists and Engineers Statistical Data System (SESTAT) integrated data. This unique data allows me to control unobserved heterogeneity. The results show that immigrant males are in earning disadvantages compared to their counterparts, thus the “discrimination” theory is supported in male sample. This study emphasizes that gender disparity exists in adult economic assimilation.

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## **Chapter I**

### **Introduction**

Due to the large size and important impacts of immigrants in U.S. society, immigrant assimilation has been a controversial topic in recent decades. A sizeable literature has emerged to document the path of immigrant assimilation. However, since immigrant groups in the U.S. are highly heterogeneous with regards to race and ethnicity, age structure, levels of education, and residential duration in the U.S., it is difficult to merge the literature on assimilation into a single narrative. Generally there are two streams of thought on immigrant assimilation, depending on which group is examined: foreign-born immigrants or their children. The research on children's assimilation mainly focuses on their social well-being and academic achievement, while the research on adults' assimilation primarily focuses on their economic achievement.

Among contemporary scholars, there is a considerable interest in the assimilation path of children of new immigrants (Alba and Nee 1997; Bankston and Zhou 1997; Farley and Alba 2002; Perlmann and Waldinger 1997; Gans 1992; Portes and Rumbaut 1996, 2001; Xie and Greenman 2005). A wide range of outcomes have been examined, both regionally and nationally. These include children's education achievement, health behavior, friendship, and cultural (mainly language) adaptations, with some outcomes emphasized more than others. However, the majority of the research concentrates on at-risk behaviors and academic achievement while other positive behaviors, such as

volunteering and civic participation, have largely been ignored in the literature.

Assimilation, which is defined as a diminishing difference between immigrant and non-immigrant individuals with respect to a particular outcome, should not only be based on at-risk behaviors and academic achievement. To get a more comprehensive picture of the assimilation process, we need to examine other positive dimensions of culture and norms in U.S. society. In this sense, volunteering as an outcome is appropriate for two reasons. First, it is a socially desired behavior, especially in U.S. society. Compared to the rest of the world, Americans have the highest rate of having ever volunteered. Second, volunteering is a social behavior, so people usually engage in the activity in the company of others. Therefore, volunteering can promote assimilation. Thus, the diminishing differences in volunteering between immigrant youth and their native counterparts will help further understanding of the assimilation process of immigrant youth.

Unlike economic assimilation which mainly depends on human capital investment, the discrepancy in social behaviors between immigrants and natives involves the key variable of degree of immigrants' exposure to the host society. To determine the degree of exposure, two approaches have been used based on different assimilation theories. One focuses on time exposure such as duration of migration, which is usually indicated by immigrant generations, and years since arrival when only studies the first generation immigrants. This approach is widely used in assimilation studies. The other one, based on segmented assimilation theory, argues that social contexts in which immigrants live also affect the paths of assimilation. These contexts may consist of family, school, neighborhood, and peer groups, as well as geographic region. The first approach argues that the more time a person has spent in the United States, the more

similarities he/she will share with natives with respect to a particular outcome such as social behavior. According to this approach, one can expect that longer duration of residence for immigrants and their families will result in larger degrees of assimilation. The second approach contends that exposure to the U.S. depends not only on the amount of time exposure but also the type of social environment that an immigrant lives in and who he/she interacts with. This includes family acculturation, the degree of neighborhood segregation by immigrants and natives, and the characteristics of the school he/she attends. In addition, friendship segregation may also play a role in the exposure to the destination culture. Thus, social contexts play a role as socialization agents, channeling the effect of American culture on adolescents. One can expect that the more Americanized the social contexts are in which immigrant children live and interact, the greater similarity he or she would share with the natives.

Since children of immigrants are exposed to residential duration and social context at same time, these two factors may interact with each other. According to segmented assimilation theory, American society is diverse and segmented. As a result, different immigrant groups may take distinct assimilation paths, and people in different social contexts may experience different assimilation outcomes even if they immigrated at about the same time. Motivated by this possible divergence, Chapter Two of this dissertation examines whether family process mediates or moderates the assimilation path on volunteering, and Chapter Three tests how neighborhood context moderates the assimilation on volunteering.

As mentioned before, the research on adult immigrants focuses primarily on economic achievement. As a result, research on adult assimilation is rooted in the

economic literature. Previous studies argued that new immigrants face economic disadvantages at the beginning of their residence in destination countries due to language barriers and discounted human capital that they had obtained from their origin countries. However, after some time, they usually catch up with and overtake the natives after a greater investment in human capital and diminished language barrier (Chiswick 1978). This description of the economic assimilation path has been challenged on both theoretical and empirical grounds due to the cross-sectional designs in studies. Researchers argue that non-random emigration and changes in human capital composition across immigrant cohorts affect the apparent economic assimilation path in cross-sectional studies (Borjas 1985). Static cross-sectional Census data cannot capture a person's earnings change over the life course nor the unobserved factors which are associated with earning ability and immigrant status. Longitudinal data tracking the same individuals over time can serve as a better resource for understanding the earnings situation of immigrants in the United States. In addition, due to the changes in human capital composition of new immigrants and economic shifts over time, disparities of earnings across different groups have grown. Hence, in Chapter Four, I choose an immigrant group with relatively high human capital scientists and engineers, to study the difference in earnings between immigrants and non-immigrants as well as to examine the assimilation path. Since men and women may have different assimilation paths in the labor market due to their different immigration experiences and roles in the public and private spheres, I also examine the gender disparity with respect to economic assimilation.

This dissertation is in a three-article format. Chapter Two examines whether exposure, measured as residential duration in the U.S., increases volunteering among youth. I use both immigrant generation and years of migration to measure the residential duration, which appeared in intergenerational model and intragenerational model respectively. I also examine if family process mediates or moderates the effect of time exposure on volunteering. In addition, I examine if the time exposure effect on volunteering persists into young adulthood. Thus, outcome variable of volunteering is measured as a dichotomous variable at both adolescence and early adulthood. Utilizing data from the National Longitudinal Study of Adolescent Health (Add Health), I use logistic regression to conduct the empirical analysis and predict the probabilities of volunteering among different immigrant groups using micro-simulation method.

Chapter three builds on the results from chapter two, but only takes out the children from immigrant families to study how time exposure measured as length of residence in US interact with neighborhood exposure measured as proportion of foreign-born at census tract. Different from previous study about immigrant neighborhoods such as immigrant enclave or ethnic community (Logan et al. 2002), this chapter emphasizes the density of social ties with natives, not immigrants. To test the segmented assimilation theory, I apply multilevel logistic regression to examine the interaction between individual time exposure and neighborhood exposure separately for better-off neighborhoods and poor neighborhoods.

The fourth chapter examines earnings assimilation on highly educated immigrants for overall sample as well as by gender. I use birth nativity and citizenship status to represent their immigrant status when compared to their native counterparts.

Previous studies have theorized labor market outcomes of immigrant scientists/engineers into either “displacement” or “discrimination”. These two perspectives are not competitive with each other since both suggest that immigrant scientists/engineers put downward pressure on the payment structure on the highly educated labor market in the U.S. However, they have different policy implication for U.S. society. Using the Scientists and Engineers Statistical Data System (SESTAT) integrated data and fixed-effect model, this chapter examines if immigrants are truly are at an earning disadvantage and whether there is a gender difference.

The goal of this dissertation is to add to the literature of immigrant assimilation for both youth and adult studies. For immigrant youth studies, the main contribution will be incorporating the positive social behavior of volunteering in assimilation literature, which makes the picture of adolescent assimilation more complete. Furthermore, it also tests the segmented assimilation from a unique perspective through measuring the neighborhood exposure as degree of exposure to natives. For adult studies, it will reexamine the earnings assimilation using repeated measures for same individuals, as well as look into the gender disparity in this process.

## **Chapter II**

### **Immigrant Generation, Family Process and Assimilation of Volunteering of Youth**

#### **INTRODUCTION**

In the past decade, there has been considerable debate on the assimilation of immigrant children (Xie and Greenman 2005). Given the fact that children growing up in contemporary immigrant families will represent a crucial component of American society in the future (Zhou, 1997), the smooth assimilation of these children will benefit U.S. society as well as lower social costs. Children in immigrant families are defined as children under age 18 who were either themselves born in countries other than the United States or have at least one foreign-born parent. According to the 2000 Census, there were 13.5 million children living in immigrant families in the United States (PRB, 2005). In 2000, one of every five children living in the United States was living in an immigrant family. More than eight of 10 children in immigrant families are ethnic minorities.

Due to the lack of data on immigrant children or missing information on nativity (Hogan and Eggebeen 1997; Jensen and Chitose 1996; Portes 1996), studies of children in immigrant families were not given much attention until the last two decades. During this period, assimilation and adaptation became the main subject of studies on children of immigrant families. A wide range of outcomes have been examined, both regionally and nationally (Rumbaut 1997; Zhou 1997; Bankston and Zhou 2002; Harris 1999).

Education, health behavior and cultural (mainly language) adaptations have been addressed in the literature. Among these, research in the area of immigrant health (Williams et al. 1986; Collins and Shay 1994; Eberstein 1991; Landale, Oropesa and Gorman 1997), risk behavior (Harris 1997), educational achievement (Rumbaut 1995; 1997; Kao and Tienda 1995) and ethnic self-identity (Rumbaut 1994) points out the negative aspects of the assimilation of immigrant children in the United States. The findings often run precisely in the opposite direction of what might be expected from traditional perspectives on assimilation (Rumbaut 1997). They describe a less favorable future for children from immigrant families. The causes have been attributed to the American economic context, racial attitudes and the national origins of today's immigration flows (Gans 1992; Portes and Zhou 1993; Portes and Rumbaut 1996).

Others suspect that these authors are too pessimistic. Compared to the historical European immigration from a century ago, Perlmann and Waldinger (1997) argue that it is too soon to say whether the new immigrants' adaptation to America will turn out differently from the last great immigration to the United States. They argue that the experiences of European immigrants were not particularly promising at the beginning, nor were established groups at the time ready to accept the newcomers and their descendants. They concluded that acquisition of full membership in American society and a path of upward mobility are still possible for children from contemporary immigrant families.

With respect to the debate, most evidence comes from the comparison between first and second generation immigrants, with the presumption that the second generation should be better off than the first. However, assimilation, defined as the diminishing

difference between immigrant and non-immigrant individuals with respect to a particular outcome (Alexander 2001), focuses on the differences between immigrants and non-immigrants. Thus, to see if the second generation is truly in an adverse position, one needs to compare them to the children of non-immigrants. There is a possibility that at-risk or unhealthy behaviors are more prevalent among immigrant adolescents in the U.S. than their counterparts in the origin countries. Children of immigrants may do what children of non-immigrants do, whether these are desired or non-desired behaviors. To test the degree of similarity between immigrants and non-immigrants, one should not only examine at-risk behaviors and academic achievement, but dimensions of culture which are typical and positive with respect to U.S. society also should be examined. With this in mind, it is important to consider volunteering as a part of civic assimilation. Volunteering is a socially desired behavior, which can be seen as a part of positive social norms.

American society has long been recognized to have a tradition of volunteerism. Compared to the rest of the world, Americans have the highest rate of having ever volunteered. While trust among young people has declined and materialism has grown in America, rates of volunteering have remained stable or have even increased over the past two decades (Astin et al. 1998; Bachman et al. 1980; Johnson et al. 2001). Volunteerism has a great deal of benefits for an industrial economy and for society. Informal social control theories suggest that volunteerism gradually draws persons to virtues (Janikula and Uggen 1999). Empirical studies show that volunteering makes children more understanding and more tolerant in a diverse society, and can even improve children's classroom learning (Hepburn et al. 2000; Kirilin 2002). In addition, compared to at-risk

behaviors, volunteering as part of citizenship belongs to the public sphere. Thus, volunteering promotes positive immigrant assimilation. Adolescence is a critical time of socialization and development (Erikson 1968). Socialization is a process to inculcate values, both intrinsic and altruistic, which occurs as immigrant children grow up in American society. It is important to consider civic assimilation when evaluating the path of assimilation for immigrant children. Therefore, by examining the assimilation of those who volunteer, the picture of assimilation becomes more complete.

Although the positive aspects of volunteerism are clear, why some people volunteer and others do not has been a subject of sociological interest for many years. In the literature, attention has largely focused on the individual attributes of the volunteers (Mustillo, Wilson and Lynch 2004) such as gender, race, and intergenerational transmission (Janoski and Wilson 1995; Mustillo et al. 2004; Musick et al. 2000). Studies of volunteerism, however, have not incorporated immigrant assimilation. In addition, most studies of volunteerism have primarily focused on adults, so that participation of adolescents has been overlooked.

In this study, I attempt to bridge these gaps by examining the association between volunteerism and length of time in the U.S. (measured as immigrant generation for all immigrants and residence duration for first generation immigrants). Three research questions are addressed in this paper. First, are young children in immigrant families similar to their native-born counterparts in terms of volunteerism? Second, does family process mediate or moderate the effect of length of time on volunteering? Third, does the effect of length of time in the U.S. on volunteering remain the same when these adolescents enter into young adulthood?

## **BACKGROUND**

### Assimilation and Volunteering

Gordon (1964, 1978) defines assimilation as a process of interpenetration and fusion in which persons and groups acquire memories, sentiments and attitudes of other persons and groups. By sharing their experience and history, immigrants are integrated in a common cultural life. He proposed seven major dimensions of the overall construct: cultural, structural, marital, identity, attitude reception, behaviors reception, and civic assimilation. The last is particularly relevant to this study. Civic assimilation occurs when immigrant youth learn the society and cultures during the socialization process. During the adolescent developmental period, the biological, intellectual, emotional, and social changes can be difficult (Chinman and Linney 1998). Meanwhile, socialization of affective and moral components of personality is usually conceived as being completed by the end of adolescence (Parsons and Platt 1970). In addition to the difficulties that are common to all children, immigrant children also face a unique issue: the struggle between learning American culture and preserving their own ethnic customs. Whether immigrant children can deal with these difficulties becomes an important issue for the immigrant population and U.S. society as a whole.

For immigrant youth, adaptation to American values is part of socialization. Wentworth (1980) shows that socialization has always addressed the problem of individual adjustment to society. Through socialization, society successfully shapes its members toward compliance and cooperation with societal requirements (Long and Hadden 1985). Although not the only factor, the amount of time exposed to the society

plays a significant role in shaping an individual's behaviors and way of thinking. For children from immigrant families, the adjustment becomes more difficult because of the exposure to two cultures, sometimes with conflicting values. In general, the length of exposure to the receiving community shapes individual adaptation cumulatively. Warner and Srole (1945) propose that the foreign-born and their offspring must acculturate and seek acceptance among native-born Americans as a prerequisite for social and economic advancement. This assimilation implies positive social integration.

Voluntary action is part of civic participation, and it is contingent on the degree of social integration of the individual in society. Moen (1989) and her colleagues noted that social integration is a concept historically applied to collectivities, but it can also describe the multiple roles of individuals where it "denotes the concrete involvement of individuals with various aspects of a collectivity." If we assume that longer exposure to American society results in greater social integration, then we expect that second generation immigrant children will volunteer more than the first generation and that those who arrive earlier will volunteer more than those who arrive later.

However, processes of adaptation and assimilation among new immigrants may be different from those experienced by earlier European immigrants (Portes and Rumbaut 1996; 2001; Zhou and Bankston 1998). In contrast to expected upward mobility across generations, negative assimilation paths have been identified in many studies. Rumbaut (1997) argues that while linguistic assimilation among children of immigrants proceeds rapidly and inexorably as a linear function, other outcomes such as infant and adolescent health, diet and divorce, delinquency and risk behaviors, educational achievement and aspirations, an ethos of hard work, and development of an ethnic identity contradict

conventional expectation and point instead to assimilation's discontents. In studies of these outcomes, for example, scholars found that births to immigrant mothers had lower rates of prematurity, low birth weight and infant mortality than those to U.S.-born mothers (Landale et al. 1994). Harris (1997) pointed out that second-generation immigrant youth are more likely than first-generation immigrant youth to report poor health and to have engaged in deviant behaviors. Students whose parents are both immigrants outperform their counterparts whose mother or father was U.S.-born (Rumbaut 1995, 1997). It has been explained that the limited assimilation (or selected acculturation) of the first generation is beneficial (Bankston and Zhou 1995; Portes and Rumbaut 2001). First generation immigrants may be relying on their origin culture to resist negative assimilation and help them stay at a higher level of psychological well-being. Over time and generations, children's psychological health deteriorates with more assimilation in U.S. (Harker 2003). However, this "delayed acculturation" might also prevent immigrant children from positive social integration, which may also delay their civic assimilation.

In addition to the straight-line assimilation and negative assimilation perspectives, scholarship has also suggested that today's immigrants may experience different assimilation pathways depending on a variety of vulnerabilities and resources, experiences and exposure, and contexts of emigration and reception (Gans 1992; Portes and Zhou 1993; Portes 1995). This approach is called segmented assimilation theory, which is based on the recognition that American society is diverse and segmented, and as a result, different immigrant groups may take distinct assimilation paths. These paths include upward mobility (argued by straight-line assimilation), downward mobility and

selective acculturation. According to segmented assimilation theory, immigrants may experience different degrees of social integration according to their resources, living contexts and interaction with social contexts. Children of immigrants may have distinct paths of civic assimilation. Those from social environments with greater resources may experience positive assimilation while those in social environments with limited resources may experience negative assimilation. Based on selective acculturation theory, we may expect that immigrants may use their home culture to protect them from downward mobility but may also resist assimilation to civic participation.

#### Family Process and Volunteerism

Social integration promotes volunteering and vice versa. The benefits of volunteering for adolescents are ample: volunteering can increase self-acceptance, instrumentality, and civic identity; volunteering can promote prosocial actions such as helping behavior and political participation, as well as reduce antisocial and criminal behavior (Janikula and Uggen 1999). Moreover, for immigrant children, volunteering leads to diversified social connections through interaction with various social groups. In all, by volunteering, children from immigrant families can be exposed to American society to a greater degree, and at the same time, volunteering can help assimilate immigrant children in a favorable direction unlike other kinds of risky social behaviors.

While volunteering is a socially desired social behavior and it represents a dimension of civic assimilation, immigrants are not homogeneous in their volunteer behavior. Other factors may promote or hinder volunteer behavior as well. This paper

examines how family process mediates and modifies the effect of length of time in the U.S. on the volunteer activities of youth.

The family has a major influence on the socialization of children. Over the years, a profusion of studies have documented the influence of parenting practices upon children's psychosocial development. Parents have broad powers to shape their children's lives. They help children develop a basic sense of trust in other human beings as well as learn both life and social skills. One of the primary tasks in socialization is to familiarize children with the culture and integrate them into the society in which they are growing up. Socialization also involves the inculcation of norms and values, and the value of civic participation is one of these.

In studies on the determinants of volunteering, Wilson and Musick (1997) argue that volunteer work is affected by human capital involving in productive activity; is a collective work that needs social capital and a ethical work that requires cultural capital. Family as a major socialization arena provides important social cultural capital to influence their children's volunteering as well as their value of civic participation.

Families are important as a conduit to volunteer work. Americans are twice as likely to volunteer if their parents volunteer (Mustillo et al. 2004). Since families teach their children in a number of ways, they usually prioritize some values over others. The value of giving may be emphasized more in some families than other families. In a community youth survey (Prudential 1995), 43 percent of high school-age volunteers said that their parents emphasized community involvement, compared to only 12 percent of those who do not volunteer. Children also learn to participate in volunteer work through observation. If parents are involved in volunteerism, their children are more likely to

follow their example. Families not only provide a social and economic environment for their children, they also provide role models and demonstrate norms.

A loving, nurturing relationship with parents has been shown to be an important vehicle through which children learn to care, to give and to compromise in relationships with others (Hoffman 1983; Maccoby and Martin 1983). Social learning theory would predict variability in parenting practices. Thus, how families socialize their children depends on the parent-child relationship. In immigrant families, the parent-child relationship is affected by the acculturation of parents, which is mainly comprised of parental language skills and cultural integration. Children learn English quickly when they attend schools. Most immigrant children attain English-language fluency rapidly and develop a preference for speaking English over their native language. Thus, linguistic assimilation may cause a communication barrier between immigrant children and their parents (Mouw and Xie 1999). Generational consonance occurs when both parents and children acculturate in the same direction at a similar speed, while generational dissonance occurs when children are neither guided nor accompanied by changes in their parents (Portes and Rumbaut 1996). Parents of immigrant children who are actively trying to learn the language and American culture usually have consonant acculturation in contrast to immigrants who do not learn English and adopt American culture and norms (Hao and Bonstead-Bruns 1998). In families with generational dissonance, immigrant families may try to delay assimilation of their children by maintaining the use of their native language at home, adhere to traditional cultural values and use ethnically segregated social networks (Portes and Schauflier 1994; Rumbaut 1994; Zhou and Bankston 1994). Thus, when the pace of assimilation is slow for parents, children will

either fall into a generational dissonant relationship with their parents or they will be more likely maintaining their own ethnic culture. In the latter case, lagged acculturation may occur for these immigrant children.

Immigrant parents who speak fluent English provide greater access to knowledge about America (Fuligni and Yoshikawa 2002). Accessibility of culture and society make parents aware of various social problems and are more likely to use a variety of resources to help their children. Coleman (1988) sees parents' interaction with children as a form of social capital expended on children, which enables intergenerational transmission of norms and values. In contrast, parents who lack English proficiency may have fewer chances to take advantage of opportunities to promote their children's adaptation. For example, Kao and Tienda (1995) found that immigrant parents were more hesitant about joining parent-teacher organizations, volunteering at school, and attending school events than non-immigrant parents. They are also less likely to visit the library with their children or go to a play, concert, or live show with a family member.

In addition to the parent-child relationship, family economy also plays a role in assimilation. As relative newcomers, family members put their energy into economic self-maintenance. It is reasonable that the focus of immigrant parents is on the establishment of economic security for their families in the present and for their children in the future (Fuligni and Yoshikawa 2002). Therefore, immigrant parents' economic status and stability will strongly affect their preference for their children's volunteer activities. If immigrant parents are struggling to make ends meet, their teenage children may have a great deal of family responsibilities that compete with their volunteer work. Sometimes the choice between community service and family obligation is really no

choice at all. Responsibilities come first, and extracurricular activities must be set aside. If immigrant parents have been able to achieve the economic security, their children have less pressure to help with meeting the family's basic needs and are more able to volunteer.

Other family-level variables also contribute to the assimilation process. Education enables parents to obtain knowledge to help their children's adaptation. Parental education is also associated with a more constructive parenting style. According to Simon and his colleagues (1993), parents with higher levels of education are more likely to seek scientific materials on parenting than parents with lower levels of education (Simon et al. 1993). This kind of parenting usually promotes children's independence, self-esteem, diverse social skills, and awareness of social problems.

Overall, family context plays a strong role in the development of children's norms. Immigrant families are usually in the process of assimilation, so their child-rearing values and behaviors are affected by both their origin and destination cultures. These family context variables may mediate or moderate the effect of length of time in the U.S. on volunteering. Thus, there may be different assimilation paths for immigrant children in different family contexts, which would be in accordance with segmented assimilation theory. Specifically, family context may interact with time exposure in destination to shape children's social behaviors.

The life course perspective (Elder et al. 1993; Shanahan 2000) posits that the meaning of roles and activities differs across life stages. The life course perspective also emphasizes the interdependence of events in one's life history (Elder 1984). For example, higher educational achievement in adulthood is built on earlier educational performance.

