

Examining the Measurement of Health and its Relationship to Acculturation for Older Asian Americans

Author: Keith T. Chan

Persistent link: <http://hdl.handle.net/2345/3873>

This work is posted on [eScholarship@BC](#),
Boston College University Libraries.

Boston College Electronic Thesis or Dissertation, 2013

Copyright is held by the author, with all rights reserved, unless otherwise noted.

BOSTON COLLEGE
Graduate School of Social Work

EXAMINING THE MEASUREMENT OF HEALTH AND ITS RELATIONSHIP TO
ACCULTURATION FOR OLDER ASIAN AMERICANS

A dissertation
by

KEITH TSZ-KIT CHAN

Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

April 2013

Abstract

Purpose: According to census estimates, Asians are one of the fastest growing immigrant groups in the US, and the fastest growing group among all elderly. This study examines the impact of acculturation, measured as English ability, along with other predictors on health for older Asian Americans.

Data Sources: Data from the 2009 American Community Survey and the National Latino and Asian American Study were used to examine large-scale population characteristics of Asian American elderly.

Measures: A broad view of health (physical, mental, Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living(iADLs)) was examined using items capturing functional disability. Psychological health was examined using the Kessler Psychological Distress Scale (K10).

Analytical Methods: Confirmatory factor analysis, logistic regression analysis, and path analysis was conducted.

Results: CFA suggests scales are reliable for use. Cross-cultural comparability was found for psychological distress, but not for functional disability. Results indicated that English ability predicted lower disability, but had no relationship to psychological distress. Higher levels of intergenerational family conflict increased distress for Asian elders. Perceived discrimination, which represents a form of social marginalization, emerged as a key mediating variable and was consistently associated with poorer mental health.

Conclusion: This study provided key insights into the applicability and measurement invariance of two key measures of health for older Asian Americans. While the measures

captured health reasonably well, the results suggest confounds for this population, which may be due to perceptions of disability, language, immigration status, social networks, health insurance status, and access to services. Acculturation is a process involving the individual and the family, and can cut across age groups and generations. Policies should emphasize the development of culturally-specific services for Asian American elders. The study highlights that social workers must engage families across generations and the lifespan when working with Asian elders.

Acknowledgements

Thank you to all my friends and family, my martial arts community, and everyone else who cared so much about me. Without the support, love and guidance, I would not have known to think big, and get to here now.

I want to express my deepest and profoundest gratitude to my committee members, Professor Thanh Van Tran, Dr. Barbara Berkman, and Dr. Melissa Kelley for all their generosity and support. My mentors at the Graduate School of Social Work at Boston College, Dr. Jim Lubben, Dr. Ce Shen, and many others were instrumental in the completion of this work.

I also want to thank Ms. Rani Dalgin and Dr. Barry Schaudt, who were my employers, my colleagues, and my good friends at Research Services. They were always patient and kind with me, and gave me the opportunity to hone my skills in such a supportive, nurturing environment.

There is of course, Ms. Jeanne Zilliox, who helped to see me through the first half of my doctoral program, and Ms. Brenda Vitale, who made sure I can head off to my next adventure. Without their kindness and dedication, I am uncertain if I could have navigated through this process.

I am also grateful to the support of the Hartford Doctoral Fellowship, and all the people from the program, like Dr. Jim Lubben and Dr. Ruth Dunkle, who shared their sage

wisdom with me about the entire job search process. I have to give a shout out to Dr. Tam Perry, who spent a whole afternoon on Skype with me to help me clean up my job talk PowerPoint slides.

I want to also express my gratitude to the CSWE Minority Fellowship Program, who helped me to find my voice with the support of so many other researchers of color. We share one cause, and sing many songs, in our pursuit of social justice and what we believe in. Thank you to everyone from the program.

I want to also thank Dr. Greg Offringa, who always made time for me, and saw me through so much in the last 13 years. His wisdom and nurturance helped me to see what could be possible, through some of the most difficult moments I've encountered in my life.

And to Ms. Laren Friedman, Bagheera and Chandra, who provided me with love when I needed it most.

TABLE OF CONTENTS

CHAPTER I: INTRODUCTION	1
<i>Research Questions</i>	4
CHAPTER II: LITERATURE REVIEW	5
<i>Significance of Proposed Study on Health for Asian American Elderly</i>	17
<i>Research Aims & Hypotheses</i>	18
CHAPTER III: METHODS	22
<i>Data Sources</i>	22
<i>Analytical Procedure</i>	35
CHAPTER IV: RESULTS	39
<i>Results from the 2009 American Community Survey</i>	39
<i>Results from the National Latino and Asian American Study</i>	60
CHAPTER V: DISCUSSION	87
<i>Conclusion</i>	97
REFERENCES	108
APPENDIX	117

LIST OF TABLES

Table 1. Six items Measuring Functional Disability from the American Community Survey (ACS).....	25
Table 2. 10 items of the Kessler Psychological Distress Scale from the NLAAS	30
Table 3. Nine items from the Everyday Discrimination Scale	31
Table 4. Scales and Items for Social Factors from National Latino and Asian American Study (NLAAS)	34
Table 5. Goodness of Fit Indices for Pan-ethnic Asian Group from 2009 American Community Survey (n = 30,257).....	42
Table 6. Factor Loadings, Measurement Errors and Goodness of Fit for older Asians from American Community Survey (2009).....	44
Table 7. Multiple Logistic Analysis of Disability for Aggregate Sample of Foreign-Born Asian Elders (n=22,096).....	50
Table 8. Simple Logistic Regression of Disability as Outcome with Selected Predictors.....	51
Table 9. Multiple Logistic Regression Analysis of Disability for Foreign-Born Older Asian American.....	53
Table 10. Unadjusted and Adjusted Effects of Language Acculturation with Chinese (n=8267)	55
Table 11. Unadjusted and Adjusted Effects of Language Acculturation with Filipinos (n=6499)	56
Table 12. Unadjusted and Adjusted Effects of Language Acculturation with Vietnamese (n=3161).....	57
Table 13. Unadjusted and Adjusted Effects of Language Acculturation with Koreans (n=3127).....	58
Table 14. Unadjusted and Adjusted Effects of Language Acculturation with Japanese (n=1042).....	59
Table 15. Seven items from Kessler Psychological Distress Scale (K10) in NLAAS	63

Table 16. Confirmatory Factor Analysis on K10 Scale for Subgroups in NLAAS ..	65
Table 17. Pearson Correlation Matrix of Variables Examined in NLAAS for Asian Americans aged 55 and Older.....	71
Table 18. Regression Results with the Kessler Psychological Distress Scale as Outcome for Foreign-born Asian Elders (n = 332).....	73
Table 19. Regression Results with the Physical Health Rating Scale as Outcome from NLAAS (n = 332)	78
Table 20. Logistic Regression Results with Disability as Outcome from NLAAS (n = 332)	80
Table 21. Comparison of Results from Logistic Analysis of Disability for Foreign-Born Asian Elders from ACS 2009 (n=22,096) and NLAAS (n=388)	82

LIST OF FIGURES

**Figure 1. Final Path Model with Perceived Discrimination as the Mediating
Variable.....86**

CHAPTER I: INTRODUCTION

According to the US Census estimates in 2010, there are 17.3 million Asian Americans living in the United States. By 2050, the projected number of U.S. residents who will identify as Asian or Asian with another race will comprise 40.6 million persons, or 9% of the total population. Over 1.5 million are age 65 and older, and census projections predict that this population will exceed 7.5 million by 2050, accounting for 11.7% of the total elderly US population. The population of Asian Americans grew 46% from the 2000 to 2010 census, a higher percentage growth than any other major racial group in the United States. According to census projection, they are also the fastest growing group among all elderly population groups. Recent research has highlighted social barriers to health and well-being for the Asian American elderly, such as inaccessibility to care, lack of insurance, social isolation, and personal factors such as language, their perception of whether or not they are disabled, immigrant status, and other family issues (CDC, 2010; Chi, Chappell & Lubben, 2001; Choi, 2000; Kim & Choi, 2010; Min, Moon & Lubben, 2005; Mui, Kang, Kang & Domanski, 2007; Ngo, Tran, Gibbons & Oliver, 2001; Tran, Chan & Nguyen, 2011; Takeuchi, Zane, Hong, Chae, Gong, Gee, et al., 2007; Yip, Gee & Takeuchi, 2008). These factors may be inherently related to culture, ethnicity, and the acculturative process for immigrants and their family members.

One of the major challenges to understanding health for older Asian Americans is their inherent variability. Asian Americans are incredibly diverse and vastly different in each ethnic subgroup, with distinct languages, cultural practices, values, beliefs, traditions, historical context as well as regions of settlement in the US. It is likely that

health along physical and psychological dimensions is understood and expressed differently for each ethnic subgroup. Particularly, the reliability and validity of measures used to capture health and wellness have not been rigorously examined for Asian Americans, particularly older Asian Americans. Traditional measures capture a very narrowly-defined conceptualization of health. In 1946, the World Health Organization defined health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO, 1946).” Health has been measured by a number of scales, mostly in terms of physical health and the absence of disease. While it would be near impossible to capture all aspects of health for any population, working to understand how health can be understood for older Asian Americans can give invaluable insight into their unique needs. Despite high life average expectancies for this population, the substantial variation in longevity as well as other health factors suggests that there exists a wide spectrum of health for this population (Office of Minority Health, 2011). Asians are at higher risk than the general population of White Americans for health disorders ranging from COPD, hepatitis B, diabetes, depression, substance abuse, and liver disease (CDC, 2010). A fuller, more accurate understanding of health and the risk factors for well-being with the Asian American elderly can substantially advance future scholarship and research, while informing policy decisions and improving clinical outcomes in gerontological social work with this population.

The current assessment of health for Asian Americans using traditional measurements assumes that the tools which are used to capture health are valid for all populations. This assumption that well-being can be understood in the same way for all race and ethnic groups may be seriously flawed, and can lead to misguided outcomes,

particularly for vulnerable and under-served populations. Measures comparing health for Asian Americans and their elderly for major subgroups, i.e. Chinese, Filipino, Vietnamese, Korean, and Japanese, must be rigorously determined to be reliable and valid through careful and thorough examination (Tran, 2009). It is only after this process has taken place that the measurement of health should be applied in predictive analysis for this population.

Additionally, the often unexplored social well-being in WHO definition may be particularly critical for the Asian American elderly. Most are immigrants, and despite the multitude of differences in culture, language, values, and backgrounds, there is a common thread in their shared history of migration from the place of their birth to their arrival in the United States (Alegría, Vila, Woo, Canino, Takeuchi, Vera, et al. 2004). Specific social dimensions of well-being, such as the positive impact of family supports, a sense of family cohesion, community resources, and benefits from spirituality may help to buffer the loss of social ties from home countries (Alegría et al., 2004; Chi, Chappell & Lubben, 2001; Min, Moon & Lubben, 2005; Takeuchi, Zane, Hong, Chae, Gong, Gee, et al., 2007; Yip, Gee & Takeuchi, 2008) . On the flip side of that same coin, intergenerational differences in acculturation for older Asian Americans and their families may present problems and conflicts which may contribute negatively to overall wellness. Examining the reliability and validity of measures of health for older Asian Americans will provide crucial insights in identifying key components for well-being for this population.

The purpose of the research in this dissertation aims to critically examine the reliability and validity of two traditional measurements of health for aging Asian

Americans. These instruments have not been previously examined for Asians or their elders with large-scale, nationally representative data. The impact of social and acculturative components to well-being will then be tested with the physical and psychological health instruments for each major subgroup of Asian American elderly.

Research Questions

This dissertation aims to rigorously examine the psychometric properties of two dimensions of health among older Asian Americans, and if they are found to be feasible, then test the relationship between health and acculturation for this population.

Particularly, the topics examined in this dissertation relate to 1) the measurement issues of two scales capturing health for Asian Americans as a pan-ethnic group, particular in regards to its reliability and validity (functional disability and psychological distress), 2) the reliability and validity of these measures for major Asian American subgroups and the critical examination of their comparability across these cultures, and 3) testing the ethnic differences in the relationship of disability and psychological distress with English ability, as a measure of acculturation, and other social determinants for Asian elderly in the US.

CHAPTER II: LITERATURE REVIEW

A Brief History of Asian Americans

Since the restructuring of immigration policies in 1965, Asians as a whole have become the fastest growing pan-ethnic immigrant group to the United States. From 2004 to 2008, Asians accounted for more than one-third (35.0%) of all persons obtaining legal permanent resident status (US Department of Homeland Security, Office of Immigration Statistics, 2009). The US Census estimates that there are currently 17.3 million people who report having full or partial Asian heritage, and are approximately 5% of the total US population. The majority of Asians live on the West Coast and other major metropolitan areas in the US, with almost three-quarters residing in highly urbanized communities. Census estimates indicate that the areas with the highest concentration of Asians in the US, in order of magnitude, are Greater Los Angeles (1.87 million), NYC and its surrounding area (1.78 million), and the San Francisco Bay Area (979 thousand). The largest subgroups of Asian Americans are the Chinese (4.1 million), Filipinos (3.05 million), Indians (2.77 million), Vietnamese (1.8 million), Koreans (1.7 million), and the Japanese (1.3 million) (US Census, 2010). Asian Americans reportedly have some of the highest median incomes and educational attainment compared to many other racial groups; however, the poverty rate for Asian Americans is also higher than for whites (US Census, 2010).

Chinese Americans. There are approximately 4.1 million persons in the US who are Chinese or have Chinese heritage (US Census, 2010). Chinese Americans are the largest group of Asians in the United States. Estimates from 2008 indicate that Chinese immigrants are also the third largest immigrant group (1.7 million), exceeded only by those born in Mexico and the Philippines (US Department of Homeland Security, Office

of Immigration Statistics, 2009). The 2010 Census indicate that there are over 298 thousand Chinese Americans who are 65 and older, which is 9.7% of the entire Chinese American population. Over 60% of all Chinese in the US are foreign-born, and over 74% speak a different language than English at home, suggesting that most Chinese are immigrants or have immigrants in their families (US Census, 2010). For the Chinese elderly, there appears to be a high numbers who lack English skills and were immigrants who had to acculturate to the United States as adults.

Filipino Americans. The US Census Bureau in 2010 reports that there are approximately 3.36 million persons of Filipino heritage in the United States. Filipino Americans are the second largest Asian American group in the US, and are also the second largest immigrant group, exceeded only by Mexican immigrants. The 2010 Census indicate that there are over 312 thousand Filipino Americans who are 65 and older, or 9.3% of all Filipino Americans. The migration of Filipinos to the US date back to the Spanish-American War. However, the most substantial wave of Filipino migration began after the Immigration and Nationality Act of 1965. While some Filipinos immigrated into the US based on family reunification programs through those who served in the US Navy during World War 2, many more migrated in the 1970's as professionals due to a shortage in qualified nurses in the US. Over 50% are foreign-born, and over 55% speaking a language other than English at home (US Census, 2010).

Vietnamese Americans. The Vietnamese account for approximately 1.8 million of all Asian Americans, and are the fourth largest Asian group, as well as being the seventh largest immigrant group in the United States (US Census, 2010). Substantial waves of migration of Vietnamese families arriving into the US from relatively later

periods indicated that their numbers have exceeded Korean and Japanese Americans in recent years. The 2010 Census indicate that there are over 138 thousand Vietnamese Americans who are 65 and older, or 7.7% of all Vietnamese Americans. In contrast to other Asian groups such as the Japanese, the Chinese, and the Filipinos, the mass migration of Vietnamese Americans as a group began much more recently in 1975 with the Fall of Saigon, primarily under refugee entry status. Highlights from the 2010 US Census Bureau indicate that 64% of Vietnamese are foreign-born, and 85% reported speaking a language other than English at home (US Census, 2010).

Korean Americans. The 2010 Census reports that there are approximately 1.7 million Korean Americans in the United States, and over 155 thousand, or over 9.0%, are 65 and older. Similar to the other groups, Korean Americans typically arrived in large numbers after 1965, primarily to metropolitan areas around Los Angeles, San Francisco, and NYC. While few studies exist on the Korean American elder population, a study comparing 223 Korean elders with 201 non-Hispanic white elders in the Los Angeles area report that 51% have fair or poor health, compared to 23% of white elders (Moon, Lubben, & Villa, 1998). Korean American elders appear to have lower education and income than their white counterparts, and are at risk for social isolation and lack of access to health care. Over 63% of all Korean Americans are foreign-born, and 70% report speaking a different language than English at home (US Census, 2010).

Japanese Americans. The 2010 Census reports that there are over 1.3 million Japanese Americans in the US. Over 190 thousand are 65 and older, which is over 14% of all Japanese Americans, making them on average the oldest Asian American group in the United States. Japanese migration began in the latter part of the 18th century, and in

contrast to other Asian Americans, relatively higher proportions of this population are US-born and their families may have lived in the US for multiple generations. In contrast to other Asian American groups, Japanese Americans have perhaps the most established history in the US; however, there does not appear to be the same ethnic enclave phenomenon for this population, in large part due to the impact of forced relocation of all Japanese American families during World War 2 from their homes to internment camps. Approximately 25% are foreign-born, and less than 34% report speaking a language other than English at home (US Census, 2010).

Diversity in Asian American Groups

While some groups such as Japanese and Chinese Americans have a long history of migration to the US, it was only since the passage of the Immigration and Nationality Services Act of 1965 when mass migration occurred, primarily through family reunification programs, spurring the emergence of large-scale Asian American communities. However, large segments of Asian Americans who are highly educated professionals live alongside low-waged, unskilled workers in urban centers, which suggest tremendous diversity in the Asian American experience. Census estimates also indicate that this population is rapidly aging, and older Asian Americans are much more likely to have little formal education and have fewer language skills, resulting in greater risk for social isolation (Choi, 2001).

Despite similarities from a shared history of migration from Asia and the importance of values on family, community, and tradition, there are diverse differences for each of the Asian American subgroups in their reason for migration, method of entry, resources available, level of education, English language proficiency, and community

supports upon arrival (Alegría et al., 2004; Ngo, Tran, Gibbons & Oliver, 2001; Portes & Rumbaut, 2006; Takeuchi, Zane, Hong, Chae, Gong, Gee, Walton, Sue, Alegria, 2007; Waters, Ueda & Marrow, 2007). For example, while ethnic enclaves exist for Chinese, Vietnamese, and Korean Americans, Filipinos as a group tend to have higher professional incomes, settle in a more dispersed fashion and intermarry with other races and ethnicities more than other Asians. Most Vietnamese Americans arrived comparatively recently as refugees beginning in 1975, and have diverse differences in level of education, resources, and professional skills depending upon the wave of migration. Japanese Americans have perhaps the most established history in the US; yet, there does not appear to be the same ethnic enclave phenomenon for this population, in large part due to the impact of forced relocation of all Japanese American families during World War 2 from their homes to internment camps. Chinese Americans have some of the largest enclaves in the US, but differ largely in the inherent diversity within class, generational, and regional backgrounds within their own communities (Mui & Kang, 2006; Mui, Kang, Kang, & Domanski, 2007). Korean Americans also have diverse migration backgrounds, and according to census estimates, they have the lowest naturalization rates compared to all other major Asian American groups in the United States (see Appendix, Table 3). Such inherent diversity within Asian Americans and their subgroups poses challenges in identifying reliable and valid measures of physical and psychological health which can be used for cross-cultural research with this population.

Predicted Outcomes: Health for Older Asian Americans

Physical health. As a distinct major racial group in the United States, Asians are highly varied in differences with nativity, generational status, English-proficiency, years

of residence and socioeconomic status in the United States. Asian American elderly—the majority of whom are foreign-born immigrants—appear to use self-care to counteract health issues, and are less likely to seek professional medical help or take prescription medicine than are native-born American elderly (Hsiao et al., 2006). The Center for Disease Control report in 2010 that “Asian Americans represent both extremes of socioeconomic and health indices.” Despite statistics indicating infrequent medical visits, language barriers and higher overall lack of health insurance, Asian-American women reportedly have the highest life expectancy compared to any other group (CDC, 2010). However, the CDC highlighted that Asian American populations experience genuine health disparities in cancer screening, diabetes, and infectious diseases, and have a high prevalence and number of risk factors for chronic obstructive pulmonary disorder, hepatitis B, HIV/AIDS, smoking, tuberculosis, and liver disease. The lack of English language skills may be related to health disparities, which leads to more disability defined as poor physical and functional health. Without exposure to culturally and/or linguistically appropriate care, Asian elders may be at much higher risk for disability.

Functional Disability of Asian Elders. The CDC (2010) reports that there are more than 50 million persons in the US who are diagnosed with a disability, and, of those, 35 million (12%) reported having a severe disability. Additionally, the chance of having a disability goes up with age, from less than 10% for people 15 years of age or younger, to almost 75% for people 80 years of age or older. The CDC emphasizes that good health habits and access to health care during the life course can delay or even prevent many disabilities. Overall, it appears that Asian Americans have the lowest rate of reported disabilities compared to other ethnic groups, lower than non-Hispanic Whites

and Non-Hispanic Black or African Americans (Asians: 11.6%, Non-Hispanic Whites: 20.3%, Non-Hispanic Black or African Americans: 21.2%) as measured by the Behavioral Risk Factor Surveillance System (BRFSS). However, the CDC does acknowledge that racial and ethnic differences in self-rated health and disability “might reflect differences in potentially confounding factors, such as education, income, and health insurance status.” They also add that these factors are significantly associated with both race/ethnicity and disability, and were not controlled for in their analysis. It is interesting to note that the percentage of Hispanics who report having a disability is also lower than both Whites and Blacks (16.9%), which may suggest that many acculturative factors such as language, perception of disability, immigrant status, and access to services may contribute to measurement confounds.