Other associations may reflect consistent values and preferences, such as the maintainence of social ties and involvement in volunteering (Oesterle et al. 2004). On the other hand, norms and values may also change over the life course. [Whether the effect of length of time in the U.S. on adolescent volunteering persists into young adulthood is an interesting question. Taking into account the impact of the length of time in the U.S. on volunteering during adolescence, is there an additional effect when the adolescents transition into young adulthood. Studies of this question have important policy implications. If volunteer work facilitates assimilation of children in immigrant families, then volunteering may be encouraged. If social institutions encourage adolescents to volunteer, and volunteer experience in adolescence encourages volunteering in young adulthood, then school systems can require adolescents to engage in volunteer work since it may facilitate assimilation of children in immigrant families.

## **DATA**

Data from the National Longitudinal Study of Adolescent Health (Add Health) are used for this study. Add Health started as a nationally representative sample of more than 20,000 adolescents in grades 7-12 in 1994-95 in the United States (Harris et al. 2003). The in-home respondents were followed up with two additional in-home interviews, one in 1995-96 (Wave II) and another in 2001-02 (Wave III). The study used a multistage, stratified, school-based, cluster sampling design. Certain populations were oversampled in in-home survey, including racial and ethnic minorities, the physically disabled, and a selection for genetic study purposes. A parent, usually the mother, was also interviewed

in Wave I. Wave III investigated the influence of adolescence on young adulthood. About 80 percent of respondents were re-interviewed at the third wave.

Since data on civic participation was available only in Wave III, this study is restricted to those with data in Wave III and complete information on immigrant status, family origins, race and ethnic background and sampling weights. More than 10,000 respondents are included in the analysis. In Wave I, all respondents were adolescents, ages 11 to 18. In Wave III, all of the adolescents had entered into young adulthood, ages 18 to 27. Sampling weights are used to adjust for the differential probabilities of adolescents in each racial and ethnic group. To test whether the effect of length of time in the U.S. on volunteerism persists from adolescence to adulthood, both volunteering in adolescence and young adulthood are examined.

There are some features which make the data set useful for this analysis. First, is the data are nationally representative, which is particularly important when comparing with previous studies on immigrant assimilation that were usually based on regions (e.g. Rumbaut 1994; St-Hilaire 2002). Second, Add Health oversampled some ethnic groups (e.g., Cuban, Puerto Rican and Chinese), which makes the sample size large enough for meaningful comparisons. Third, the parenting questionnaire includes information with respect to parents' social and economic resources (e.g. parental education), which is particularly important for this study. However, there are also some limitations of this data set for this study. First, information on volunteering is only available in Wave III. Information on adolescent volunteering was obtained retrospectively, which may introduce recall errors. Since American culture values volunteering, there is a possibility for over-reporting. Thus, if children who have been in the U.S. for 10 years volunteer

more than children who have been in the U.S. for five years, this may be a result of over-reporting than actual difference in volunteering. However, there is no way to calculate how much this measurement error affects the result. Second, the attrition from Wave I to Wave III and non-response might bias the result. Thus, appropriate weights are used to correct this bias. Third, missing data in the parental questionnaire is substantial, which causes the loss of some important parental information such as income and volunteer behaviors.

## **MEASURES**

### *Dependent Variable*

The measure for adolescents' volunteer activity is a categorical variable, based on a retrospective question asked in Wave III. The question asks if the respondent ever participated in volunteer or community service work regularly when they were 12 to 18 years old. A distinction between non-required and required voluntary work is made. Required voluntary work includes court-ordered volunteering or volunteering that is mandated by parents, school, or religious groups. Both are included in this study. "Non-required voluntary" can truly reflect the voluntary motivation. The wave III in-home respondents are also asked if they have done any volunteer or community service work during the last 12 months. Adult volunteerism is different from adolescent volunteerism since it is all voluntary.

Although the categories of the dependent variable are very clear literally, they still may be biased due to the reporting error during interviewing. However, little is known about the reporting errors of volunteerism. Just like any behavior studies, researches are

mostly depending on the retrospective self-reported questions on the volunteerism. The typical way to ask this question is whether they have done any volunteer work during last 12 months or how many hours/weeks/times they have been involving in volunteer work in particular time duration (Wilson and Musick 1997; Mustillo, Wilson and Lynch 2004; Rotolo and Wilson 2004). Since the volunteering is a socially desired behavior, respondents might have over-reported it. There is no way to measure how much this over-reporting is, although children born to native parents may be more likely to over-report it since they have stronger feeling that this is socially desirable than their immigrant counterparts.

#### Key Independent Variables

Exposure to American society is measured by the length of time the respondent has been in the U.S. It is hypothesized that exposure to American society leads to assimilation, which in turn leads to a greater likelihood of volunteering. One measure of exposure to American society is settlement period. The settlement period is determined by both the respondents, and their parents' country of birth. If both the respondent and at least one parent of the respondent are foreign-born, then the respondent is categorized as a first-generation immigrant. If the respondent was born in the U.S and at least one of his/her parents was born outside of United States, then he/she is categorized as a second-generation immigrant. Information for third- and earlier generation immigrants is not available in the data since grandparents' birth nativity is not available. As a result, third and plus immigrant generations are not distinguished.

Another measure of exposure to American society is length of time in the U.S., which is usually used in an intragenerational model. The intergenerational model treats

individuals in the same generation as having the same length of time in the U.S., but this is not true for first-generation immigrants. For example, some first-generation immigrants who arrive at pre-school ages (0-4 years old) share many linguistic, cultural, and developmental experiences with those of the second generation (Zhou 1997). Therefore, it is important to also consider an intragenerational model. Length of time in the U.S. is measured as the number of years since arrival in the U.S. Unlike the analysis based on settlement period, this measure allows examination of more time-specific assimilation processes.

### *Family Context Variables*

A family's economic status is believed to shape parents' values and child-rearing goals and behaviors (Gecas 1979; Kohn 1969; Mortimer and Kumka 1982). Parent's educational level not only affects parenting style, but it can also be used to indicate the economic stability of the family. It would be ideal to include family income in the analysis, but this variable is not accurate due to a high proportion of missing values. I expect that a favorable family economic situation increases the likelihood of children volunteering since these children would less likely have to choose between family responsibilities and volunteering. Previous studies have shown a positive effect of mother's education on household participation in volunteer work, as well as the next generation's propensity to participate in volunteer work (Brown 1999). Parental education can approximate the economic status of the family. In this study, parent's education is coded as the highest degree obtained by a parent. If two parents are present, then the parent with the highest level of education is used. The response categories are less than high school; high school graduate; some college; college graduate and missing.

Parent-child relations have been linked with type of social activities during adolescence. Adolescents who describe their parents as attentive and supportive report participating in less risky activities during junior high school and high school (Mueller and Powers 1990). A variable for parent-children closeness is used to represent parent-child relations. Parent-child closeness is coded as the number of times parents spoke to their child's friend's parents during last four weeks. Another measure of the parent-child relationship is the parents' educational expectations to their children. A higher educational expectation may cause parents to encourage their children to volunteer, since volunteering and community service are desirable activities for admission to competitive colleges. Expectations for children's educational achievement is measured on a scale of 1-5, with 1 as the lowest expectation and 5 as the highest expectation about attending college. This variable considers both parents' expectations and uses the average.

Rapid linguistic assimilation of children and slower linguistic assimilation of parents may cause a communication barrier between immigrant children and their parents (Mouw and Xie 1999). Speaking English at home shows generational consonance between parents and children, and speaking their native language at home may indicate generational dissonance. Thus, a dummy variable is coded for the language spoken at home, 1 if it is English and 0 if it is another language. The number of siblings is included to represent family resource distribution. Previous research shows inconsistent conclusions about the effect of number of siblings on children's intellectual development, but it is unknown if this also affects the formation of norms and values in adolescents (Blake 1981; Guo and VanWey 1998).

Other variables that are relevant to the family process include family structure and church activities. Family structure affects children's adaptation and interaction with society, as well as access to resources. Immigrants in single-parent families usually have more constraints than those in two-parent families. Additionally, divorce may be socially stigmatized in their ethnic group. Family structure was measured at Wave I, and the response categories are living with two biological parents, only biological mother, only biological father and other family structure (living with grandparents, aunts and uncles, other adult relatives, or non-relative adults).

All major religions emphasize service, charity, caring for others, and involvement in the religious community (Johnson 2002). Higher levels of religious participation in the U.S. play a substantial role in America's lead in unpaid volunteer service. Religion has also played a key role in immigrant assimilation into U.S. culture (Cavalcanti and Schleef 2005; Hirschman 2004). Musick and colleagues (2000) argue that while the ability to volunteer might be contingent on personal resources, deciding to do so is an expression of identity, a feeling of being linked to those who will benefit from one's labor (McAdam and Paulsen 1993). For adolescents, most religious activities run in the family, so church attendance is also related to family process. Church attendance is measured as going to church weekly or more, once a month or more, less than once a month and never going.

### Control Variables

Demographic variables are used to control individual attributes relevant to volunteering. I include age, gender and race/ethnicity in this study.

*Age:* Based on panel data from a national sample, Johnson (2002) indicates that individual work values change across the life course. Usually they become more realistic

with age. When people age, cash rewards become more important, and other types of rewards become less so. The aspiration for altruistic rewards changes when children grow up and transition into adulthood. However, other studies show a different age effect. For example, previous studies also showed that the propensity to volunteer rises in the middle years of adult life (Musick, Wilson and Bynum 2000). This suggests that the age effect on volunteering may not be linear. However, few studies have examined the age effect on adolescent volunteering before and during the transition to adulthood.

*Gender:* Studies of youth generally find that females place greater importance than males on intrinsic, altruistic, and social job rewards (Bridges 1989; Herzog 1982; Lueptow 1980; Marini et al. 1996). Volunteer work has traditionally been thought of as a female activity, especially for mothers (Daniels 1988; Mustillo et al. 2004). The reason is that mothers act as “keepers of friends, neighbors, and even those strangers served by local volunteering group.” This argument is based on gender role differences during the socialization process. In addition, women traditionally were not part of formal work force, so they were expected to conduct more informal work. It is unclear if these differences stem from early socialization or are formed during adult socialization.

*Race/ethnicity:* Race and ethnicity play important roles both in initial adolescent values and in changes that occur across the young adult years (Johnson 2002). Previous work shows that whites volunteer more than blacks (Musick, Wilson and Bynum 2000). Hispanic and Asian volunteer behaviors are unknown so far. In this paper, race and ethnic background is defined as a five-category variable: White, Black, Asian, Hispanic and Other.

Other control variables include educational aspirations and working status during a typical non-summer week. Adolescent educational aspirations reflect current academic performance as well as motivation for achievement. In Wave I, respondents are asked how likely he/she would go to college, which is coded on the scale of 1-5 with 1 as lowest and 5 as highest value. A variable indicating participation in part-time work during Wave I is used to measure time constraints.

For the investigation of young adults, marital and cohabitation experience are also included. Previous studies show that married people are more likely to volunteer than single people (Hodgkinson and Weitzman 1996), regardless of whether they have children. Since the respondents are all young adults, it is meaningful to examine their marital history instead of current marital status. Cohabitation is pretty common among this age group, and cohabitants share some similarities with married couples. Therefore, cohabitation experience is also considered. The response categories of this variable are married, but did not cohabit; cohabited, but never married; cohabited then married; and single. Control variables include educational achievement and labor force participation. Education is a strong predictor of volunteering (Rotolo and Wilson 2004). Volunteer work and paid work compete for a person's time, so labor force participation should be controlled for (Rotolo and Wilson 2004; Mustillo, Wilson and Lynch 2004).

In addition, other factors which are associated with young adults volunteering are considered in the model. Immigrant children's self-identities and ethnic loyalties can often influence patterns of behavior and outlook independently of the economic status of their families or the type of schools that they attend (Rumbaut 1997). Citizenship for the first generation is used to measure the feeling of belonging in U.S society. Language used

to speak with friends is used to represent cultural assimilation, which is measured as other language, half English and English only.

## **ANALYTICAL APPROACH**

The analysis is conducted in two stages. The first stage examines whether longer exposure to U.S. society leads to a higher probability of volunteering. Statistical regression modeling is used to determine the independent effect of the time exposure on the probability of volunteering for both adolescents and young adults. Because volunteering, the dependent variable in the analysis, is measured as a dichotomous variable, I use a binary logit model. I estimate four sets of logit models: *intergenerational* models of volunteering in adolescence; and *intragenerational* models of volunteering in adolescence; and the same two models in adulthood. In adolescence, required volunteering and non-required volunteering are examined separately. Each model can be written as (1):

$$\ln\left(\frac{\Pr(Y_i = 1)}{\Pr(Y_i = 0)}\right) = \beta'X \quad (1)$$

where  $Y_i$  is volunteering for individual  $i$ , and  $\beta'X$  is a matrix notation for the linear predictors, i.e., the linear combination of independent variables. To control for the sample design effect, weights are used to correct the sampling biases in both descriptive analysis and regression analysis. The results are presented as both raw coefficients and odds ratios for ease of interpretation.

The second stage of the analysis uses the results from the first stage to estimate the effect of assimilation on volunteering. In this step, for each individual, three predicted probabilities are calculated for first-generation immigrants, second-generation

immigrants, and third-generation or later, while keeping all of the other variables at their actual values. I also use the same procedure to predict the probabilities of volunteering by years since immigration.

## **RESULTS**

### Descriptive analysis

Table 1 shows the estimated proportions of people who have done volunteer work by settlement period for both adolescence and young adulthood. On average, about 43 percent of respondents reported volunteering as adolescents, and 36 percent of them report non-required volunteering. Among all generations of immigrants, second-generation adolescents have the highest rate of volunteering. Almost half (47.6 percent) of second-generation immigrants volunteered as adolescents, and more than one-third (39.4%) did so voluntarily. First-generation and third-generation adolescents have lower rates of volunteering than second-generation immigrants. In young adulthood, the difference between second- and third- generation disappears, but first-generation immigrants still report lower rates of volunteering. Table 2 shows the means and percentages of all variables included in the models. The two left columns show the statistics for adolescents, and the two right columns show the statistics for the young adults.

### Volunteering Among Adolescents

Table 3 presents the logistic regression results for volunteering in adolescence. Model 1 examines the immigrant generation effect on all volunteering. Compared to third plus generation immigrants, second-generation immigrants are about 29 percent more likely to

volunteer. The first generation is not significantly different than the third generation. Thus, instead of an unfavorable direction with regards to exposure on volunteering, the second generation is doing very well in this positive behavior. However, compared to the third generation, the result is contrary to what I expected from assimilation theory, since second-generation immigrants do better than third-generation immigrants. Females are 20 percent more likely to volunteer than males. As expected, age has a negative effect on volunteering for adolescents. Older age is associated with a decrease in likelihood of volunteering. Blacks, Asians and Hispanics are significantly different from whites in volunteering, but the differences are weak since they are at the 0.1 significant level.

To examine if family processes mediate the effect of generation, Model 2 also includes family variables based on Model 1. The results show that family processes do not mediate the effect of immigrant generation on volunteering. Instead, the impact was strengthened. Second-generation immigrants are about 34 percent more likely to volunteer than third and plus generation immigrants. However, family processes mediated the weak effect of race on volunteering. Parental education shows a positive effect on volunteering. Parents with higher education have children who are more likely to volunteer than parents with lower education. Compared to high school graduates, children of college graduates are 73 percent more likely to volunteer. Parent-child closeness is positively associated with volunteering. Different from expected, linguistic dissonance between parental and children does not affect volunteering, which suggests that the language spoken at home may be a family choice but not a reflection of dissonance assimilation. Parents' educational expectations for their children do not affect the likelihood of volunteering. Number of siblings negatively affects volunteering, which

supports the resource constraint hypothesis. Frequent church attendance positively affects volunteering. Compared to living with two biological parents, all other family structures have negative effects on the volunteering work. Personal aspirations to go to college play a significant role in volunteering. When the desire to go to college is increased by one unit, the likelihood of volunteering is increased by 26 percent. For adolescents, working during a typical non-summer week has a positive effect on volunteering, which shows that paid work and volunteering encourage each other instead of placing constraints on each.

Model 3 and Model 4 show the immigrant generation effect on non-required volunteering. The basic patterns are comparable to those already discussed, except that the effects are slightly weaker and at times are not significant. When including family process variables, second-generation immigrants are 32 percent more likely to volunteer than third and plus generation. However, demographic characteristics show different effects on non-required volunteering. Age does not impact non-required volunteering for adolescents, and blacks are less likely to do non-required volunteering than whites. Among family process variables, the effect of number of siblings disappears. All of the other family process variables affect required volunteering and all volunteering similarly.

To test if family context modifies the effect of time exposure on all volunteering and non-required volunteering, I also examined the interaction between immigrant generation and the family process variables in the models. The regression results did not show any significant interaction effect between immigrant generation and any family process variables, so I dropped them from the models (not shown). This indicates that the effect of time exposure on volunteering is independent of family context.

Table 4 presents regression results for the adolescent intragenerational model. The intragenerational model includes only first-generation immigrants to examine duration of residence on volunteering. Model 1 presents the assimilation effect on all volunteering. When years of residence in the United States is increases by one year, the likelihood of volunteering increases by 9.3 percent. For first-generation immigrants, blacks are more likely to volunteer than whites. None of the other demographic variables have a significant effect on volunteering.

To test if family process mediates the effect of length of residence in the U.S., Model 2 adds family process in the model. Again, it does not show a meditation effect and the original exposure effect is strengthened. Most of the family process variables do not have any effect on volunteering except for church attendance. For other control variables, aspiration to go to college plays a significant role in volunteering, which is similar to the intergenerational models. Model 3 and Model 4 show the regression results for non-required volunteering. The effect of duration of residence is similar to its effect on all volunteering. The race difference disappears. Closeness of the parent-child relationship encourages non-required volunteering but not volunteering in general. Number of siblings has a negative effect on non-required volunteering but not on all volunteering. In contrast to the intergenerational models, most of the family process variables do not have a significant effect on volunteering.

#### Volunteering Among Young Adults

Table 5 displays the regression results for young adults. Models 1 and 2 examine the generation effect and Models 3 and 4 present the effect of residence duration among first-generation immigrants. In intergenerational models, there is no effect of being first-

generation or second-generation on volunteering, compared to third and plus generation immigrants. Although the descriptive statistics in Table 1 show that first-generation immigrants have a lower rate of volunteering, this result is not statistically significant in regression models. Non-required volunteering in adolescence significantly affects adult volunteering, making them four times more likely to volunteer when they enter into young adulthood. Age decreases the likelihood of volunteering in young adulthood. Females do not volunteer more than males, which indicate that gender differences disappear when they transition from adolescence to young adulthood. Blacks volunteer less than whites. Parent's education still affects young adult volunteering, but only college educated parents make a significant difference compared to parents who are high school graduates. The effect of family structure on volunteering during adolescence disappears when they enter into young adulthood. With respect to cohabitation and marital history, single young adults are more likely to volunteer than those who have cohabited or married before, which is contrary to previous studies that showed married adults are more likely to volunteer than single adults. Church attendance still positively affects volunteering. Both individual educational achievement and work status during young adulthood affect volunteering. Higher educational achievement increases the likelihood of volunteering. Work does compete with volunteering in adolescence. Young adults who participate in the labor force are less likely to volunteer than those who are not.

Models 3 and 4 in Table 5 display the intragenerational models for young adults. The pattern is similar to that found for adolescents. One additional year of residence in the U.S. increases the likelihood of volunteering by 9.8 percent. Age appears to a

negative effect on volunteering. The family process variables do not affect the likelihood of volunteering. Educational achievement affects volunteering positively, which is consistent with the intergenerational models. Compared to young adults who speak with their friends using English only, those who speak in both English and their native language are more likely to volunteer. An ethnic friendship network may promote the likelihood of volunteering for young adults because it provides more diverse social contacts for them. Frequent church attendance positively affects volunteering. First-generation immigrants who are U.S. citizens are more likely to volunteer than those who are not U.S. citizens.

## **DISUCSSION AND CONCLUSION**

In this paper, I examined the influence of immigrant assimilation, measured as immigrant generation and years of residence in the U.S., on the volunteerism of adolescents and young adults using a nationally representative dataset. I also studied how family process mediates and modifies the assimilation process of civic participation. The work presented here shows that volunteer work participation is significantly different across immigrant generations and years of residence. The assimilation effect was not mediated by family process, although family process does affect volunteerism.

First, although the findings do not confirm straight-line assimilation for volunteerism in the intergenerational models, they do indicate that the second generation is likely to engage in civic participation. Thus, unlike other assimilation studies on risk behaviors of youth, this indicates a favorable direction instead of an unfavorable one. The intragenerational models do suggest a straight-line assimilation path; a longer period of

residence in the destination country is associated with a higher rate of volunteerism. Figure 1 shows the predicted probabilities of all types of volunteering by immigrant generation for both adolescents and young adults. After controlling for demographic characteristics and family process, 49 percent of second-generation youth, volunteer compared to 42.7 percent for first-generation and 42.6 percent for third-generation youth. Non-required volunteering follows the same pattern. However, generational differences in volunteering disappear when adolescents transition into young adulthood, which suggests that the second generation is only temporarily ahead with regard to volunteering. Thus, these results may not indicate true civic assimilation across immigrant generations.

Second, intragenerational models show that the likelihood of volunteering increases when duration of residence increases. This is the case for both all volunteering and non-required volunteering. It indicates that the effect of time exposure on volunteering is positive. Figure 2 shows the predicted probabilities of volunteering by duration of residence, and straight-line assimilation is suggested. These results indicate that it is necessary to examine both intergenerational and intragenerational models since the two represent different types of time exposure. In the intergenerational models, both second- and third-plus generation immigrants have the same amount of exposure to U.S. society; the difference exists in their parents' exposure. In intragenerational models, the comparison of time exposure exists within the children.

Third, family process variables affect volunteering in the intergenerational models, but they neither mediate nor modify the effect of time exposure on volunteering. This indicates that time exposure affects volunteering independently, and this independent effect persists into young adulthood. However, family context during

adolescence does affect volunteering when they enter into adulthood. In addition, adult volunteering was built on adolescent volunteering, which suggests that this positive social behavior is connected during the transition from adolescence to young adulthood.

In contrast to previous studies in the area of immigrant health (Williams et al. 1986; Collins and Shay 1994; Eberstein 1991; Landale, Oropesa and Gorman 1997), risk behavior (Harris 1997), education achievement (Rumbaut 1995; 1997; Kao and Tienda 1995) and ethnic self-identity (Rumbaut 1994), this paper shows that the second generation is ahead rather than behind the third and plus generation for adolescents. Why does the second generation do better in civic participation than their native-born counterparts? Is this an outcome of civic assimilation? According to the results from both the adolescent and young adult intergenerational models, it is not a civic assimilation. An alternative interpretation is that the second generation is accommodating instead of assimilating. Park and Burgess argue that assimilation is a “process of interpenetration and fusion in which persons and groups acquire the memories, sentiments, and attitudes of other persons and groups, and, by sharing their experience and history, are incorporated with them in a common cultural life” (1924:735). They elaborate that accommodation may take place quickly, and the people are “conscious protagonists of the process of accommodating the new circumstances when they stay in a new society.” In contrast, assimilation is typically unconscious, so that the person is incorporated into the common life of the group largely unaware of how it happened (Rumbaut 1997). Second-generation immigrants may learn that volunteerism is a favorable behavior in American society, and they may adopt it consciously to have their social and national identity be recognized. This hypothesis makes sense when comparing first-generation

young adults. For first generation youth, they may have more difficulties to adapt to the culture, behavior, structure, identification, attitude etc. Civic assimilation may be behind relative to others. When adolescents enter into young adulthood, volunteerism might be more likely an unconscious behavior in their cultural, and as a result, so that the rate difference between second and third plus generation disappear...

Alternatively, the apparent positive position of the second generation in adolescence might be due to the diverse social contacts of second-generation youth. Second-generation youth may have multiple social contacts from both their own ethnic community as well as the native-born community. Therefore, they may have the most diverse social contacts among all immigrant generations, which may provide more opportunities to participate in volunteering.

Without considering family context variables, Blacks and Hispanics are less likely to volunteer than Whites in intergenerational models. According to Musick, Wilson and Bynum (2000), blacks are less likely to volunteer and less likely to accept the invitation to volunteer if it is made. Hispanics might face similar issues. However, when family context variables are included, these differences disappear. This result supports the resource hypothesis that states that family resources facilitate children's volunteering (Mustillo, et al 2004). Thus, as one of the most important socialization contexts, family plays a significant role in children's involvement in volunteerism both in adolescence and their adulthood. This result indicates persistence effect of family context during adolescence over the life course.

Intragenerational models shed some light on the straight-line assimilation approach on volunteering. Each additional year of exposure to America society is

associated with a greater likelihood of volunteering. Thus, an assimilation effect is implied. However, unlike intergenerational models, family context does not have a strong effect on volunteering.

To summarize, this paper finds that the second generation is ahead rather than behind first and third-plus generations with regards to participation in volunteering during adolescence. Two possible interpretations are made based on this finding. First, I argue accommodation, rather than assimilation, may be occurring, as second-generation youth may consciously adopt volunteerism as a socially desired behavior for being accepted in American society. An alternative explanation is the multiple contacts hypothesis, which contends that more volunteer opportunities are available to second-generation youth than other generations. Time exposure persistently affects volunteering during the transition from adolescence to young adulthood, and it is net of volunteering in adolescence. Family context are strong predictors of volunteering in both adolescent and young adulthood models in the intergenerational models, but it does not mediate nor modify the effect of time exposure.

Table 2.1: Estimated Proportion of People Who Have Done Volunteer Work by Immigrant Generation

Immigrant generation	All generation	First generation	Second generation	Third generation
Adolescence				
All volunteering	0.431(0.407, 0.454)	0.415(0.342, 0.488)	0.476(0.428, 0.525)	0.423(0.399, 0.447)
Non required volunteering	0.357(0.336, 0.377)	0.324(0.264, 0.384)	0.394(0.349, 0.436)	0.352(0.330, 0.347)
Young Adulthood				
Adult volunteering in past 12 months	0.291(0.273, 0.310)	0.244(0.196, 0.292)	0.290(0.243, 0.337)	0.292(0.273, 0.310)
Total				

Source: Add Health Wave III

Note: Parenthesis are 95% CI

Table 2.2: Means or Percentages of Other Variables by Life Stage

Variables	Mean/percent	Variables	Mean/percent
Adolescence		Young Adulthood	
<i>Demographic Characteristics</i>			
Age	15.538	Age	21.887
Female	0.499		
White	0.685		
Black	0.154		
Asian	0.038		
Other	0.004		
Hispanic	0.120		
<i>Family Context at Wave I</i>		<i>Family Context at Wave III</i>	
<i>Parent Education</i>		<i>Marriage and Cohabitation</i>	
College graduate	0.338	Cohabit and married	0.084
Less than high school	0.113	Married, not cohabitation	0.076
Some college	0.203	Cohabit, not married	0.306
Missing	0.046	Single	0.533
High school graduate	0.300	<i>Church Attendance at Wave III(adulthood)</i>	
<i>Parent-child relations</i>		Weekly or more	
Parent-Child closeness	0.204	Once a month or more	0.170
Parent expectation to go to college	3.977	Less than a month	0.167
Speak English at home	0.928	Never	0.386
<i>Family Structure</i>		<i>Other Controls</i>	
Daddy only	0.030	<i>Language speaking with close friends</i>	
Mom only	0.196	English	0.971
Step family	0.163	Other language	0.016
Other family	0.041	Half English	0.013
Two biological parents	0.570	<i>Education</i>	
Num of siblings	1.450	Less than high school	0.152
<i>Church Attendance</i>		High school graduate	0.323
Weekly or more	0.393	Some college	0.408
Once a month or more	0.190	College graduate	0.117
Less than a month	0.169	<i>Work</i>	
Never	0.248	Working status	0.688
<i>Other Controls</i>		<i>Citizenship status</i>	
Self-aspiration to go to college	4.279	Citizen	0.973
Work during a typical non-summer week	0.507		

Table 2.3: Volunteer Activity in Adolescence and Immigrant Generations, Logistic Regression Estimates

Variables	Model 1			Model 2			Model 3			Model 4		
	Non required volunteering						All volunteering					
	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )
Intercept	-0.734+	0.394		-0.374	0.414		-1.514***	0.392		-1.288***	0.409	
<b>Immigrant generation</b>												
3+ generation immigrants(omitted)												
First generation immigrants	-0.018	0.153	0.982	0.003	0.176	1.003	-0.061	0.153	0.941	0.005	0.178	1.005
Second generation immigrants	0.251**	0.092	1.285	0.292**	0.099	1.338	0.223*	0.095	1.249	0.276**	0.104	1.318
<b>Demographic Variables</b>												
Age	-0.085***	0.022	0.919	-0.058**	0.021	0.943	-0.055*	0.021	0.947	-0.028	0.020	0.972
Female	0.178***	0.051	1.195	0.201***	0.05	1.223	0.236***	0.054	1.266	0.261***	0.054	1.298
White(omitted)												
Black	-0.159+	0.088	0.853	-0.054	0.086	0.948	-0.309***	0.094	0.734	-0.202*	0.087	0.817
Asian	0.276+	0.155	1.318	0.201	0.16	1.223	0.156	0.154	1.168	0.084	0.155	1.087
Other	0.416	0.367	1.516	0.692	0.37	1.997	0.644+	0.356	1.905	0.910*	0.363	2.484
Hispanic	-0.174+	0.093	0.840	-0.028	0.105	0.972	-0.239**	0.086	0.787	-0.071	0.108	0.931
<b>Family Context</b>												
<i>Parent Education</i>												
High school graduate(omitted)												
College graduate				0.546***	0.089	1.726				0.525***	0.090	1.691
Less than high school				-0.281*	0.109	0.755				-0.322*	0.123	0.725
Some college				0.259***	0.074	1.296				0.258***	0.073	1.294
Missing				-0.148	0.178	0.862				-0.298*	0.174	0.743
<i>Parent-child relations</i>												
Parent-Child closeness				0.069***	0.018	1.072				0.063***	0.017	1.065
Parent expectation to go to college				0.008	0.025	1.008				0.015	0.027	1.015
Speak English at home				-0.177	0.139	0.838				-0.095	0.161	0.909

<i>Family Structure</i>												
Two biological parents (omitted)												
Father only				-0.364*	0.182	0.695				-0.401*	0.199	0.670
Mother only				-0.045	0.075	0.956				-0.076	0.076	0.927
Step family				-0.174*	0.084	0.841				-0.152+	0.087	0.859
Other family				-0.403**	0.153	0.668				-0.298+	0.155	0.742
Num of siblings				-0.051*	0.025	0.951				-0.042	0.026	0.959
<i>Church Attendance</i>												
Weekly or more(omitted)												
Once a month or more				-0.327***	0.077	0.721				-0.281***	0.070	0.755
Less than a month				-0.437***	0.09	0.646				-0.380***	0.087	0.684
Never				-0.644***	0.081	0.525				-0.586***	0.083	0.557
<i>Other Controls</i>												
Self-aspiration to go to college	0.374***	0.035	1.454	0.231***	0.035	1.26	0.374***	0.039	1.453	0.228***	0.038	1.256
Work during a typical non-summer week	0.123*	0.049	1.131	0.11*	0.05	1.116	0.141**	0.054	1.151	0.125*	0.056	1.133
Number of persons		10447			10447			10447			10447	
Prob > F		0.000			0.000			0.000			0.000	

\*\*\*p<0.001 \*\*P<0.01 \*P<0.05 +p<0.1 (two-tailed test)

Notes: Statistics are weighted to correct for design effects

Table 2.4: Volunteer Activity in Adolescence and migration duration for first generation immigrants, Logistic Regression Estimates

Variables	Model 1			Model 2			Model 3			Model 4		
	Non required volunteering						All volunteering					
				Coeff.	S.E.	Exp( $\beta$ )				Coeff.	S.E.	Exp( $\beta$ )
Intercept	-2.107	1.574	0.122	-1.702	1.735	0.182	-3.059	1.471	0.047	-3.05*	1.515	0.047
Years since immigration	0.094**	0.030	1.099	0.123***	0.032	1.131	0.088**	0.028	1.093	0.123***	0.035	1.131
<b>Demographic Variables</b>												
Age at Wave I survey	-0.132	0.096	0.876	-0.116	0.105	0.890	-0.045	0.086	0.956	-0.021	0.098	0.979
Female	0.031	0.253	1.031	-0.114	0.276	0.892	-0.092	0.250	0.912	-0.126	0.269	0.882
White(omitted)												
Black	1.741*	0.703	5.701	1.557*	0.705	4.743	0.695	0.812	2.004	0.804	0.790	2.234
Asian	0.017	0.535	1.017	-0.161	0.539	0.852	-0.256	0.517	0.774	-0.291	0.570	0.748
Other	-0.010	0.877	0.990	0.288	0.875	1.334	0.064	0.881	1.066	0.767	0.950	2.153
Hispanic	0.215	0.532	1.240	0.128	0.595	1.137	-0.139	0.540	0.870	0.017	0.639	1.017
<b>Family Context</b>												
<i>Parent Education</i>												
High school graduate(omitted)												
College graduate				0.432	0.443	1.541				-0.077	0.410	0.926
Less than high school				0.004	0.581	1.004				-0.424	0.572	0.654
Some college				0.444	0.566	1.559				-0.123	0.461	0.884
Missing				-0.802	0.718	0.449				-2.73*	1.100	0.065
<i>Parent-child relations</i>												
Parent-Child closeness				0.119	0.099	1.127				0.225*	0.102	1.253
Parent expectation to go to college				0.034	0.123	1.034				0.108	0.129	1.114
Speak English at home				-0.334	0.319	0.716				-0.279	0.362	0.757
<i>Family Structure</i>												
Two biological parents (omitted)												
Father only				0.843	0.637	2.323				0.587	0.743	1.798
Mother only				0.006	0.384	1.006				-0.096	0.383	0.908

Step family				-0.075	0.338	0.928				-0.095	0.363	0.910
Other family				0.247	0.605	1.280				0.519	0.692	1.680
Num of siblings				-0.253+	0.149	0.776				-0.306*	0.135	0.736
<i>Church Attendance</i>												
Weekly or more(omitted)												
Once a month or more				-0.284	0.421	0.753				-0.522	0.461	0.593
Less than a month				-1.399**	0.454	0.247				-1.119*	0.479	0.327
Never				-0.781**	0.284	0.458				-0.481	0.341	0.618
<b>Other Controls</b>												
Self-aspiration to go to college	0.682***	0.177	1.978	0.638**	0.201	1.893	0.562***	0.171	1.755	0.516**	0.190	1.676
Work during a typical non-summer week	-0.123	0.261	0.885	-0.194	0.291	0.824	0.162	0.255	1.176	0.075	0.305	1.077
Number of persons		711			711			711			711	
Prob > F		0.000			0.000			0.000			0.000	

\*\*\*p<0.001 \*\*P<0.01 \*P<0.05 p<0.1(two-tailed test)

Notes: Statistics are weighted to correct for design effects

Table 2.5: Volunteer Activity in Young Adulthood and Immigrant Generations/migration duration, Logistic Regression Estimates

Variables	Model 1			Model 2			Model 3			Model 4		
	Intergenerational model						Intragenerational model					
	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )
Intercept	-0.598	0.507		-1.927**	0.562		-0.433	1.455		-2.234	1.817	0.107
<b>Immigrant generation</b>												
3+ generation immigrants(omitted)												
First generation immigrants	0.020	0.195	1.020	0.037	0.202	1.037						
Second generation immigrants	-0.059	0.136	0.942	-0.043	0.142	0.958						
Years since immigration							0.074+	0.044	1.077	0.093*	0.046	1.098
<b>Demographic Variables</b>												
Age	-0.128***	0.020	0.880	-0.082***	0.022	0.921	-0.264**	0.085	0.768	-0.229*	0.097	0.906
Female	-0.169**	0.063	0.845	-0.091	0.065	0.913	0.396	0.309	1.486	0.427	0.309	0.987
White(omitted)												
Black	-0.218*	0.093	0.804	-0.272**	0.096	0.762	0.836	1.256	2.306	0.564	1.131	0.71
Asian	-0.189	0.179	0.828	-0.247	0.184	0.781	0.571	0.696	1.771	0.828	0.768	0.812
Other	0.135	0.444	1.144	0.178	0.474	1.195	1.462	1.061	4.313	1.446	1.113	1.408
Hispanic	-0.128	0.128	0.880	-0.086	0.133	0.917	1.499+	0.780	4.481	1.873*	0.892	6.506
<b>Family Context</b>												
<i>Parent Education</i>												
High school graduate(omitted)												
College graduate				0.283***	0.080	1.327				0.749*	0.324	2.116
Less than high school				-0.148	0.135	0.863				0.653	0.534	1.922
Some college				0.078	0.087	1.081				0.241	0.601	1.272
Missing				-0.481**	0.181	0.618				0.186	0.878	1.204
<i>Family Structure in adolescence</i>												
Two bio parents (omitted)												
Daddy only				0.006	0.215	1.006				1.809	1.578	6.106
Mom only				0.153	0.096	1.165				0.106	0.424	1.112

Step family				0.110	0.093	1.117				0.985*	0.447	2.678
Other family				0.351	0.183	1.420				-1.748	1.387	0.174
<i>Marriage/Cohabitation</i>												
Cohabit and married(omitted)												
Married, not cohabitation				0.035	0.165	1.036				-0.484	0.614	0.617
Cohabit, not married				0.149	0.156	1.161				-0.582	0.724	0.559
Single				0.509***	0.153	1.663				0.272	0.604	1.313
<b>Other Controls</b>												
<i>Language speaking with friends</i>												
English (omitted)												
Other language	0.079	0.295	1.082	0.158	0.308	1.171	0.429	0.537	1.535	-0.074	0.301	0.928
Half English	0.454+	0.257	1.574	0.514*	0.250	1.672	1.238**	0.453	3.450	0.287	0.242	1.332
<i>Education achievement</i>												
Less than high school(omitted)												
High school graduate	0.511***	0.153	1.667	0.384*	0.153	1.468	0.882	0.613	2.417	0.484**	0.153	1.622
Some college	1.331***	0.141	3.784	1.051***	0.139	2.859	1.705	0.507	5.500	1.298***	0.145	3.663
College graduate	1.700***	0.160	5.476	1.322***	0.166	3.751	2.711***	0.594	15.048	1.627***	0.165	5.089
Working	-0.162*	0.075	0.851	-0.134+	0.076	0.875	-0.347	0.297	0.707	-0.376	0.297	0.687
<i>Church Attendance</i>												
Never (omitted)												
Less than once a week	0.425***	0.090	1.529	0.409***	0.089	1.506	0.062	0.469	1.064	-0.107	0.476	0.899
Once a month or more	0.637***	0.105	1.891	0.628***	0.103	1.873	0.638	0.494	1.892	0.449	0.513	1.567
Weekly or more	1.021***	0.110	2.777	1.020***	0.113	2.774	0.886*	0.427	2.425	0.766+	0.457	2.151
Citizen	0.672**	0.240	1.958	0.682***	0.251	1.978	0.864**	0.275	2.372	0.884**	0.331	2.422
Volunteering in adolescence	1.428***	0.072	4.171	1.409***	0.072	4.093	1.396***	0.274	4.039	1.446***	0.259	4.245
Number of persons		10550			10550			711			711	
Prob > F		0.000			0.000			0.000			0.000	

\*\*\*p<0.001 \*\*P<0.01 \*P<0.05 +p<0.1(two-tailed test)

Notes: Statistics are weighted to correct for design effects

Figure 2.1: Predicted Probabilities of Adolescent Volunteering by Immigrant Generations: Intergenerational Models

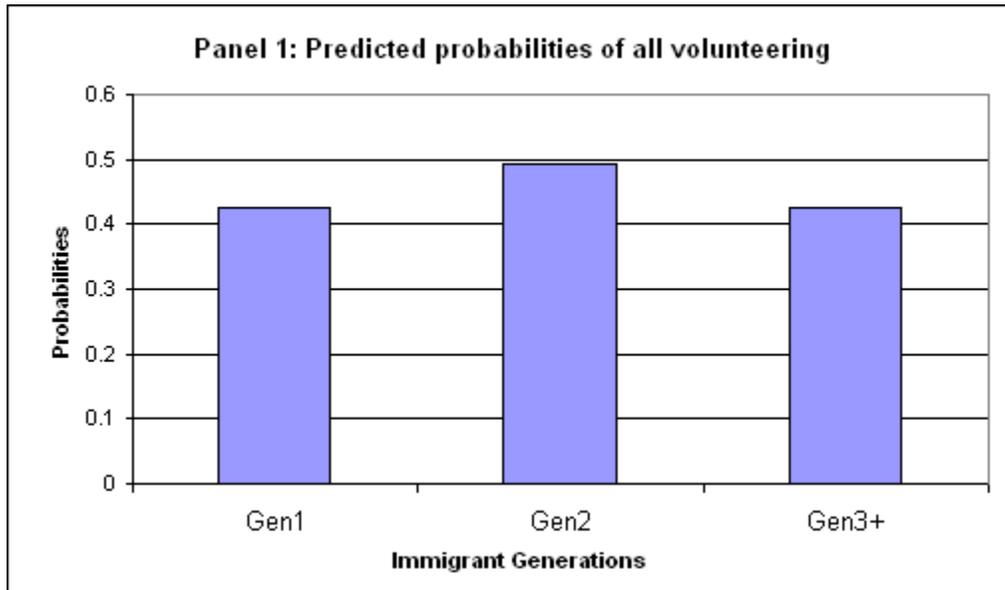
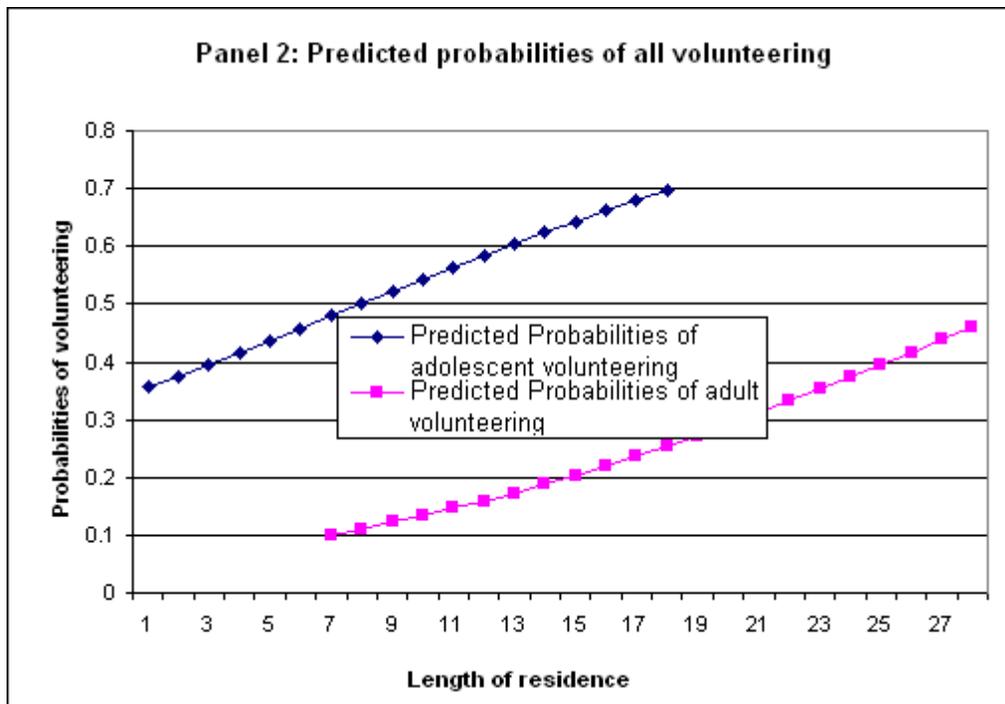


Figure 2.2: Predicted Probabilities of Volunteering by Duration of Migration: Intragenerational Models



## **Chapter III**

### **Neighborhood Context, Immigrant Assimilation and its Relationship to the Volunteering of Immigrant Youth**

#### **INTRODUCTION**

Volunteering is an activity performed freely (Rosenfeld 2000). Volunteering usually benefits others (Wilson 2000; Oesterle et al. 2004), and it has been conventionally thought of as an altruistic activity designed to assist the disadvantaged (Gomez and Gunderson 2003). Americans have long been considered to contribute to the welfare of others through their involvement in the improvement of the public and private life (Tocqueville 1959; Oesterle et al. 2004). Although some researchers indicate that the proportion of people volunteering has declined in recent years (Rosenfeld 2000), the U.S. still has the highest rate of volunteering in the world. According to a 1998 survey by the Gallup organization, 56% of the United States population volunteered at some point during the past year (Wilson 2000). In such a context, adolescents are encouraged to volunteer.

Most studies of volunteerism have focused primarily on adults (Janoski and Wilson 1995; Mustillo et al. 2004; Musick et al 2000). However, we know little about the factors which draw young people into the voluntary participation of work activities. Except for a few studies on school-based service learning programs (Andersen 1998; Marullo and Edwards 2000), research on volunteering has primarily focused on adult

participation (Oesterle et al. 2004). On the other hand, civic participation is seen as having many positive consequences for both youth and society (Thoits and Hewitt 2001; Wilson and Musick 1999). From surveys with more than one million 6th-12th graders in more than 1,000 U.S. communities since the early 1990s, researchers identified 40 development assets or building blocks of success that help young people to be healthy, caring, responsible, and productive (Scales et al. 2000). The studies show that the more development assets youth report having in their lives, the less likely they are to engage in high-risk behaviors. They are also more likely to show evidence of developmental success such as doing well in school, valuing racial diversity, helping others, and overcoming adversity. One of these assets, volunteerism, also has been associated with prosocial attitudes and behaviors such as caring and generosity (Mattis et al. 2000). Besides, consistency of values and expectations across young people's lives has been found to be a meaningful contributor to positive outcomes such as succeeding in school and being mentally healthy (Scales and Leffert 1999; Sanders 1998).

Thus, what contributes to volunteering in the United States is an interesting research question, especially for youth. Theories about volunteering have pointed to three sets of factors: characteristics of the individual, the properties of the relationships in which that individual is involved, and community context (House 1981). Contemporary scholars also point to the resources that promote the action of volunteering. Three sets of resources have been distinguished based on human, social and cultural capital (Wilson and Musick 1997).

With respect to both individual attributes and accessibility of resources, immigrant status is a potentially important factor affecting participation in volunteering.

However, this population group has largely been ignored in the previous literature on volunteering. Furthermore, little attention has been paid to the effects of social contextual factors on volunteering (Wilson 2000). Just like any group of adolescents, immigrant children live within sets of interconnected social systems and structures that shape their life experience in the new society (Bronfenbrenner 1986; Elder, Modell and Park 1993). How immigrants interact with and are influenced by their social context with respect to volunteering remains a fruitful field.