Mental health. Until recently, there has been little information on national estimates of prevalence in mental disorders among Asian Americans in community, non-clinical settings. In previous cross-cultural studies of Asian American elderly immigrants, higher prevalence rates of depression were found, compared to their non-Asian or native-born peers (Lam, Pacala, & Smith, 1997; Mui, Kang, Chen, & Domanski, 2003). Factors such as life satisfaction, social support, health status, functional status, years in the United States, level of acculturation, and command of the English language and family support were all found to be inversely related to depressive symptoms (Casado & Leung, 2001; Min, Moon, & Lubben, 2005; Ngo, Tran, Gibbons, & Oliver, 2001; Shibusawa & Mui, 2001). Additionally, Asian American elders are also at higher risk for suicide and depression, likely due to social isolation and the breakdown of support networks (Chi, Chappelle & Lubben, 2001). Mui et al. (2003) also found that Asian elders who feel they

are not emotionally and physically connected to their children are at higher risk for depression, and that there may be tremendous group differences among the various Asian subgroups (Highest % Depressed, Japanese: 76%; Lowest % Depressed, Filipino: 15.4%). Regardless, they found that all Asian elders in their study are observed to have a higher rate of depression than other ethnic elderly elders in the US and other parts of the world.

Takeuchi, Zane, Hong, Chae, Gong, Gee, Walton, Sue, Alegria (2007) examined the impact of immigration-related factors and mental health disorders in a nationally representative sample of 2095 Asians living in the United States. The results from their analysis suggest that Asian who are foreign-born and have poor English proficiency may be more likely to have a mental illness, for both older men and women. More recent analysis by Kim & Choi (2010) on the 12-month prevalence of mental disorders among older Asian Americans with the same nationally representative data used by Takeuchi et al. (2007) suggest that older Asians, compared to younger cohorts, may have lower reactivity to life stressors and more adaptive coping strategies. Despite having less education, lower income, and lower English proficiency, older Asians as a whole may be better able react to their health problems and regulate their emotions in response to life difficulties.

Acculturation of Older Asian Americans

Acculturation is a highly nuanced concept, which may encompass acceptance from the mainstream culture, as well as a sense of ethnic identity. The *Random House Dictionary* (2013) defined acculturation as “the process of adopting the cultural traits or social patterns of another group.” The *American Heritage Dictionary* defined

acculturation as “the learning of the ideas, values, conventions, and behaviors that characterize a social group,” and that “acculturation is also used to describe the results of contact between two or more different cultures; a new composite culture emerges, in which some existing cultural features are combined, some are lost, and new feature are generated ... usually one culture is dominant (as in the case of colonization).” The definition of acculturation has evolved from the assumption that all immigrants experience a straight-line process of assimilation into the middle-class to a more nuanced understanding. Successful acculturation is a balancing act which incorporates the acquisition of essential skills necessary for thriving in the host culture, such as language ability, along with the maintenance of important values and characteristics from the culture of origin (Berry, 2003; Triandis, 2008). Recent research has also highlighted the influence of structural factors, such as institutional oppression and health disparities in geographic areas of entrenched poverty, which can have a serious, deleterious impact on the process of acculturation for immigrants and their families across multiple generations (Portes & Rumbault, 2006; Waters & Ueda, 2004).

Past research has also tended to operationalize acculturation simply as English ability or length of stay in the US (Berry, 2003, Portes & Rumbault, 2006; Triandis, 2008, Waters & Ueda, 2004). These proxy measures are limited in the sense that, conceptually, they solely represent the potential adaptation of immigrants to the norms of the host society. English ability is an important concept to acculturation, as it can potentially capture how well an immigrant can successfully engage in social and work environments in the US. Therefore, research in acculturation must at least address this important indicator for immigrant populations. In the case of older Asian Americans, US

Census estimates indicate that more than half of all Asian elders speak English well or very well (63.07% for 50 & older; 50.17% for 65 & older). Most older Asians are immigrants (over 80% for 65 and older) and have been in the US for many years (50 and older: Mean = 26.92, SD = 13.20; 65 and older: Mean = 29.87, SD = 15.13). Based on this demographic profile, English ability would likely play an important but limited role in capturing acculturation, since this older population either knows enough English to get by or would be unlikely to learn it at this point in their lives. In terms of length of stay in the US as an indicator of acculturation, for the majority of older Asian Americans who have immigrated over 25 years ago, the further accumulation of time living in the US would likely have any relationship to increased well-being. In fact, research on immigrants have suggested that an increased length of time in the US may be associated with poorer well-being (Crockett, Iturbide, Torres, Stone, McGinley, Raffaelli, & Carlo, 2007; Finch, Kolody, & Vega, 2000; Frank, Cerdá, & Rendón, 2007; Portes & Rumbault, 2006). Recent research on a nationally-representative sample in the US (Chan, Tran, & Nguyen, 2012) suggest that a measure of perceived discrimination, characterized by a sense of unfair treatment in everyday life, may represent a dimension of social marginalization for Asian Americans, which is comparable to but different from the structural and institutional context of race for African Americans. Chan et al. (2012) assert that this experience of perceived discrimination is found empirically to be different for Chinese, Filipino, and Vietnamese elders, and ethnic differences may be tied to the different pathways of acculturation of these groups to the US. For Asians as a whole, it appears also that perceived discrimination has a complex relationship in increasing psychological distress and somatic symptoms (Mereish, Liu, Helms, 2012). A deeper

level of understanding of discrimination for Asian elders may provide an opportunity to examine acculturation in the context of their perceived sense of acceptance from American society, as one of the largest immigrant groups in the US.

A major limitation in studying acculturation for Asian Americans is that most research have typically lumped all of them into one single group. Differences in language, cultural practices, migration histories, support systems, economic conditions and political climate at time of arrival will have a significant impact on acculturation and well-being on different ethnic populations of Asian elders. With few exceptions, these differences have typically been ignored in acculturation research with older Asian Americans, either due to small sample sizes and/or a general lack of awareness of the inherent ethnic differences within the diaspora of this population.

Social Determinants to Health for Older Asian Americans

While large scale community studies with Asian Americans suggest there are unique challenges to the population, not enough is known about the well-being of older Asian Americans and how the current US health care system can best serve this population. It does appear, however, that physical and mental health, particularly for older Asian Americans, are intricately tied to social health and its domains. Research findings that are available indicate some salient characteristics which may be important to well-being for this community. Mui and Kang (2006) found that living alone may contribute to the social isolation of Asian elderly, which appears to negatively impact physical and mental health. Additionally, they found that the experience of having more stressful life events and dissatisfaction with help received from family members also increased the likelihood of being sick. These empirical findings strongly suggest that

Asian elderly immigrants in the United States are at risk for health concerns resulting from poor social networks, which is compounded by migratory grief and acculturative stress (Mui & Kang, 2006; Mui, Kang, Kang, & Domanski, 2007). In addition, the small relative size of social networks among Asian immigrant elderly compared to the general population of elders may increase the inherent vulnerabilities of this population, making them more isolated and susceptible to abuse with little recourse (Tam & Neysmith, 2006).

There appears to be great variation in the prevalence of risk and protective factors for health across Asian American ethnic groups. The interdependence and support within family structures may provide a protective buffer against risks factors such as isolation, discrimination, traumatic experiences, and poverty for Asian American elders (Tummala-Narra, 2001; Yee, DeBaryshe, Yuen, Kim, & McCubbin, 2007). However, the cultural ideology, family dynamics, and intrapsychic experiences of many Asian American elderly immigrants may be profoundly impacted by migration, interdependence of the Asian family structure, and the process of acculturation (Choi, 2001). In spite of the strong Asian value of caring for their elder family members, the disintegration of family structures within the traditional family network and extended family systems present new challenges for the care and well-being of Asian elderly in the United States (Sue, 2005). The inclusion of social determinants as a fundamental covariate of health has gained increased attention from policymakers, researchers, and practitioners. The association of social networks to health has been highlighted by public health experts, where inadequate social networks have been associated with increased morbidity and mortality (Berkman, 2000; Berkman, 2009). Social support may come from a variety of sources, including

family, friends, and neighbors, who may serve different functions particularly in an older person's life (Lubben & Girona, 2004). Additionally, community resources may be particularly relevant for many older Asian Americans who arrived as immigrants to the United States. These resources may be essential in addressing social isolation and promoting physical and mental well-being for this population.

Significance of Proposed Study on Health for Asian American Elderly

Asians have become an integral part of the American landscape. Since 1965, large scale migration of all major Asian American subgroups has led to the growth of many ethnic enclave communities in the US (US Census, 2010). Asians appear to occupy extremes in socioeconomic status, and while many have been highly successful in the acculturation process, others within these communities have also met with challenges to successful adaptation. In particular, the impact of social factors to physical and psychological health are crucial areas where current research can be advanced to improve the lives of many older Asian Americans. At the same time, because there is so little information on this growing population, it is unlikely that the needs of Asian American elderly persons can be fully met unless there is a major shift in understanding for this population. The collective aims of this proposal are to provide some key insights into the measurement of health, particularly the reliability and validity of functional disability and psychological distress, and examine how these measures of health may be related to the processes of acculturation and other social factors for Asian American elders.

Research Aims & Hypotheses

Aim 1. Examine the measurement of two instruments capturing health for older Asian Americans as a pan-ethnic-group in order to assess their reliability and validity: 1) functional disability as a proxy for overall health, and 2) psychological distress as a proxy for psychological health.

Hypotheses

Ho. 1. Results from reliability and confirmatory factor analysis with the items from the functional disability scale will yield inconsistent estimates in its psychometric properties, indicating limitations in how overall health is captured in this measurement as it is perceived by older Asian Americans.

Ho. 2. Results from reliability and confirmatory factor analysis with the items from the Kessler Psychological Distress Scale (K10) will yield inconsistent estimates in its psychometric properties, indicating limitations in how psychological health is captured in this measurement as it is perceived by older Asian Americans.

Aim 2. Assess the reliability and validity of two scale instruments of health for major Asian American subgroups of elders and examine their cross-cultural comparability. Specifically, the dimensionality of each of the two scales (functional disability and psychological distress) will be assessed separately for each major Asian American subgroup for within-group analyses, and then pairwise between-group comparisons will be made as appropriate for subgroups in order to assess the measurement invariance of the two scales.

Hypotheses

Within-Group Analysis

Ho. 1. Results from reliability and confirmatory factor analysis on the items from the functional disability scale, when conducted separately for each of the five available major subgroups (Chinese, Filipino, Vietnamese, Korean, Japanese), will yield more consistent and stable estimates in its psychometric properties, compared to the pan-ethnic model from Aim 1, Ho. 1.

Ho. 2. Results from reliability and confirmatory factor analysis on the Kessler Psychological Distress Scale (K10), when conducted separately for each of the major subgroups (Chinese, Filipino, Vietnamese), will yield more consistent and stable estimates in its psychometric properties when compared to the pan-ethnic model from Aim 1, Ho. 2.

Between- Group Analysis

Five separate hypotheses to assess measurement invariance can be tested using confirmatory factor analysis on each of the two scales, conducted pairwise with subgroups in the data (Byrne, 1998; Jöreskog & Sorbom, 1996; Schmitt & Kuljanin, 2008; Tran, 2009)

Ho. 1. The covariance matrices of the observed items in the disability and psychological distress scales will not be equivalent across the major Asian Americans groups identified in the data.

Ho. 2. The factor patterns of observed items in the disability and psychological distress scales will be equivalent between the major Asian Americans groups identified in the data.

Ho. 3. The factor loadings of observed items in the disability and psychological distress scales will not be completely equivalent on their respective factors between the major Asian Americans groups identified in the data.

Ho. 4. The measurement errors of observed items in the disability and psychological distress scales will not be completely equivalent between the major Asian Americans groups identified in the data.

Ho. 5. The factor variances and covariances in the disability and psychological distress scales will not be equivalent between the major Asian Americans groups identified in the data.

Aim 3. Estimate the effect of acculturation and socio-demographic factors on functional disability and psychological distress for older Asian Americans relative to ethnic differences.

Overall Health: Functional Disability as Outcome

Hypotheses

Ho. 1. Greater acculturation, as measured by English ability, is associated with a decrease in disability for all older Asian American respondents, regardless of ethnic differences.

Ho. 2. While greater English ability should be associated with a decrease in disability for all older Asian American respondents, ethnic differences will be found across subgroups of older Asians.

Psychological Distress as Outcome

Hypotheses

Ho. 1. Greater acculturation, as measured by English ability, is associated with a decrease in psychological distress for all older Asian American respondents, regardless of ethnic differences.

Ho. 2. Higher perceived discrimination is associated with an increase in psychological distress for all older Asian American respondents, regardless of ethnic differences.

Ho. 3. Higher family and social support is associated with a decrease in psychological distress, regardless of ethnic differences.

Ho. 4. Perceived discrimination can potentially serve as a mediator for ethnicity, English ability, length of stay in the US, and family and social factors in predicting psychological distress.

CHAPTER III: METHODS

Data Sources

American Community Survey (ACS). The American Community Survey is a nation-wide survey produced by the U. S. Census Bureau designed to capture demographic, social, economic and housing data every year. Estimates from the ACS are used by policymakers to help determine the availability of federal and state funding to population areas. The disability scale from the ACS will be used to assess physical health.

The data of the ACS was collected in a rolling sample design, and three modes of data collection were used: 1) mailout, 2) telephone non-response follow-up, and 3) personal visit non-response follow-up. The sampling rate was determined by identifying five different strata, with the smallest receiving higher sampling rates in order to increase reliability in the overall sample. Addresses are randomly assigned to a specific year, and no housing unit will be in the sample more than once in any 5 year period. Non-respondents with mailable addresses and available telephone numbers are sent for follow-up with computer assisted telephone interviews (CATI). The survey designers decided to use larger weights for cases from these housing units in order to reduce the inflated variances from differences in the proportions of responders using mailout and CATI for collection. For more information, see Appendix, ACS 2009 1-Year PUMS File, p.5.

For the purposes of this study, Asian American elderly who are 50 and older, and identified as Chinese, Filipino, Vietnamese, Korean, and Japanese were selected from the ACS 2009 dataset. The overall sample consisted of 29,386 individuals, with 10,084 Chinese, 7,945 Filipino, 3,323 Vietnamese, 3,511 Korean and 4,533 Japanese elders. The

inclusion of those 50 between 50 to 64 as part of the sample was to allow for statistical comparisons between this groups and other older age cohorts.

National Latino and Asian American Study (NLAAS). The National Latino and Asian American Study (NLAAS) was funded by the National Institute of Health as part of the Collaborative Psychiatric Epidemiology Surveys (CPES). The Kessler Psychological Scale will be used to measure psychological health, and is drawn from this data. NLAAS was collected from 2001 to 2003, and the 27,026 respondents sampled includes Latino American, Asian American, and non-Latino, non-Asian White American adults aged 18 and older residing in households located in the coterminous United States and the state of Hawaii. The primary objective of the CPES was to collect data on the prevalence of mental disorders, impairments associated with these disorders, and their treatment patterns from representative samples of majority and minority populations in the US. Secondly, the study was conducted to obtain information on language use and ethnic disparities, support systems, discrimination and assimilation in order to examine the intersection of mental health disorders to social and cultural issues.

Multi-stage sampling procedures were employed for this study. Participants were screened and administered the instruments using computer assisted software during the scheduled interview by trained bilingual personnel with similar linguistic and cultural background. The NLAAS instruments were made available in English, Spanish, Mandarin, Cantonese, Tagalog, and Vietnamese, and the researchers employed forward and back translation techniques to increase cross-cultural validity. The instruments were designed also to interview in Tagalog, Vietnamese, Chinese, or English, and multilingual interviewers were employed in the study and certified to be fluent in both English and the

other language. For more information, see Appendix, National Latino and Asian American Study (NLAAS), p.7.

A total of 2,095 persons identifying as Asian in NLAAS, Chinese, Filipino, and Vietnamese were targeted by the research team as the major Asian subgroups for analysis, but persons identifying as “other” Asian ancestry were also included. All Asians who were 50 and older were included in the pan-ethnic analysis (Total n = 550). Separate target ethnic groups of respondents who were 50 and over were selected for the between-group analysis (Chinese: n = 160; Filipinos: n = 145; Vietnamese: n = 153).

Variables from American Community Survey (ACS) 2009

Functional Disability as Overall Health. The measurement of well-being has focused primarily on physical health, conceptualized as the absence of physical disability or disease. Some commonly used measures of population health status may include morbidity and mortality indicators such as the incidence or prevalence rates of diseases, number of deaths (adult and infant), or the presence of a disability. Health practitioners have extensively used instruments such as the SF-12 and SF-36 to assess functional health and well-being along physical and psychological domains (McHorney, Ware & Raczek, 1993).

For the purposes of this study, the six items assessing functional disability from the American Community Survey (ACS) will be critically examined for their reliability and validity when used as a scale. These six items were developed by a federal interagency workgroup to capture disability as it relates to impairment, an activity limitation, and/or participant restrictions. Impairment is defined by a significant deviation or loss in body function or structure, activity limitation as limitations in activities of daily

living, and participant restriction as problems with involvement in life situation with work or social environments (Weathers, 2005). This definition of disability was drawn from the concepts from the World Health Organization's International Classification of Functioning, Disability, and Health (ICF), and is consistent with the definition of disability from the American Disability Act of 1990. The ADA defines a disability as "a physical or mental impairment that substantially limits one or more of the major life activities, a record of such an impairment, or being regarded as having such an impairment (ADA, 1990)."

Estimates from the ACS are used by policymakers to help determine the availability of federal and state funding to population areas. The US Census (2010) reports that "information from the survey generates data that help determine how more than \$400 billion in federal and state funds are distributed each year." Functional Disability from the ACS encompasses a broad view of health, which includes physical and mental health, along with ADLs (Activities of Daily Living) and IADLs (Instrumental Activities of Daily Living). Functional disability has important implications for the well-being of elderly, and can impact quality of life in important ways that are related to successful aging.

Table 1. Six items Measuring Functional Disability from the American Community Survey (ACS)^a

1. Is this person deaf or does he/she have serious difficulty hearing?
2. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?
3. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?
4. Does this person have serious difficulty walking or climbing stairs?
5. Does this person have difficulty dressing or bathing?

6. Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?

- a. Respondents were asked to answer yes or no to these questions. Yes was recoded with a score of 1, and no was recoded with a score of 0.

Disability as Outcome. Functional disability as an outcome was initially examined as a continuous variable (sum of disability items). This reflects the conceptualization of the questions in the American Community Survey, as it is used in policy decision making to determine the amount of funding for state block grants from the federal government. When the composite scale was examined for its properties, it was found that the overwhelming majority of Asian elders (84.8%) did not report any disability, and there was substantial non-normality in this scale (skewness = 3.26, kurtosis = 13.95). It seemed theoretically feasible to recode disability as a dummy variable, where the item is coded as "0" for no disability and "1" as having one or more disabilities. This, as the researcher argues, can theoretically better capture the differences between those who identify as having no disabilities versus those who have some form of functional impairment. Additionally, it can be reasonably assumed that the real difference in the impact of being disabled for older adults is having any major disability, where the personal freedom to live independently would become severely limited in terms of caring for oneself.

Demographic Variables. Demographic variables such as female gender, being married, the log of income, education, immigrant status (having citizenship or no citizenship) and age at immigration were examined as predictors for disability. Age was recoded as 50 to 64, 65 to 74 and 75 and older, to better reflect those who are close to retirement, recently retired, and mostly retired category of Asians. Years in the US was

also recoded as less than 10 year = 0, and more than 10 years in the US = 1. This conceptualization is based on the understanding that acculturation is not a linear process, and that it may take about 10 years for an immigrants to adapt to their surroundings, build social supports, amass savings to purchase a home, tap into various resources, and be acclimated to their conditions in the US (Tran, 2005).

Language Acculturation. Language acculturation was measured by two variables, Speak English and Linguistic Isolated Household. These two variables were found from two separate datasets from the ACS. Speak English is an individual-level variable from the population data, and is coded in four categories, 1) Very Well, 2) Well, 3) Not Well, and 4) Poor. The variable was reversed coded to reflect higher English speaking ability in the analysis. Linguistic isolation is defined by the US Census as living in a household where no persons 14 or older speak English well or very well. This variable was merged into the individual-level data, based on a household ID provided in the American Community Survey (see Appendix). This variable was recoded with a value of 1 for living in a linguistically isolated household, and 0 for not linguistically isolated.

Asian Ethnicity. Asian Ethnicity is defined by the five major subgroups of Chinese, Filipino, Vietnamese, Korean and Japanese. The variable is the response from participants who identified exclusively as any of one of these ethnic groups. Admittedly, this fails to capture those who identified themselves in combination of any one of these five subgroups of Asian ethnicities with another ancestry background. However, this seems plausible in that the analyses aim to compare ethnic differences in disability, and this strategy would yield more consistent and stable estimates for purposes of

comparison, when respondents exclusively identified only one ethnic heritage. Five dummy variables were created for each ethnicity (Chinese: 1 for Chinese, 0 for all others; Filipino: 1 for Filipino, 0 for all others; Vietnamese: 1 for Vietnamese, 0 for all others; Korean: 1 for Korean, 0 for all others; Japanese: 1 for Japanese, 0 for all others).