Over decades, immigrant studies have made great progress in examining factors related to the adjustment of immigrant children. Major gains have been achieved in understanding immigrant assimilation in education and health behaviors, including risk behaviors. For example, scholars found that births to foreign-born mothers had lower rates of prematurity, low birth weight and infant mortality than those to U.S.-born mothers (Landale et al. 1994). Harris (1997) pointed out that second-generation youth were more likely than the first generation to report poor health and to have engaged in deviant behaviors. Students whose parents are both immigrants outperform their counterparts whose mother or father was U.S.-born (Rumbaut 1995; 1997). Despite the progress, a broad range of quality-of-life indicators still need to be examined to fully understand immigrant population behaviors in the United States and their assimilation process. Volunteering, as a part of the social citizenship and normative culture in the destination, needs to be examined in studies of immigrants. Moreover, the literature on immigrant assimilation has tended to focus on how time exposure, such as generation comparisons and residence duration, affects the assimilation. In the previous chapter of this dissertation, I used both intergenerational and intragenerational models to test the

effect of time exposure on volunteering. Contrary to what other studies found, that second-generation youth fared worse than the third generation, I found that they actually fared better with regards to volunteering. In the literature, less attention has been paid to the social context that may promote or hinder the assimilation with respect to a particular outcome. In fact, not only does time in the U.S. make a difference for immigrant children's assimilation, exposure to and involvement in specific social contexts also matter. Based on the recognition of the importance of social contexts for assimilation, some researchers argue that the children of new immigrants will experience segmented assimilation paths (Gans 1992; Portes and Zhou 1993; Portes and Rumbaut 1996; 2001). Segmented assimilation argues that immigrants adapt to certain societal norms but not others because of the social contexts in which they interact. These authors identified three paths of assimilation: upward mobility, downward assimilation and selective acculturation. Just like traditional assimilation theory (Park 1928; Wanber and Srole 1945), upward mobility is a path which applies to middle class immigrants who eventually adopt traits and behaviors of white majority. Downward assimilation is a path that applies to immigrants who live in inner city, poor neighborhoods. Selective acculturation is a path between upward mobility and downward assimilation, where lagged acculturation protects immigrant children from assimilating to an adverse outcome. The context of intense ethnic networks and cultures protects children from interacting with disadvantaged native children, allowing them to avoid downward assimilation.

Although the relevance of social context for assimilation has been recognized in both segmented assimilation theory and previous empirical studies, we have little

knowledge on how much social context moderates the process of immigrant assimilation. For example, although studies have found that immigrant enclaves benefit socially and economically disadvantaged children through cultural protection and ethnic control from risky behaviors (Zhou and Bankston 1994), the relation between social context and assimilation lacks systematic empirical examinations. No specific study examines the association of neighborhood social and economic context and assimilation. In addition, in segmented assimilation theory, children in disadvantaged neighborhoods are expected to experience a downward assimilation path, which states an unfavorable future for these children living disadvantaged social context. However, according to Alba and Nee (1997), the childhood circumstances of young immigrant children are not necessarily identical to nor predictive of experiences in adulthood. It is meaningful to use a longitudinal data to test how social context in adolescence affect young adult assimilation paths.

In the literature on volunteering, despite some research showing social context to be influential in shaping participation in volunteering (Serow 1990; Wilson and Musick 1997), most of the studies have focused on micro-level determinants. The impact of social context on individual volunteering is one of the least understood issues in the studies of volunteering (Wilson 2000). In this paper, I attempt to bring both social and economic context and degree of exposure to U.S. society at the neighborhood level to the study of volunteering in a framework of immigrant assimilation theory. In addition, I also examine whether the neighborhood context in adolescence continues to affect the effect of assimilation of volunteering during young adulthood. Specifically, I address two research questions in this paper. First, does a higher proportion of immigrants living in a

neighborhood moderate the path of assimilation with respect to volunteering? If so, will that be segmented based on social and economic disparity at the neighborhood level? Second, taking the advantage of longitudinal design of Add Health data, I examine how the neighborhood context in adolescence affects assimilation of volunteering during young adulthood.

## **BACKGROUND**

Neighborhoods shape the life chances of their residents in important ways (Sampson, Morenoff and Earls 1999; South and Crowder 1999). According to Massey and Denton (1993), neighborhood socioeconomic status indexes indicate the relative availability and quality of local public services such as school facilities and community resources. Indirectly, they indicate the nature of neighborhood social relations. Neighborhoods usually are segregated by socioeconomic status and race. Despite the widespread agreement that neighborhood context can contribute to social isolation and generate attitudes, norms and behaviors which are sharply different from mainstream society (Wilson 1987), how neighborhood context affects positive social behaviors like volunteering has received less attention. Over recent decades, only a few empirical studies have examined the impact of neighborhoods on volunteering. At the community level, one study found that “membership in civic and other voluntary organizations is significantly lower in low-income, central city areas than elsewhere, and this difference persists when most characteristics of individual respondents are taken into account” (Wuthnow 1998:113). At a more macro level, cities are thought to be less congenial to volunteering (Smith 1994:245).

Neighborhoods in the United States are becoming increasingly diverse, in part, because of the continual resettlement of refugees and immigrants from around the world (Goodkind and Foster-Fishman 2002). The predominant post-1965 immigrant groups have established settlement areas in many American cities and suburbs (Logan et al. 2002) as a result of immigration policy reform giving preference to family unification (Gibson 1988). Concentrations of immigrants serve as social networks which facilitate immigrant settlement and incorporation when they are marginalized by socioeconomic, cultural, or linguistic distinctions that inhibit their full incorporation into destination contexts (Abu-Lughod 1961; Logan et al. 2002; Portes and Bach 1985).

Immigrants, by and large, have been seen as receivers of the benefits of volunteer work in the United States, although earlier immigrants also provided free services to later immigrants. In most situations, we can presume that an immigrant's native culture places less emphasis on volunteering than the U.S., since the U.S. has the highest rates of volunteering over the world. To what extent will immigrants adopt this social norm of American culture after they are exposed to American society? Conventional assimilation models of immigrant adaptation would predict assimilation as a function of the length of U.S. residence and succeeding generations. It hypothesizes that the longer an immigrant has resided in the destination country, the more similar they will become to natives. Usually the immigrant generation or length of residence is used to measure exposure to the destination society. These measures have the advantage of not being contaminated by the behavior of the individual (Xie and Greenman 2005). However, studies of contemporary immigrants show that positive assimilation is not always the case, and often, assimilation runs in the opposite direction. For example, longer U.S. residence is

associated with more negative outcomes, whether measured in terms of school performance, aspiration, or behaviors (Kao and Tienda 1995; Rumbaut and Ima 1988; Zhou 1997). In Chapter 2, I found that second-generation immigrant children are ahead of both first- and third-plus- generation youth and that this difference disappeared when they entered into young adulthood. However, among children of foreign-born immigrants, positive assimilation occurred over the duration of residence. Thus, traditional assimilation theory was challenged on both theoretical grounds and in empirical studies. These conflicting and sometimes unexpected findings are due to the various settlement patterns among new immigrants, and it is a weak test of acculturative change which assumes that individuals who arrive at the same time have the same level of potential integration (Xie and Greenman 2005). Segmented assimilation theory, which incorporates the socioeconomic background of immigrants and the context of settlement areas, argues that adaptation is affected by whether immigrants settle in affluent middle-class suburbs or in impoverished inner city ghettos (Zhou 1997). Three possible assimilation paths have been described: upwardly mobile integration into middle class America, downward mobility into the underclass, and economic integration into middle class America with lagged acculturation and deliberate preservation of the immigrant community's values and solidarity (Zhou 1997). In the deliberate preservation case, often it is said that ethnic values and cultural control help children avoid disadvantaged acculturation, even if they live in an underclass community. For example, Whitmore (1989) found that Southeast Asian refugee children (excluding Cambodians and Hmongs) excelled in American school systems despite the disadvantaged location of their schools and their parents' lack of education and English. Other studies (Kao and Tienda 1995;

Portes and Rumbaut 1996) also found that ethnic controls and values encourage Asian children's high educational achievement.

Thus, the focal point of segmented assimilation theory is that exposure also depends on where the immigrant lives and with whom they interact. The factors would include the socioeconomic context of the neighborhood and degree of neighborhood segregation by people who are foreign- and native-born. Neighborhood context serves as a buffer that promotes or maintains specific acculturation patterns. As segmented assimilation theory has argued, individual-level determinants, such as duration of residence and contextual factors at the neighborhood level play a minimal role. Rather, the most important part is the interaction between the two (Zhou 1997). Operationally, this means that assimilation might be affected by the interaction of individual-level characteristics and the multiple social contexts in which they live. For example, if immigrant children live in a neighborhood where non-English speakers predominate, then we may surmise that they would experience less exposure to American culture than immigrant children who live in a neighborhood where English speakers predominate. Thus, neighborhood context can be a socializing agent that channels the effects of American culture on adolescents who are also rooted in their ethnic cultures.

Segmented assimilation identifies the contextual, structural, and cultural factors that separate successful assimilation from unsuccessful, or even "negative," assimilation. The process is still not yet completely clear. For example, this theory argues that when immigrant children live in poor neighborhoods, they are more likely to experience downward assimilation. However, in some situations, particular ethnic cultures may help them avoid the adverse consequence of living in poor neighborhoods. This implies that

both socioeconomic context and concentration of co-ethnics may play a role and that they interact with each other. To what extent ethnic culture can counterbalance downward assimilation in poor economic contexts is the key. Do children in middle-class neighborhoods experience selected acculturation which can help them from assimilating into risk behaviors? If so, will this prevent them from greater assimilation in positive social behaviors as well?

Studies in spatial assimilation shed some light on answers to these questions. Massey (1985) argues that segregation is natural as a group enters the United States. Living in a predominately immigrant community, for example, may limit immigrant contacts with people who are native-born, thereby decreasing exposure. In a recent study, Logan et al. (2002) found that ethnically-bound cultural and social capital are mutually reinforcing. They argue that an immigrant community can be identified by its physical characteristics as well as by the characteristics of the people who live in them. They use the term “ethnic community” in distinction to the term “immigrant enclave.” In the traditional immigrant enclave, people live there due to lack of choice, but in an ethnic community, people may choose to live there as a favored destination to preserve their ethnic integrity. As they define it, an ethnic community is formed through a different social process than is the immigrant enclave, since it is motivated by preferences and tastes that symbolize and sustain ethnic identity. The traditional concept of an immigrant enclave not only refers to people who live there, but more importantly, it also indicates their labor market opportunities, since people in traditional immigrant enclaves mainly rely on employment in firms in immigrant communities. On the contrary, immigrant groups with high levels of human and financial capital who live in ethnic community

have more opportunities to work in the mainstream labor market. Thus, their daily exposure is not necessarily limited to the co-ethnics with whom they live. Thus, what is common about the immigrant enclave and ethnic community is the large proportion of immigrants in a physical location. Both communities may create multiple barriers for immigrants to interaction with native-born people, which includes language differences, time constraints, discrimination and a lack of awareness of opportunities. Neighborhood context is one of the most important channels to affect the assimilation of immigrant children. In general, the greater the concentration of a particular immigrant group living in a neighborhood, the more likely immigrants will rely on members of their own ethnic group to support them in meeting the demands of adjustment. They have fewer opportunities to familiarize themselves with the destination society's culture and norms. Also, the preservation of the origin culture may also limit their motivation to engage in activities with native-born people.

Because of socioeconomic differences across neighborhoods, neighborhoods may drive assimilation in different directions. According to segmented assimilation theory, immigrant children living socio economically well-off neighborhoods are more likely to experience positive assimilation, and the opposite occurs when they live in poor neighborhoods (Zhou 1997). This is consistent with the research on volunteering. In neighborhoods with high socioeconomic status, such as those with high household incomes and/or educational attainments membership in civic and other voluntary organizations is significantly higher than neighborhoods with low socioeconomic status (Wuthnow 1998: 113). However, since a high concentration of immigrants in a neighborhood limits the chances of interaction with native-born people in residential

areas, immigrants in these neighborhoods may experience selected acculturation. On the one hand, this may preserve immigrant values and solidarity. On the other hand, this may slow down assimilation to engage in positive behaviors like volunteering. In parallel, when children live in disadvantaged neighborhoods, segmented assimilation theory predicts negative assimilation on volunteering since they come into direct contacts with the poor rather than with the middle class. They are also apt to encounter members of native-born minorities rather than members of the dominant majority, which creates barriers for positive assimilation (Zhou 1997). However, when the concentration of immigrants in this type of neighborhood is high, they are more likely to interact with their co-ethnic group. This may benefit socially and economically disadvantaged children through cultural protection and control (Gans 1992; Portes and Zhou 1993). As a result, living in a disadvantaged neighborhood may not necessarily predict negative assimilation, especially when the co-ethnic group is large.

Thus, whether the concentration of immigrants will limit exposure to the destination culture and whether this will result in divergent paths based on socioeconomic disparities needs to be examined by a specific research design. Living in an economically disadvantaged immigrant enclave may be a reflection of lack of choices, while living in better-off ethnic communities may more likely reflect personal choice. In this paper, I argue that a high concentration of immigrants within a neighborhood moderates the assimilation path in volunteering behavior. In general, a large proportion of immigrants in a neighborhood will slow assimilation in volunteering behavior. However, due to the socioeconomic differences between neighborhoods, the moderating effect may not be the same. This test will add to the literature on segmented assimilation by examining how

selected acculturation affects children's assimilation in positive behaviors in segmented socioeconomic neighborhood contexts.

An additional question is whether the effect of neighborhood context on volunteering persists from adolescence into young adulthood. In another words, does past pattern or effect through exposure to neighborhood context might continue to work when those adolescents enter a new life stage. Do social relations across cultures in neighborhood during adolescence exert a long-term influence during young adulthood for immigrant children? Segmented assimilation describes an unfavorable future for children growing up in disadvantaged neighborhoods. However, Alba and Nee (1997) were critical of this, saying that childhood circumstances of young immigrant offspring are not necessarily identical to nor predictive of experiences in adulthood. According to life course theory, the interdependence of the life history of family members (Elder 1984) and the potential for both continuity and change in pattern are possible over the life course. How much impact of neighborhood context on assimilation in volunteering behavior can we expect to persist when children move from adolescence to young adulthood? This study has the advantage of using neighborhood context in adolescence to predict assimilation outcomes in young adulthood.

Based on the theoretical background above, three hypotheses are listed as below:  
*Hypothesis A:* Children in better-off communities will experience positive assimilation in volunteering behavior, and a high proportion of immigrants in a neighborhoods will be associated with a lower degree of assimilation with respect to volunteering.

*Hypothesis B:* Children in disadvantaged neighborhoods will experience negative assimilation in volunteering behavior, and the higher proportion of immigrants in neighborhoods, the less likelihood to assimilate to adverse direction.

*Hypothesis C:* Neighborhood context in adolescence will predict assimilation in volunteering behavior when they enter into young adulthood. Whether the impact is continuity or change from adolescence depends on the socioeconomic disparity of the neighborhood.

## **DATA**

The National Longitudinal Study of Adolescent Health (Add Health) is used for this study. Add Health started as a nationally representative sample of more than 20,000 adolescents in grades 7-12 in 1994-5 in the United States (Harris et al. 2003). Initially, 132 middle, junior high and high schools were selected for participation in 1994. From those schools, all students present in the survey day (N=90118) completed in-school questionnaires. Then 20,745 students were sampled and interviewed at home in 1995. After that, two follow-up interviews were conducted in 1996 and 2001. A number of special over-samples were also selected for in-home interviews, including ethnic samples, physically disabled adolescents, and genetic sample. Administrators from the 132 schools also completed a school-administrator survey describing various school characteristics. A parent, usually the mother, was also interviewed in Wave I.

Questions about civic participation were asked in Wave III. This study is thus restricted to Wave III samples, who are children of immigrants, and who had information on immigrant generations, family origins, race and ethnic background. However, the

subjects could be linked to wave I, wave II, as well as parental questionnaire and school administrator questionnaire for the analysis purpose.

Except for the national representatives and relatively large sample, one of unique advantages of Add Health study is the collection of residential location of each respondent included in the in-home interview. External sources such as the U.S. Census are linked to individual respondents to obtain the broader neighborhood characteristics. Since neighborhood context is the key in this study, information from other sources is crucial to test how the neighborhood context affects the process of assimilation. Limitation of this data set for this study is the possible recall errors due to the self-reported dependent variables by retrospective method. In addition, because volunteering is a socially desired behavior, it may be over-reported. However, as part of social citizenship education in schools, the definition of volunteering should not have great disparity among adolescents. Another problem about this data is the large proportion of missing on parental questionnaire, thus, it lost important information on family context, especially household income.

## **MEASURES**

### Dependent variable

The measure for adolescents' volunteerism is a categorical variable, which was asked retrospectively in wave III. The question asks the wave III respondents if they ever participated in volunteer or community service work regularly when they were 12 to 18 years old. To clearly measure the motivation for volunteerism, it is necessary to distinguish "non-required volunteering" versus "required volunteering", since some

volunteering behavior maybe required by others such as school and court for adolescents. By definition, this kind of required volunteering does not really reflect self-motivated volunteering. Thus, this analysis only codes those “Non-required volunteering” as volunteering. This means that volunteer work is not mandated by any institutions.

Adult volunteerism may be different from adolescent volunteerism since norms and values change over the life course. In the wave III in-home questionnaire, those adolescents who have arrived their adulthood were asked if they had done any volunteer work during the last 12 months. This provides an opportunity to examine if the factor of neighborhood context affects their assimilation on volunteering in their young adulthood.

Little is known about the reporting errors of volunteerism. Studies are mostly depending on the retrospective questions on the volunteerism. The typical way to ask this question is asking whether they have done any volunteer work during last 12 months or how many hours/weeks/times they have been involving in volunteer work in particular time duration (Wilson and Musick 1997; Mustillo, Wilson and Lynch 2004; Rotolo and Wilson 2004). Reporting error is possible since volunteerism is a socially desired behavior. Respondents might be more likely to self-report it in such a way as to avoid criticism or has the tendency to seek praise. Unfortunately, there is no way to test the reliability of the self-reported volunteering directly at the analysis stage.

### Independent Variables

Exposure to American society is determined by both length of residence in the United States and neighborhood context. Since the sample includes both first and second generation immigrants, migration duration of second generation immigrants was

determined by their age at each survey. Different coding systems were conducted to test the sensitivity of this variable, and the results do not depend on grouping. The proportion of people who are foreign-born at the Census tract level is used to measure the exposure to the destination culture at the neighborhood level. To test the theory described earlier, a difference is made between better-off neighborhoods and disadvantaged neighborhoods. The disadvantaged neighborhoods are similar to the immigrant enclave as discussed in literature, which usually refers to immigrants who live in an ethnic community and are marginalized by socioeconomic, cultural, or linguistic distinctions that inhibit full incorporation into destination contexts (Logan et al. 2002; Portes and Bach 1985). The difference between an immigrant community and an enclave exists in the concentration of the ethnic group. Proportion of foreign-born is a direct measure of the degree of contact with the native culture.

Although the proportion of foreign-born people in a neighborhood can measure the degree of direct contact with native-born people, the socioeconomic status of the neighborhood may also strengthen or weaken the degree of the contact. Poor neighborhoods may lead immigrants to marginalization socio economically, culturally, and/or linguistically. Thus, analysis will be conducted separately for advantaged and disadvantaged neighborhoods. Median household income at the neighborhood level is used to approximate economic advantage. Respondents are divided into two groups of equal size. Half of the respondents live in neighborhoods with median household income lower than the median of median household income in all neighborhoods, while the other half of respondents live in neighborhoods with median household income higher than the

median of median household income. These two contextual variables are measured at the Census tract level.

Census tracts have enjoyed widespread use as measures of neighborhoods, although they have also been criticized. The criticism stems from the argument that neighborhoods are defined as government statistical areas rather than the actual dynamic neighborhood processes that are hypothesized to shape child and adolescent well-being (Jencks and Mayer 1989; 1990). However, these administratively-defined units are reasonably consistent with the notion of overlapping and nested ecological structures, and nationwide, it is an efficient and convenient way to capture the characteristics of neighborhoods (Sampson et al. 2002).

*Control variables:* [See Chapter 2] Parental education is used to indicate the social economic status of family. I expect that the more desired family social economic situation, the higher probability of immigrant children involvement in volunteering, since they do not need struggle between volunteering and family responsibilities. Parental education is decided by the higher of the two parents if both are present, which is a binary variable of high school graduate or not. Family socioeconomic status is also thought to shape parents' values and in turn their child-rearing goals and behaviors (Gecas 1979; Kohn 1969; Mortimer and Kumka 1982). Previous studies have shown that positive effect of mother's education on household participation in the volunteer work, as well as next generation's propensity to participate in volunteer work (Brown 1999). Parent-child relationship is very important for children's psychological wellbeing. As immigrants, high ability of English speaking skill by parents will help their children keep up with school work and social activities, which also provides more resources and instructions for

their children's volunteering. It will be ideal if this variable can be included in the analysis. However, since the dataset has no measurement on parental English communication ability, I use a proxy variable of whether children speak English at home to represent this.

Adolescent volunteering has been linked to education aspirations since the U.S. school system take volunteering into account as an important factor during college admission. Both parental and children educational aspirations are included in the models. Family structure has been linked to the availability of resources for children. Single parent family in immigrant community has less social capital to obtain information. Previous research argues that the family is usually considered the most important mechanism in value socialization (Bengtson, 1975, P.358). Immigrants in a single-parent family usually have more constraints than natives. Not only is economic security a concern, divorce maybe socially stigmatized among their ethnic group, so their direct social contacts may be significantly reduced. Thus, I included a binary variable of two biological parental families verse others in my analysis. I also included whether an adolescent taking a job during a typical non-summer week and church attendance as the control variables in the models. Part-time job may compete with volunteering for children' time and it may also be a self-selection of choices. Thus, part-time job during a typical non-summer week is expected to have a negative effect on the likelihood of volunteering if the time competition theory holds. However, in Chapter 2 I found that part-time job during a typical non-summer week has a positive effect on adolescent volunteering probably because involvement in the labor market provides more

opportunities for them to volunteer. Church attendance is expected to have a positive effect on volunteering.

Other variables include age, gender, and race/ethnicity. Add Health respondents were aged 11-18 in the Wave I survey and they became 18-27 during the Wave III survey. Age may affect volunteering. Johnson (2002) suggests that people will have more concerns about the economic costs and benefits of a particular work as age increases. In his research, he uses a quite wide age group for adults. Whether this pattern exists among a younger group is examined in this paper. Gender is an important control variable to be considered since volunteer work has traditionally been thought of as a female activity (Daniels 1988; Mustillo et al. 2004). I expect females will be more likely to volunteer than males. Race and ethnicity play important roles both in initial adolescent values and in changes that occur across the young adult years (Johnson 2002). Previous work shows that whites volunteer more than blacks (Musick, Wilson and Bynum 2000). It is unclear if this difference exists among adolescents. It is also not clear what the patterns are among other minority groups.

To examine whether neighborhood context in adolescence will affect assimilation in volunteering behavior when immigrant children enter into young adulthood, volunteering during these two life stages is examined in separate models. In addition to the aforementioned variables, marital and cohabitation experience are also included. [See Chapter 2] Previous studies show that married people are more likely to volunteer than single people (Hodgkin Son and Weitzman 1996), regardless of whether they have children (Sundae 1990). Since the respondents are all young adults, it is meaningful to examine their marital and cohabitation history instead of current marital status. Marital

and cohabitation history includes married, but did not cohabit; cohabited, but never married; cohabited then married; and single. Control variables include educational achievement and labor force participation. Education is a strong predictor of volunteering. Volunteer work and paid work compete for a person's time, so labor force participation should be controlled for (Rotolo and Wilson 2004; Mustillo, Wilson and Lynch 2004) when studying adult volunteerism. In addition, I use the daily language spoken with best friends, which includes English, some English and other language as categories to measure the language acculturation. Church attendance is used to measure religiosity, which is defined as a two category variables of weekly or more and less than weekly.

## METHODS

The statistical modeling approach used in this paper is multilevel logit model (Raudenbush and Bryk 2002). The choice of statistical methods is guided by the categorical nature of the outcome variable as well as the data structure. The self-reported variable of volunteering in both adolescence and adulthood,  $y_{ij}$ , is a binary response for individual  $i$  in neighborhood  $j$  (volunteering=1 and not volunteering=0). The probability that the response is equal to one is defined as  $P_{ij} = \Pr(y_{ij} = 1)$ , where  $y_{ij}$  has a Bernoulli distribution. The data in the regression equation are transformed by taking the log of odds of volunteering.

$$\log\left(\frac{P_{ij}}{1 - P_{ij}}\right) = \beta_{0j} + \beta_{1j}mig\_dur_{ij} + \beta_{2j}race_{ij} + \beta_{3j}females_{ij} + \dots \quad \text{Level 1 model}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \text{prop}_{-foreign_j} + u_{0j}$$

**Level 2 model**

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \text{prop}_{-foreign_j} + u_{1j}$$

**Level 2**

**model**

$$\log\left(\frac{P_{ij}}{1-P_{ij}}\right) = \gamma_{00} + \gamma_{10} \text{mig}_{-dur_{ij}} + \gamma_{01} \text{prop}_{-f_j} + \gamma_{11} \text{mig}_{-dur_{ij}} * \text{prop}_{-f_j} + u_{1j} \text{mig}_{-dur_{ij}} + u_{0j} + \beta_{2j} \text{race}_{ij} + \dots$$

**Combined model**

Where  $\beta$  are regression coefficients at individual level

$\gamma$  are regression coefficients at neighborhood level

$u_{0j}$  and  $u_{1j}$  is the random effect at level two, the neighborhood level. Other

predictors are omitted in the formula to make it concise.  $\beta_0$  is the intercept, which represents the log odds of volunteering when immigrant generation is set at its reference group (for example, first generation) and all categorical independent variables are at their reference group and continuous variables at 0s.  $\beta_1$  represents the generation effect on volunteering. To examine the effect of neighborhood exposure on volunteering, I use the contextual variable of proportion of foreign-born in a particular neighborhood to predict the intercept and the coefficient of time exposure measured as residential duration to see if the concentration of foreign-born moderates the effect of assimilation in volunteering behavior. In other words, an interaction effect is expected to exist between time exposure and neighborhood exposure. Thus, the moderation effect of proportion foreign-born on residential duration is expressed as a cross-level interaction. Two sets of models are conducted for adolescents and young adults separately. I present results in the form of

both raw coefficients and odds ratios for ease of interpretation. In addition, since this data is structured at different levels, multilevel models can correct the biases of standard errors due to the dependence of individuals in same neighborhood. The model also uses the likelihood ratio to test for significance when examining the model as a whole.

## **RESULTS**

### **Descriptive Analysis**

Tables 1 and 2 show descriptive statistics of the variables in both adolescent and adult models by the socioeconomic status of neighborhood to distinguish the advantaged and disadvantaged immigrant communities. About 37 percent of immigrant adolescents regularly engaged in non-required volunteering work. Adolescents in socioeconomically advantaged neighborhoods were four percent higher in engaging in non-required volunteering than adolescents from disadvantaged neighborhoods. Residential duration does not differ much across neighborhood types. The proportion of people who are foreign-born in socioeconomically disadvantaged neighborhoods (30 percent averagely) is higher than in advantaged neighborhoods (24 percent averagely). However, the range of the proportion of people who are foreign-born in disadvantaged neighborhoods is much higher than the range in advantaged neighborhoods. The logged median household income for advantaged neighborhoods is 10.68 and for disadvantaged neighborhoods is 9.96. When youth transition from adolescence to young adulthood, the proportion who volunteers decreases. For example, only 26 percent of young adults volunteer compared to 37 percent of adolescents. The rate of volunteering is higher for immigrant children growing up in advantaged neighborhoods than in disadvantaged neighborhoods.

### **Multilevel Logit Model Results**

Table 3 presents the regression results for adolescent volunteering. Model 1 in Table 3 includes all respondents, with no distinction between advantaged and disadvantaged neighborhoods. According to Model 1, time exposure measured as residential duration has a positive effect on the likelihood of volunteering, with one additional year of living in the U.S. increasing the likelihood of volunteering by 4 percent. Thus, positive assimilation in volunteering is indicated in this case. Logged household income at the neighborhood level also significantly increases the likelihood of volunteering. When logged income is increased by one unit, the likelihood of volunteering is increased by 41 percent. However, controlling for median income, the proportion who are foreign-born at the neighborhood level does not have a significant impact on volunteering, nor is there an interaction effect between exposure as measured by residential duration and exposure as measured by proportion of foreign-born. A large proportion of immigrants in a neighborhood neither reduces nor increases assimilation in the case of volunteering when the entire sample is examined.

To test if the segmented assimilation model applies for volunteering, Model 2 and Model 3 present the separate regression results for socioeconomically advantaged and disadvantaged neighborhoods. Model 2 reports the results for adolescents who live in disadvantaged neighborhoods. Residential duration, logged median household income, and the proportion of foreign-born people do not have significant effect on volunteering in disadvantaged neighborhoods. Model 3, however, shows a completely different story for immigrant children living in better-off neighborhoods. For them, not only do residential duration and neighborhood context affect assimilation in volunteering

behavior, but the interaction of these two does as well. The interpretation of this cross-level interaction should not be interpreted by a single estimate and has to take into consideration both the main effect and interaction effect. The odds ratio of residential duration based on the change in the proportion who are foreign-born can be calculated from the following equation:

$$\text{Odds Ratio} = \exp \left( \beta_{\text{mig\_dur}} + \beta_{\text{mig\_dur*prop\_foreign}} * p \right) \quad (5)$$

where letter  $p$  refers to the proportion who are foreign-born at neighborhood. As expected, since the effect of the cross-level interaction between time exposure and neighborhood exposure is negative, it reduces the positive effect of time exposure on volunteering when the concentration of foreign-born at neighborhood increases. It confirms *hypothesis A*, that a reduction of contact with native-born people at the residential level decreases the positive effect of time exposure on assimilation in volunteering in socioeconomically advantaged neighborhoods. To simulate how these two exposure variable interact with each other, I calculated odds ratios given different proportions of people who are foreign-born into the equation (5). Figure 1 presents the predicted odds ratios of time exposure on the likelihood of volunteering when the proportion of foreign-born people in the neighborhood increases. The predicted odds ratios show the effect that an additional year of living in the United States increases the likelihood of volunteering given a fixed proportion of foreign-born people in a neighborhood. Although residential duration initially has a significantly positive effect on volunteering, the effect weakens as the proportion of foreign-born in the neighborhood increases. When the proportion of foreign-born increases to over 30 percent, the effect of time exposure becomes negative. Thus, 30 percent of people who are foreign-born in the

neighborhood is the turning point for the effect of time exposure on volunteering. This indicates that a higher concentration of immigrants in advantaged neighborhoods is an obstacle for assimilation. In these communities, volunteering rates would not increase with additional years of residence in the United States.

Among other control variables, age has a negative effect on adolescent volunteering. This is consistent with previous studies on the age effect on volunteering in adults. Female adolescents are about 25 percent more likely to volunteer than male adolescents. Since Hispanics compose the largest group of immigrants, they are the omitted category in the models. The results do not show any differences between Hispanics and other racial and ethnic groups for both the aggregate model and separate models. Educational aspiration encourages volunteering. Contrary to what is expected, working during a typical non-summer week does not affect immigrant adolescent volunteering. Parental education positively affects volunteering. Having a parent who has at least a high school degree increases the chances of volunteering by more than 50 percent. Frequent church attendance also significantly increases the chances of volunteering by 40 percent compared to less than frequent church attendance.

Table 4 displays the multilevel regression results for young adults. Model 1 includes individuals who grew up in both disadvantaged neighborhoods and advantaged neighborhoods. With each additional year of residence in the United States, the likelihood of volunteering increases by about 3 percent, which is a weak association since significance is at the 0.1 level. A higher percentage of foreign-born in a neighborhood does not affect volunteering, nor is there a significant interaction between duration of residence and proportion of foreign-born. Logged median household income in the

neighborhoods that respondents lived in during adolescence positively impacts the likelihood of volunteering when they enter into young adulthood.

Model 2 and Model 3 present the results for people who grew up in advantaged neighborhoods and disadvantaged neighborhoods separately. In disadvantaged neighborhoods, both the proportion of foreign-born and the cross-level interaction between duration of residence and the proportion of foreign-born have a significant effect on volunteering. Again, since it is an interaction effect, the odds ratios of residential duration based on the change in proportion who are foreign-born can be calculated from equation (5). In contrast to what was found in the adolescent models, when the proportion of foreign-born increases, the residential duration effect is positive. Predicted odds ratios given different proportions of foreign-born are represented by the diamond line in Figure 2. Thus, the proportion of foreign-born positively moderates the effect of time exposure on volunteering in young adulthood models when they grew up in disadvantaged neighborhoods. Also, according to Model 3, one additional year of residence in the U.S. increases the likelihood of volunteering by 18 percent. Residential duration, contact with residents in the neighborhood, and the interaction of these two factors each have a significant effect on volunteering. This result is similar to what was found for adolescents in Table 2. The predicted odds ratios are presented in Figure 2 by the square line. Similar to the model for those who lived in advantaged neighborhoods in adolescence, the effect of time exposure on volunteering is positive initially, but the effect weakens when the proportion of immigrants in the neighborhood increases. When the proportion increases to over 40 percent, living in an advantaged neighborhood hinders the positive assimilation on volunteering for young adults instead of encouraging volunteering. The

result confirms Hypothesis C, that neighborhood context play an important role in the assimilation process for young adults.

In the young adult models, age negatively affects volunteering. Asians volunteer more than Hispanics. Work does not impact volunteering, but educational achievement does. High school graduates are significantly more likely to volunteer than those who do not complete high school, about 90 percent more likely. Language use with friends has no effect on adult volunteering, whether they are in advantaged or disadvantaged communities. In examining marital and cohabitation history, young adults who had experience with cohabitation and/or marriage are less likely to volunteer than those who had never cohabited or married. Frequent church attendance increases the likelihood of volunteering by 110.6 percent.

## **DISCUSSION AND CONCLUSION**

In this paper, I test hypotheses based on segmented assimilation theory with specific relevance to a positive social behavior, volunteering. In multilevel regression analyses of Add Health data for children from immigrant families, the results show that, in general, longer length of residence in the United States is associated with a higher likelihood that respondents engaged in non-required volunteering. This pattern of positive assimilation on volunteering for children from immigrant families marginally holds when they enter their early adulthood, which indicates a continuity of assimilation on positive behaviors across the life course. By examining the effects of both neighborhood exposure and time exposure on volunteering, different assimilation paths were demonstrated for children of immigrants living in different types of neighborhood. The cross-level

interaction is significant for children of immigrants living in advantaged neighborhoods in adolescence, which means that neighborhood exposure to native-born people moderates the path of assimilation on volunteering in advantaged neighborhoods. In other words, when the proportion of foreign-born immigrants living in the same neighborhood increases, the initial positive assimilation on volunteering becomes weaker until it reverses to become negative. This is consistent with the segmented assimilation hypothesis that fewer contacts with native-born people present barriers to assimilation, even if they live in advantaged neighborhoods. In poor neighborhoods, both types of exposure and their cross-level interaction do not have an effect on adolescent volunteering. Therefore, negative assimilation does not occur in this case, even if they live in disadvantaged neighborhoods. Thus, there is the possibility that fewer contacts with disadvantaged native-born children can protect them from adverse outcomes.

In young adulthood, interactions occur in both advantaged and disadvantaged communities, but the effects run in opposite directions. Neighborhood context during adolescence plays a role when they enter into young adulthood. In advantaged neighborhoods, the effect runs in the same direction as in adolescence, which indicates a continuation of the neighborhood effect on assimilation in volunteering behavior over the life course. On the contrary, in disadvantaged neighborhoods, the likelihood of volunteering is improved when the proportion of foreign-born people in neighborhood during adolescence increases. This suggests that disadvantaged neighborhood context during adolescence does not necessarily lead to disadvantaged adult civic participation, especially in the case of growing up in immigrant communities. Thus, this suggests a change of adolescent social context effect on adult assimilation.

Studies on neighborhood effects have been preoccupied with problem behaviors and health related outcomes, and neighborhood research (Wilson 1987; Sampson et al. 2002) has primarily concentrated on the structural dimensions of neighborhood disadvantage, especially poverty. Wilson (1987) argues that neighborhood concentrations of the most disadvantaged populations have propagated destructive attitudes and behaviors that perpetuate disadvantage, such as high rates of teenage childbearing, female family headship, drug use, illegal market activity, and detachment from the labor force. To a lesser extent, the social-ecological literature has considered aspects of neighborhood differentiation other than concentrated disadvantage, such as residential stability and home ownership. In the first case, for example, segmented assimilation argues that immigrant children will assimilate into the native-born underclass permanently if they live in disadvantaged inner cities (Zhou 1997; Gan 1992). Moreover, research has shown that children of immigrants can adjust their behaviors if they live in an immigrant enclave, since their ethnic cultures can protect them from this downward assimilation (Zhou 1997). This paper includes both kinds of neighborhood characteristics but emphasizes the latter more than the former. Moreover, little research has been done on the positive social behaviors of immigrants. This paper adds to the literature by examining neighborhood effects on immigrant assimilation in volunteering behavior, taking into consideration the different levels of exposure to native-born people in residences for children of immigrants living in neighborhoods of different socioeconomic levels.

Previous studies have also paid particular attention to the impact of the immigrant enclave because not only does the immigrant enclave economy show a competitive return

to human capital relative to people who work in the secondary sector of the economy (Wilson and Portes 1980), but also the immigrant enclave exhibits strong ties to ethnic culture and values. With respect to how local context affects immigrant assimilation, studies have focused on the density of the ethnic networks on the outcome of assimilation. For example, research has shown that immigrant children from families in tight-knit social networks have better psychological outcomes, higher levels of academic achievement, and higher educational aspirations than those in socially isolated families (Portes and Schauffler 1994; Rumbaut 1994 1996; Zhou and Bankston 1994). Less attention has been paid to the association between residential exposure to native-born people and assimilation outcomes.

This paper uses the proportion of foreign-born immigrants in the neighborhood to represent residential exposure to the culture of the destination society. The concentration of foreign-born is not the same as the concentration of co-ethnics, so the representation of ethnic social capital is lacking in this context. Moreover, this kind of neighborhood also might create a situation where immigrants are even more isolated from both co-ethnic and native-born people. Thus, whether the concentration of foreign-born people, not the density of co-ethnic groups, will make immigrant children resist assimilation is a new question which fits the framework of segmented assimilation.

By considering the side of density of exposure to native-born people instead of exposure to ethnic culture and networks, this paper adds to the literature on segmented assimilation theory. Based on the regression analysis, lack of exposure to native-born people does decrease the assimilation in volunteering behavior, whether or not the neighborhood is composed of mostly co-ethnics or other immigrant groups. This weakens

the selective acculturation theory, which posits that strong ethnic ties decreases assimilation. Rather, the relatively weaker ties with native-born people decreases assimilation, at least in the case of volunteering. This challenges the current segmented assimilation theory that focuses on the impact of ethnic culture.

However, this conclusion is only true in socioeconomically advantaged neighborhoods. In disadvantaged neighborhoods, the degree of exposure to the disadvantaged native-born underclass neither improves nor worsens assimilation in volunteering behavior. Segmented assimilation theory argues that socioeconomically disadvantaged children of immigrants living in immigrant enclaves may be protected from destructive attitudes and behaviors because of the strong ties of ethnic cultures; therefore it is possible that the protective effect will also protect the children from assimilation to positive social behaviors. However, this is not the case when measuring contact with native-born people instead of co-ethnics. The possible reason is that disadvantaged immigrants may give the priority to surviving over others. Thus, no matter how long they have lived in the United States and what the race/ethnic composition is, their volunteering rate remains about same for this group of immigrants.

How does neighborhood context during adolescence affect their assimilation in volunteering behavior when they enter into young adulthood? The life course perspective emphasizes the interdependence of the life history of family members as well as social context (Elder 1984). In this paper, I use neighborhood context in adolescence to predict whether it moderates the effect of residential duration on volunteering, taking into account their education, work status, marital status and religiosity. Based on the statistical results, when children of immigrants in disadvantaged neighborhoods grew up, their

experience of living in poor immigrant neighborhoods during adolescence actually makes them more likely to volunteer. This is counter to segmented assimilation theory that argues that disadvantaged adolescent social context will lead to permanent adverse assimilation. One speculation is that their experiences in poor neighborhoods as immigrants motivate them to volunteer when they enter into young adulthood. They may volunteer to help new immigrants. However, this is only a speculation. The neighborhood context during young adulthood may also play a role. Unfortunately, Add Health data does not include the neighborhood context variables when they enter into adulthood. For children living in socioeconomically advantaged neighborhoods during adolescence, the young adult pattern of assimilation in volunteering behavior is same as during adolescence, which suggests a continuity of the neighborhood effect over the life course. However, neighborhood differences in moderation of assimilation in volunteering behavior may also reflect differences in racial and ethnic composition in neighborhoods, which may coincide with the concentration of foreign-born people. Moreover, it may also be the racial segregation within the immigrant community. For example, Asian Americans are more likely to live in socioeconomically advantaged immigrant neighborhoods than Hispanics. The next step of this work will examine how the racial and ethnic composition of a neighborhood affects the assimilation of immigrant children.

To summarize, this paper tested the neighborhood effects on the immigrant children's volunteering behavior. The results shed some light on segmented assimilation theory by making the distinction between economically advantaged and disadvantaged neighborhoods. Living in immigrant community does curb the assimilation path in volunteering behavior, but it is conditioned on the socioeconomic status of the

neighborhood. In advantaged neighborhoods, the assimilation effect on volunteering is weakened by an increase in the concentration of immigrants. This implies that less exposure to native-born residential contacts limits assimilation. This also offers a unique perspective to assimilation literature in that living in advantaged neighborhoods does not necessarily mean assimilating into the mainstream American culture. On the other hand, living in a poor neighborhood with high proportion immigrants during adolescence does not necessarily lead to permanent negative outcomes. The adolescent context actually prompts positive behavior when entering young adulthood.

Table 3.1: Descriptive statistics of variables for adolescent models

<i>Adolescent Models</i>	All				Below median income neighborhood				Above median income neighborhood			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Volunteering in adolescence	0.45	0.50	0	1	0.44	0.50	0	1	0.46	0.50	0	1
Strict volunteering in adolescence	0.37	0.48	0	1	0.35	0.48	0	1	0.39	0.49	0	1
Migration duration	13.85	4.55	0.75	20.58	13.82	4.34	0.75	20.58	13.88	4.74	0.92	19.92
Age	16.44	1.65	11.42	21.33	16.29	1.71	11.42	21.33	16.57	1.59	11.75	20.67
Female	0.51	0.50	0	1	0.52	0.50	0	1	0.50	0.50	0	1
White	12.82				11.07				14.51			
Black	5.85				7.32				4.44			
Asian	26.61				13.47				39.25			
Other	6.67				8.49				4.91			
Hispanic	48.05				59.66				36.89			
Education aspiration	4.33	0.94	1	5	4.29	0.97	1	5	4.37	0.91	1	5
Parent education expectation	4.13	1.09	1	5	4.09	1.09	1	5	4.17	1.09	1	5
Part-time work	0.46	0.50	0	1	0.44	0.50	0	1	0.48	0.50	0	1
Speaking English at home	0.56	0.50	0	1	0.51	0.50	0	1	0.62	0.49	0	1
Church attendance	0.40	0.49	0	1	0.35	0.48	0	1	0.44	0.50	0	1
Parent high school graduate	0.68	0.47	0	1	0.61	0.49	0	1	0.75	0.43	0	1
Two biological parents	0.62	0.49	0	1	0.54	0.50	0	1	0.70	0.46	0	1
Neighborhood proportion of foreign-born	0.27	0.23	0	0.87	0.30	0.29	0.00	0.87	0.24	0.14	0.00	0.55
Logged median household income	10.33	0.45	8.52	11.74	9.96	0.34	8.52	10.44	10.68	0.21	10.45	11.74
Number of individuals	3315				1626				1689			

Table 3.2: Descriptive statistics of variables for adult models

<i>Adult Models</i>	All				Below median income neighborhood				Above median income neighborhood			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Volunteering in early adulthood	0.26	0.44	0	1	0.24	0.42	0	1	0.29	0.45	0	1
Migration duration	20.22	4.59	5.92	28.00	20.22	4.39	7.08	28.00	20.23	4.78	5.92	27.58
Age	22.82	1.72	18	28	22.71	1.77	18	28	22.93	1.65	18.42	27.58
Female	0.51	0.50	0	1	0.51	0.50	0	1	0.50	0.50	0	1
White	12.78				10.74				14.8			
Black	6.10				7.76				4.46			
Asian	26.61				13.54				39.46			
Other	6.60				8.29				4.93			
Hispanic	47.91				59.67				36.35			
High school graduate	0.88	0.32	0	1	0.85	0.36	0	1	0.91	0.28	0	1
Work	0.70	0.46	0	1	0.72	0.45	0	1	0.69	0.46	0	1
English	86.36				83.65				89.02			
Other Language	7.07				9.25				4.93			
Half English	6.57				7.10				6.05			
Cohabit and married	0.08	0.26	0	1	0.09	0.28	0	1	0.07	0.25	0	1
Married, not cohabitation	0.12	0.33	0	1	0.15	0.36	0	1	0.09	0.29	0	1
Cohabit, not married	0.25	0.43	0	1	0.26	0.44	0	1	0.25	0.43	0	1
Single	0.54	0.50	0	1	0.50	0.50	0	1	0.59	0.49	0	1
Church attendance	0.34	0.47	0	1	0.31	0.46	0	1	0.36	0.48	0	1
Neighborhood proportion of foreign-born	0.27	0.23	0	0.87	0.30	0.29	0.00	0.87	0.24	0.14	0.00	0.55
Logged median household income	10.32	0.45	8.52	11.74	9.97	0.33	8.52	10.44	10.67	0.21	10.45	11.74
Number of individuals	3379				1676				1703			