Waves of Immigration. Waves of immigration, as dummy variables used in this analysis, were designed to capture changes in attitudes and policy practices based on political changes and socioeconomic shifts in relation to immigration in the US. The year 1965 was monumental in that the Immigration and Nationality Act repealed various legislations which excluded the immigration of Asians into the US. In the year 1975, the Fall of Saigon occurred shortly after the withdrawal of US troops, which introduced the first major wave of Vietnamese refugees to the US. The 1980's and 1990's were particularly important, when large numbers of Asians continued to arrive to the US, and major Asian American enclaves grew substantially in metropolitan areas in the Northeast and along the West Coast. The most recent wave of Asian immigrants from 2000 to 2009 serves as a good reference point in the analysis. Three groups were created for this analysis, 1) before 1975, 2) from 1975 to 1999, and finally 3) from 2000 to 2009. The groups were fairly well-sampled for each wave in the study, with 6,050 (25.22%) before 1975, 15,345 (89.19%) from 1975 to 1999, and 2,594 (10.81%) from 2000 to 2009.

Variables from the National Latino and Asian American Study (NLAAS)

Psychological Distress as Psychological Health. Psychological health has been measured by a whole host of instruments designed to capture overall well-being, perceived quality of life, and specific disorders such as the Beck Depression Inventory (BDI). Studies using data from the Midlife in the US Survey (MIDUS) has indicated that

older persons are at risk for depression due to role loss with age (Kessler, Mickelson, Walters, Zhao & Hamilton, 2004), and that health inequalities may shape the subjective experience of aging (Barret, 2003). However, few studies specifically deal with the mental health concerns of older Asian Americans, or address the cross-cultural validation of instruments used to capture psychological health for this population. Mui, Kang, Chen & Domanski (2003) assessed the risk of depression in community-dwelling Asian immigrant elders in New York City and found that the Geriatric Depression Scale (GDS) was reliable and valid when used with this population. Mui et al. suggested that some of the reasons that the GDS was an appropriate measure are that it contains no somatic items that introduce age bias, and that it has a simple yes/no format suitable for Asian elders with little to no formal education.

The Kessler Psychological Distress Scale has also been used as a measure of psychological health in many other large scale population studies, such as the CDC's National Health Interview Survey, the WHO World Mental Health Surveys, and the Australian National Survey of Mental Health and Well-being. Two versions of this psychological health measure have been used, the K6 and the K10. Both were found to have good precision as well as consistent psychometric properties (Furukawa, Kessler, Slade, & Andrews, 2003; Kessler, Andrews, Colpe, Hiripi, Mroczek, Normand, Walters, Zaslavsky, 2002). The K10 was used to capture psychological distress by the National Latino and Asian American Study (NLAAS), which will be assessed for its reliability and validity for older Asian Americans in this paper.

Table 2. 10 items of the Kessler Psychological Distress Scale from the NLAAS^a

-
1. During the last 30 days, about how often did you feel depressed?
 2. During the last 30 days, about how often did you feel so depressed that nothing could cheer you up?
 3. During the last 30 days, about how often did you feel so restless that you could not sit still?
 4. During the last 30 days, about how often did you feel tired out for no good reason?
 5. During the last 30 days, about how often did you feel that everything was an effort?
 6. During the last 30 days, about how often did you feel nervous?
 7. During the last 30 days, about how often did you feel so nervous that nothing can calm you?
 8. During the worst month in the past year, how often did you feel hopeless?
 9. During the worst month in the past year, how often did you feel restless or fidgety?
 10. During the worst month in the past year, how often did you feel worthless?
-
- a. The scale was recoded for each item to range from 0 to 4, with 0 = none of the time, and 4 = all the time.

Variables for Regression Analysis

Psychological Distress. The Kessler Psychological Distress Scale (K10), described above, is a 10-item inventory that assesses the prevalence of negative feelings in the past 30 days (see Table 2). Respondents reported frequency on a 5-point scale (1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = most of the time, and 5 = all of the time). Items from this measure were summed up to create a continuous scale. The full scale has a possible range of 10 to 50, with higher scores representing higher psychological distress.

Asian Ethnicity. Dummy variables were created for the three distinct major Asian American ethnic groups from the NLAAS data (Chinese: 1 for Chinese, 0 for all others; Filipino: 1 for Filipino, 0 for all others; Vietnamese: 1 for Vietnamese, 0 for all others).

others). Chinese was treated as the reference group, and omitted as a predictor in the aggregate-group regression analysis.

Language Acculturation. Language acculturation was measured by three variables 1) How well do you speak English, 2) How well do you read English, and 3) How well do you write English. The three variables were coded as 1= poor, 2 = fair, 3 = good, and 4 = excellent. The three items were summed up and treated as a scale and ranged from a possible value of 3 to 9. The combined three items appear to have very good internal consistency ($\alpha = 0.97$) for the sample.

Perceived Discrimination. The Williams Perceived Discrimination Scale, developed by Williams and colleagues, was used from this data to examine the impact of discrimination on psychological distress in the analysis. Perceived discrimination has been found to be negatively associated with psychological well-being in large-scale surveys (Kessler, Mickelson & Williams, 1999), research with African Americans (Williams, Yu, Jackson & Anderson, 1997) and Asian Americans populations (Yip, Gee & Takeuchi, 2008).

Table 3. Nine items from the Everyday Discrimination Scale^a

-
1. Frequently treated with less courtesy than others
 2. Frequently treated with less respect than others
 3. Frequently received poorer service than others
 4. Frequently people think you're not smart
 5. Frequently people are afraid of you
 6. Frequently people act like you are dishonest
 7. Frequently people act like they are better than you
 8. Frequently called names/insulted
 9. Frequently threatened/harassed
-

a. The scale was recoded for each item to range from 0 to 4, with 0 = none of the time, and 4 = all the time.

Recent research from Chan, Tran & Nguyen (2012) suggest that five items in particular (Items 1, 2, 3, 4 & 7) which capture “covert discrimination,” characterized by more indirect forms of unfair treatment, appear to better reflect this social phenomenon for Asian Americans and is measurement invariant for ethnicities within the Asian population. This reduced 5-item scale was summed and used as a predictor in the model and has a possible range of 0 to 25, with higher scores representing higher perceived discrimination. The reduced 5 item scale appears to have very good internal consistency (Cronbach’s $\alpha = 0.89$).

Demographic Variables. Demographic variables examined as predictors from NLAAS in the analysis include: Age, female gender (1 as female, 0 as male), education (1 = 0–11 years, 2 = 12 years, 3 = 13-15 years, 4 = greater than or equal to 16 years), household income, and marital status (1 for married, 0 for all others). Years in the US was originally coded in the data in 5 categories (0 = US-born, 1 = less than 5 years, 2 = 5-10 years, 3 = 11-20 years, 4 = 20+ years). The category for US-born was dropped, and this portion of the analysis was conducted only for the foreign-born population in the sample. Additionally, the variable was further collapsed into two categories, where less than or equal to 10 years was coded as 0, and greater than 10 years coded as 1, in order to better capture the non-linear relationship of years in the US to well-being.

Social and Family Factors. Social and family factors were examined with a number of scales and items. Family Pride is a 7-item measure developed by Olson & colleagues (Olson, 1986; 1989) to capture shared familial cultural values such as trust between family members, loyalty to the family, family pride, and a general orientation towards the family. Higher scores represent lesser levels of family pride in the item’s

response categories in the original scale (1. Strongly agree to 4. Strongly disagree). Items were summed up and then reversed in order to reflect higher levels of family pride in the scoring for analysis, and has a possible range of 0 to 21. The scale appears to have good internal consistency (Cronbach's $\alpha = 0.89$).

Family Cohesion is a 3-item measure developed by Olson & colleagues (Olson, 1986; 1989) to capture elements of family closeness and communication, such as whether family togetherness is important. Higher scores represent lesser levels of family cohesion in the item's response categories in the original scale (1. Strongly agree to 4. Strongly disagree). Items were summed up and then reversed in order to reflect higher levels of family cohesion in the scoring for analysis, and has a possible range of 0 to 9. The scale appears to have good internal consistency (Cronbach's $\alpha = 0.84$).

Family Cultural Conflict is a 5-item scale drawn from the Hispanic Stress Inventory (HSI) (Cervantes et al., 1991), developed to address issues of cultural and intergenerational conflict with families such as interference with personal goals, arguments due to different belief systems, and the breakdown of family unity. Higher scores represent higher levels of family cultural conflict in the item's response categories in the scale (1. Hardly ever to 3. Often), and has a possible range of 0 to 10; Cronbach's $\alpha = 0.77$).

Social Cohesion is a scale which evaluated the cohesiveness of a neighborhood by asking if neighbors get along with each other and if they can count on one another in emergencies. The measure was adapted from a scale used by Sampson, Raudenbush and Earls (1997), the UNOCCAP questionnaire (NIMH, 1994), and a questionnaire used in the National Longitudinal Study of Adolescent Health, entitled "Add Health" (Bearman,

Jones, and Udry, 1997). Higher scores represent lesser levels of social cohesion in the item's response categories in the original scale (1. Very true to 4. Not true at all). Items were summed up and then reversed in order to reflect higher levels of family cohesion in the scoring for analysis, and the scale has a possible range from 0 to 12 (Cronbach's $\alpha = 0.81$).

Table 4. Scales and Items for Social Factors from National Latino and Asian American Study (NLAAS)

Family Pride (7 items)	
1.	Family members respect one another.
2.	We share similar values and beliefs as a family.
3.	Things work well for us as a family.
4.	We really do trust and confide in each other.
5.	Family members feel loyal to the family.
6.	We are proud of our family.
7.	We can express our feelings with our family.
Family Cohesion (3 items)	
8.	Family members like to spend free time with each other.
9.	Family members feel very close to each other.
10.	Family togetherness is very important.
Family Cultural Conflict (5 items)	
11.	Being too close to family interfered with goals.
12.	Argue with family over different customs.
13.	Lonely and isolated due to lack of family unity.
14.	Family relations less important to people close to you.
15.	Personal goals conflict with family.
Social Cohesion (4 items)	
16.	People in neighborhood can be trusted.
17.	People in neighborhood get along w/ each other.
18.	People in neighborhood help in emergency.
19.	People in neighborhood look out for each other.

Descriptive analysis revealed that all items assessing social factors were skewed, suggesting that respondents in general reported higher values for the items from Family Pride, Family Cohesion, Social Cohesion, while they reported lower values for Family Cultural Conflict. All items had some clustering, but the kurtosis was greatest for "Family members feel loyal to the family" (kurtosis = 9.46) and "We are proud of our

family” (kurtosis = 9.51) from the Family Pride scale, and “Family members feel very close to each other” (kurtosis = 6.95) and “Family togetherness is very important” (kurtosis = 12.56) from the Family Cohesion Scale.

Disability. Disability from the NLAAS dataset was measured using four dichotomous items: 1) Difficulty dress/bathe/getting around house due to condition, 2) Difficulty leave home/go to doctor due to condition, 3) Difficulty working at job/business due to condition, 4) Difficulty participating in school/housework/daily activities. The four items were summed up, then dummy coded, with 1 for having 1 or more disabilities and 0 for no disabilities.

Physical Health Rating. The Physical Health Rating Scale, a 1-item measure of physical health, from NLAAS was also examined as part of this analysis. The scale ranged from 1 to 5, where a higher score represented better physical health. This scale has been found to be a robust indicator of general health status, and there were no systematic differences in reporting between foreign- and US-born Asian Americans (Erosheva, Walton, & Takeuchi, 2007).

Analytical Procedure

This dissertation applied a number of different analytic techniques to assess functional disability and psychological distress as measurements, and then as outcomes when exploring ethnic differences for older Asians.

Measurement of Overall Health: Functional Disability. The first portion of the analysis entails the critical assessment of the reliability and validity of disability captured by the US Census as a measure of overall health for older Asian Americans. The dimension of overall health was captured by the six items from the American Community

Survey (ACS), which form a scale that represents functional disability. These items measure dichotomously if respondents have functional disabilities which impact their everyday life, such as hearing, seeing, cognitive functioning, as well as activities of daily living (ADLs) (see Table 1). Reliability and confirmatory factor analysis will be used to examine the scale's applicability for a combined group of Asian elders (Chinese, Filipino, Vietnamese, Korean, Japanese), first as one pan-ethnic group, and then separately as subgroups. A polychoric, and in this case, a tetrachoric matrix will be generated and used as starting values for estimation in confirmatory factor analyses in order to account for the dichotomous response structure from the disability items (Jöreskog & Moustaki, 2001; Millsap & Yun-Tein, 2004). Factor structure, loadings, t-values and goodness of fit indices will be assessed for the stability of the model, and error covariances can be specified as needed in order to improve the overall model. Using the techniques outlined by Byrne (1998), Jöreskog & Sorbom (1996), Schmitt & Kuljanin (2008), and Tran (2009) for assessing measurement invariance, the scale can be modified as needed, and between-group analyses will then be conducted among the subgroups in order to examine its cross-cultural comparability. SPSS 19 will first be used to examine descriptive properties of the scale, and Lisrel 8.80 will be employed for confirmatory factor analysis.

Association of Language Acculturation and Social Factors with Functional Disability. Logistic regression analysis was performed on disability as a dichotomous outcome from the American Community Survey using Stata 12. Multiple logistic regression analysis was first conducted with the aggregate sample of Asian elders, with Asian Ethnicity recoded as dummy variables for each ethnic category (Chinese as reference group, Filipino, Vietnamese, Korean, & Japanese). Subgroup logistic regression

analyses were then conducted separately for each of the five major Asian subgroups identified by the ACS, which allowed for comparisons in the impact of various predictors across these different ethnicities.

Results from unadjusted, simple logistic regression for all predictors in the subgroup analysis are presented in Table 6, and the adjusted, multiple logistic regression results are presented in Table 7. Parameter estimates for English ability in the subgroup analyses were compiled across different ethnicities in order to compare its impact on disability for each subgroup of Chinese, Filipino, Vietnamese, Korean and Japanese older Americans.

Measurement of Psychological Health: Kessler Psychological Distress Scale (K10). The Kessler Psychological Distress Scale (K10) is a 10-item inventory that assesses the prevalence of negative feelings in the past 30 days (see Table 2). Respondents reported frequency on a 5-point scale (1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = most of the time, and 5 = all of the time). The scale has been established to have good reliability and validity in past studies, but not rigorously through confirmatory factor analysis and for use with Asian Americans. Data from the National Latino and Asian American Study (NLAAS) will be used for analysis with the Kessler Psychological Distress Scale. The NLAAS data has three distinct groups of Asian Americans (Chinese, Filipino, and Vietnamese) and one group labeled ‘other’. The full sample of Asian Americans who are 50 and older (n=550) will be used for estimation with confirmatory factor analysis on the scale, and then separately for the three distinct subgroups of elders (Chinese: n = 160; Filipinos: n = 145; Vietnamese: n = 153). The previously outlined techniques will be employed to examine the scale for

model fit and measurement invariance. SPSS 19 and Lisrel 8.80 will be used for this analysis.

Association of Language Acculturation and Social Factors on Psychological Distress. Multiple regression was conducted to examine the association of a number of predictors on the Kessler Psychological Distress Scale (K10) using Stata 12 for the three distinct Asian American groups identified from NLAAS (Chinese, Filipino, Vietnamese). Various social indicators such as family cohesion, family pride, social support, perceived discrimination, and other demographic variables were examined as predictors on psychological health for Asian American elders.

Comparative Analyses on Functional Disability and Self-Reported Physical Health in ACS and NLAAS

A further set of analyses were conducted with Stata 12 using functional disability and Self-Reported Physical Health using data from NLAAS. This series of analyses were compared to results from the ACS data, to further validate the results from two distinct sources of data on Asian American elders.

Analysis on Perceived Discrimination as a Mediating Variable

Path analysis was conducted with Lisrel 8.80 to determine the role of Perceived Discrimination as a mediating variable between ethnicity, English ability, and social and family factors on Psychological Distress. A final best fitting model is presented for interpretation to investigate the direct and indirect effects of predictors.

CHAPTER IV: RESULTS

Results from the 2009 American Community Survey

Measurement of Functional Disability for Older Asians as a Pan-ethnic Group

Aim 1. Examine the measurement of functional disability as overall health for older Asian Americans as a pan-ethnic-group in order to assess its reliability and validity.

Results from analysis with the 2009 American Community Survey suggest that the six-item scale measuring functional disability captures overall health imperfectly for the pan-ethnic group. Initial descriptive results with the six items indicate that 18.0% of Asian American elders 50 and older report any one of the six functional disabilities, while no single item exceeded 11% (Difficulty Hearing: 6.0%; Difficulty Seeing: 3.0%; Difficulty Remembering: 6.1%; Physical Difficulty: 10.8%; Difficulty Dressing: 4.6%; Difficulty Going Out: 9.3%). Reliability analysis indicated that the inter-correlation of the six items are reasonably good (Kuder-Richardson $\alpha = 0.78$). Initial confirmatory factor analysis using a tetrachoric matrix as initial values for estimation with a six item single-factor model yielded moderate fitting goodness of fit indices ($\chi^2 = 331.98$, $df = 9$, $p < 0.00001$, RMSEA = 0.035, 90 Percent Confidence Interval for RMSEA = (0.0102; 0.0143), P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00, GFI = 0.877, AGFI = 0.712, Critical N = 1919.440, Model AIC = 355.982, NFI = 0.999, NNFI = 0.998, CFI = 0.999, RMR = 0.0566, Standardized RMR = 0.0566). Modification indices from this initial single factor model suggested that the error covariance of the items “Difficulty seeing” and “Difficulty hearing” should be allowed to be correlated ($\Delta\chi^2 = 4599.2$, new estimate = 0.25). “Difficulty remembering” was also dropped, due to inherent problems in capturing “remembering” for an older population. A two-factor model where

“Difficulty seeing” and “Difficulty hearing” were loaded on a separate factor from the rest of the items, yielding higher factor loadings for these two items. However, as seen in Table 3, goodness of fit results were virtually identical as compared to the single factor model, owing to an identically specified degrees of freedom in the two models ($df = 4$).

A final one-factor model was estimated for the pan-ethnic group, where error covariances for “Difficulty dressing” and “Physical difficulty” were correlated, and “Difficulty dressing” and “Difficulty going out” were correlated. This final model made intuitive theoretical sense, given how these three questions in the ACS may capture the same type of functional disability explaining the loss of mobility from natural decline and old age related disorders. As seen in Table 3, the estimation of this final model yielded the best goodness of fit indices.

Standardized factor loadings for the disability items were all significant for these three models ($t > 1.95$). It appears that the three items, 1) Difficulty Dressing, 2) Difficulty Going Out, and 3) Physical Difficulty were accounted for the most in the models. The factor loadings for the two sensory items were moderate for the single factor models. Once they were loaded onto their own factor, unsurprisingly, the loadings for these two items improved, but continued to have the least accounted-for variance, as compared to other items in the scale. However, the goodness of fit results were identical when comparing a single factor model where the measurement errors for Difficulty Seeing and Difficulty Hearing were correlated, against a two factor model where the two items were loaded onto a factor separate from the rest of the items.

In examining the results from Table 3, it would appear that further analysis should be conducted on a single factor-model. The reasons are twofold. First, despite having

substantially higher loadings for the two sensory items in the two-factor model, the goodness of fit results are identical to a single-factor model where the corresponding measurement error correlations are specified. This is due to the same number of parameters estimated in both models, leading to the same degrees of freedom in Model 1 and Model 2, as seen in Table 3. Secondly, for all intents and purposes, the scale is used in practice as an unweighted, composite measure, which better reflects a single-factor model in its application. As such, it is more practical to examine the five chosen items in this functional disability scale as a unidimensional construct.

For these reasons, subsequent CFA models for the separate ethnic groups were conducted with a 5-item, single factor model where the correlated measurement errors were specified for 1) Difficulty Hearing & Difficulty Seeing, 2) Difficulty Going Out & Difficulty Dressing, and 3) Physical Difficulty & Difficulty Dressing.

Table 5. Goodness of Fit Indices for Pan-ethnic Asian Group from 2009 American Community Survey (n = 30,257)

	Model 1: One Factor	Model 2: Two Factor	Model 3: One Factor
Disability Items	λ (δ)	λ (δ)	λ (δ)
Difficulty Hearing	0.59 (0.67)	0.75 (0.44)	0.62 (0.61)
Difficulty Seeing	0.63 (0.60)	0.82 (0.33)	0.67 (0.56)
Physical Difficulty	0.94 (0.12)	0.94 (0.12)	0.93 (0.14)
Difficulty Dressing	0.97 (0.06)	0.97 (0.06)	0.85 (0.28)
Difficulty Going Out	0.95 (0.10)	0.95 (0.10)	0.95 (0.10)
Error Covariance (θ_{δ})			
Hearing & Seeing	0.25	NA	0.20
Going out & Dressing	NA	NA	0.11
Physical & Dressing	NA	NA	0.12
Goodness of Fit			
Satorra-Bentler Scaled χ^2 (df)	65.82 (4)*	65.82 (4)*	1.98 (2)
p-value	< 0.001	< 0.001	0.37
RMSEA	0.0226	.0226	< 0.001
90% Confident Interval for RMSEA	0.0180 ; 0.0276	0.0180 ; 0.0276	<0.001 ; 0.011
p-value for Test of Close Fit	0.099	1.000	1.00
NFI	1.00	1.00	1.00
NNFI	0.99	0.999	1.00
CFI	1.00	1.00	1.00
CN	6104.376	6104.376	140671.80
RMR	0.0229	0.0229	0.0044
Standardized RMR	0.0229	0.0229	0.0044
GFI	0.956	0.956	1.00
AGFI	0.833	0.833	0.99

Measurement of Functional Disability for Separate Older Asian Ethnic Groups

Aim 2. Assess the reliability and validity of functional disability for major Asian American subgroups of elders and examine their cross-cultural comparability.