Table 3.3: Volunteer Activity in Adolescence, Random Effect Logit Models

Variables	Model 1			Model 2			Model 3		
	All			Below median income neighborhood			Above median income neighborhood		
	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )
Intercept	-5.746***	1.266	0.003	-3.252	1.875	0.039	-9.837**	3.227	0.000
Migration duration	0.04*	0.017	1.041	0.031	0.023	1.032	0.091**	0.031	1.095
<i>Demographic variables</i>									
Age	-0.075**	0.026	0.928	-0.037	0.035	0.964	-0.127**	0.04	0.881
Female	0.219**	0.076	1.245	0.322**	0.11	1.38	0.095	0.108	1.099
White	0.168	0.141	1.183	0.323	0.202	1.381	0.011	0.198	1.011
Black	0.163	0.181	1.177	0.148	0.232	1.159	0.161	0.286	1.174
Asian	0.178	0.109	1.195	0.245	0.173	1.278	0.189	0.147	1.208
Other	0.059	0.175	1.06	0.028	0.23	1.028	0.018	0.271	1.018
Hispanic(omitted)									
<i>Education Aspiration</i>									
Aspiration to go to college	0.252***	0.049	1.287	0.25***	0.067	1.284	0.257***	0.073	1.293
Parent expectation to go to college	0.081*	0.038	1.085	0.06	0.054	1.062	0.113*	0.055	1.119
<i>Part-time job and Language use</i>									
Work during non-summer time	0.124	0.08	1.132	0.053	0.114	1.055	0.197	0.114	1.217
Speaking English at home	-0.015	0.097	0.985	0.148	0.145	1.16	-0.145	0.133	0.865
<i>Family background</i>									
Parent high school graduate	0.414***	0.096	1.513	0.449***	0.125	1.566	0.346*	0.153	1.413
Two biological parents	0.157	0.083	1.17	0.201	0.115	1.223	0.093	0.122	1.097
<i>Church attendance</i>									
Weekly or more	0.333***	0.079	1.395	0.364**	0.116	1.44	0.349**	0.111	1.417
<i>Neighborhood segregation</i>									
logged Median household income	0.347**	0.115	1.414	0.03	0.178	1.031	0.754*	0.298	2.126
Proportion of foreign-born	0.935	0.585	2.548	0.661	0.668	1.937	3.598*	1.533	36.513
Proportion of foreign-born*migration duration	-0.049	0.042	0.952	0.016	0.046	1.016	-0.276**	0.098	0.759
Number of observation	3315			1626			1689		

Two tail test: +  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 3.4: Volunteer Activity in Early Adulthood, Random Effect Logit Models

Variables	Model 1			Model 2			Model 3		
	All			Below median income neighborhood			Above median income neighborhood		
	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )	Coeff.	S.E.	Exp( $\beta$ )
Intercept	-2.207	1.456	0.11	0.615	2.303	1.85	-6.763*	3.288	0.001
Migration duration	0.031 <sup>+</sup>	0.018	1.031	-0.005	0.026	0.995	0.118**	0.035	1.125
<i>Demographic variables</i>									
Age	-0.112***	0.027	0.894	-0.129***	0.038	0.879	-0.118**	0.041	0.889
Female	0.15	0.084	1.162	0.245	0.125	1.277	0.054	0.116	1.055
White	0.256	0.144	1.291	0.465*	0.215	1.591	0.042	0.197	1.043
Black	0.039	0.186	1.04	0.211	0.241	1.235	-0.16	0.302	0.852
Asian	0.287*	0.113	1.332	0.319	0.197	1.375	0.199	0.144	1.22
Other	-0.143	0.195	0.867	0.159	0.26	1.172	-0.545	0.305	0.58
Hispanic(omitted)									
<i>Work and Education</i>									
Work	-0.117	0.091	0.89	0.0003	0.137	1	-0.184	0.125	0.832
High school graduate	0.638***	0.164	1.892	0.632**	0.215	1.881	0.661*	0.261	1.936
<i>Language speaking with friends</i>									
English	0.247	0.19	1.28	0.25	0.273	1.284	0.247	0.269	1.28
Other Language	-0.019	0.258	0.981	-0.184	0.357	0.832	0.165	0.385	1.179
Half English(omitted)									
<i>Marital Status</i>									
Cohabit and married	-0.59**	0.187	0.554	-0.488	0.257	0.614	-0.736**	0.283	0.479
Married, not cohabitation	-0.335*	0.143	0.716	-0.333	0.191	0.716	-0.328	0.223	0.72
Cohabit, not married	-0.406***	0.107	0.666	-0.519**	0.16	0.595	-0.318*	0.147	0.727
Single(omitted)									
<i>Church attendance</i>									
Weekly or more	0.745***	0.087	2.106	0.743***	0.129	2.102	0.729***	0.12	2.073
<i>Neighborhood segregation</i>									
logged Median household income	0.212 <sup>+</sup>	0.126	1.236	0.016	0.211	1.016	0.504	0.297	1.655
Proportion of foreign-born	-0.994	1.000	0.37	-2.902*	1.223	0.055	5.092*	2.309	162.636
Proportion of foreign-born*migration duration	0.026	0.049	1.027	0.14*	0.06	1.15	-0.283**	0.109	0.754

Number of observation

3379

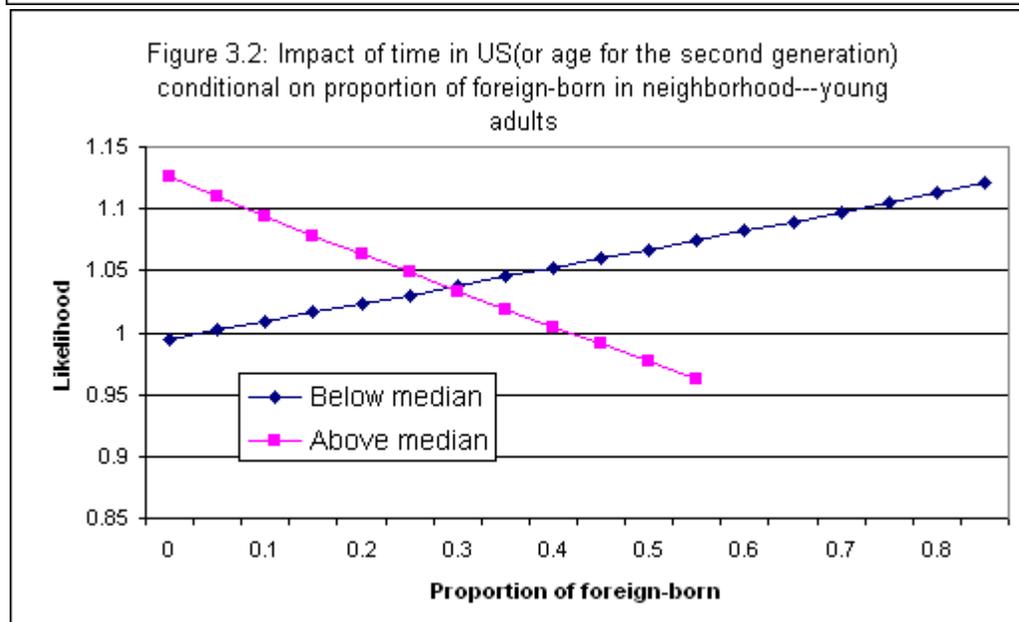
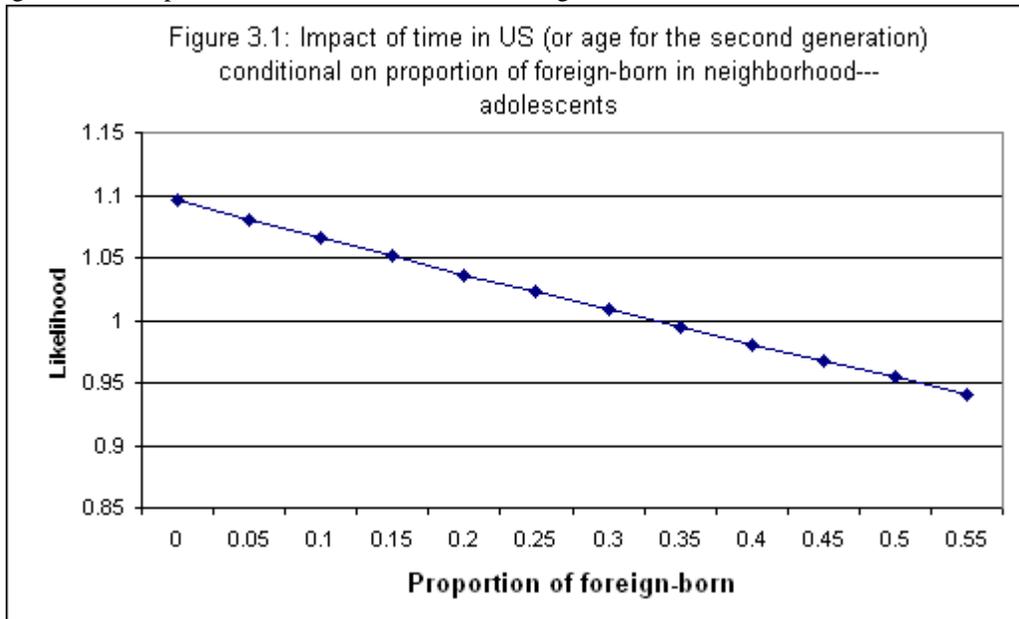
1676

1703

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*Two tail test: +  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$*

Figure 3.1-2: Impacts of Assimilation on Volunteering: Adolescents and Youth Adults



## **Chapter IV**

### **Immigrant Status, Gender Disparity and Assimilation of Immigrant Scientists/Engineers Earnings**

#### **Introduction**

Due to their large numbers and concerns about their adaptation to U.S. society, a sizable literature has emerged to examine the integration of immigrants. How immigrants perform in the U.S. labor market has been one of the central questions in these studies (Borjas, 1994). Different answers for this question underlie much of current debate on costs and benefits for the destination country. Using Census data, the earliest influential work by Chiswick (1978) indicates that the relative earnings of immigrants grow fast and eventually outpace the earnings of native workers. Borjas (1985, 1989, 1994), however, suggests that non-random emigration and quality differences in human capital across immigrant cohorts bias these cross-sectional estimates. He argues that the assimilation path on earnings measured in cross-sectional studies is partly due to a decline in human capital in immigrants admitted to United States since 1965, after the Immigration and Naturalization Act eliminated national origins quotas.

The relative skills of immigrant cohorts declined substantially when the national origin composition shifted away from traditional European source countries to Asian and Latin American countries due to the 1965 Immigration Act (Borjas 1985). The immigrants were also more likely to enter to reunite with kin than on the basis of their

occupational skills (Duleep and Regets 1996), since one key factor in the immigration law was that immigrants who became U.S. citizens could sponsor family members to obtain visas by this legal change. As a consequence, immigrants in the United States are fairly heterogeneous with respect to ethnicity, social class, and other characteristics correlated with economic stratification. Nevertheless, previous studies using Census data to study immigrant earnings always take the immigrant population as a whole or only choose sub-samples of men to study immigrant labor market outcomes. Less attention has been paid to group differences across gender, social class, and racial and ethnic groups. For example, limited consideration has been paid to the gender gap when studying immigrant earnings, and less work has been done to differentiate the earnings of immigrants and their native-born counterparts separately for low-skilled and high-skilled workers. A great deal of work needs to be done to fully understand the gender differences of immigrants. This paper will examine gender difference in earnings in the highly educated group of scientists and engineers, using a national representative dataset with repeated measures on individuals.

For many decades, highly-skilled immigrants have gained a higher premium for their education and skills by coming to the United States. In the past, highly-educated immigrants rarely caught the attention of the general public and policy makers (North 1995), partly because of their high level of productivity in the destination country and partly because there are fewer public concerns about them. Since the 1990s, the size of the highly-educated group of immigrants has been increasing dramatically. Thirteen percent of all college graduates in the U.S. civilian labor force were foreign-born in 2000, and over one-third arrived in the 1990s. However, over the same period, the labor market

for the highly-educated population tightened, increasing concerns among the native-born. How do highly educated foreign-born people perform in the U.S. labor market compared with their native-born counterparts? Are there any differences in the labor market performance among racial/ethnic and gender groups? Answers to these questions will help increase knowledge about the costs and benefits of immigration in the U.S. Previous research has already shed some light on this subject matter (Bojars 1989; North 1995; Tang 1993; Goyette and Xie 1999; Xie and Shauman 2003). However, except Goyette and Xie (1999), most of the studies focus on inequalities in labor market outcomes by nativity or generation and overlook the role of gender.

According to Pedraza (1991), the experience of immigration profoundly impacts both the public and private lives of women. Scholars also argue that the assimilation path is different between men and women (Lopez et al. 2005). A recent publication by Parrado and Flippen (2005) found that although women are more likely to work after migrating and their employment is likely to yield economic benefits that may facilitate equality, migration disrupts the social bonds and support available in their countries of origin and promotes dependency on their husbands. Also, although more women are migrating independently these days, women are still more likely than men to accompany their spouses and bring children when they migrate. Women's migration is more likely seen as a secondary movement generated by the original migration of economically-motivated males. Hence, men and women's labor market assimilation may be different because of the different conditions of their migration experiences.

With greater autonomy and self-esteem, one would expect that the pattern of gender differences among highly-educated immigrants is similar to the native-born.

Using 1990 Census PUMS data, Goyette and Xie (1999) examined this hypothesis. They found that foreign-born female scientists and engineers earn about 4.7 percent less than other scientists and engineers, but the earnings ratio of men to women is approximately the same between the foreign-born and native-born. No studies have been conducted to compare the impact of assimilation on earnings by gender, so this is a gap in the literature. In addition, previous research using cross-sectional data is subject to potential biases when studying assimilation effects. For example, this method of data collection cannot capture the life changes of individuals in the process of assimilation. More importantly, cross-sectional data analysis cannot solve the problems of non-random emigration among immigrants and human capital differences across immigration cohorts. Thus, longitudinal data and more suitable research methods need to be used to correct the potential biases.

In this paper, I use repeated measures on the same individuals to examine the effect of assimilation on the earnings of scientists and engineers. I examine two research questions. First, do nativity and naturalization affect earnings? If so, are there any gender differences? Second, if immigrants are at a disadvantage compared to those who are native-born, does residential duration in the U.S. matter? Is the impact contingent on gender? A fixed-effect modeling approach is used to answer these research questions.

## **Background**

Prior to the 1965 Amendments to the Immigrants and Nationality Act, immigrants to the United States were regulated by numerical quotas based on the ethnic population of the United States in 1920. This encouraged immigrants from European countries and

restricted immigrants from Asia and Latin America. After 1965, the Immigration Act allowed more individuals from other countries to enter the U.S., including Asians, who had traditionally been barred from entering America. The new immigration law also created a separate quota for refugees. Skilled workers and relatives of U.S. citizens were eligible for U.S. immigration, and country of origin no longer posed a significant barrier. As a result, immigrants since 1965 originate mostly from Asia and Latin America, and is more heterogeneous in their racial and ethnic composition than previous cohorts. Heterogeneity is the most significant characteristic in the current immigrant population in the United States.

Migrant streams can alter the composition of places with respect to ethnicity, social class, and other characteristics related with economic stratification (Cobb-Clark, 1993). Ethnicity often defines the boundaries for social and cultural interaction. One study contended that ad hoc explanations for why the U.S. earnings of immigrants from different countries tended to exhibit so much variation were no longer necessary (Hirschman and Kraly 1988). The economic theory of immigration suggests that this variance can be “explained” in terms of the economic and political conditions that guided the nonrandom sorting of persons across countries at the time of migration (Borjas, 1989). However, other earnings difference such as those due to gender is far less clear.

The study of residential duration and earnings has led to a great deal of debate in the literature. The earliest work by Chiswick (1978) used a cross-sectional data from the 1970 Census and found that the earnings of foreign-born persons immediately upon arrival were lower than the earnings of comparable native-born people. Over time, however, since immigrants had lower earnings, they had greater incentives to invest in

human capital development than native-born people. Immigrant earnings can be expected to rise relatively fast as the returns to human capital investments are realized. The “catch-up” earnings profiles reflect the assimilation or adaptation of immigrants to the destination country’s labor market (Chiswick 1978; Becker 1975). This implies that immigrants will be self-selected not only on the basis of wage levels but also on the basis of wage growth.

However, the conclusion that immigrants have relatively high earnings growth has been challenged on both empirical and theoretical grounds (Duleep and Regets 1997). Borjas (1985) argues that the cross-sectional approach used in Chiswick’s study might bias the estimates because of nonrandom emigration and human capital composition changes over time. He argues that if there has been decline over time in the earnings ability of immigrants, then the assimilation effect measured in cross-sectional studies could be spuriously inflated by declining immigrant earnings ability. In his other study, Borjas found that immigrants’ initial wages, adjusting for education and age, have declined over time (Borjas 1992).

Studies using cross-sectional Census data cannot sufficiently solve the problems of bias due to the cohort composition changes. In addition, an assumption in these studies is that immigrants and native-born people are approximately similar in their socioeconomic status composition in the United States. However, it is well-known that the current immigrants in the U.S. exhibit a bimodal distribution; they are more likely to be in both the lower end and the upper end of the socioeconomic status distribution than in the middle. Since the opportunities faced by highly-educated immigrants are different from other groups of immigrants, it would be valuable to compare the earnings pattern of

a specific immigrant group with their native-born counterparts rather than comparing the undifferentiated aggregated group of immigrants with all native-born people. An examination of the amount of earnings and change in earnings will capture the earnings patterns.

As an important part of the scientific workforce in the United States, immigrant scientists and engineers are relatively less heterogeneous than low-skilled workers with regards to their human capital. Although a relatively small proportion of the immigrant population, the number of foreign-born scientists and engineers grows each year. A higher percentage of the college-educated foreign-born holds post-graduate degrees than their native-born counterparts. Forty-four percent of college-educated foreign-born people have a master's, professional, and/or doctoral degree compared to 35 percent of the college-educated native-born people. The important impact of the foreign-born population on the U.S. skill pool has led to heated discussion (Goyette and Xie 1999). Two types of arguments have been made: displacement (North 1995) and discrimination (Tang 1993; 2000).

From the perspective of displacement, North (1995) argues that there are two groups of foreign-born scientists and engineers. One group is those who enter the U.S. individually, study at U.S. graduate schools, secure advanced degrees and then, in large numbers, stay in the U.S. The other group is those who enter already holding a degree and participate in the U.S. labor market without a U.S. education. In addition, there is a third group, those who enter the U.S. before they pursue their college education. Because so many foreign-born people obtain degrees from U.S. schools, immigrant scientists and engineers occupy positions that might otherwise be taken by women and native-born

minorities. The consequence is that the U.S. does not need to expand its efforts to recruit Americans, particularly women and minorities, to enter science and engineering graduate programs since the demand for highly-skilled workers can easily be satisfied by immigrants. According to the displacement perspective, immigrant scientists and engineers enlarge the pool of skilled workers and thus cause a downward pressure on the earnings structure of science and engineering field.

In contrast, the discrimination perspective (Tang 1993; 2000) posits that immigrant scientists face unfair treatment in the U.S labor market. Previous studies show that Asians, regardless of gender, have a lower level of income and career status than whites with comparable training and qualifications (Barringer, Takeuchi, and Xenos 1990; Chu 1988; Hirschman and Wong 1984; Nee and Sanders 1985; U.S. Commission on Civil Rights 1988). Tang (1993) uses the 1986 Survey of Natural and Social Scientists and Engineers (SSE), separates the foreign-born Asians and native-born Asians, and compares them with native-born whites. Her study shows that the economic status of foreign-born Asian engineers improves with the passage of time, but they still are less likely to enter into a management position or earn a promotion than both native-born Asians and native-born whites. One reason could be that these minority scientists/engineers are more likely to be confined to employment in the periphery of the profession where mobility opportunities are scarce, and, as a result, suffer from significant income loss and downward occupational mobility (Wu 1980; Sung 1976; Villones 1989). Numerous studies have examined the adverse effect of nativity status on the earnings of Asian immigrants (Hirschman and Kraly 1988; Hirschman and Wong

1981 1984; Nee and Sanders 1985; Poston and Jia 1989). Less attention has been paid to other immigrant groups.

Compared to the displacement perspective, the discrimination perspective suggests that immigrant scientists and engineers as a whole are in an earnings disadvantage compared to the native-born. Although both perspectives push down the earnings structure in U.S. scientific labor market, the displacement perspective does not necessarily suggest discrimination toward immigrants. Thus, a comparison of earnings between native- and foreign-born groups cannot prove or disprove the displacement perspective, but a comparison between the two groups can test the discrimination perspective. However, when comparing native- and foreign-born people, it is difficult to identify the cause of discrimination. For example, the reason for discrimination may be due to citizenship status. Thereby, three groups are distinguished: foreign-born and not a U.S. citizen, foreign-born and a naturalized U.S. citizen, and native-born (inherently a U.S. citizen). In general, naturalized U.S. citizens have lived in the U.S. for at least 5 years and for as long as 30 or 40 years. They may have experienced a greater degree of assimilation in the U.S. labor market than those who are foreign-born and not U.S. citizens. In theory, they are entitled to the same privileges as native-born citizens (Massey and Bartley 2005). Thus, if the discrimination perspective is true, then we would expect that foreign-born scientists and engineers would still be disadvantaged after controlling for citizenship. In this paper, I test this hypothesis by combining both nativity and citizenship status in examining earnings pattern of immigrants. If foreign-born immigrants are at a disadvantage, I will examine if duration of residence in the U.S. helps to improve the situation. In addition citizenship, the country in which the immigrant

received his/her degree will also be considered. In their study of Asian Americans, Zeng and Xie (2004) found that the Asian American earning disadvantage is not associated with being native-born versus foreign-born, but rather, the earnings disadvantage was associated with whether the foreign-born were foreign-educated or U.S.-educated. Thus, a distinction will be made according to country of baccalaureate training.

According to Pedraza (1991), gender plays a central role in the decision to migrate and the composition of the migration flows. The gender composition affects subsequent immigrant incorporation. Beginning in the 1970s, the dearth of research on women was replaced by a flurry of historical and contemporary studies that examined women migrants as the primary subject of inquiry. Many other studies incorporated gender by inserting a gender variable into their quantitative data collection (Mahler and Pessar 2006). Although women are more likely to work and yield economic benefits in receiving countries than their original places, which facilitates gender equality, migration shapes men and women's lives differently. Hagan (1998) found that women are less likely than men to develop weak ties outside of co-ethnics. They are also more likely than men to rely on strong ties within their ethnic groups. Migration disrupts the social bonds and support available in their origin country and promotes the dependence of women on their husbands (Parrado and Flippen 2005). These studies, focusing on a particular immigrant group, have shed some light on the gender differences on settlement pattern. However, less research has been conducted that studies gender differences in labor market performance among highly-educated immigrants.

Among immigrants with a college degree or higher, men outnumber women in the scientific workforce. In 2000, 58 percent of foreign-born, college-educated workers are

men, and this percentage was even higher among college-educated immigrants who have arrived since 1990. In comparison, men constitute 53 percent of the native-born, college-educated workforce. Women represent only 21 percent of the scientists and engineers being admitted with permanent resident status in 1993, although women compose a fairly large group among both foreign-born and native-born populations. Pedraza (1991) argued that women are more likely to be secondary movements of male migration. Goyette and Xie (1999) explain that married women who work in science and engineering may be more likely to come to the U.S. as secondary immigrants of their husbands. They concluded that the understanding of immigrant scientists would be incomplete without consideration of gender differences in the study. Since a career in science and engineering requires long-term investment and pursuing a graduate degree, women with special roles related to the family might experience labor market outcomes different from their male peers. Many more women than men migrate to unify with their spouses, so their choices of careers may be more limited, even if they may have similar educational backgrounds at the time of migration compared to their male counterparts. Thus, the lack of consideration of gender differences may result in an inaccurate characterization of the experiences of immigrant scientists and engineers. Motivated by this, Goyette and Xie (1999), using the 5 percent PUMS data from the 1990 U.S. Census, systematically studied the effect of immigrant status on labor force participation, earnings and promotion of immigrant scientists and engineers. Their regression results showed that foreign-born female scientists/engineers earn about 5 percent less than all other groups of scientists/engineers. They argue that family responsibilities mainly account for women's earnings disadvantage.