Analysis on the psychometric properties of the functional disability items were conducted based on the 5-item model with correlated errors for 1) Difficulty Hearing & Difficulty Seeing, 2) Difficulty Going Out & Difficulty Dressing, and 3) Physical Difficulty & Difficulty Dressing. When examined separately for Asian American ethnic groups, the goodness of fit results indicated similar overall performance of this 5-item measurement of disability when applied to specific Asian ethnic groups and when used for the entire pan-ethnic Asian American population. The factor loadings for the items, particularly Difficulty Hearing, are found to be higher for the Chinese elder subgroup, as compared to any other older Asian ethnic group. Additionally, the error covariances for Hearing and Seeing were lower overall for Japanese elders ($\theta_8 = 0.18$) and the Filipinos ($\theta_8 = 0.15$), when compared to the other Asian ethnic groups presented in Table 4.

Due to clear differences in the goodness of fit statistics, factor loadings and error covariances amongst the 5 groups, comparative analyses were not needed to determine measurement invariance.

Table 6. Factor Loadings, Measurement Errors and Goodness of Fit for older Asians from American Community Survey (2009)

Disability Items	Chinese N = 10,084 λ (δ)	Filipinos N = 7,945 λ (δ)	Vietnamese N = 3,323 λ (δ)	Koreans N = 3,511 λ (δ)	Japanese N = 4533 λ (δ)
Difficulty Hearing	0.71 (0.49)	0.57 (0.68)	0.57 (0.68)	0.59 (0.66)	0.59 (0.65)
Difficulty Seeing	0.69 (0.53)	0.65 (0.58)	0.65 (0.58)	0.62 (0.62)	0.68 (0.54)
Physical Difficulty	0.96 (0.07)	0.89 (0.22)	0.94 (0.13)	0.93 (0.13)	0.91 (0.17)
Difficulty Dressing	0.90 (0.20)	0.84 (0.30)	0.83 (0.32)	0.80 (0.35)	0.80 (0.37)
Difficulty Going Out	0.94 (0.12)	0.98 (0.04)	0.90 (0.19)	0.94 (0.12)	0.96 (0.07)
Error Covariance (θ_{δ})					
Hearing & Seeing	0.22	0.18	0.24	0.26	0.15
Going out & Dressing	0.08	0.08	0.17	0.18	0.16
Physical & Dressing	0.07	0.16	0.13	0.17	0.18
Cronbach's Alpha	0.775	0.708	0.730	0.718	0.734
Goodness of Fit					
Satorra-Bentler Scaled χ^2 (df)	1.326(2)	1.506(2)	1.188(2)	0.453(2)	2.38(2)
P-value	0.515	0.471	0.552	0.797	0.304
RMSEA	<0.001	<0.001	<0.001	<0.001	0.00647
90% Confident Interval for RMSEA	<0.0001; 0.00175	<0.0001; 0.0204	<0.0001; 0.0295	<0.0001 ; 0.0211	<0.0001 ; 0.0309
p-value for Test of Close Fit ^a	1.00	1.00	1.00	1.00	1.00
NFI	1.00	1.00	1.00	1.00	1.00
NNFI	1.00	1.00	1.00	1.00	1.00
CFI	1.00	1.00	1.00	1.00	1.00
Critical N	70022.252	48593.778	25753.666	71412.041	17545.610

RMR	0.00617	0.00987	0.0143	0.0154	0.0238
Standardized RMR	0.00617	0.00987	0.0143	0.0154	0.0238
GFI	0.996	0.995	0.993	0.995	0.998
AGFI	0.971	0.965	0.947	0.961	0.921

a. This p value should be >0.05 , which tests the null hypothesis that $RMSEA < 0.05$.

Association of Functional Disability with Language Acculturation and Social Factors

Aim 3. Estimate the effect of acculturation and sociodemographic factors on functional disability for older Asian Americans relative to ethnic differences.

Testing Hypothesis 1: Asian elders with greater acculturation as measured by English ability are less likely to be disabled, regardless of ethnic differences

Results from the aggregate group analysis reported in Table 7 indicate that Asian elders who speak English were 30% less likely to be disabled (Odds Ratio = 0.70, $p < 0.001$). As indicated in Tables 10 to 14, these results were statistically significant and consistent for all subgroups, even when controlling for the impact of all other predictors in the analysis (Chinese: Odds Ratio = 0.68, $p < 0.001$; Filipino: Odds Ratio = 0.74, $p < 0.001$; Vietnamese: Odds Ratio = 0.67, $p < 0.001$; Korean: Odds Ratio = 0.77, $p < 0.001$; Japanese: Odds Ratio = 0.51, $p < 0.001$). The results show that Hypothesis 1 is supported by the data, that Asian elders who speak better English are less likely to be disabled, regardless of ethnic differences. The other measure of language acculturation, defined as living in a linguistically isolated household, yielded inconsistent results. In the bivariate analysis presented in Table 8, Asian elders who lived in a linguistically isolated household were more likely to be disabled. However, this association was not statistically significant when individual English ability was included in the analysis (only respondents who did not speak English lived in linguistically isolated households, as seen in Table 9).

Testing Hypothesis 2: While Asian elders with greater English ability should be less likely to be disabled ($H_0: 1$), ethnic differences will be found across subgroups of older Asians.

Aggregate analysis for the full sample presented in Table 7 revealed that both Filipinos and Vietnamese elders were more likely to be disabled than Chinese elders. In fact, Filipino elders are more than twice as likely to be disabled compared to their Chinese counterparts (Odds Ratio = 2.08, $p < 0.001$), while Vietnamese elders are more than 60% as likely to be disabled compared to older Chinese (Odds Ratio = 1.61, $p < 0.001$). As seen in Table 7, Korean and Japanese elders do not differ from Chinese elders in their likelihood for having one or more disabilities. The results from this analysis confirm that Hypothesis 2 is supported by the data, and that ethnic differences are statistically observed in the likelihood of being disabled for older Asians.

Control Variables

Demographic Variables. As seen in Table 7, gender was not significantly associated with being functionally disabled in the aggregate model. Asian elders who are married, have higher income, and are more educated were less likely to be disabled (Married: Odds Ratio = 0.61, $p < 0.001$; Income: Odds Ratio = 0.96, $p < 0.001$; Education: Odds Ratio = 0.97, $p < 0.001$). Asian elders who have citizenship, were older when first arrived to the US, and have lived in the US for more than 10 years were more likely to be disabled (Citizen: Odds Ratio = 1.25, $p < 0.001$; Age Arrive US: Odds Ratio = 1.03, $p < 0.001$; Lived > 10 years in US: Odds Ratio = 1.67, $p < 0.001$). Of note, the effect of age was substantial in the aggregate analysis; compared to those who are aged 50 to 64, Asian elders who are 65 to 74 were 84% as likely to be disabled (Odds Ratio = 1.84, $p < 0.001$). Asian elders who are aged 75 and older were almost 5 times as likely to be disabled, compared to those who are 50 to 64 (Odds Ratio = 4.75, $p < 0.001$).

Subgroups analyses revealed similar patterns of associations observed in the aggregate model, in terms of significance and direction of demographic variables. Older Asian women were more likely to be disabled than men in the bivariate analysis in Table 8 for all ethnic subgroups, but this relationship became non-significant once it was controlled by all other variables in the analysis presented in Table 9, in particular marital status. Married Asian elders were less likely to be disabled for all subgroups, but the association was not significant for Japanese elders (Chinese: Odds Ratio = 0.56, $p < 0.001$; Filipino: Odds Ratio = 0.64, $p < 0.001$; Vietnamese: Odds Ratio = 0.66, $p < 0.001$; Korean: Odds Ratio = 0.56, $p < 0.001$; Japanese: Odds Ratio = 0.72, $p = 0.12$, see Table 9). Asian elders from all ethnic groups with higher incomes and more education were less likely to be disabled in the bivariate analysis (see Table 8). Once all other variables were included in the analysis, income had a significant association with being disabled for Filipino, Korean and Japanese elders, but not their Chinese or Vietnamese counterparts (Filipino: Odds Ratio = 0.93, $p < 0.001$; Korean: Odds Ratio = 0.96, $p < 0.05$; Japanese: Odds Ratio = 0.92, $p < 0.05$; see Table 9). Asian elders who were more educated were less likely to be disabled, where for one standard deviation change in years of education of around 6 years, there is around a 15% decrease in the probability for an Asian elder to be disabled (SD of change in years of education: 5.75, % change in being disabled: -14.9). The impact of education remained fairly consistent for Chinese, Filipino, Vietnamese, Korean and Japanese elders in the analysis.

Belonging to an older age cohort was consistently associated with a higher likelihood of being disabled for all ethnic subgroups, similar to the results from the aggregate group analysis. Interestingly, age of arrival to the US was observed to be one

of the most important and consistent predictors associated with being disabled, even when controlling for the effects of age. As seen in Table 7, 8 & 9, immigrating at a later age was consistently associated with a higher likelihood of being disabled in the aggregate and subgroup analyses, even when controlling for all other predictors.

Waves of Immigration. Results from the aggregate groups analysis presented in Table 7 suggest that those who immigrated before 1975 were almost 3 times more likely to be disabled, compared to Asian elders who immigrated from 2000 to 2009. (Odds Ratio = 2.14, $p < 0.001$). Those who immigrated before 1975 to 1999 were 77% more likely to be disabled (Odds Ratio = 1.77, $p < 0.001$), compared to those who arrived to the US from 2000 to 2009, even when controlling for age and other predictors as seen in Table 7. Subgroup analyses suggest similar results for Chinese, Filipino, and Vietnamese elders, where immigrating before 2000 was associated with a higher risk for being disabled, as seen in Table 9. However, these effects were not observed for Koreans or Japanese.

Table 7. Multiple Logistic Analysis of Disability for Aggregate Sample of Foreign-Born Asian Elders (n=22,096)

Predictors	Odds Ratio(SE)	Z	p	Confidence Interval
Asian Ethnicity				
Chinese (Reference)				
Filipino	2.08 (0.12)	12.35	0.001	(1.85; 2.34)
Vietnamese	1.61 (0.10)	7.50	0.001	(1.42; 1.83)
Korean	1.06 (0.07)	0.89	0.375	(0.93; 1.22)
Japanese	1.00 (0.11)	0.01	0.989	(0.81; 1.24)
Language Acculturation				
Speak English	0.70 (0.02)	-10.95	0.001	(0.66; 0.75)
Linguistically Isolated	0.86 (0.05)	-2.58	0.01	(0.77; 0.97)
Demographic Variables				
Female	1.01 (0.05)	0.32	0.75	(0.93; 1.11)
Married	0.61 (0.03)	-10.51	0.001	(0.56; 0.67)
Income	0.96 (0.01)	-5.25	0.001	(0.95; 0.98)
Education	0.97 (0.004)	-7.18	0.001	(0.96; 0.98)
US Citizen	1.25 (0.08)	3.56	0.001	(1.10; 1.41)
Age Arrive US	1.03 (0.003)	11.09	0.001	(1.02; 1.04)
Lived > 10 years in US	1.67 (0.15)	5.81	0.001	(1.41; 1.99)
Age Groups				
50 to 64 (Reference)				
65 to 74	1.84 (0.12)	9.75	0.001	(1.63; 2.08)
75 and over	4.75 (0.40)	18.67	0.001	(1.44; 2.18)
Immigration Wave				
2000 to 2009 (Reference)				
Before 1975	3.14 (0.43)	8.31	0.001	(2.40; 4.11)
1975 to 1999	1.77 (0.19)	5.39	0.001	(1.44; 2.18)

Table 8. Simple Logistic Regression of Disability as Outcome with Selected Predictors

Variables	Ethnicity									
	Chinese n=8267		Filipino n=6499		Vietnamese n=3161		Korean n=3127		Japanese n=1042	
Predictors	Odds Ratio (SE)	z	Odds Ratio (SE)	z	Odds Ratio (SE)	z	Odds Ratio (SE)	z	Odds Ratio (SE)	z
Language										
Acculturation										
Speak English	0.46 (0.02)	-22.72***	0.53 (0.02)	-15.22***	0.52 (0.03)	-11.68***	0.46 (0.03)	-11.88***	0.53 (0.06)	-5.81***
Linguistically Isolated	2.55 (0.16)	14.72***	1.91 (0.28)	4.47***	1.72 (0.16)	5.96***	2.27 (0.25)	7.53***	1.30 (0.31)	0.98
Demographic Variables										
Female	1.46 (0.09)	6.04***	1.23 (0.08)	3.10**	1.15 (0.10)	1.59	1.29 (0.14)	2.28*	4.19 (1.18)	5.09***
Married	0.28 (0.02)	-19.36***	0.39 (0.03)	-14.04***	0.43 (0.04)	-8.78***	0.29 (0.03)	-11.18***	0.40 (0.07)	-5.20***
Income	0.96 (0.01)	-5.71***	0.92 (0.01)	-9.47***	0.97 (0.01)	-2.35*	0.96 (0.01)	-3.25***	0.96 (0.02)	-1.73
Education	0.92 (0.003)	-20.67***	0.90 (0.01)	-16.24***	0.94 (0.01)	-10.00***	0.89 (0.01)	-12.02***	0.84 (0.02)	-7.26***
US Citizen	0.95 (0.07)	-0.72	1.10 (0.09)	1.23	0.85 (0.10)	-1.38	0.85 (0.10)	-1.37	2.69 (0.52)	5.14***

Age arrive US	1.06 (0.002)	26.04***	1.04 (0.002)	17.50***	1.05 (0.004)	14.56***	1.06 (0.004)	14.62***	1.03 (0.01)	4.71***
Lived > 10 years in US	1.11 (0.09)	1.44	1.28 (0.11)	2.95**	1.26 (0.15)	1.89	1.50 (0.25)	2.45*	2.05 (0.74)	2.00*
Age Groups										
50 to 64 (Reference)										
65 to 74	3.83 (0.34)	14.84***	3.11 (0.26)	13.56***	2.85 (0.31)	9.53***	3.08 (0.42)	8.29***	4.37 (1.30)	4.96***
75 and over	19.62 (1.63)	35.82***	14.76 (1.31)	30.34***	10.75 (1.38)	18.51***	14.26 (2.04)	18.56***	14.39 (3.89)	9.86***
Immigrant Wave										
2000 to 2009 (Reference)										
Before 1975	1.33 (0.16)	2.41*	1.77 (0.20)	4.99***	1.78 (0.48)	2.12*	1.09 (0.23)	0.41	2.39 (0.98)	2.12*
1975 to 1999	1.38 (0.15)	3.06**	1.27 (0.14)	2.25*	1.56 (0.27)	2.58**	1.01 (0.20)	0.09	1.24 (0.53)	0.49

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

Table 9. Multiple Logistic Regression Analysis of Disability for Foreign-Born Older Asian American

Variables	Ethnicity									
	Chinese n=8267		Filipino n=6499		Vietnamese n=3161		Korean n=3127		Japanese n=1042	
Predictors	Odds Ratio (SE)	z	Odds Ratio (SE)	z	Odds Ratio (SE)	z	Odds Ratio (SE)	z	Odds Ratio (SE)	z
Language										
Acculturation										
Speak English	0.68 (0.04)	-7.21***	0.74 (0.05)	-4.83***	0.67 (0.05)	-4.88***	0.77 (0.07)	-2.77**	0.51 (0.08)	-4.46***
Linguistically Isolated	0.89 (0.08)	-1.35	0.68 (0.12)	-2.16*	0.86 (0.10)	-1.35	0.96 (0.14)	-0.29	0.37 (0.12)	-3.01**
Demographic Variables										
Female	1.13 (0.09)	1.65	0.96 (0.08)	-0.51	0.89 (0.09)	-1.15	0.86 (0.12)	-1.08	1.82 (0.60)	1.81
Married	0.56 (0.05)	-6.96***	0.64 (0.05)	-5.35***	0.66 (0.07)	-3.79***	0.56 (0.08)	-4.16***	0.72 (0.15)	-1.55
Income	1.00 (0.1)	-0.39	0.93 (0.01)	-5.57***	0.97 (0.02)	-1.67	0.96 (0.02)	-2.35*	0.92 (0.04)	-2.26*
Education	0.97 (0.01)	-4.49***	0.97 (0.01)	-3.04**	0.98 (0.01)	-2.61**	0.95 (0.01)	-4.52***	0.95 (0.03)	-1.68
US Citizen	1.38 (0.15)	2.89**	1.38 (0.16)	2.76**	0.93 (0.14)	-0.52	0.95 (0.15)	-0.33	1.74 (0.43)	2.25*
Age arrive US	1.04 (0.01)	7.02***	1.03 (0.01)	5.49***	1.02 (0.01)	3.09**	1.05 (0.01)	4.59***	1.06 (0.02)	3.70***

Lived > 10 years in US	1.43 (0.21)	2.50**	1.46 (0.24)	2.32*	1.54 (0.29)	2.36*	6.32 (2.42)	4.82***	3.60 (3.73)	1.24
Age Groups										
50 to 64 (Reference)										
65 to 74	2.02 (0.23)	6.13***	1.81 (0.20)	5.50***	1.88 (0.27)	4.45***	1.54 (0.28)	2.36*	2.45 (0.94)	2.33*
75 and over	5.41 (0.79)	11.53***	4.96 (0.74)	10.75***	4.41 (0.91)	7.17***	3.06 (0.80)	4.26***	5.37 (2.27)	3.97***
Immigrant Wave										
2000 to 2009 (Reference)										
Before 1975	3.32 (0.78)	5.14***	3.88 (0.94)	5.58***	3.31 (1.27)	3.13**	0.85 (0.40)	-0.36	1.52 (1.81)	0.35
1975 to 1999	2.07 (0.35)	4.30***	1.93 (0.37)	3.45***	1.83 (0.46)	2.40*	0.44 (0.18)	-1.96*	1.08 (0.06)	0.07
Goodness of Fit										
Log Likelihood	-2550.98		-2482.64		-1334.47		-963.37		-332.69	
Likelihood	1873.04		1198.68		485.72		502.95		214.49	
Ratio χ^2 (df)	(13)***		(13)***		(13)***		(13)***		(13)***	
Pseudo R ²	0.27		0.19		0.15		0.21		0.24	

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

Table 10. Unadjusted and Adjusted Effects of Language Acculturation with Chinese (n=8267)

Predictors	Unadjusted		Adjusted	
	Odds Ratio (SE)	z	Odds Ratio (SE)	z
Language Acculturation				
Speak English	0.46 (0.02)	-22.72***	0.68 (0.04)	-7.21***
Linguistically Isolated	2.55 (0.16)	14.72***	0.89 (0.08)	-1.35
Demographic Variables				
Female			1.13 (0.09)	1.65
Married			0.56 (0.05)	-6.96***
Income			1.00 (0.1)	-0.39
Education			0.97 (0.01)	-4.49***
US Citizen			1.38 (0.15)	2.89**
Age arrive US			1.04 (0.01)	7.02***
Lived > 10 years in US			1.43 (0.21)	2.50**
Age Groups				
50 to 64 (Reference)				
65 to 74			2.02 (0.23)	6.13***
75 and over			5.41 (0.79)	11.53
Immigrant Wave				
2000 to 2009 (Reference)				
Before 1975			3.32 (0.78)	5.14***
1975 to 1999			2.07 (0.35)	4.30***

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

Table 11. Unadjusted and Adjusted Effects of Language Acculturation with Filipinos (n=6499)

Predictors	Unadjusted Odds Ratio (SE)	z	Adjusted Odds Ratio (SE)	z
Language Acculturation				
Speak English	0.53 (0.02)	-15.22***	0.74 (0.05)	-4.83***
Linguistically Isolated	1.91 (0.28)	4.47***	0.68 (0.12)	-2.16*
Demographic Variables				
Female			0.96 (0.08)	-0.51
Married			0.64 (0.05)	-5.35***
Income			0.93 (0.01)	-5.57***
Education			0.97 (0.01)	-3.04**
US Citizen			1.38 (0.16)	2.76**
Age arrive US			1.03 (0.01)	5.49***
Lived > 10 years in US			1.46 (0.24)	2.32*
Age Groups				
50 to 64 (Reference)				
65 to 74			1.81 (0.20)	5.50***
75 and over			4.96 (0.74)	10.75***
Immigrant Wave				
2000 to 2009 (Reference)				
Before 1975			3.88 (0.94)	5.58***
1975 to 1999			1.93 (0.37)	3.45***

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

Table 12. Unadjusted and Adjusted Effects of Language Acculturation with Vietnamese (n=3161)

Predictors	Unadjusted Odds Ratio (SE)	z	Adjusted Odds Ratio (SE)	z
Language Acculturation				
Speak English	0.52 (0.03)	-11.68***	0.67 (0.05)	-4.88***
Linguistically Isolated	1.72 (0.16)	5.96***	0.86 (0.10)	-1.35
Demographic Variables				
Female			0.89 (0.09)	-1.15
Married			0.66 (0.07)	-3.79***
Income			0.97 (0.02)	-1.67
Education			0.98 (0.01)	-2.61**
US Citizen			0.93 (0.14)	-0.52
Age arrive US			1.02 (0.01)	3.09**
Lived > 10 years in US			1.54 (0.29)	2.36*
Age Groups				
50 to 64 (Reference)				
65 to 74			1.88 (0.27)	4.45***
75 and over			4.41 (0.91)	7.17***
Immigrant Wave				
2000 to 2009 (Reference)				
Before 1975			3.31 (1.27)	3.13**
1975 to 1999			1.83 (0.46)	2.40*

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

Table 13. Unadjusted and Adjusted Effects of Language Acculturation with Koreans (n=3127)

Predictors	Unadjusted Odds Ratio (SE)	z	Adjusted Odds Ratio (SE)	z
Language Acculturation				
Speak English	0.46 (0.03)	-11.88***	0.77 (0.07)	-2.77**
Linguistically Isolated	2.27 (0.25)	7.53***	0.96 (0.14)	-0.29
Demographic Variables				
Female			0.86 (0.12)	-1.08
Married			0.56 (0.08)	-4.16***
Income			0.96 (0.02)	-2.35*
Education			0.95 (0.01)	-4.52***
US Citizen			0.95 (0.15)	-0.33
Age arrive US			1.05 (0.01)	4.59***
Lived > 10 years in US			6.32 (2.42)	4.82***
Age Groups				
50 to 64 (Reference)				
65 to 74			1.54 (0.28)	2.36*
75 and over			3.06 (0.80)	4.26***
Immigrant Wave				
2000 to 2009 (Reference)				
Before 1975			0.85 (0.40)	-0.36
1975 to 1999			0.44 (0.18)	-1.96*

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

Table 14. Unadjusted and Adjusted Effects of Language Acculturation with Japanese (n=1042)

Predictors	Unadjusted Odds Ratio (SE)	z	Adjusted Odds Ratio (SE)	z
Language Acculturation				
Speak English	0.53 (0.06)	-5.81***	0.51 (0.08)	-4.46***
Linguistically Isolated	1.30 (0.31)	0.98	0.37 (0.12)	-3.01**
Demographic Variables				
Female			1.82 (0.60)	1.81
Married			0.72 (0.15)	-1.55
Income			0.92 (0.04)	-2.26*
Education			0.95 (0.03)	-1.68
US Citizen			1.74 (0.43)	2.25*
Age arrive US			1.06 (0.02)	3.70***
Lived > 10 years in US			3.60 (3.73)	1.24
Age Groups				
50 to 64 (Reference)				
65 to 74			2.45 (0.94)	2.33*
75 and over			5.37 (2.27)	3.97***
Immigrant Wave				
2000 to 2009 (Reference)				
Before 1975			1.52 (1.81)	0.35
1975 to 1999			1.08 (0.06)	0.07

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

Results from the National Latino and Asian American Study

Measurement of Psychological Distress for Older Asians as a Pan-ethnic Group

Aim 1. Examine the measurement of psychological distress as psychological health for older Asian Americans as a pan-ethnic-group in order to assess its reliability and validity.