However, the measurement of earnings in Goyette and Xie's study is annual earnings in 1989, and the results from the cross-sectional PUMS data are static. Therefore, the results have questionable bearing on dynamic processes such as earnings changes that could capture a more complete picture of gender differences in earning in a person's life course. More importantly, assimilation as a process cannot be fully reflected from static cross-section comparison of immigrants and non-immigrants. In addition, cross-sectional data might provide biased estimates on the association of immigration status and earnings. The potential bias is due to the well-known problem that a single cross-sectional regression cannot differentiate the effects between migration experiences and individual characteristics. In this context, immigration status captures the difference in earnings among a typical immigrant scientist/engineer and a native-born scientist/engineer, while the individual effect captures the differences in productivity and ambition across different individuals. Since individual effects such as ability, ambition, intelligencies, and other characteristics may be correlated with the migration decision, using immigrant status as a predictor to study earnings outcomes in a cross-sectional data analysis may bias the parameter estimation. In cross-sectional analysis, if immigrant scientists/engineers have no earning disadvantage compared to the native-born, the observed result may be due to their higher ability or career ambition which compensates for their disadvantage as immigrants. If they are indeed at an earnings disadvantage, then the magnitude of the disadvantage may have been underestimated. To deal with the problem in this paper, I use a repeated measure of individuals and a fixed-effect model to control for unobserved variables such as ability, ambition and other factors. The exact amount of unobserved individual effect is determined by personal characteristics that

would not change over time. However, the unobserved variables that change cannot be incorporated in the model.

In sum, this paper uses repeated measures on individuals to examine the effect of nativity and citizenship, as well as residential duration in the U.S., to test the pace of earnings growth. An exploration of gender difference is one of the important aims.

## **Methodology**

### ***Data***

For this analysis, I use the Scientists and Engineers Statistical Data System (SESTAT) integrated data. SESTAT is a database of the employment, education, and demographic characteristics of the nation's scientists and engineers. SESTAT is made up of three component surveys: the National Survey of College Graduates (NSCG), the National Survey of Recent College Graduate (NSRCG) and the Survey of Doctorate Recipients (SDR). All three surveys are sponsored every two to three years since 1993 by the National Science Foundation.

In this paper, I use the integrated databases for 1993, 1995, 1997 and 1999. Although the period from 1993-1999 is a relatively short period, the data collected prior to 1993 is not comparable with data collected subsequently because of a change in data collection methodology. Also, the 1990s is a period for U.S. economic expansion, so I assume that the period effect for immigrant scientists/engineers is the same for all groups — immigrants and native-born, men and women.

The target population of SESTAT is residents of the United States who have at least a bachelor's degree and, as of the survey period (April 15 for each survey year), were

non-institutionalized, 75 years of age or younger, and either educated in a science or engineering (S&E) field or working in an S&E field. Since the sample for the follow-up year survey was selected from previous NSCG, NSRCG and SDR respondents (for details, see <http://srsstats.sbe.nsf.gov/docs/techinfo.html#sampledesigns>), the majority of the respondents have been measured repeatedly, with more than 50,000 individuals surveyed in all four waves. In addition, a large group was surveyed in three or two waves. Only about 25 percent appear in a single wave of the data set. The response rates vary across survey components and across survey years, ranging from 77 percent to 95 percent. Although this data set was integrated from different survey components and years, more than 90 percent of the measurements are exactly the same across different surveys. The longitudinal data can be arranged into a pooled cross-sectional time-series in which the unit of analysis is an individual in a particular survey year.

However, although this dataset has a large coverage of U.S. scientists and engineers, there are also some limitations. First, since the NSCG sampled from 1990 Census, the database does not include anyone who came to the US after April 1990 who had earned a bachelor's, master's or doctorate in another country and did not subsequently earn another degree in the United States. Those who earned degrees in the U.S. after 1990 would be picked up in NSRCG and SDR. This means that the employment-based immigrants will be not available in the follow-up surveys. Thus, in my study, I will limit the sample to the 1993 respondents and follow them in 1995, 1997 and 1999 so that the comparison between immigrants and non-immigrants are based on the same sample frame. Second, although a large number of individuals were indeed surveyed repeatedly for the purpose of building robustness of a cross-sectional design,

the sample was not designed to follow all of the same individuals across time. As a result, the SESTAT is not a truly longitudinal dataset. Therefore the statistical analysis might be biased without an appropriate weight variable. To correct the bias, a longitudinal weight variable would be ideal. However, an appropriate weight for the longitudinal design is not available so far. Since the baseline survey is in 1993, I will use the 1993 weight variable for the 1993 cross-sectional data and compare the potential bias. If the bias is not significant, then it will be safe not to include weights in the analysis.

### *Measures*

#### Dependent variable:

The dependent variable for this study is the natural logarithm of annual salary. This variable was constructed from the salary of the principal job that the individual holds in the survey reference week (April 15 in the survey year) before deductions. Although it is possible for a scientist/engineer to take a secondary job, the total earned income from all jobs was not asked in the year 1993. Values are top-coded at 150,000 and rounded to the nearest thousand. In addition, non-zero values are bottom-coded, and values greater than zero but less than 5,000 are assigned the value "4,999". Since salary is a form of recognition for professional contributions and a measure of worth in the scientific community (Long, 2001), it usually accumulates over time. In this study, each person will have at least one and at most four measurements of earnings.

#### Independent variables:

Immigrant status: As argued in the literature review, immigrant scientists/engineers may increase the pool of scientists/engineers and thereby put downward pressure on the earnings structure, as the displacement theory argues. Alternatively, they may simply

accept or be forced to accept lower-paid jobs because of discrimination, as the discrimination perspective argues. Thus, immigrant status is the key predictor of this study. Immigrant status can test discrimination perspective directly. If the foreign-born earn less than the native-born after controlling for individual characteristics by a fixed-effect model, then the data support the discrimination perspective. However, displacement theory cannot be tested directly. If there is no discrimination against immigrants, then the displacement perspective may be partially supported.

Immigrant status is measured using both nativity and citizenship. Immigrants with citizenship have much broader economic opportunities than immigrants without citizenship (Yang 1994). For example, they enjoy more education and job choices, such as work at federal government agencies, bureaus, think tanks and many public safety positions and certain private industries. Previous studies use nativity to indicate immigrant status. However, using foreign-born versus native-born as a dummy variable to indicate immigrant status loses important information. To distinguish the actual reason for disadvantage, I consider both foreign-born status and naturalization status. Foreign-born without citizenship people would be less assimilated compared to the native-born, and naturalized citizens would face less discrimination than those who are foreign-born and not naturalized. I use a categorical variable to distinguish three groups of immigrant status: non-naturalized foreign-born immigrants (NNFB), naturalized foreign-born (NFB) and native-born (NB). Since a non-citizen immigrant might be naturalized later on in his work life, immigrant status will be a time-varying variable in the model. It would be more valuable to distinguish the non-immigrants and immigrants at the first time of entry. However, that information was not available in SESTAT dataset until 2003.

The second assimilation variable is the years since entry into the United States. Residential duration reflects assimilation. This variable was only collected in 1993. Since I use 1993 data as the baseline and follow up respondents in 1995, 1997 and 1999, the information obtained in 1993 is sufficient.

Demographic variables: Age could be a factor contributing to earnings differences between foreign-born and native-born scientists and engineers. Age could also be a factor contributing to earnings differences between males and females since the entry of females into the science and engineering field is relatively new (Long 2000). The age composition of immigrant scientists/engineers differs from their native counterparts. Since almost one-third of the immigrants who worked in natural and social science, engineering, and computer-related occupations arrived between 1990 and 2000, immigrant scientists/engineers are generally younger than those who are native-born. In the dataset, the earliest cohort was born before 1929 and the latest was born after 1970. I will use age as a time-varying variable in the data analysis. Gender is measured as a dummy variable. Race/ethnicity is another variable that might confound earnings differences between foreign-born and natives. Race is recoded into the broad categories of White, Asian and Other (which includes Hispanics, African Americans, and other minorities).

Human capital variables: Although the sample in this study is relatively homogeneous with all respondents having higher education degrees, those with post-graduate degrees are usually significantly different from those with only bachelor's degrees. Compared with the native-born, foreign-born college graduates are more likely to have post-graduate degrees. Female college graduates are less likely to hold post-graduate degrees than male college graduates. In this study, I create a series of dummy

variables to indicate education, which includes bachelor's, master's, professional, doctoral and other degrees. It is well-known that work experience is an important explanatory variable for individual earnings, but a direct measure of work experience in the data set is not available. Therefore I use the years since the most recent degree as a proxy. At the same time, I use a dummy variable (full-time versus part-time) to indicate employment status, since women are more likely to hold part-time jobs. Work status changes over the life course. Previous studies show that an overseas education has less human capital value compared to a U.S. education, so it is necessary to control the country in which the degree was earned. A dummy variable is included to indicate if an individual obtained a bachelor's degree from the U.S. or not.

Work sector: It is well-known that the distributions of men and women in the highly-educated group are extremely uneven (Jacobs 1996). In a cross-national study of highly educated people, Charles and Bradley (2002) concluded that females are underrepresented in engineering, math/computer science (and to a lesser degree, natural science), and overrepresented in education, humanities, and health fields. There is approximate gender parity in the social sciences. They argue that this is consistent with the culture-centered and human-capital accounts, since both predict that careers are characterized by functional or symbolic proximity to traditional female roles (Becker 1991; Reskin 1993). Because of the segregation of fields by gender in the highly-educated population, it is necessary to control for work field to net out this confounding factor. I group the scientists/engineers into five well-established occupational categories: computer and mathematical science; life and related science; physical and related science; social and related science; engineering. Employment sector is also an important

factor that impacts earning. Usually industry offers a higher wage than academia or government (Peek 1995; Goyette and Xie 1999). Therefore, the employment sector variable includes three categories: industry, academia, and government. Both variables of occupation and employment sector may change for a particular person over time.

Family responsibility: On average, women in contemporary U.S. get better grades in school, take math and science classes at the same rate, and earn roughly the same number of bachelor's degrees in science and engineering as men. But because of childbirth, cultural norms and social expectations, women tend to become scarcer in the highest ranks (Long 2001; Xie and Shauman 2003). Among them, childbirth might be the most significant factor acting as a barrier to women's careers (Gronau 1973; Heckman 1974). Although there is no evidence that immigrant women scientists/engineers are having more children, the effect of having young children for these women might be larger than for native-born women due to their less developed social and kinship network support. In this paper, a time-varying variable of number of young children under age 12 is included for both males and females. I hypothesize that the number of young children only impacts women's earnings. Marital status may limit individual career choices, so it is necessary to include the effect of marital status on an individual's earning change. In addition, when people are married, the decision to work may be based on household income instead of individual job income; thus the spouse's earning status is included in the models.

### ***Statistical Approach***

Since individuals are repeatedly surveyed across years, a fixed-effect model is used to study the effect of immigrant status. Most previous studies on earnings which use

longitudinal data choose the fixed effect approaches (England et al. 1988; 1996) to control for unobserved effects, as fixed effects models based on longitudinal data allow us to control for unmeasured effects that are constant across repeated measures over time (Guo and Hipp 2003). For example, England et al. (1996) studied the effect of gender composition on starting wages in an organization. They pooled across all job spells for each worker to control for such unmeasured and unchanging personal characteristics as intelligence, preferences, ambitions resulting from early socialization, life cycle plans, and unmeasured human capital. Compared with the fixed effect model, a random effect model can also be used with longitudinal data, which have some features over fixed-effect model (Bollen and Brand 2007). For example, it can show the estimates of time-invariant covariates. In a fixed effect model, those variables would be swept out from the model since a fixed effect model controls for time-invariant variables such as gender, race, and cohort effect. However, a random-effect model does not actually control for between-person variation. This is because a key assumption of the random effect model is that unobserved individual factors are uncorrelated with predictors in models. The fixed-effect model, on the other hand, imposes no restriction on this (Allison 2006). To test if unobserved individual characteristics are indeed correlated with the predictors, I use the Hausman test. The Hausman test shows that differences in coefficients are not systematic, therefore the random effect model is rejected for in this study and a fixed-effect model is used instead. To estimate time-invariant variables such as gender disparity, I estimated fixed-effect models for men and women separately to see if there is a gender disparity in the effect of immigrant status and assimilation on earnings.

In my analysis, each individual is measured at least once and at most four times.

The basic fixed-effect model is given by the following equation:

$$Y_{it} = \mu_t + \beta x_{it} + \alpha_i + e_{it}$$

$$i=0, 1, 2, 3, \dots, n; \quad t=1, 2, 3, 4$$

Where  $Y_{it}$  is the logarithm of the annualized salary for person  $i$ .  $\alpha_i$  is a set of fixed parameters,  $e_{it}$  is the error term which satisfies the assumptions of a standard linear model and  $x_{it}$  are assumed to be strictly exogenous.  $\alpha_i$  captures unobserved variables whose effects are shared by each measurements of each individual. To implicitly control for all time-invariant effects, the fixed-effect model can transform data to remove the time-invariant effects by fitting  $x_{it}^*$  on  $y_{it}^*$ .

$$\text{where } y_{it}^* = y_{it} - \bar{y}_i$$

$$x_{it}^* = x_{it} - \bar{x}_i$$

PROC GLM and ABSORB command in SAS is used to analyze the model.

In the present analysis, these unobserved fixed factors include cohort and socioeconomic background. They also include personality, natural ability, ambitions, early socialization, and so on, as long as these personal characteristics do not change over time. The exact “amount” of unobserved individual effect controlled is determined by the extent to which they affect individual earnings. In fixed effect models, the effects of these unobserved variables are removed by subtracting the person-mean from each observation. Removing this is important since it can net out the effect of immigration status and

assimilation on earnings. It removes the selection biases of immigrants and non-immigrants, which are unmeasured but may affect their ability in the labor market. A fixed effect model also eliminates the effect of observed variables that do not change over time such as race and gender, although they have been controlled for in the model.

### ***Immigrant Selection Biases***

It has been traditionally assumed that immigrants are positively selected. Immigrants are more skilled, on average, than people in their origin countries. Borjas (1987) argued that it is because of endogenous sorting from origin countries. Jasso and Rosenzweig (1990) pointed out that Borjas ignores the self-selection of emigration in the United States. To test how the selection of emigration affects the direction of analysis, I used Heckman's (1979) correction for sample selectivity direction. Heckman's selection shows that immigrant scientists/engineers who are less successful in the U.S. are more likely to be return migrants, which suggests that those who stayed in the sample are positively selected. If this is true, the discrimination effect will be robust if the discrimination theory is supported.

To test if self-selection on emigration exists, I performed logistic regression analysis for the 1993 sample to see who left the sample over the period of 1993 to 1999. To make the dropping out of the survey as a proxy of emigration, I coded those who left all three follow-up surveys as emigrants. The variables used to predict their emigration include their demographic background and human capital. The results (not shown) indicated that those who left the follow-up surveys are indeed negatively selected. In other words, the immigrants who stayed in the sample are more successful in the U.S. labor market than those who left the sample.

Another type of selection bias may come from work status. It has been argued that women who receive low wage offers may reduce their work hours or exit employment entirely. Traditionally, it has been believed that such a selection is not common among men. As a result, it might bias the coefficient estimates of demand side effects such as returns to experience or education (England et al. 1989). Previous studies have used the Heckman (1979) selection model to correct biases. However, this bias should not be a problem in this study since the differences in rate of unemployment between men and women is fairly small, about 3 percent across all waves. Thus, I removed the people who are unemployed as if they have no income.

## **Results**

Table 1 presents the means and percentages of variables by survey year. Gender, race, country of bachelor degree are time-invariant variables. Immigrant status, employment status, recent degree and field, work sector, number of children, marital status and work status are all time-varying variables. For example, it is possible for a person who has a bachelors degree holder in 1993 to have a masters degree in 1997. According to Table 1, annual salaries for all scientists and engineers grew over time (with a small dip in during 1995)<sup>1</sup>. About 20 percent of scientists and engineers are foreign-born in the sample. About 12 percent of scientists and engineers are from Asian countries, which suggests that Asians are the largest minority group in the highly educated labor market. More than 90 percent of all respondents participate in the labor force full-time, although the exact proportions vary over different survey years. Women

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<sup>1</sup> The proportion of full-time scientists and engineers dropped about 8 percent from 1993 to 1995, which may lower mean earnings in 1995 comparing to 1993.

are more likely to be part-time workers than men, and they also are more likely to have their highest degree be a bachelors degree than men, and men are more likely to have their highest degree be doctorate instead. The proportion of males who are engineers is higher than the proportion of females, with the reverse in the life and science field. The proportion who have young children under age 12 is higher for males than for females. About 70 percent of the respondents are married, and 50 percent are married and their spouses work.

The panels in Figure 1 show mean salary over time by gender and immigrant status. Women earn less than men. Interestingly, naturalized foreign-born scientists and engineers earn more than their native-born counterparts. Non-naturalized foreign-born immigrants earn the least among all three groups. The pattern holds for both males and females. Thus, citizenship status matters according to the descriptive statistics. Panel 3 and Panel 4 present the mean salary over time by immigrant status for males and females.

Table 2 shows the regression coefficients for the fixed-effect models to test the influence of immigrant status on earnings. Three separate models were estimated: one includes all respondents and the other two estimate models for males and females separately. When the fixed-effect model is used to control for person-specific characteristics, the observed time-invariant variables are also controlled. Thus, there are no estimates for time-invariant variables such as gender, race/ethnicity and cohort. As a result, to test the gender differences effect caused by immigrant status, separate models for males and females are necessary.

From the fixed-effect model results, we learn that about 61 percent (type I sum of squares divided by the corrected total sum of squares) of the variation in logged salary is

between-person variation, while the remaining 39 percent is within-person variation across time. Since the total R square is 0.63, the time-dependent predictors only contribute an additional 2 percent to the explanation of the variation in earnings. Thus, earnings outcome is still predominantly determined by individual characteristics and person-specific demographic characteristics. From this point of view, a fixed-effect model is necessary to control for person-specific characteristics.

*Examining the discrimination perspective:* In Table 2, time has a positive effect on earnings, which indicates that earnings grow with time. With each additional two years, logged annual earning increases by 0.05. Immigrant status shows a significant effect on earnings. Non-naturalized immigrants earn significantly less than people who are native-born, as do naturalized immigrants. The result also show that immigrants who are naturalized earn only slightly more than immigrants who are not naturalized, after controlling for person-specific characteristics, human capital and family responsibilities. Immigrants as a whole are at a disadvantage in the highly-educated labor market. This supports the possibility of labor market discrimination toward immigrants, in which the naturalization process only matters a little. The finding on earnings differences from the fixed-effect model differs from the descriptive statistics. The descriptive statistics show that naturalized immigrants actually earn more than native-born people. Thus, it is necessary to control for the person-specific fixed-effect. Controlling for between-person variation greatly reduced the errors when predicting earning differences.

Model 2 and Model 3 present the fixed-effects results for the male and female samples separately. For males, both non-naturalized immigrants and naturalized immigrants earn significantly less than those who are native-born. Thus, whether or not

they are naturalized, immigrants earn less than natives. This supports the discrimination perspective since citizenship status matters little. However, the disadvantages of immigrant status do not appear to hold in the female sample. After controlling for person-specific characteristics, immigrant females do not earn less than native-born females in the highly-educated labor market. Thus, the statistics analysis suggests a huge gender disparity on assimilation in earnings. Women as a whole are at an earnings disadvantage compared to men in the labor market, but immigrant women are not earning less than native-born women when unobserved person-specific characteristics are controlled.

Gender differences also exist in the effects of the other control variables. Among human capital variables, holding any kind of post-graduate degree is positively associated with earnings compared to holding only a bachelors degree. The results show that professional degrees benefit women more than men, with an increase of 0.515 in earnings for women who hold a professional degree compared to a bachelor's degree. After controlling for person-specific fixed effects, the career field does not matter for earnings except for engineering. The employment sector significantly impacts highly-educated people's earnings. Compared to people who work in industry, those who work in academia make 0.11 less, and it is surprising to observe that people who work in government earn slightly more. Years since last degree is a proxy variable for work experience, which slightly increases earnings. Family responsibilities are the source of significant differences in men and women's earnings. Greater family responsibilities are associated with a significant increase in men's earnings. For example, married men earn 0.12 more than never-married men, but there is no difference between married and never-married women. When families have more young children, both men and women earn

more, but the magnitude and effect is stronger for women than men. Having a working spouse reduces earnings for men but not women. This suggests that highly-educated women still perform traditional gender roles with regards to family responsibilities.

*Examining the assimilation process.* According to the statistical results described above, foreign-born immigrants are at a disadvantage after controlling for person-specific characteristics, especially male immigrants. Does this change over time? Will highly-educated immigrants' earnings increase after they accumulate more experience and human capital? Table 3 limits the sample to immigrants only and uses fixed-effect models to examine the effect of residential duration on earnings. According to Model 1 in Table 3, earnings increase for immigrants over time, although only slightly. U.S. citizenship does not have a significant effect on earnings among immigrants. When residential duration increases, logged earnings significantly increase. However, residential duration does not have a linear effect on earnings. The squared term for residential duration has a significantly negative effect on logged annual earning, although the effect is fairly small. This indicates that although highly-educated immigrants are at an earnings disadvantage in labor market, their earnings do increase over time in the United States. It would be ideal if the tipping point of transition can be calculated. However, the fixed-effect model does not offer coefficients for time-invariant variables nor an intercept, so the turning point cannot be obtained from models. Men and women follow a similar pace in assimilation with regards to residential duration, but the effect is weaker for women. The effects of human capital variables are similar to previous models in Table 2. For example, professional degrees benefit women more than men. Career fields do not make any difference on logged earning after controlling for person-specific

fixed effects. With respect to employment sector, academics make significantly less in terms of logged earnings, with a larger gap for female immigrant scientists and engineers than males. According to the results in Table 2, family responsibilities affect both men's and women's earnings. However, this kind of pattern does not exist in the immigrant sample. Although people who have a spouse working do reduce their earnings slightly, this effect disappears in separate models for men and women. The strong effect of marital status in Table 2 for men does not play a role in the models in the immigrant sample, which suggests that immigrants and non-immigrants may be different in terms of the impact of family roles on earnings.

From the models in Table 3, we learned that about 62 percent (type I sum of squares divided by the corrected total sum of squares) of the variation in logged earnings is between-person variation, while the remaining 38 percent is within-person variation across time. Since the total R square is 0.65, the time-dependent predictors contribute an additional 3 percent to the explanation of the variation in earnings.

## **Discussion and Conclusion**

Are immigrant scientists and engineers at an earnings disadvantage compared to their native-born counterparts? Do their earnings improve as their time in the U.S. labor market increases? Are there gender differences in terms of earnings and residential duration? In this chapter, I use repeated measures on scientists/engineers and fixed-effect models to answer these questions. The results show that unobserved time-invariant variables such as ability, early socialization, intelligence, and personality explained more than 60 percent of the variance in logged earnings. According to the fixed-effect model,

immigrant scientists and engineers are at an earnings disadvantage, suggesting that discrimination towards immigrants exists in the U.S. high skilled labor market. Naturalized immigrants only do slightly better than non-naturalized immigrants, and the difference due to naturalization is not statistically significant. To examine whether the discrimination effect is contingent on gender, I stratified the analysis and found that foreign-born female scientists/engineers are not at a disadvantage compared to those who are native-born, although generally women are at a disadvantage compared to men.

Based on the statistical results, the discrimination perspective rather than the displacement perspective is supported in general. However, according to the results specific to gender, the discrimination perspective is only supported for males. For males, both naturalized immigrants and non-naturalized immigrants are at a disadvantage compared to natives, so we can conclude that their disadvantage is not due to discrimination toward non-U.S. citizenship. Although naturalized male immigrants have fewer constraints than non-naturalized immigrants due to the privileges associated with citizenship status, they are still at an earning disadvantage. “Glass ceilings” and “broken ladders” have been used to describe the limited prospects that immigrants face in advancing to management or administrative positions (Chan 1989; Saigo 1989; Tom 1988). This obstacle in career advancement limits their ability to enter the upper end of the distribution in the U.S. science and engineering labor market. Secondly, immigrant human capital may be marked down in the U.S. labor market due to language and cultural gaps. Although immigrants are well-schooled and well-trained, their language fluency and culturally-adapted interpersonal skills may make them less likely to compete well with their native-born counterparts. The lack of “soft U.S. labor market skills” may lower

their apparent working ability in U.S. labor market. Scientists and engineers from non-English-speaking countries have to overcome a greater number of obstacles in order to narrow the gap between them and the native-born. With the increase in the number of immigrants since 1965, their assimilation may be made more difficult because the immigrant population size may be perceived as threatening to the native-born. Therefore, greater resistance to the foreign-born by the native-born may result (Blalock 1982). Language and interpersonal skills may be more likely used as excuses by the native-born to keep their immigrant co-workers in a lower earnings position. Third, the immigrant disadvantage may also be due to their disproportionate concentration in peripheral, or undesirable, sectors.

In contrast, immigrant women scientists and engineers are not at an earnings disadvantage compared to their native counterparts. Thus, the displacement perspective may be partially supported. The displacement perspective argues that a large number of immigrants in science and engineering lowers the incentive to encourage women and minorities to enter into science and engineering fields. What makes immigrant women different from men in their earnings compared to the native-born? I speculate that this gender gap could be due to both gender differences in the U.S. labor market and gender differences in immigration and assimilation. In terms of gender differences in the U.S. labor market, native-born women scientists/engineers are at an earnings disadvantage compared to men. Empirical research almost always finds a gender earnings gap which widens with work experience (Hagan 1990, Morgan 1998), and they conclude that women continue to face a glass ceiling in many professions. Male-female earnings differentials within professions may also stem from social processes. Specifically, women

may be concentrated in lower-paying jobs (Morgan 1998). Native-born women, immigrant men and immigrant women are all at an earnings disadvantage compared to native-born men, and foreign-born women may be at a double disadvantage. Thus, it may be relatively easy for women immigrants to catch up with their native-born counterparts. An alternative explanation is that women may assimilate faster than men in the U.S. labor market. For example, Carliner (2000) found that women are more likely to be fluent in English than men. A third possible explanation could be differences in family roles between immigrants and the native-born. For example, the number of young children does not make a significant difference between men and women in the immigrant sample, but it does for the overall sample. This suggests that the gender division of family labor is not as strong among immigrants as it may be among the native-born, which contributes to making the earnings of female immigrants more similar to their male counterparts.

The pace of assimilation in earnings does not differ by gender. Both men and women experience curved earnings growth over time. The fixed-effect model shows that residential duration in the U.S. matters, but naturalization does not. Chiswick (1978) found that earnings for the foreign-born and native-born will equalize after the foreign-born residential duration reaches approximately 13 years. After 23 years, their earnings will actually be 6 percent higher than their native-born counterparts. However, Borjas (1985) found that this strong assimilation effect is partly due to a decline in skill level in immigrants admitted to the United since 1950. He used pooled Census data and found that earnings assimilation actually was sluggish. His cohort analysis, by matching cohorts across Censuses, has its limitations. For example, some immigrants left the country between the two Censuses, and this may overestimate assimilation if emigrants were

negatively selected. Second, the coverage of immigrants may differ across Censuses (Schoeni 1998). In this study, longitudinal data with repeated measures on the same individual partially avoids these kinds of problems. In addition, the cohort effect was controlled by using fixed-effect techniques so that the net effect of assimilation can be estimated. Thus, this study confirmed that immigrant earnings grow over time, but it is still unclear if and when they overtake their native-born counterparts since male immigrant scientists and engineers are still at an earnings disadvantage.

To summarize, this study found that foreign-born males are at an earnings disadvantage compared to their native-born counterparts, which is not significantly affected by citizenship status. Hence, a discrimination perspective is supported for males. However, foreign-born women's earnings are not significantly different from native-born women scientists and engineers. In terms of degree of the assimilation effect, both men and women experience about the same amount of positive earnings increase over time. The result suggests that the gap between foreign-born women and their native-born counterparts is much smaller than the gap between foreign-born men and their native male counterparts. Of course, there are some limitations in this analysis. First, during the 1990s, the U.S. economy experienced prosperity, which might affect native-born and foreign-born scientists and engineers differently. However, since there is no way to identify the period effect in the model, I assume the period effects are same for all subgroups. Second, since a fixed-effect model cannot estimate the exact magnitude of the effect of time-invariant variables on earnings, the degree of disadvantages between men and women cannot be estimated in this model.

Table 4.1: Mean or Percentage of Variables by Survey Year, SESTAT

Variable	1993	1995	1997	1999
Annualized salary	52508.19	55805.93	62168.29	68282.80
Logged annualized salary	10.747	10.659	10.859	10.894
<i>Citizenship status</i>				
Non-naturalized Foreign-born	0.068	0.060	0.043	0.039
Naturalized foreign-born	0.118	0.124	0.128	0.128
Native-born	0.813	0.816	0.829	0.832
<i>Demographic characteristics</i>				
Female	0.262	0.276	0.279	0.277
Age	40.855	44.174	45.785	47.866
White	0.763	0.769	0.777	0.776
Asian	0.121	0.120	0.112	0.110
Other	0.117	0.111	0.111	0.114
<i>Education</i>				
BA degree from U.S	0.897	0.892	0.905	0.904
Years since most recent degree	12.782	15.606	17.281	19.155
Bachelor	0.416	0.349	0.350	0.323
Master	0.213	0.211	0.220	0.217
Doctorate	0.328	0.388	0.368	0.393
Professional	0.043	0.045	0.049	0.050
Other Degree	0.000	0.007	0.013	0.017
<i>Employment</i>				
Full-time job	0.999	0.924	0.914	0.908
Social & related Science	0.096	0.089	0.089	0.090
Computer & math Science	0.176	0.191	0.187	0.166
Life & related Science	0.115	0.119	0.117	0.126
Physical & related Science	0.182	0.196	0.195	0.211
Engineering	0.271	0.244	0.237	0.228
Non-S&E Degree	0.161	0.161	0.176	0.180
Academia	0.260	0.283	0.272	0.273
Government	0.151	0.131	0.131	0.126
Industry	0.589	0.585	0.597	0.601
<i>Family Situation</i>				
Having no children under age 12	0.663	0.627	0.648	0.662
Having one child under age 12	0.161	0.214	0.163	0.160
Having 2 more children under age 12	0.135	0.129	0.143	0.137
Married	0.700	0.768	0.771	0.784
Divorced/separated/widow	0.084	0.089	0.098	0.104
Never married	0.217	0.143	0.131	0.112
Married and spouse work	0.495	0.554	0.557	0.567
Number	96064	70670	62564	46931

Table 4.2: Coefficients and Standard Errors of Logged Earnings Measured at Two-Year Intervals, Overall and by Gender: Fixed Effect Model

Variance Structure	Model1			Model2			Model3		
	All			Male			Female		
	Coeff.		Std. Err	Coeff.		Std. Err	Coeff.		Std. Err
Time	0.052	***	0.01	0.051	***	0.01	0.093	***	0.024
Age	0.008	+	0.004	0.012	**	0.004	-0.013		0.011
Native-born(omitted)	---	---	---	---	---	---	---	---	---
Foreign-born without citizenship	-0.339	*	0.154	-0.483	**	0.169	0.018		0.345
Naturalized foreign-born	-0.306	*	0.153	-0.466	**	0.167	0.102		0.342
Full-time	0.875	***	0.011	0.914	***	0.014	0.828	***	0.019
Bachelor(omitted)	---	---	---	---	---	---	---	---	---
Master	0.152	***	0.034	0.082	*	0.041	0.243	***	0.062
Doctorate	0.228	***	0.047	0.158	**	0.057	0.314	***	0.087
Professional	0.273	***	0.065	0.102		0.078	0.525	***	0.122
Other Degree	0.177	***	0.034	0.152	**	0.042	0.212	***	0.06
Social & related Science(omitted)	---	---	---	---	---	---	---	---	---
Computer & math Science	0.079		0.078	0.039		0.097	0.085		0.142
Life & related Science	0.001		0.079	0.019		0.111	-0.015		0.123
Physical & related Science	0.068		0.093	0.07		0.114	0.023		0.177
Engineering	0.146	*	0.059	0.086		0.074	0.201		0.142
Non-S&E Degree	0.159	**	0.051	0.116	+	0.069	0.173	+	0.084
Industry(Omitted)	---	---	---	---	---	---	---	---	---
Academia	-0.118	***	0.011	-0.109	***	0.013	-0.129	***	0.022
Government	0.047	**	0.014	0.052	***	0.016	0.037		0.029
Years since latest degree	0.007	**	0.002	0.003		0.003	0.011	*	0.004
Having no children under 12	---	---	---	---	---	---	---	---	---
Having one child under 12	0.019	**	0.006	0.014	+	0.007	0.032	*	0.015
Having 2 more children under age 12	0.025	**	0.008	0.021	**	0.008	0.031	+	0.012
Never married (Omitted)	---	---	---	---	---	---	---	---	---
Married	0.091	***	0.014	0.123	***	0.015	0.041		0.033
Divorced/separated/widow	0.097	***	0.016	0.119	***	0.019	0.056	+	0.033
Married and spouse work	-0.018	***	0.007	-0.015	*	0.007	-0.034		0.023
Time*female	0.009	***	0.003	---	---	---	---	---	---
R square	0.63			0.61			0.63		
Number of Subjects	107192			76947			30244		
Number of Observations	276229			201043			75186		

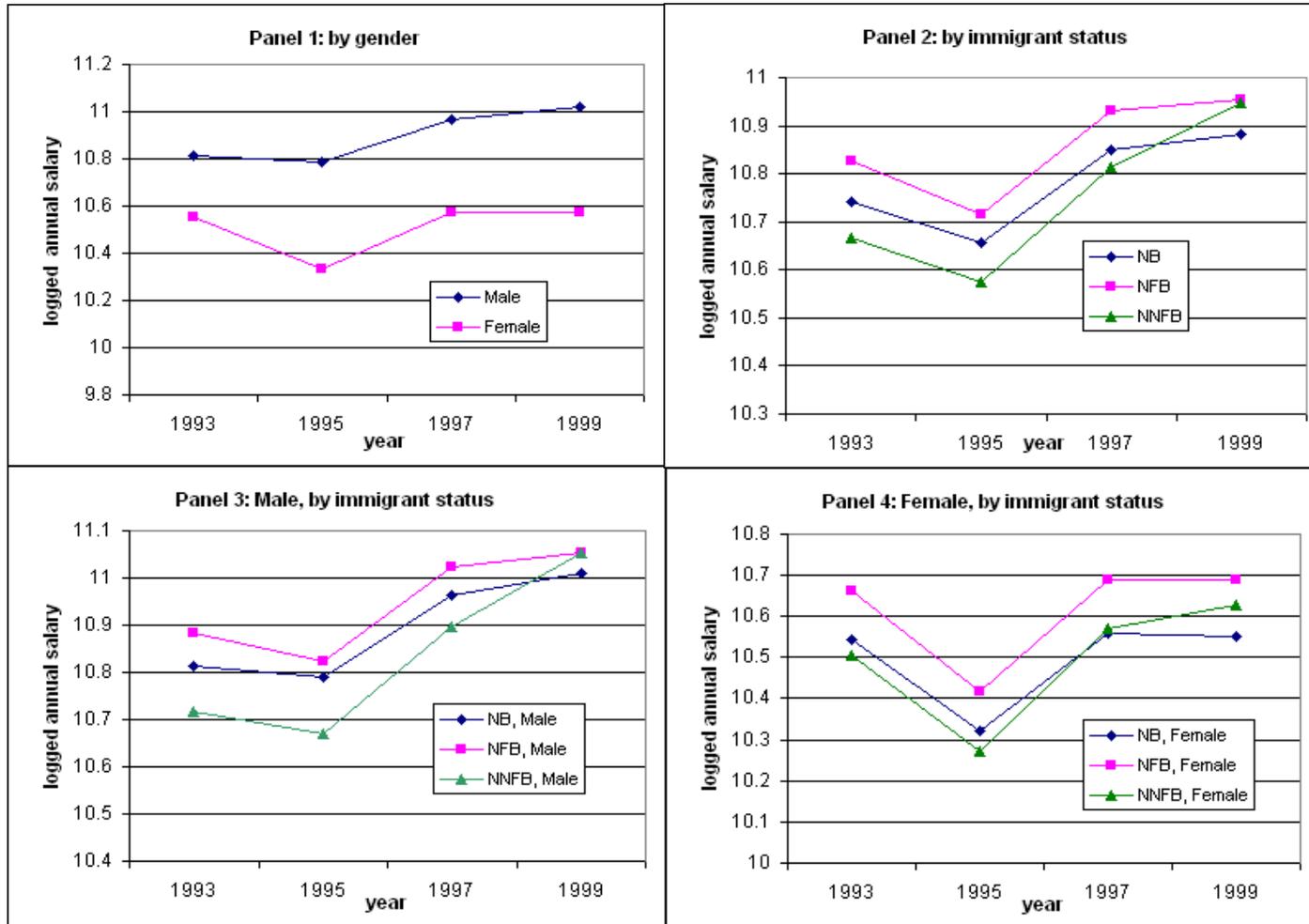
Two tail test: \*\*\* $p < 0.001$  \*\* $P < 0.01$  \* $P < 0.05$  + $p < 0.1$

Table 4.3: Coefficients and Standard Errors of Immigrant Logged Earnings Measured at Two-Year Intervals Overall and by Gender: Fixed-Effect Model

Variance Structure	Model1		Model2		Model3	
	All Immigrants		Male Immigrants		Female Immigrants	
	Coeff.	Std. Err	Coeff.	Std. Err	Coeff.	Std. Err
Time	0.069 *	0.033	0.073 +	0.038	0.08	0.063
Age	-0.007	0.008	-0.006	0.008	-0.015	0.021
Citizenship	-0.001	0.021	0.013	0.023	-0.044	0.05
Years in U.S.	0.069 ***	0.019	0.073 ***	0.021	0.066 +	0.04
Squared years in U.S.	-0.001 ***	0.0001	-0.001 ***	0.0001	-0.001 **	0.0002
Full-time	0.805 ***	0.027	0.802 ***	0.034	0.805 ***	0.047
Bachelor(omitted)	---	---	---	---	---	---
Master	0.081	0.084	0.028	0.099	0.129	0.167
Doctorate	0.229 *	0.107	0.159	0.123	0.306	0.219
Professional	0.553 **	0.181	0.19	0.199	1.74 ***	0.436
Other Degree	0.109	0.086	0.161	0.107	0.064	0.156
Social & related Science(omitted)	---	---	---	---	---	---
Computer & math Science	0.059	0.18	0.067	0.227	-0.129	0.347
Life & related Science	-0.045	0.214	-0.226	0.344	-0.077	0.31
Physical & related Science	0.021	0.216	-0.073	0.273	0.041	0.405
Engineering	0.03	0.153	-0.024	0.193	0.162	0.433
Non-S&E Degree	0.171	0.131	0.124	0.179	0.132	0.22
Industry(Omitted)	---	---	---	---	---	---
Academia	-0.112 ***	0.025	-0.1 **	0.029	-0.135 **	0.051
Government	0.027	0.033	0.02	0.037	0.04	0.07
Years since latest degree	0.004	0.006	0.001	0.007	0.007	0.011
Having no children under age 12	---	---	---	---	---	---
Having one child under age 12	0.004	0.014	0.003	0.015	0.01	0.034
Having 2 more children under age 12	0.021	0.017	0.011	0.018	0.06	0.043
Never married (Omitted)	---	---	---	---	---	---
Married	0.032	0.031	0.053	0.034	0.004	0.075
Divorced/separated/widow	0.069 +	0.039	0.084 +	0.045	0.031	0.081
Married and spouse work	-0.029 *	0.015	-0.023	0.015	-0.061	0.049
Time*female	0.012	0.008	---	---	---	---
Time*BA degree in U.S.	0.019 *	0.008	0.023 **	0.009	0.01	0.018
Time*arrival after 1965	-0.048 ***	0.012	-0.056 ***	0.013	-0.026	0.026
R-square	0.65		0.63		0.65	
Number of Subjects	20095		14719		5375	
Number of Observations	49585		36742		12843	

Two tail test: \*\*\*p<0.001 \*\*P<0.01 \*P<0.05 +p<0.1

Figure 4.2: Mean of Logged Earnings by Year



## **Chapter V**

### **Conclusion**

In this dissertation, I investigated the process of immigrant assimilation in the United States. The second and third chapters focused on assimilation of immigrant youth in volunteering behavior. The fourth chapter examined the assimilation of highly-educated adults in earnings. I initially chose volunteering for youth assimilation because it is a socially desired behavior and positive behaviors have been largely ignored in previous studies on assimilation in adolescents. The motivation behind choosing earnings assimilation for adults is that earnings represent standard measure of achievement for scientists and engineers in U.S. society. The goal of this concluding chapter is to summarize the results from previous three chapters. In the meanwhile, comparisons across different chapters will be emphasized. Since each chapter is a distinct research study and uses unique data and methodologies, I first summarize each chapter separately.

In the second chapter, I chose volunteering as a positive social behavior to distinguish it from the common health and risky behaviors analyzed in previous assimilation studies. To test if a straight-line assimilation path is correct in this case, I examined whether exposure as measured by the duration of residence in the U.S. increases volunteering among youth. I assess duration of residence in two ways: intergenerationally and intragenerationally. The dataset is from the National Longitudinal Study of Adolescent Health (Add Health). To investigate if the time exposure effect on

volunteering persists into young adulthood, the volunteering activities were also examined when these adolescents enter into young adulthood. In addition, to see whether family context makes a difference in the assimilation path, I examined if family context variables mediate or moderate the effect of time exposure on volunteering. Since volunteering is measured as a dichotomous variable at both adolescence and early adulthood, logistic regression was used to conduct the empirical analysis. In addition, I predicted the probabilities of volunteering among different immigrant groups using a micro-simulation method.

Results from the second chapter indicate that volunteer work participation is significantly different across immigrant generations and residential duration. Different from the results in other behavior studies, second generation immigrants actually participate more in volunteer work than the third generation immigrants, though this difference disappears in adulthood. Thus, such difference should not be looked as an indicator of positive assimilation over immigrant generations. Instead, this suggests a temporary accommodation by second generation adolescents. Second generation immigrants may consciously adopt this behavior quickly with encouragement from school systems and families since they are eager to have their social and national identity recognized by U.S. society . In addition, other speculation could be that (1) second-generation youth volunteer for college admissions applications and (2) second-generation youth volunteer in culturally-related activities to bridge the two cultures). When they enter into young adulthood, volunteering may more likely be an unconscious behavior. Although the generation effect on volunteering is different for adolescents and young adults, the intragenerational model shows that duration of residence has a persistent

positive effect on volunteering, which is net of the effect of volunteering in adolescence. In addition, family context neither mediates nor moderates the effect of time exposure on volunteering for both adolescents and young adults.

In the third chapter, I conceptualize exposure based not only on duration of residence but also neighborhood-level exposure to native-born people. I use the proportion of the neighborhood that is foreign-born to measure the degree of exposure to native-born people at the neighborhood level. This chapter tests segmented assimilation theory. I divide the children of immigrants into two equally sized groups, economically advantaged and disadvantaged, according to the median household income at the neighborhood-level. Multilevel logistic regression was applied to examine the interaction between time exposure (measured by length of residence) and neighborhood exposure (measured by proportion foreign-born) for the overall sample, economically advantaged neighborhoods, and economically disadvantaged neighborhoods separately. To test if neighborhood exposure persistently interacts with time exposure over the life course, I estimated a set of similar models for young adults.

I found that in general, longer length of residence in the United States is positively associated with volunteering. This pattern continues on into young adulthood. In adolescence, the effect of neighborhood exposure on volunteering and the interaction of neighborhood exposure with time exposure only exist in economically advantaged neighborhoods. This indicates that when the proportion of foreign-born immigrants living in the same neighborhood increases, the initial positive effect of time exposure on volunteering weakens and changes direction to become a negative effect. In young adulthood, the pattern observed for economically advantaged neighborhoods still hold. In

addition, the interaction effect is also significant in poor neighborhoods for young adults but in the opposite direction. The results partially confirmed segmented assimilation theory: in economically advantaged neighborhoods, the lack of exposure to native-born people indeed reduces assimilation. Since proportion foreign-born is used to measure exposure to native-born people, the results suggest that selective acculturation and strong co-ethnic ties are not the cause of reduced assimilation. Instead, it is the relatively weaker ties with native-born people that limit the opportunities to assimilate. In contrast, living in an economically disadvantaged neighborhood neither increases nor decreases assimilation in volunteering behavior in adolescence, but it improves assimilation in volunteering behavior in young adulthood. The results suggest that growing up in a disadvantaged neighborhood does not necessarily lead to negative assimilation with regards to positive behaviors, which is counter to what segmented assimilation theory would predict.

Unlike the previous two chapters, Chapter Four examines the impact of assimilation in earnings of highly-educated immigrants, in the aggregate as well as by gender. Using the Scientists and Engineers Statistical Data System (SESTAT) integrated data and fixed-effect models, I examined how immigrant status and years of residence in the United States affect the earnings of immigrant scientists and engineers. Two theoretical perspectives of displacement or discrimination have been discussed.

According to the statistical results using fixed-effect models, the discrimination perspective rather than the displacement perspective is supported for the aggregate sample. Both naturalized immigrants and non-naturalized immigrants are at an earnings disadvantage compared to native-born people. When stratified by gender, the immigrant

earnings disadvantage is only observed in the male sample. Immigrant women have no significant earnings difference compared to their native-born counterparts. Thus, the displacement perspective is partially supported for women immigrants. The possible reasons for immigrant males' disadvantage may be due to 1) the "glass ceiling" and "broken ladder" theories, which argue that immigrants have limited opportunities to advance to management and administrative positions; 2) the language ability of immigrants may discount their true work capabilities; 3) the larger size of immigrants after 1965 produced greater resistance by native-born people against promotion of immigrants. Possible explanations for the displacement perspective for women include: 1) native-born women are already at an earnings disadvantage compared to native-born men, which makes the gap between immigrant and native-born women relatively small; 2) immigrant women are more likely to be fluent in English and are also more easily accepted by U.S. society than immigrant men.

In sum, the main contribution of the studies on immigrant youth is incorporating the positive social behavior of volunteering in the assimilation literature. The second generation being ahead of the first and third generations has important implication. First, this shows that this positive social behavior follows neither a straight-line positive assimilation path nor a negative assimilation path as do most health and risk behaviors for contemporary youth. Instead, this positive social behavior shows a unique path. Second, although family context affects volunteering, it does not affect the path of assimilation. Instead, neighborhood context shows a moderating effect on the path of assimilation in volunteering. This indicates that it is important to consider exposure to native-born people in neighborhood contexts when studying assimilation. For the study on adults, it

augmented the literature on earnings assimilation by using repeated measures for the same individuals. The results showed that it is indeed important to consider unobserved personal characteristics when examining earnings disparities between immigrants and the native-born. In addition, the study suggests that male and female immigrants differ in their assimilation paths.

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