Initial descriptive results for the Kessler Psychological Distress Scale were examined for the sample of Asian Americans age 50 and over in the National Latino and Asian American Study (n = 550). Frequency analyses on the 10 items revealed that while most items had less than 1% missing, three items had substantial missing responses for the total sample (“so depressed that nothing could cheer you up,” missing = 61.0%; “so restless that you could not sit still,” missing = 74.1%, and “so nervous that nothing can calm you,” missing = 74.1). Cross-tabulation of missing cases across ancestries found that the largest proportions of missing for these three items were found within the Vietnamese population, around 10% higher than for the total sample. Chinese respondents on average had the lowest missing for these three items, compared to the other categories of Filipino, Vietnamese and all other Asians. Further examination of missing patterns in relation to immigrant status revealed that, unsurprisingly, substantially more immigrants had missing responses than non-immigrants. However, the Vietnamese sample continued to have approximately 10% more missing in all three items compared to the other race categories. Due to these patterns in responses, it would appear that for these three items, responses are not missing at random, and would not be appropriate for multiple imputation techniques.

A decision was made to not include these three items for measurement validation analysis, and subsequent analyses were conducted with the remaining seven items. After listwise deletion, 548 valid cases were retained for these seven items in this scale. It is noteworthy to point out that all the items were positively skewed, indicating that respondents tended to report lower levels of psychological distress on all the items. The kurtosis on two particular items were very high (“During the worst month in the past year, how often did you feel hopeless,” kurtosis = 16.79; “During the worst month in the past year, how often did you feel worthless,” kurtosis = 9.41). Additionally, the sample overwhelmingly reported “none of the time” as a response for all seven items, ranging from 68.9% for the item “During the last 30 days, about how often did you feel depressed” to 85.8% for the item “During the worst month in the past year, how often did you feel worthless.”

Reliability analysis on the seven items revealed that they are adequately inter-correlated and have fairly strong internal consistency when used as a scale (Cronbach’s $\alpha = 0.82$). All seven items appear to contribute to the internal consistency of the scale, and have corrected item-total correlations ranging from 0.505 to 0.627.

Initial exploratory factor analysis using principal axis factoring generated a single factor solution, where all seven items load onto a one factor, and thus no rotation was needed. This single factor solution explained 40.13% of the variance from the seven items. Loadings for items ranged from 0.556 for “everything is an effort” to 0.716 for “feeling worthless.”

Confirmatory factor analysis (CFA) was conducted for this sample of 50 and over Asian Americans (n=548). An initial model estimated with a covariance matrix as

starting values yielded inadequately fitting goodness of fit indices ($\chi^2 = 66.58$, $df = 14$, $p < 0.001$, $RMSEA = 0.0829$, 90 Percent Confidence Interval for $RMSEA = (0.0635 ; 0.103)$, P-Value for Test of Close Fit ($RMSEA < 0.05$) = 0.00331, Model AIC = 94.581, NFI = 0.983, NNFI = 0.979, CFI = 0.986, Critical N = 228.401, Standardized RMR = 0.0259, GFI = 0.966, AGFI = 0.933). Based on the non-normality of the items, the analysis was repeated with a polychoric matrix as starting values for estimation with a single-factor model. The seven items were then found to have good construct validity and no further modifications were needed ($\chi^2 = 11.642$, $df = 14$, $p = 0.635$, $RMSEA < 0.001$, 90 Percent Confidence Interval for $RMSEA = (0.0 ; 0.0349)$, P-Value for Test of Close Fit ($RMSEA < 0.05$) = 0.996, Model AIC = 39.642, NFI = 0.997, NNFI = 1.001, CFI = 1.00, Critical N = 1370.375, Standardized RMR = 0.0259, GFI = 0.966, AGFI = 0.9333). Factor loadings with confirmatory factor analysis for these seven psychological distress items were comparable to estimates from exploratory factor analysis. Factor loadings ranged from 0.71 with “everything is an effort” to 0.87 for “feeling worthless,” as seen in Table 15.

Table 15. Seven items from Kessler Psychological Distress Scale (K10) in NLAAS

Distress Scale Items	λ (δ)
During the last 30 days, about how often did you feel depressed?	0.771 (0.405)
During the last 30 days, about how often did you feel tired out for no good reason?	0.749 (0.439)
During the last 30 days, about how often did you feel that everything was an effort?	0.708 (0.498)
During the last 30 days, about how often did you feel nervous?	0.770 (0.407)
During the worst month in the past year, how often did you feel hopeless?	0.799 (0.362)
During the worst month in the past year, how often did you feel restless or fidgety?	0.737 (0.457)
During the worst month in the past year, how often did you feel worthless?	0.865 (0.407)
Goodness of Fit	
Satorra-Bentler Scaled χ^2 (df)	11.642 (14)
P-value	0.635
RMSEA	<0.001
90% Confident Interval for RMSEA	<0.001 ; 0.0349
p-value for Test of Close Fit (RMSEA < 0.05) ^a	0.996
NFI	0.997
NNFI	1.001
CFI	1.000
CN	1370.375
RMR	0.0259
Standardized RMR	0.0259
GFI	0.966
AGFI	0.933

a. This is a χ^2 test on the null hypothesis that RMSEA < 0.05, and the p-value should be > 0.05 (Byrne, 1998, Tran, 2006).

Measurement of Psychological Distress for Separate Older Asian Ethnic Groups

Aim 2. Assess the reliability and validity of psychological distress for major Asian American subgroups of elders and examine their cross-cultural comparability.

Analysis on the psychometric properties of the 7-item Kessler Psychological Distress Scale was conducted for the three separate and distinct groups of older Asian Americans aged 50 and over from the NLAAS data (Chinese: $n = 160$; Filipinos: $n = 144$; Vietnamese: $n = 153$). Internal consistency appears to be fairly strong for all three subgroups (Chinese: $\alpha = 0.83$; Filipino $\alpha = 0.79$; Vietnamese: $\alpha = 0.84$). Results from confirmatory factor analysis indicate that the 7 items from the K10 as a scale have differing psychometric properties and may not be completely measurement invariant for the three groups. All three models yielded adequate goodness of fit indices for their respective groups, as seen in Table 16. It would appear that, overall, the specified model performed the best with the Vietnamese sample, where goodness of fit indicators were the strongest for this sample. However, the Vietnamese seems to be the most different, compared to Chinese and Filipinos, with regards to the stronger factor loadings for the three items, “feel tired for no good reason,” “everything was an effort” and “feel nervous.”

Based on these results, it would appear that the seven items in the K10 are not measurement invariant due to differences in the factor loadings, and equivalence testing is not needed. However, the scale does appear to be congeneric for all three groups, and should be amenable for use in analysis for all three groups.

Table 16. Confirmatory Factor Analysis on K10 Scale for Subgroups in NLAAS

7 items from K10	Chinese N = 160	Filipinos N = 144	Vietnamese N = 153
	λ (δ)	λ (δ)	λ (δ)
During the last 30 days, ... feel depressed?	0.78 (0.05)	0.78 (0.39)	0.82 (0.32)
During the last 30 days, ... feel tired out for no good reason?	0.69 (0.08)	0.70 (0.51)	0.88 (0.23)
During the last 30 days, ... feel that everything was an effort?	0.51 (0.09)	0.70 (0.52)	0.82 (0.32)
During the last 30 days, ... feel nervous?	0.75 (0.07)	0.68 (0.53)	0.87 (0.24)
During the worst month in the past year, ... feel hopeless?	0.81 (0.07)	0.77 (0.41)	0.84 (0.29)
During the worst month in the past year, ... feel restless or fidgety?	0.83 (0.06)	0.81 (0.34)	0.68 (0.54)
During the worst month in the past year, ... feel worthless?	0.93 (0.04)	0.79 (0.37)	0.81 (0.34)
Cronbach's Alpha	0.83	0.79	0.84
Goodness of Fit			
Satorra-Bentler Scaled χ^2 (df)	22.04 (14)	14.76 (14)	11.94 (14)
P-value	0.0777	0.395	0.611
RMSEA	0.0601	0.0195	0.001
90% Confident Interval for RMSEA	(0.0001; 0.106)	(0.0001 ; 0.0844)	(0.0001; 0.0678)
p-value for Test of Close Fit ^a	0.326	0.706	0.863
NFI	0.981	0.985	0.992
NNFI	0.989	0.999	1.002
CFI	0.993	0.999	1.000
Critical N	211.209	283.289	371.966
RMR	0.0601	0.0613	0.0446
Standardized RMR	0.0601	0.0613	0.0446
GFI	0.853	0.859	0.8

AGFI	0.706	0.717	0.746
a. This is a χ^2 test on the null hypothesis that RMSEA < 0.05, and the p-value should be > 0.05.			

Association of Psychological Distress with Language Acculturation and Social Factors

Aim 3. Estimate the effect of acculturation and sociodemographic factors on psychological distress for older Asian Americans relative to ethnic differences.

Testing Hypothesis 1: Greater acculturation as measured by English ability is associated with a decrease in psychological distress for all older Asian American respondents, regardless of ethnic differences.

Results presented in Table 17 indicate that the combined scale for English acculturation was negatively associated with psychological distress in bivariate analysis (Pearson's $R = -0.134$, $p < 0.05$). However, when controlling for all other variables in the analysis as seen in Table 18, English acculturation was not significantly associated with psychological distress for the older Asian population ($\beta = -.05$, $p = 0.49$). This indicates that Ho. 1 is not supported by the data in the full model, and that English ability is not associated with psychological distress for Asian elders.

Testing Hypothesis 2: Higher perceived discrimination is associated with an increase in psychological distress for all older Asian American respondents, regardless of ethnic differences or immigration status

Higher levels of perceived discrimination was consistently associated with higher psychological distress for Asian elders, even when controlling for all other variables in the analysis as seen in Tables 17 & 18 (Pearson Correlation: $r = 0.21$, $p < 0.01$; Full Model: $\beta = 0.14$, $p = 0.01$; Final Model: $\beta = 0.12$, $p = 0.02$). These results indicate that Ho. 2 was supported from the data, and that higher perceived discrimination is associated

with an increase in psychological distress, regardless of ethnic differences or immigration status.

Testing Hypothesis 3: Higher family pride, family cohesion and social cohesion are associated with a decrease in psychological distress, regardless of ethnic differences or immigration status

Family Pride and Family Cohesion were found to both be negatively associated with psychological distress in the bivariate analysis (Family Pride: Pearson's $R = -0.246$, $p < 0.01$; Family Cohesion: Pearson's $R = -0.153$, $p < 0.01$), and Family Cultural Conflict was associated with an increase in psychological distress (Pearson's $R = 0.345$, $p < 0.01$). When accounting for all other variables in the analysis, Family Cultural Conflict emerged as the only significant predictor of psychological distress in the final model, indicating that higher family cultural conflict was related to higher levels of distress for older Asians ($\beta = 0.24$, $p < 0.001$). These results suggest that family cultural conflict represents one of the most powerful predictors of psychological distress, even when controlling for English acculturation, ethnicity, and other demographic, family and social well-being variables in the analysis. Social Cohesion was not significantly associated with psychological distress when examined by itself or when controlling for all other variables. The overall results from this analysis indicate that Ho. 3 is partially supported. Family Pride and Cohesion were not significant when controlling for all other variables, while Family Conflict consistently contributed to higher psychological distress for older Asians, even when all other variables were included in the analysis.

Control Variables

Asian Ethnicity. Results indicate that ethnicity does not play a role in psychological distress for the Asian elder population. Filipino and Vietnamese elders do not appear to be statistically significantly different from Chinese elders in terms of psychological distress, as seen in Table 17 & 18. This suggests that ethnic differences in psychological distress are not observed among distinct ethnic groups of Asian elders from the NLAAS data. Due to this finding, separate models for the different ethnic groups were not needed for regression analysis.

Demographic Variables. Being married was the only demographic variable which emerged as a significant predictor for disability when controlling for all other predictors in the model, as seen in Table 18 ($\beta = -1.17, p < 0.05$). This indicates that being married is associated with lower psychological distress for older Asians. Income was negatively associated with psychological distress in the bivariate analysis as seen in Table 17 (Pearson's $R = -0.120, p < 0.05$), but became non-significant in the full model when controlling for all other predictors as seen in Table 18 ($\beta = -0.01, p = 0.81$). Gender, education, being a citizen, and living in the US for more than 10 years were not statistically associated with psychological distress for older Asians.

Physical Health Indicators. The two variables, having 1 or more disabilities, and the Physical Health Rating, both emerged as statistically significant predictors of psychological distress in the bivariate and multivariate analysis. As expected, having 1 or more disabilities was associated with higher psychological distress (Pearson's $R = 0.343, p < 0.01; \beta = 0.24, p < 0.001$), while a higher Physical Health Rating was associated with

decreased psychological distress for older Asians (Pearson's $R = -0.363$, $p < 0.01$; $\beta = -0.27$, $p < 0.001$).

Table 17. Pearson Correlation Matrix of Variables Examined in NLAAS for Asian Americans aged 55 and Older

	Distress	Chinese	Filipino	Viet	English	Discrim	Female	Married	Income	Ed	Citizen
Distress	1										
Chinese	.101	1									
Filipino	-.063	-.465**	1								
Vietnamese	-.035	-.501**	-.533**	1							
English Ability	-.134*	-.131*	.594**	-.455**	1						
Discrimination	.214**	.079	.275**	-.345**	.262**	1					
Female	-.022	-.004	-.034	.037	-.101	-.148**	1				
Married	-.185**	-.005	-.013	.018	.028	-.001	-.230**	1			
Income	-.120*	-.027	.157**	-.128*	.400**	.202**	-.157**	.188**	1		
Education	-.059	-.014	.245**	-.226**	.588**	.180**	-.190**	.071	.290**	1	
Citizen	.037	-.033	-.002	.034	.146**	.122*	-.057	.021	.169**	.123*	1
Age arrive US	.042	-.062	-.198**	.253**	-.404**	-.204**	.117*	-.023	-.304**	-.232**	-.247**
More than 10 years in US	.057	.155**	.140*	-.285**	.321**	.246**	-.090	-.051	.229**	.241**	.456**
50 to 64	-.072	.057	-.022	-.033	.145**	.079	.058	.058	.308**	.134*	-.026
65 to 74	-.001	-.048	-.058	.103	-.147**	-.065	-.035	.026	-.181**	-.065	-.029
75 and over	.110*	-.023	.108*	-.084	-.028	-.034	-.042	-.123*	-.230**	-.117*	.077
Family Pride	-.246**	-.352**	.157**	.183**	.066	-.221**	-.050	.161**	.037	-.027	-.094
Family Cohesion	-.153**	-.268**	.165**	.094	.016	-.186**	.015	.204**	.033	-.019	-.068
Family Cultural Conflict	.345**	.151**	.042	-.185**	.123*	.386**	-.038	-.138*	.150**	.133*	.088
Social Cohesion	-.094	-.193**	.067	.118*	.089	-.130*	.043	.163**	.138*	.010	.083
1 or more disabilities	.343**	-.056	.029	.025	-.084	.049	-.080	-.084	-.250**	.022	.038
Physical Health Rating	-.363**	-.090	.215**	-.124*	.337**	.040	-.069	.139*	.291**	.135*	.089

	Age arrive to US	More than 10 years	50 to 64	65 to 74	75 and over	Family Pride	Family Cohesion	Family Cultural Conflict	Social Cohesion	1 or more disabilities	Physical Health Rating
Age arrive US	1										
More than 10 years in US	-.431**	1									
50 to 64	-.251**	.019	1								
65 to 74	.216**	-.080	-.757**	1							
75 and over	.097	.076	-.525**	-.159**	1						
Family Pride	.169**	-.168**	-.065	.076	-.001	1					
Family Cohesion	.208**	-.157**	-.054	.045	.023	.802**	1				
Family Cultural Conflict	-.138*	.178**	.065	-.038	-.048	-.444**	-.360**	1			
Social Cohesion	-.035	-.058	.058	-.010	-.074	.371**	.302**	-.186**	1		
1 or more disabilities	.093	.130*	-.217**	.062	.247**	-.107	-.089	.086	-.125*	1	
Physical Health Rating	-.224**	.104	.209**	-.130*	-.146**	.222**	.176**	-.103	.104	-.250**	1

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

Table 18. Regression Results with the Kessler Psychological Distress Scale as Outcome for Foreign-born Asian Elders (n = 332)

Predictors	Full Model ^a				Final Model ^b			
	B (SE)	β	t	P	B (SE)	β	t	p
Asian Ethnicity								
Chinese (Reference)								
Filipino	-0.42 (0.52)	-0.05	-0.81	0.42				
Vietnamese	-0.29 (0.47)	-0.04	-0.62	0.54				
Language Acculturation ^c	-0.06 (0.09)	-0.05	-0.69	0.49				
Perceived Discrimination	0.12 (0.04)	0.14	2.64	0.01	0.10 (0.04)	0.12	2.42	0.02
Demographic Variables								
Female Gender	-0.33 (0.37)	-0.05	-0.91	0.36				
Married	-1.17 (0.49)	-0.12	-2.38	0.02	-0.92 (0.46)	-0.09	-2.01	0.05
Income	-0.09 (0.40)	-0.01	-2.38	0.81				
Education	-0.15 (0.18)	-0.05	0.89	0.38				
Citizen	0.25 (0.48)	0.03	0.52	0.61				
Age Arrive in US	-0.08 (0.35)	-0.01	-0.23	0.82				
Lived > 10 years in US	-0.21 (0.51)	-0.02	-0.41	0.68				
Age Groups								
50 to 64 (Reference)								
65 to 74	-0.33 (0.46)	-0.04	-0.70	0.48				
75 and older	0.02 (0.64)	0.001	0.03	0.98				
Social and Family Factors								
Family Pride	-0.19 (0.12)	-0.13	-1.53	0.13				

Family Cohesion	0.47 (0.24)	0.016	1.92	0.06				
Family Cultural Conflict	0.55 (0.13)	0.24	4.32	0.001	0.54 (0.12)	0.24	4.65	0.001
Social Cohesion	0.09 (0.08)	0.06	1.18	0.24				
Physical Health Indicators								
1 or more Disabilities	2.93 (0.61)	0.25	4.78	0.001	2.84 (0.56)	0.24	5.04	0.001
Physical Health Rating	-0.79 (0.17)	-0.24	-4.54	0.001	-0.88 (0.16)	-0.27	-5.60	0.001
Adjusted R ²				0.29				0.30

-
- a. Full Model has all predictors
 - b. Final Model has only significant predictors.
 - c. Language acculturation is a Likert scale on English ability, coded as “poor,” “not well,” “well,” and “very well.”

Physical Health Rating and Functional Disability

Self-reported Physical Health and functional disability were examined as dependent variables with data from NLAAS, to assess the results for physical well-being compared to those found from the ACS dataset.

Physical Health Rating. Table 19 presents the results from the NLAAS data, with the Physical Health Rating Scale as outcome for the same set of predictors examined in the previous analysis (Chinese, Filipino, and Vietnamese ethnicity, Language Acculturation, Perceived Discrimination, Gender, Being Married, Income, Education, Citizenship status, Age arrived to the US, Living more than 10 years in the US, Age Category, Family Pride, Family cohesion, Family Cultural conflict, Social Cohesion, Having 1 or More Disabilities, & Psychological Distress).

Language Acculturation emerged as a statistically significant predictor of physical health, where greater English ability predicted higher overall physical well-being for older Asians ($\beta = 0.28, p < 0.001$). The results also indicate that being older was associated with lower physical health. Asians who are 60 to 74 were not as physically healthy compared to those who are 55 to 64 ($\beta = -0.11, p < 0.03$). The results were similar but initially appeared somewhat stronger for those who are 74 and older, compared to those who are 55 to 64 ($\beta = -0.12, p < 0.02$). Results of a Wald Test comparing the parameter estimates for those who are 65 to 74, against those who are 75 and older, indicated no statistical differences between these two groups ($F(1, 312) = 0.37, p = 0.55$). Results from multivariate regression analysis also indicated that psychological distress predicted lower overall physical well-being ($\beta = -0.31, p < 0.001$).

Functional Disability. Table 20 presents the results from logistic regression analysis, with disability as outcome from the NLAAS data. Consistent with analysis from the ACS data, Filipino elders were more than 4 times as likely to be disabled compared to Chinese elders (Odds Ratio = 4.22, $p = 0.01$). The odds ratio estimate for Vietnamese elders was in the expected direction, suggesting they were more likely to be disabled compared to Chinese elders, but this relationship did not emerge as statistically significant (Odds Ratio = 2.77, $p = 0.09$). Higher income predicted an over 70% decrease in the likelihood of being disabled (Odds Ratio = 0.27, $p < 0.01$). Asian elders who lived in the US for more than 10 years appears to be almost 9.5 times more likely to be disabled, compared to more recent immigrants (Odds Ratio = 9.48, $p < 0.01$). Those who were 65 to 74 did not appear to be statistically different from those aged 55 to 64 in their likelihood to be disabled (Odds Ratio = 1.96, $p = 0.21$) in this portion of the analysis. However, Asian elders who are 75 and older were more than 3 times more likely to be disabled, compared to those who are 50 to 64 (Odds Ratio = 3.37, $p < 0.05$). A higher score on the Physical Health Rating Scale was associated with a 39% decrease in the likelihood of being disabled (Odds Ratio = 0.61, $p < 0.05$), while a higher score in the psychological distress scale was associated with a 21% increase in the likelihood of being disabled (Odds Ratio = 1.21, $p < 0.001$).

Comparison of Functional Disability as Outcome from ACS and NLAAS.

Table 21 presents a comparison of parameter estimates from logistic regression conducted with the ACS and NLAAS datasets, with having 1 or more disabilities as the dependent variable regressed on the same set of predictors in both models (Asian ethnicity, Language Acculturation, Female Gender, Being Married, Income, Education,

Citizenship, Age Arrive to US, Living more than 10 years in the US, and Age groups of 50 to 64 as reference, 65 to 74 and 75 and over as dummy variables).

The results were fairly consistent from the two data sources, with small differences in the odds ratio estimates but same direction of relationship of predictors to disability in ACS and NLAAS. Almost all predictors from the analysis with the ACS were statistically significant, with the exception of female gender. Results from the NLAAS data indicate that only Filipino ethnicity, income, living more than 10 years in the US, and being 75 and over were statistically significantly associated with being disabled for Asian elders. The differences in number of predictors which emerged as significant in the two models can likely be explained by the exponential differences in sample sizes of the two datasets (ACS: $n = 17,927$; NLAAS: $n = 388$). The much larger sample size of the ACS data contributed to overall smaller standard errors, compared to those in NLAAS, as seen in Table 21. This allowed for more relaxed conditions in the ACS data for finding significance in the estimated effects of predictors, compared to similar analysis performed in NLAAS.

Table 19. Regression Results with the Physical Health Rating Scale as Outcome from NLAAS (n = 332)

Predictors	Full Model ^a				Final Model ^b			
	B (SE)	β	t	P	B (SE)	β	t	p
Asian Ethnicity								
Chinese (Reference)								
Filipino	0.06 (0.16)	0.03	0.37	0.71				
Vietnamese	-0.06 (0.15)	-0.03	-0.39	0.70				
Language Acculturation ^c	0.08 (0.03)	0.22	2.68	0.01	0.10 (0.02)	0.28	5.58	0.001
Perceived Discrimination	0.005 (0.01)	0.02	0.33	0.74				
Demographic Variables								
Female Gender	-0.09 (0.11)	-0.04	-0.80	0.42				
Married	0.07 (0.16)	0.02	0.43	0.67				
Income	0.17 (0.12)	0.08	1.40	0.16				
Education	-0.09 (0.06)	-0.10	-1.57	0.12				
US Citizen	0.17 (0.15)	0.06	1.14	0.26				
Age Arrive in US	-0.15 (0.11)	-0.08	-1.37	0.17				
Lived > 10 years in US	0.03 (0.16)	0.01	0.17	0.87				
Age Groups								
50 to 64 (Reference)								
65 to 74	-0.26 (0.14)	-0.09	-1.79	0.07	-0.31 (0.14)	-0.11	-2.21	0.03
75 and older	-0.39 (0.20)	-0.11	-1.97	0.05	-0.45 (0.18)	-0.12	-2.45	0.02

Social and Family Factors								
Family Pride	0.05 (0.04)	0.12	1.34	0.18				
Family Cohesion	0.06 (0.08)	0.06	0.74	0.46				
Family Cultural Conflict	-0.003 (0.04)	-0.004	-0.07	0.95				
Social Cohesion	-0.02 (0.02)	-0.04	-0.71	0.48				
1 or more Disabilities	-0.27 (0.20)	-0.07	-1.35	0.18				
Psychological Distress (K10)	-0.08 (0.02)	-0.26	-4.54	0.001	-0.10 (0.01)	-0.31	-6.39	0.001
Adjusted R ²	0.25				0.23			

- a. Full Model has all predictors
- b. Final Model has only significant predictors.
- c. Language acculturation is a Likert scale on English ability, coded as “poor,” “not well,” “well,” and “very well.”

Table 20. Logistic Regression Results with Disability as Outcome from NLAAS (n = 332)

Predictors	Odds Ratio (SE)	Full Model ^a		Odds Ratio (SE)	Final Model ^b	
		z	P		z	p
Asian Ethnicity						
Chinese (Reference)						
Filipino	6.80 (5.06)	2.58	0.01	4.22 (2.48)	2.45	0.01
Vietnamese	3.19 (2.22)	1.66	0.10	2.54 (1.49)	1.59	0.11
Language Acculturation ^c	0.95 (0.13)	-0.41	0.69			
Perceived Discrimination	1.02 (0.06)	0.32	0.75			
Demographic Variables						
Female Gender	0.60 (0.33)	-0.93	0.35			
Married	2.05 (1.45)	1.02	0.31			
Income	0.21 (0.10)	-3.22	0.001	0.27 (0.11)	-3.11	0.002
Education	1.57 (0.37)	1.88	0.06			
Citizen	0.64 (0.48)	-0.60	0.55			
Age Arrive in US	1.56 (0.80)	0.87	0.38			
Lived > 10 years in US	13.85 (12.95)	2.81	0.005	9.48 (7.22)	2.95	0.003
Age Groups						
50 to 64 (Reference)						
65 to 74	1.72 (1.02)	0.92	0.36	1.96 (1.05)	1.25	0.21
75 and older	4.04 (2.64)	2.13	0.03	3.37 (1.95)	2.10	0.04
Social and Family Factors						
Family Pride	1.02 (0.17)	0.12	0.91			

Family Cohesion	0.86 (0.28)	-0.48	0.63			
Family Cultural Conflict	0.92 (0.16)	-0.51	0.61			
Social Cohesion	0.89 (0.09)	-1.16	0.25			
Physical Health Rating	0.56 (0.16)	-2.03	0.04	0.61 (0.14)	-2.08	0.04
Psychological Distress	1.24 (0.08)	3.50	0.001	1.21 (0.07)	3.57	0.001
Pseudo R ²	0.38			0.32		

-
- a. Full Model has all predictors
 - b. Final Model has only significant predictors.
 - c. Language acculturation is a Likert scale on English ability, coded as “poor,” “not well,” “well,” and “very well.

Table 21. Comparison of Results from Logistic Analysis of Disability for Foreign-Born Asian Elders from ACS 2009 (n=22,096) and NLAAS (n=388)

Predictors	American Community Survey (n = 17,927)				National Latino & Asian American Study (n = 388)			
	Odds Ratio(SE)	z	p	CI	Odds Ratio(SE)	Z	p	CI
Asian Ethnicity								
Chinese (Reference)								
Filipino	2.14 (0.13)	12.50	0.001	(1.90; 2.40)	3.89 (2.27)	2.33	0.02	(1.24; 12.19)
Vietnamese	1.57 (0.10)	7.10	0.001	(1.38; 1.77)	2.42 (1.23)	1.75	0.08	(0.89; 6.53)
Language Acculturation								
Speak English	0.72 (0.02)	-10.02	0.001	(0.67; 0.77)	0.92 (0.09)	-0.84	0.40	(0.75; 1.12)
Demographic Variables								
Female	1.01 (0.05)	0.27	0.79	(0.92; 1.12)	0.53 (0.22)	-1.56	0.12	(0.24; 1.18)
Married	0.60 (0.03)	-9.82	0.001	(0.55; 0.67)	0.72 (0.32)	-0.74	0.46	(0.12; 0.57)
Income ^a	0.97 (0.01)	-3.96	0.001	(0.96; 0.99)	0.26 (0.10)	-3.38	0.001	(0.12; 0.57)
Education	0.97 (0.004)	-6.21	0.001	(0.97; 0.98)	1.28 (0.24)	1.35	0.18	(0.89; 1.84)
Citizen	1.35 (0.09)	4.35	0.001	(1.18; 1.55)	0.70 (0.38)	-0.66	0.51	(0.25; 2.02)
Age Arrive US	1.01 (0.002)	5.98	0.001	(1.01; 1.02)	1.48 (0.56)	1.04	0.30	(0.70; 3.11)
Lived > 10 years in US	1.70 (0.14)	6.64	0.001	(1.45; 1.99)	6.03 (3.94)	2.75	0.01	(1.68; 21.70)
Age Groups								
50 to 64 (Reference)								
65 to 74	2.38 (0.14)	14.64	0.001	(2.12; 2.68)	1.21 (0.58)	0.40	0.69	(0.47; 3.10)
75 and over	7.65 (0.56)	27.80	0.001	(6.63; 8.83)	3.27 (1.61)	2.39	0.02	(1.23; 8.60)
LR χ^2 (df)	3466.66 (12)				48.49 (12)			

p value	0.0001	0.0001
Log Likelihood	-6438.4058	-106.65303
Pseudo R ²	0.21	0.19

a. Income was log transformed to improve normality of distribution in the variable.

Perceived Discrimination as Mediating Variable for Psychological Distress

Testing Ho. 4. Perceived discrimination can potentially serve as a mediator for ethnicity, English ability, length of stay in the US, and family and social factors in predicting psychological distress.

Using the NLAAS data, Perceived Discrimination was tested as a mediating variable to Psychological Distress for Ethnicity, English Ability, Gender, Marital Status, Income, Education, Being a Citizen, Age of Arrival to the US, Living more than 10 years in the US, Family Pride, Family Cohesion, Family Cultural Conflict, and Social Cohesion. Initial analysis revealed that of these variables, only Filipino ethnicity, Vietnamese ethnicity, Family Cultural Conflict, and Living more than 10 years in the US were jointly significant in predicting Perceived Discrimination. These variables were tested for indirect effects on Psychological Distress through Perceived Discrimination. The final conceptual model is shown in Figure 1. Overall, the final model that is illustrated demonstrated a good empirical fit with the data on Asian elders ($\chi^2 = 4.84$, $df = 6$, $p = 0.56$, $RMSEA < 0.001$, 90 Percent Confidence Interval for $RMSEA = (0.0 ; 0.062)$, $P\text{-Value for Test of Close Fit } (RMSEA < 0.05) = 0.89$, $Model\ AIC = 82.81$, $NFI = 0.99$, $NNFI = 1.01$, $CFI = 1.00$, $Critical\ N = 1217.28$, $Standardized\ RMR = 0.015$, $GFI = 1.00$, $AGFI = 0.98$). This indicates that Hypothesis 4 is largely supported by the data, and that Perceived Discrimination is a central mediating variable in predicting psychological distress.

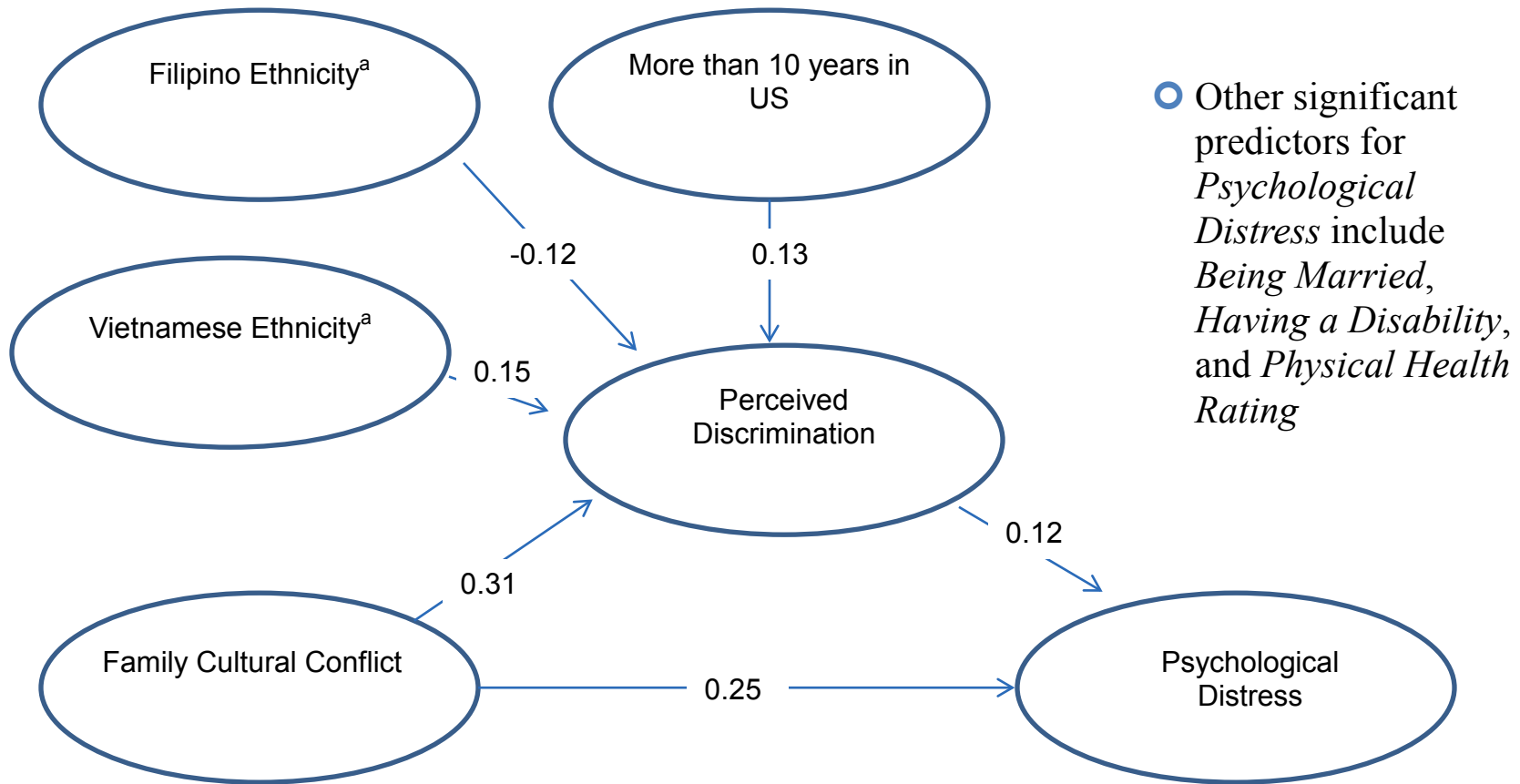
Ethnicity. While ethnic differences were not observed directly for psychological distress, indirect effects were found with perceived discrimination as the mediating variable. Compared to Chinese elders, Filipino elders experienced lower Perceived

Discrimination ($\gamma = -0.12$), while Vietnamese elders had higher Perceived Discrimination ($\gamma = 0.15$). Based on these results, indirect effects were calculated from the product of their respective coefficients and the coefficient for Perceived Discrimination on Psychological Distress. As such, the path final model indicated that Filipino ethnicity had a negative indirect effect on Psychological Distress through Perceived Discrimination (indirect effect = -0.01), while Vietnamese ethnicity had a positive indirect effect through this mechanism (indirect effect = 0.02).

English ability and Living More than 10 Years in the US. Interestingly, greater English ability was initially associated with higher Perceived Discrimination, but became non-significant when Living more than 10 years in the US was included in the model. Living in the US for more than 10 years is associated with higher Perceived Discrimination for Asian elders ($\gamma = 0.13$, $p < 0.01$), which in turn is indirectly associated with higher Psychological Distress (indirect effect = 0.02).

Family Cultural Conflict. In addition to having a direct effect on Psychological Distress (Direct effect = 0.25), Family Cultural Conflict also had an indirect effect through Perceived Discrimination (Indirect effect = 0.04). Of all variables included in the analysis, higher levels of Family Cultural Conflict was the only variable that had a direct and indirect effect on increased Psychological Distress (Total effect = 0.29).

Figure 1. Final Path Model with Perceived Discrimination as the Mediating Variable



$\chi^2 = 4.81, df = 6, p = 0.57, RMSEA < 0.001$

a. Reference group for analysis is Chinese.

CHAPTER V: DISCUSSION

Functional Disability as a Measure of Overall Health

Results of reliability analysis and confirmatory factor analysis on the disability items from the American Community Survey suggest that the items (Difficulty Hearing, Difficulty Seeing, Difficulty Remembering, Physical Difficulty, Difficulty Dressing, Difficulty Going Out), when used together as a scale, reasonably capture overall health for older Asian Americans. The two items, Difficulty Dressing and Difficulty Going Out, appear to represent the greatest variability in the measurement of disability for older Asian Americans (Difficulty Dressing, $\lambda = 0.97$; Difficulty Going Out, $\lambda = 0.95$). Physical Difficulty appears to be an important item in the measurement as well ($\lambda = 0.94$). Unsurprisingly, Difficulty Hearing and Difficulty Seeing appear to load onto their own factor, as they capture the sensory dimension to disability. However, these two items which represent the sensory dimension to disability appear to be accounted for comparatively less than all other items. While the item Difficulty Remembering loaded well on the overall scale, the entire model improved overall when this item was dropped from the scale. Goodness of Fit indices suggest that this scale appears to perform better when “Difficulty remembering” was dropped, which suggest that these items would better capture crucial functional disabilities as a composite of the sensory and Activities of Daily Living (ADL) dimensions for older Asian Americans.

Older Asian Americans are likely to perceive disability differently, based on language ability, other indicators of acculturation, as well as available resources within the family and the places they live. While the impact of Difficulty Hearing was moderate in terms of accounted for variance with the overall disability scale, modification indices suggested that the error variance of this item can be correlated with Difficulty

Remembering and Difficulty Going Out. This suggests that Difficulty Hearing appears to be measured imperfectly, and is related to both Difficulty Going Out and Difficulty Remembering. The impact of acculturation processes can be elusive in that for many older Asian Americans who learn English informally, the loss of hearing may be more crucial because it cannot be as readily compensated by reading and writing skills for this population. Without the capacity to understand spoken language, older Asian Americans may be seriously impacted in their capacity to go outside their homes, maintain a connection to their communities and tap into their family as well as neighborhood resources. The goodness of fit indices from this analysis also suggest that the model has an ambiguous fit to the data. As seen in Table 5 on page 40, the Comparative Fit Index (CFI) and the Normed Fit Index (NFI) indicate that the model cannot be meaningfully improved (CFA = 1.00, NFI = 1.00).

These results suggest that the disability items may be perceived differently for the various Asian population subgroups, which have diversely different levels of education, English language skills, percentage of US-born, naturalization rate, migration background, and social networks. The within-group reliability and validity analysis for each major Asian subgroup, when examined separately, indicate that disability may vary in how it is perceived among older Chinese, Filipinos, Vietnamese, Koreans and Japanese Americans.

Functional Disability and its Association with Language Acculturation and Ethnicity

The impact of language acculturation, defined in this portion of the analysis as ability to speak English, appear to have an important impact on disability for Asian

elders, even when controlling for ethnicity and other demographic and well-being indicators. Linguistic isolation does not appear to have the same impact on disability as the ability to speak English, suggesting that it is the individual's own ability to interact with American mainstream culture which decreases an Asian elder's likelihood of being disabled.

The results suggest that Filipino and Vietnamese elders are the most different from the Chinese as a group. Chinese Americans are the majority and arguably the most representative of Asian Americans in the US, due to their large numbers and historic cultural influences on other Asians in their native countries. It appears that Filipino elders are the most likely as a group to identify as disabled, compared to Chinese elders (ACS: 214% as likely; NLAAS: 389% as likely). This finding, at first glance, may seem counter to the view that assimilation improves health, being that Filipinos as a group have some of the highest incomes, tend to have professional jobs, live in primarily White communities, and speak English better than most other Asians. Interestingly, separate analyses conducted on the distinct ethnic samples in the ACS data presented in Table 9 found that higher income predicted lower disability for Filipino, Koreans, and Japanese, but not Chinese or Vietnamese elders. Filipinos may also perceive disability very differently, compared to other Asian ethnicities. Many Filipinos speak English, and individual elders in this population may be more likely to identify themselves as disabled and receive needed services from traditional medical settings. Additionally, Filipinos as a group do not tend to live in ethnic communities, and it is likely that Filipino elders may not have convenient access to culturally-specific services. This may also influence how disability is perceived by Filipino elders, who would have to go through more

traditionally Western channels for services and may be more sensitive to how their functional impairments negatively impact their everyday life.

Vietnamese elders appear to be more likely to be disabled as well, compared to Chinese elders (ACS: 157% as likely; NLAAS: 242% as likely). This finding is consistent with other previous studies suggesting that Vietnamese as a group are less healthy than other Asians, especially when compared to Chinese Americans. It is likely that Vietnamese elders are more likely to be disabled due to their history of involuntary migration as refugees to the US. Voluntary immigrants such as the Chinese, Koreans, and Japanese are self-selected, meaning that individuals with poorer health may not choose to migrate, or in certain circumstances, may not be allowed entry into the US. Vietnamese Americans, on the other hand, were fleeing for their lives, and may represent a more varied spectrum in terms of health and pre-existing conditions. Additionally, the flight from Vietnam was incredibly arduous for many who were refugees, which may have caused high levels of stress on their overall health. It is unsurprising, then, that this may have also caught up with many Vietnamese elders, now that they are getting older. Migratory grief and the psychological sequelae of trauma undoubtedly also had an impact on well-being of this population.

Age group analyses indicate that Asian elders who are at retirement age, from 65 to 74, are more likely to be disabled compared to those who are 50 to 64 years old (ACS: 238% as likely, NLAAS: 121% as likely). This likelihood of having a disability more than doubles for those who are 75 and older (ACS: 765%.as likely; NLAAS: 327% as likely). This highlights the importance of care to the older, post-retirement age group of Asian elderly, who are at much greater risk for poorer health.

Interestingly, persons who immigrated before 2000 appear to more likely be disabled than those who came to the US after 2000, even when age effects were accounted for in the analysis. Asians came in comparatively low numbers before the changes in the Immigration and Nationality Act of 1965. Over time, immigration of Asians continued to increase. This legislative action repealed the various Asian exclusion policies enacted over a span of over a century, making it possible for larger waves to arrive and form communities in the US for the first time. The results suggest that the continued growth of Asian American communities contributed substantively to a better life for this population. This allowed for more opportunities for better jobs, higher education, and entrepreneurship for Asian immigrants, which may have improved the well-being of this population as a whole. Future research will need to include comparisons with White American populations, in order to assess if this overall drop in disability is better accounted for by medical and technological advances, which would be similarly observed in other populations.

The results indicate that education, being married and in some cases (Filipino, Korean, & Japanese), income, may decrease the likelihood of being disabled for Asian elders. Female gender did not have a statistically significant effect on the probability of disability, once being married was included in the analysis. Living longer in the US indicated an increased likelihood of being disabled, even when controlling for the effects of age. This finding suggests that Asian elders who have been in the US for longer than 10 years may be at greater risk for poor health, even when controlling for age effects, which directly contradicts the straight-line assimilation theory, where a longer period of residence in the US was assumed to be associated with increased well-being of

immigrants. However, this is consistent with more recent research which indicates that a longer period of residence may lead to worse health for immigrants, perhaps due to exposure or sensitization to some of the negative aspects of acculturation.

The Kessler Psychological Distress Scale (K10) as a Measure of Psychological Health

Results from reliability analysis and confirmatory factor analysis suggest that the Kessler Psychological Distress Scale (K10) captures this dimension well as a measure of psychological health for older Asian Americans, when used with the seven included items (Feel Depressed, Tired for No Reason, Everything was an Effort, Feel Nervous, Feel Hopeless, Feel Restless, Feel Worthless).

While this reduced 7-item Kessler Psychological Distress Scale produced good fitting results from confirmatory factor analysis, it is important to note that only a little above 30% of all older Asian respondents reported having any instance of psychological distress as measured by the seven items from the scale. Close to 70% of the entire sample of older Asian Americans report no psychological distress at all, which suggests that this scale performs better and captures greater variability for higher levels of psychological distress with this population. This is similar to other populations, and consistent with the development of this instrument, which was found to have good precision in discriminating between DSM III cases and non-cases as a screening scale (Kessler et al, 2003; Kessler et al, 2002). As such, this tool may be particularly useful in measuring the severity of distress found in clinical samples of older Asian Americans, which is consistent with the findings in the dimensionality of the measurement with other large scale population studies (Kessler et al, 2002).

Results from separate confirmatory factor analyses on the scale for Chinese, Filipino and Vietnamese older Asians suggest that the seven items from the K10 are not completely measurement invariant. However, because all the items loaded onto one dimension consistently for the three ethnic subgroups, its use as a measure of psychological distress for these three populations is justified. However, it is important to note that Vietnamese elders seem to be the most different in regards to psychological distress. Compared to Chinese and Filipinos, the factor loadings for the three items, “feel tired for no good reason,” “everything was an effort” and “feel nervous” were overall much stronger for Vietnamese elders, as seen in Table 7. This can perhaps be explained by the more recent immigrant/refugee status of this population and the psychological sequelae of their grief and trauma, and Vietnamese elders may be more likely to somaticize their psychological distress and report them as physical symptoms (Mereish, Liu, Helms, 2011).

Acculturation, Ethnicity, Social Factors and Psychological Distress

Psychological distress, as defined by the 7 items from the Kessler Psychological Distress Scale, appears to be reasonably well explained as an outcome by the predictors in the overall model (Final Model: $R^2 = 0.30$). The Physical Health Rating Scale emerged as the most important predictor of psychological distress for older Asians in this analysis, where having a higher score was associated with lower distress for Asian elders. Having 1 or more disabilities was also associated with greater distress. Increased Family Cultural Conflict also had a significant association with greater psychological distress for Asian elders. This suggests that in addition to overall physical health, family dynamics, particularly in relation to cultural conflicts across generations, have a serious and

damaging effect on the psychological well-being of older Asian adults. The impact of intergeneration conflict, which put family members at odds with one another due to clashes over cultural perceptions and values, is especially damaging to the integrity of the Asian family, and can seriously hurt the psychological well-being of older Asian Americans.

For older Asians, language ability did not have a significant association with psychological distress when controlling for all other variables in the analysis. This result is different from the previous analysis on functional disability. Years in the US did not appear to predict psychological distress for older Asians, which suggests that acculturation in regards to mental well-being cannot be easily captured by length of residence in the US for this population.

Perceived discrimination, as measured by the Everyday Discrimination Scale, appears to have a statistically significant association with increased psychological distress for the older Asian population. This is consistent with research on Asians as well as other ethnic and racial samples on the relationship of discrimination on well-being (Barnes, De Leon, Wilson, Bennett & Evans, 2004; Gee, Ro, Shariff-Marco & Chae, 2009; Gee, Spencer, Chen, Yip & Takeuchi, 2007; Gee, Spencer, Chen, & Takeuchi, 2007; Hwang & Goto, 2008; Kessler, Mickelson, Williams, 1999; Ryff, Keyes, & Hughes, 2003; Williams, Yu, Jackson & Anderson, 1997; Yip, Gee, & Takeuchi, 2008). In the current analysis, this relationship remained significant even when controlling for language acculturation and social cohesion, which measured trust in one's neighborhood along with all other variables included in the analysis. Discrimination can be reasonably argued to be another facet of acculturation, in the form of marginalization from the host culture.

To feel unfairly treated because of one's ethnicity, cultural background or immigrant status is another barrier to successful acculturation, impacted by the history and perception of race and race politics in the United States.

Being married appears to buffer against poor psychological health, consistent with past research on loneliness and isolation for this population. Female gender, education, and income did not emerge as significant predictors of psychological distress for Asian elders, suggesting that there is much more than demographic characteristics to understanding mental health for older Asians.

Perceived Discrimination and Psychological Distress

The results from path model analysis, with perceived discrimination as the mediating variable, suggest a complex relationship in understanding ethnic and acculturation differences to psychological well-being for Asian American elders. While English ability was associated with higher perceived discrimination in the bivariate analysis, this relationship became non-significant when living in the US for more than 10 years was included in the model. Past research has suggested that increased English ability may also decrease psychological well-being, either from greater exposure to mainstream society, or increased sensitivity to unfair treatment from others. The analysis conducted in this study provides evidence that, for Asian elders, it may in fact be living more than 10 years in the US which results in either greater exposure or higher sensitivity to discrimination, which in turn leads to poorer psychological health. This makes intuitive sense for the population of older Asian immigrants who have on average lived in the US for over 25 years, and if they have not learned English yet, then they have figured out a way to get by with resources in their communities. It is also possible that they have

become accustomed, or acculturated, to unspoken social cues, without learning English. Anecdotally, many of us who have immigrants in our families or have worked with immigrants who do not speak English can speak to the fact that they certainly know if they are treated unfairly or insulted, even without necessarily understanding what is being said. After living in the US for a substantial portion of their lives, Asian elders will have become acculturated to the American race and race politics, which undoubtedly will have an impact on their well-being.

Ethnic differences were found for perceived discrimination, which provided evidence for indirect effects on psychological distress. Compared to Chinese elders, Filipino elders experienced lower discrimination, while Vietnamese elders experienced higher discrimination, which may reflect their comparative pathways of acculturation (Filipinos primarily arrived as economic migrants and many had professional jobs, while Vietnamese arrived as refugees from the war, with all the American social and political complexities). While ethnic differences were not directly found for psychological distress, the results from path analysis suggest that perceived discrimination, taken as a social construct, is a crucial link between ethnicity and psychological well-being.

The results for the variable Family Cultural Conflict, which represented intergenerational conflicts within families over cultural differences, were compelling. In addition to having a direct effect on worsening psychological health, higher levels of intergeneration conflicts have an indirect effect through perceived discrimination. From a systems theory and Person-In-Environment perspective, it is unsurprising to find that Asian elders who have problems of feeling accepted from their families may likely feel

more marginalized by the larger society. The best analogy, perhaps, is to describe intergenerational conflicts within families as a tug of war where no one wins.

Conclusion

Analyses performed in this paper provided insight into the reliability and validity of the two scales measuring disability and psychological distress for Asian American elders. The disability items were examined from the 2009 American Community Survey and the Kessler Psychological Distress (K10) from the National Latino and Asian American Study, two sources of nationally representative data on Asian Americans. These two measures were examined as outcomes for English language ability and other demographic and social indicators, revealing a complex picture in how acculturation can best be modeled for older Asian adults. Structural factors, such as discrimination, are observed to be a crucial link between intergenerational conflict and psychological health for older Asians even when controlling for income and education, and may provide a part of the puzzle in explaining the ethnic differences in acculturation and well-being for this population.

Implications for Research

Functional disability and psychological distress are two measurements of health that have been extensively used as indicators of well-being. However, the disability items from the American Community Survey and the items from the Kessler Psychological Distress Scale (K10) previously have not been examined rigorously for their reliability and validity for older Asian Americans. This dissertation addresses this issue using large scale, population data in order to contribute a new level of insight on how physical and psychological health can be captured with research on older Asian Americans. Asian

elders are one of the fastest growing immigrant groups, and the fastest growing amongst the elderly in the US.

The results suggest that there is tremendous merit in how these two measures capture health for this population. However, it appears that the measures are all heavily skewed towards higher levels of functioning. The CDC reports that compared to the national percentage of 12% of persons diagnosed with a severe disability, Asian Americans have the lowest percentages of disability amongst all major race groups (Asians: 11.6%; Non-Hispanic Whites: 20.3%; Non-Hispanic Black or African American: 21.2%; Hispanics: 16.9%). These numbers are consistent with the overall low percentages of those with a disability in the data used in this study. The low percentages of reported disability and psychological distress suggest that there are confounding factors which influence how well these two measures can be applied to Asian populations, particularly those who may have different perceptions of disability, levels of education, income, language, immigration status, social networks, health insurance status and access to services. It is interesting to note, also, that Hispanics also had comparatively lower reported percentages of disability, suggesting that some of these confounds are based in the acculturation experiences of immigrants to the US. Altogether, the two measurements appear to capture health reasonably well. However, there are limitations in how well these scales can be best applied to work with older Asian Americans. While this was not formally tested for this dissertation, it is likely that the limitations in the psychometric validity of the two measurements may not be limited to just Asian elderly samples. The confounds which may lead to under-reporting for Asian Americans are likely to be present for other ethnic samples, such as Hispanic and

Caribbean Americans who straddle multiple cultures as immigrants or children and grandchildren of immigrants.

The measurement of health through the use of functional disability and psychological distress, while important in large-scale studies, have their limitations in explaining overall well-being in the context of complete health. Disability and psychological distress, by their very nature, capture the negative consequences of poor health, and do not reflect the positive constructs of well-being, like good dieting practices, regular exercise, and other habits of healthy living and successful aging. Future research should continue to use measures like functional disability and psychological distress, as they are intricately tied to risk factors such as isolation for this population, and are barriers to successful aging. Researchers should also consider using measurements which can reflect a definition of well-being that is more consistent with a more comprehensive understanding of good health, especially when working with ethnically diverse populations,

Consistent with previous findings on older Asians, findings from this dissertation indicate that Asian Americans represent both extremes of socioeconomic status and overall health. For example, results from analysis on disability indicate that Filipino elders, while on average having the highest English ability, do the worst when they do not speak English. Additionally, there appears to be a wide spectrum in income for Asian elders. As seen in the Appendix, Table 3 & Table 4, demographic information on the full sample of Asian Americans from both datasets indicates that while their average incomes are fairly high, this does not provide a complete picture of socioeconomic status for this population. The standard deviation was consistently larger than mean incomes, indicating

that a substantial portion of the poorest of Asians are in poverty, while many of the richest have some of the highest incomes amongst all groups in the US (Full sample: Chinese: Mean = \$41,670, SD = 60,992; Filipino: Mean = \$34,673, SD = 40,773; Vietnamese: Mean = \$27,433, SD = 38,292; Korean: Mean = \$34,115, SD = 58,342; Japanese: Mean = \$41,945, SD = 55,600). A breakdown of incomes for Asians age 50 and older for each of the ethnic groups examined in this dissertation reveals a similar picture (50 and older sample: Chinese: Mean = \$40,032, SD = 62,398; Filipino: Mean = \$40,032, SD = 62,398; Vietnamese: Mean = \$23,802, SD = 35,505, Korean: Mean = \$34,073, SD = 57,293; Japanese: Mean = \$46,153, SD = 58,189). Future research should take into account this inherent, bifurcated nature of overall socioeconomic and health status of the Asian American elderly, to explain why these extremes are observed in the spectrum of resources and well-being.

Logistic regression analysis with the 2009 American Community Survey indicate that for all older Asian American groups, there is a statistically significant relationship between the ability to speak English and having a disability. The results also highlight that those who are unmarried, less educated, and arrived to the US at a later age are more likely to be disabled. While it is difficult to definitively explain why this is the case, it is likely that social isolation plays a key role in these associations. Older Asians who do not speak English, do not have partners, are less educated, and arrive to the US at a later age likely face multiple challenges in accessing supports through a social network, both within their extended families or through the communities they live in. They would face challenges with building new, meaningful connections with others, from differences in cultural understandings and opportunities for relationship-building. Along a similar vein,

the results from regression analysis with the National Latino and Asian American Study indicate that older Asians who are unmarried, perceive more discrimination, experience more cultural conflicts with their family members, have 1 or more disabilities, and report lower physical health have higher levels of psychological distress. Again, social isolation may be a key factor for older Asians, who may face difficulties in having meaningful relationships with family members or establishing important linkages to those in their communities. Future research can focus on further examining the impact of acculturation on social isolation, which in turn has an impact on well-being for older Asian Americans. Research with longitudinal data on Asian elderly can better explain some of these issues by investigating these causal linkages.

Ethnic differences were revealed for the major older Asian American groups, in how disability was associated with income and being a citizen. The expected association for a wealthier person to be less likely to have a disability is clearly present for Filipino elders, but not for Chinese and Vietnamese elders. For Korean and Japanese elders, it is less clear. These differences may be partially explained by the differences in culture, language, migration history as refugees to the US, economic migrants, or family reunification programs, political climate, rural vs. urban place of residence, and access to resources for these ethnic groups of Asian elders. Despite these differences, there is a common thread in the experience of older Asians as immigrants who had to leave behind everything and start fresh again, rebuilding with their families new relationships and networks. Social workers in health services can engage Asian elders with their families and communities in their care, and senior services, such as day centers, can be catered to be culturally and linguistically specific to older Asian Americans.

This dissertation highlights the point that the perceived construct of disability likely means different things for the various subgroups of Asian Americans, who have different levels of English proficiency, formal education, and community resources. Psychological distress was also perceived differently for the various ethnic groups, but the associations of distress with English ability and other demographic and social indicators were statistically similar in the analysis. Future research can be conducted to examine more nuanced instruments to capture the different dimensions of health for older Asians, as well as other ethnic and cultural populations.

Implications for Practice and Policy

Historically, social workers embrace a conceptual framework that naturally pulled together multiple disciplines in the social sciences, psychology and biology, termed the person-in-environment approach, to promote recovery for vulnerable persons (CSWE, 2011). Social workers are uniquely qualified and positioned to play a key role in clinical practice for older Asians, because recovery from physical disability and psychological distress is a multi-stage and multi-factorial process which engages the individual, their families, and communities in the building of social networks and supports. The research from this dissertation highlights the multi-systemic nature of needs of the Asian American elderly. Social workers in clinical practice typically have to be engaged with the individual, their families, and communities in order to provide their services. Social work interventions can make full use of the central role of social workers in health and mental health settings, and can help to design programs that cater to the specific needs and inherent resources of the different Asian American elderly groups. Not all Asians are the same, and programs to promote healthy diets, exercise, and engagement with family

and community networks should specifically target respective older ethnic groups. For example, the analysis indicates that Filipino elders with lower incomes are many times more likely to be disabled than elders from other Asian ethnic groups. Interventions can target services for low income Filipino elders, such as home-based care and services, which can help alleviate drastically improve health outcomes and the quality of life for this population. Simultaneously, services for other Asian elderly groups, such as Chinese, Vietnamese, and Korean elders, can also become more linguistically and culturally appropriate by encouraging a new generation of social workers from these ethnic groups, who can have greater access to their respective communities.

In terms of macro and policy practice, social workers can advocate for Asian elderly by increasing awareness of the unique needs of this population and focusing services that cater to community and family supports,. Social workers can also advocate for older Asians by taking action with congressmen in their states and districts to push for federal funding for culturally and linguistically specific community services to older Asian Americans. This will improve the overall efficacy of services for this population, and can help reduce the burden of care from expensive, traditional medical models of geriatric support.

Limitations

A major challenge for this research is that acculturation as a construct has been measured imperfectly, and this continues to be so in this dissertation. English ability and years in the US are indicators which can be understood as proxies to represent the capacity of immigrants to successfully build meaningful connections with the mainstream culture. These two measures will continue to be important in understanding acculturation,

and should be included in future studies. Other factors such as opportunities available at the time of migration, economic conditions, political climate, and the overall reception of the immigrant group also play important roles in this process. It is possible to capture some of this with the arrival wave of immigrants; however, this will unlikely be enough to fully reflect all the conditions immigrants faced as they adjust to a new country. It is the hope that the research from this dissertation will help to add to the understanding of elderly Asian Americans in the US, and provide some insights into this unique population. Future research can also examine the role of family and community in the acculturation experience of older Asians, and how helping professionals can more effectively advocate and provide services to this growing population.

Social support, captured by the Social Cohesion items, did not have a statistically significant association with psychological distress for Asian elders, in the bivariate or the multivariate analysis. This appears to contradict an overwhelming body of research which indicates the importance of social support for elderly populations, including Asian elders (Berkman, 2009; Casado & Leung, 2001; Min, Moon, & Lubben, 2005; Mui & Kang, 2006; Mui, Kang, Kang, & Domanski, 2007; Ngo, Tran, Gibbons, & Oliver, 2001; Shibusawa & Mui, 2001; Sue, 2005; Yee, DeBaryshe, Yuen, Kim, & McCubbin, 2007). This may be partly explained by limitations in the instrument, which asks if people in the neighborhood can be trusted, people in the neighborhood get along with each other, people in the neighborhood help in emergencies, and people in neighborhood look out for each other. These questions may not apply so well to Asian elders who rely more strongly on family and informal networks of people who are either in the same household or do not necessarily live in the same neighborhoods. Cultural and linguistic barriers can

prevent Asian elders from forming meaningful relationships with their geographic neighbors, leading to increased risks for isolation. Future research with Asian elders should use measurements which are culturally appropriate and can capture social support as the quality of meaningful relationships.

Survey weights were initially not included in the analysis, because the researcher was interested in examining the results for the actual observations of older Asian Americans, in order to better capture the measurement characteristics of health outcomes used in this study. In order to confirm the stability of results from this analysis, Successive Difference Replication (SDR) was conducted as the recommended method of variance estimation using replicate weights provided from the ACS data (Fay & Train, 1995). These results were compared to those presented in this dissertation, and no real differences were found in the significance and directionality of the estimates. Minor differences did emerge from the point estimates, but they did not affect the interpretation of results. A comparison of the two sets of results from the multivariate logistic model, one without using SDR, and another applying the replicate weights, are presented in the Appendix. Further comparisons of results with and without weights can be furnished upon request.

Final Thoughts

The goal of this dissertation is to further the current understanding of two dimensions of health for older Asian Americans and to examine their relationship to acculturation and social factors. Since 1965, Asians as a whole have become a major immigrant group in the US and are a fundamental part of the American landscape, particularly in metropolitan areas. However, because of the relative recent arrival of

many Asian Americans as a group in the US, it is only recently that older Asians are being recognized as a major portion of the population among the elderly in the US. Much of what can be gleaned from the analyses in this dissertation is very new, primarily because it has only been in the recent years that large scale population surveys with sizeable numbers of Asian Americans have become available. As such, there will undoubtedly be numerous factors, such as other dimensions of health not explored in this proposal, which are undeniably relevant to the understanding of the lives of elderly Asian Americans. While rigorous cross-cultural validation methods were employed for analysis, a major assumption will be made that each of these subgroups are homogeneous in themselves in some regard, which is highly unlikely to be completely true. For instance, much of the research available has suggested that Chinese Americans as a group have extensive diversity in beliefs, traditions, dialects, and cultural practices. From the initial exploratory analysis of the 2009 American Community Survey data, it appears that there are many persons who cross-identify within the major Asian subgroups. Substantial numbers of Chinese, for example, also identify as Filipino and Vietnamese. Even so, the work that was done in this dissertation may be a reasonable starting point given the lack of available research for any given ethnic subgroup of Asian Americans. Because of the historical context of race in the US and the visual nature of ethnicity, there is undeniably an imposed amalgamation of Asians Americans as a pan-ethnic group, as can be seen in countless forms, surveys, and in the general media. Therefore, it is relevant to examine the Asian American identity as a pan-ethnic group as well as in the specific subgroups respondents chose to identify with. Social workers can advance research, policy, and practice in the health and mental health of Asian American elderly by embracing a more

nuanced understanding of the cultural diversity in this population, while carefully examining ethnic differences in wellness outcomes and their relationship to acculturation for individual Asian elders, their families and their communities.

REFERENCES

- Alegría M, Takeuchi D, Canino G, Duan N, Shrout P, Meng X-L, et al. (2004). Considering Context, Place, and Culture: the National Latino and Asian American Study. *International Journal of Methods in Psychiatric Research* 13(4): 208-220.
- Alegría M, Vila D, Woo M, Canino G, Takeuchi D, Vera M, et al. (2004). Cultural Relevance and Equivalence in the NLAAS Instrument: Integrating Etic and Emic in the Development of Cross-Cultural Measures for a Psychiatric Epidemiology and Services Study of Latinos. *International Journal of Methods in Psychiatric Research* 13(4): 270-288.
- Barnes, L. L., De Leon, C. F. M., Wilson, R. S., Bienias, J. L., Bennett, D. A., & Evans, D. A. (2004). Racial differences in perceived discrimination in a community population of older blacks and whites. *Journal of Aging and Health*, 16(3), 315-337.
- Berkman, L. F. (2000). Social support, social networks, social cohesion and health. *Social Work in Health Care*, 31(2), 3-14.
- Berkman, L. F. (2009). Social epidemiology: Social determinants of health in the united states: Are we losing ground? *Annual Review of Public Health*, 30, 27-41.
- Berry, J. W. (2003). Conceptual approaches to acculturation. In K. M. Chun, P. B. Organista & G. Marín (Eds.), *Acculturation : Advances in theory, measurement, and applied research* (1st ed., pp. 17-37). Washington DC: American Psychological Association.
- Byrne, B. M. (1998). Structural equation modeling with lisrel, prelis, and simplis. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Casado, B. L., & Leung, P. (2001). Migratory grief and depression among elderly Chinese American immigrants. *Journal of Gerontological Social Work*, 36, 5-26.

- Choi, N. G. (2000). Diversity within diversity: Research and social work practice issues with Asian American elders. *Journal of Human Behavior in the Social Environment*, 3, 301–319.
- Center for Disease Control. (2010). Highlights in minority and health disparities: Asian americans. Washington, DC. Retrieved on 11/30/2010 from <http://www.cdc.gov/omhd/populations/AsianAm/AsianAm.htm>
- Erosheva, E., Walton, E. C. & Takeuchi, D. T. (2007). Self-rated health among Foreign- and US-born Asian Americans: A test of comparability. *Medical Care*, 45(1), 80-97. doi:10.1097/01.mlr.0000241114.90614.9c
- Fay, R. E., & Train, G. F. (1995). Aspects of survey and model-based postcensal estimation of income and poverty characteristics for states and counties. In *Proceedings of the Government Statistics Section*, 154–159. American Statistical Association.
- Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian national survey of mental health and well-being. *Psychological Medicine*, 33(02), 357. doi:10.1017/S0033291702006700
- Gee, G. C., Ro, A., Shariff-Marco, S., & Chae, D. (2009). Racial discrimination and health among Asian Americans: Evidence, assessment, and directions for future research. *Epidemiologic Reviews*, 31, 130-151.
- Gee, G. C., Spencer, M., Chen, J., Yip, T., & Takeuchi, D. T. (2007). The association between self-reported racial discrimination and 12-month DSM-IV mental disorders

- among asian americans nationwide. *Social Science & Medicine* (1982), 64(10), 1984-1996.
- Gee, G. C., Spencer, M. S., Chen, J., & Takeuchi, D. (2007). A nationwide study of discrimination and chronic health conditions among asian americans. *American Journal of Public Health*, 97(7), 1275-1282.
- Hwang, W. C., & Goto, S. (2008). The impact of perceived racial discrimination on the mental health of asian american and latino college students. *Cultural Diversity & Ethnic Minority Psychology*, 14(4), 326-335.
- Grzywacz, J. G., & Keyes, C. L. (2004). Toward health promotion: Physical and social behaviors in complete health. *American Journal of Health Behavior*, 28(2), 99-111.
- Hahn, E. A., DeVellis, R. F., Bode, R. K., Garcia, S. F., Castel, L. D., Eisen, S. V., Bosworth, H. B., Heinemann, A. W., Rothrock, N., Cella, D., & The PROMIS Cooperative Group. (2010). Measuring social health in the patient-reported outcomes measurement information system (PROMIS): Item bank development and testing. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation*, 19(7), 1035-1044. doi:10.1007/s11136-010-9654-0
- Hsiao, A., Wong, M. D., Goldstein, M. S., Becerra, L. S., Cheng, E. M., & Wenger, N. S. (2006). Complementary and alternative medicine use among Asian-American subgroups: Prevalence, predictors, and lack of relationship to acculturation and access to conventional health care. *Journal of Alternative and Complementary Medicine*, 12, 1003–1010.

- Keyes, C. L., & Grzywacz, J. G. (2005). Health as a complete state: The added value in work performance and healthcare costs. *Journal of Occupational and Environmental Medicine / American College of Occupational and Environmental Medicine*, 47(5), 523-532.
- Kessler, R. C., Mickelson, K. D., & Williams, D. R. (1999). The prevalence, distribution, and mental health correlates of perceived discrimination in the united states. *Journal of Health and Social Behavior*, 40(3), 208-230.
- Kolenikov, S., & Angeles, G. (2004). The use of discrete data in principal component analysis with applications to socio-economic indice. *CPC/MEASURE*, Retrieved from <https://www.cpc.unc.edu/measure/publications/pdf/wp-04-85.pdf>
- Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the australian national survey of mental health and well-being. *Psychological Medicine*, 33(02), 357.
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S.-L. T., Walters, E. E., Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32(06), 959.
- Kessler, R. C., Mickelson, K. D., & Williams, D. R. (1999). The prevalence, distribution, and mental health correlates of perceived discrimination in the united states. *Journal of Health and Social Behavior*, 40(3), 208-230.
- Keyes, C. L., & Grzywacz, J. G. (2002). Complete health: Prevalence and predictors among U.S. adults in 1995. *American Journal of Health Promotion : AJHP*, 17(2), 122-131.

- Lam, R. E., Pacala, J. T., & Smith, S. L. (1997). Factors related to depressive symptoms in an elderly Chinese American sample. *Clinical Gerontologist, 17*(4), 57–70.
- Lubben, J., Blozik, E., Gillmann, G., Iliffe, S., von Renteln Kruse, W., Beck, J. C., & Stuck, A. E. (2006). Performance of an abbreviated version of the Lubben social network scale among three European community-dwelling older adult populations. *The Gerontologist, 46*(4), 503-513.
- Lubben, J., & Gironde, M. (2004). Measuring social networks and assessing their benefits. In *Social networks and social exclusion* (pp. 20-34). Aldershot, England; United Kingdom: Ashgate.
- Chen, S., Lubben, J. E., & Chi, I. (1998). Social support, stress, and depression in a context of aging and chinese culture.
- Mereish, E. H., Liu, M. M., & Helms, J. E. (2012). Effects of discrimination on chinese, pilipino, and vietnamese americans' mental and physical health. *Asian American Journal of Psychology, 3*(2), 91-103. doi:<http://dx.doi.org/10.1037/a0025876>
- Mui, A. C., & Domanski, M. D. (1999). A community needs assessment among Asian American elders. *Journal of Cross-Cultural Gerontology, 14*, 77–90.
- Mui, A. C., & Kang, S. (2006). Acculturation stress and depression among Asian immigrant elders. *Social Work, 51*, 243–255.
- Mui, A. C., Kang, S. K., Chen, L. M., & Domanski, M. D. (2003). The reliability of the Geriatric Depression Scale for use among elderly Asian immigrants in the U.S.A. *International Psychogeriatric, 15*, 253–271.

- Mui, A., Kang, D., Kang, S. Y., & Domanski, M. D. (2007). Language proficiency and health-related quality of life among Chinese and Korean immigrant elders. *Social Work in Health Care, 32*, 119–128.
- Mui, A., Nguyen, D. D., Kang, D., & Domanski, M. D. (2006). Demographic profiles of Asian immigrant elderly residing in metropolitan ethnic enclave communities. *Journal of Ethnic and Cultural Diversity in Social Work, 15*, 193–214.
- Pang, K. Y. C. (1996). Self-care strategy of elderly Korean immigrants in the Washington DC metropolitan area. *Journal of Cross-Cultural Gerontology, 11*, 229–254.
- Portes, A., & Rumbaut, R. G. (2006). *Immigrant america : A portrait* (3rd , rev., expand, and updat ed.). Berkeley: University of California Press.
- Pumariega, A. J., Rothe, E., & Pumariega, J. B. (2005). Mental health of immigrants and refugees. *Community Mental Health Journal, 41*, 581–597.
- Ryff, C. D., Keyes, C. L., & Hughes, D. L. (2003). Status inequalities, perceived discrimination, and eudaimonic well-being: Do the challenges of minority life hone purpose and growth? *Journal of Health and Social Behavior, 44*(3), 275-291.
- Salant, T., & Lauderdale, D. S. (2003). Measuring culture: A critical review of acculturation and health in Asian immigrant populations. *Social Science & Medicine, 57*, 71–90.
- Sue, D. (2005). Asian American/Pacific islander families in conflict. In K. H. Barrett, & W. H. George (Eds.), *Race, culture, psychology, and law* (pp. 257–268). Thousand Oaks, CA: Sage.

- Sue, S., Sue, D. W., Sue, L., & Takeuchi, D. T. (1995). Psychopathology among asian americans: A model minority? *Cultural Diversity and Mental Health, 1*(1), 39-51.
- Takeuchi, D. T., Chung, R. C., Lin, K. M., Shen, H., Kurasaki, K., Chun, C. A., & Sue, S. (1998). Lifetime and twelve-month prevalence rates of major depressive episodes and dysthymia among chinese americans in los angeles. *The American Journal of Psychiatry, 155*(10), 1407-1414.
- Takeuchi, D., Zane, N., Hong, S., Chae, D., Gong, F., Gee, G., et al. (2007). Immigrant-related factors and mental disorders among asian americans. *American Journal of Public Health, 97*(1), 84-90.
- Tam, S., & Neysmith, S. (2006). Disrespect and isolation: Elder abuse in Chinese communities. *Canadian Journal on Aging, 25*, 141–152.
- Tran, T. V. (2009). *Developing cross cultural measurement*. New York: Oxford University Press.
- Triandis, H. C. (2000). Cross-cultural psychology. In A. E. Kazdin (Ed.), *Encyclopedia of psychology* (pp. 361-364). London: Oxford University Press.
- U.S. Census Bureau. (2010). *American Community Survey: resources for congress*. Washington, DC.
http://www.census.gov/acs/www/about_the_survey/resources/congress.php. Retrieved on 01/12, 2011.
- U.S. Census Bureau. (2010). *The Asian and Pacific Islander population in the United States*. Washington, DC.
- U.S. Census Bureau. (2011). *Facts for Features: Asian/Pacific American Heritage Month: May 2011*. Retrieved on 01/26, 2012.

- US Department of Homeland Security, Office of Immigration Statistics. (2009). *2007 Yearbook of Immigration Statistics*, Table 3: Persons Obtaining Legal Permanent Resident Status by Region and Country of Birth: Fiscal Years 1998 to 2007.
- U.S. National Archives. (1996). *Chinese immigration and chinese in the united states* No. 99). Washington DC: National Archives and Records Administration. Retrieved 4/20/2009.
- van de Vijver. (2000). Cross-cultural psychology: Theories and methods of study. In A. E. Kazdin (Ed.), *Encyclopedia of psychology* (pp. 364-369). London: Oxford University Press.
- Waters, M. C., Ueda, R., & Marrow, H. B. (2007). *The new americans : A guide to immigration since 1965*. Cambridge, Mass.: Harvard University Press.
- Weathers, R. R. (2005). *A Guide to disability statistics from the American Community Survey*. Employment and Disability Institute, Cornell University.
- Williams, D. R., Yu, Y., Jackson, J. S., & Anderson, N. B. (1997). Racial differences in physical and mental health: Socioeconomic status, stress and discrimination. *Journal of Health Psychology*, 2, 335-351.
- World Health Organization. (1946). *WHO definition of health*. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Retrieved from <http://www.who.int/about/definition/en/print.html>

- Yee, B. W. K., DeBaryshe, B. D., Yuen, S., Kim, S. Y., & McCubbin, H. I. (2007). Asian American and Pacific Islander families: Resiliency and life-span socialization in a cultural context. In F. T. L. Leong, A. Ebreo, L. Kinoshita, A. G. Inman, & L. H. Yang (Eds.), *Handbook of Asian American psychology: Second edition* (pp. 69–86). Thousand Oaks, CA: Sage.
- Yip, T., Gee, G. C., & Takeuchi, D. T. (2008). Racial discrimination and psychological distress: The impact of ethnic identity and age among immigrant and united states-born asian adults. *Developmental Psychology, 44*(3), 787-800.
- Zane, N., & Mak, W. (2003). Major approaches to the measurement of acculturation among ethnic minority populations: A content analysis and an alternative empirical strategy. In K. M. Chun, P. B. Organista & G. Marín (Eds.), *Acculturation : Advances in theory, measurement, and applied research* (1st ed., pp. 39-60). Washington DC: American Psychological Association.

APPENDIX

Table 1. Six items Measuring Functional Disability from the American Community Survey (ACS)^a

1. Is this person deaf or does he/she have serious difficulty hearing?
 2. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?
 3. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?
 4. Does this person have serious difficulty walking or climbing stairs?
 5. Does this person have difficulty dressing or bathing?
 6. Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?
-

a. Respondents were asked to answer yes or no to these questions. Yes was recoded with a score of 1, and no was recoded with a score of 0.

Table 2. 10 items of the Kessler Psychological Distress Scale from the NLAAS^a

1. During the last 30 days, about how often did you feel depressed?
 2. During the last 30 days, about how often did you feel so depressed that nothing could cheer you up?
 3. During the last 30 days, about how often did you feel so restless that you could not sit still?
 4. During the last 30 days, about how often did you feel tired out for no good reason?
 5. During the last 30 days, about how often did you feel that everything was an effort?
 6. During the last 30 days, about how often did you feel nervous?
 7. During the last 30 days, about how often did you feel so nervous that nothing can calm you?
 8. During the worst month in the past year, how often did you feel hopeless?
 9. During the worst month in the past year, how often did you feel restless or fidgety?
 10. During the worst month in the past year, how often did you feel worthless?
-
- a. Respondents were asked to select from seven categories, 1 = all the time, 2 = most of the time, 3 = some of the time, 4 = a little of the time, and 5 = none of the time, with Refused coded as -9 and Don't Know coded as -8. For the purposes of this analysis, Refused and Don't Know were dropped, and the remaining categories will be reverse-coded, sequentially with 5 = 0 to 1 = 4, in order to reflect greater distress with a higher overall distress score.

Table 3. Demographic Characteristics of the Select Asian American Samples from ACS2009

	Chinese (n=33675)		Filipino (n=26271)		Vietnamese (n=13315)		Korean (n=13728)		Japanese (n=11447)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Age	37.0	21.7	36.8	21.5	34.1	20.9	34.8	20.7	42.4	23.9
Education	16.2	6.7	16.5	5.9	14.1	6.6	16.5	6.1	17.1	5.4
Income ^a	41670.0	60992.1	34673.4	40773.8	27433.6	38292.6	34115.4	58342.7	41944.6	55600.4
Years in US ^b	18.9	12.8	19.9	13.1	19.3	10.0	19.9	12.5	23.0	18.3
Gender	M		46.3%		44.8%		48.8%		44.2%	
	F		53.7%		55.2%		51.2%		55.8%	
Married	49.7%		46.9%		45.7%		47.4%		46.4%	
US-born	34.2%		37.4%		31.8%		30.4%		68.4%	
Immigrants										
Naturalized	41.8%		38.9%		51.9%		39.5%		8.6%	
Not Citizen	22.7%		19.7%		14.9%		27.4%		18.5%	
Speak English										
Very Well or Well	73.4%		92.6%		66.8%		72.8%		81.9%	

a. Income is based on person income and not household

b. Valid only for immigrants (Chinese=22168; Filipino=16453; Vietnamese=9081; Korean=9558; Japanese=3620)

Table 4. Demographic Characteristics of the Select Asian American Samples from NLAAS

	Vietnamese (n=484)		Chinese (n=586)		Filipino (n=495)	
	M	SD	M	SD	M	SD
Age	42.81	14.77	41.51	14.09	41.90	16.11
Education ^a	2.46	1.15	3.09	1.10	2.97	0.99
Household Income	54279.9	51611.7	77535.7	63029.0	81612.6	57466.6
Years in the US ^b	2	1	9	9	1	9
	2.62	1.12	2.23	1.47	2.06	1.65
Gender	M 48.0%		M 48.0%		M 46.3%	
	F 52.0%		F 52.0%		F 53.7%	
Married ^a	74.0%		68.0%		68.1%	
Immigrant ^a	96.0%		79.0%		68.6%	

a. Education is measured in 4 categories: 1 = less than 11 years, 2 = 12 years, 3 = 13-15 years, 4 = 16 or above

b. Years in the US is measured in 4 categories: 0 = US-born, 1 = less than 5 years, 2 = 5-10 years, 3 = 11 to 20, 4 = 20+

Additional Information on Data Sources

ACS 2009 1-Year PUMS File

I.) Overview of the Public Use Microdata Sample files (PUMS) The Public Use Microdata Sample (PUMS) contains a sample of actual responses to the American Community Survey (ACS). The PUMS dataset includes variables for nearly every question on the survey, as well as many new variables that were derived after the fact from multiple survey responses (such as poverty status). Each record in the file represents a single person, or--in the household-level dataset--a single household. In the person-level file, individuals are organized into households, making possible the study people within the contexts of their families and other household members. The PUMS contains data on approximately one percent of the United States population. The PUMS files are much more flexible than the aggregate data available on American FactFinder, though the PUMS also tend to be more complicated to use. Working with PUMS data generally involves downloading large datasets onto a local computer and analyzing the data using statistical software such as R, SPSS, Stata, or SAS. Since all ACS responses are strictly confidential, many variables in the PUMS file have been modified in small ways in order to protect the confidentiality of survey respondents. For instance, particularly high incomes are “top-coded”, uncommon birthplace or ancestry responses are grouped into broader categories, and the PUMS file provides a very limited set of geographic variables (explained more below).

II.) Public Use Microdata Area (PUMA)

While PUMS files contain cases from nearly every town and county in the country, most towns and counties (and other low-level geography) are not identified by any variables in the PUMS datasets. The most detailed unit of geography contained in the PUMS files is the Public Use Microdata Area (PUMA). PUMAs are special non-overlapping areas that partition each state into contiguous geographic units containing no fewer than 100,000 people each. ACS PUMS files from 2005-2009 rely on PUMA boundaries that were drawn by state governments at the time of the 2000 Census. PDF-format maps of PUMA boundaries are available from the Census Bureau's web site at <http://www.census.gov/geo/www/maps/puma5pct.htm>. From this index page choose a state. When you get to the PDF document be sure to note that the first page is an index page that displays entities called "Super PUMAs". These are not the PUMAs available in the ACS PUMS files. The PUMAs in the ACS PUMS are sometimes referred to a "5% PUMAs" because they were also used on the 5% Sample PUMS files from the 2000 decennial census, whereas the Super-PUMAs (also known as "1% PUMAs") were the ones used on the 1% PUMS files in 2000. The key to using these maps is to understand that the PUMAs nest within the Super-PUMAs and these PDF files have, following the initial state-level Super-PUMA overview map, 1 or more inset maps showing more detail. If data users have doubts about the way they are computing estimates should attempt to reproduce the estimates that are provided in the files located on the following URL: <http://www.census.gov/acs/www/Products/PUMS/>

IV.) Getting PUMS data

PUMS files can be accessed via the ACS website at

http://www.census.gov/acs/www/data_documentation/pums_data/.

It is also possible to get PUMS data from the Census Bureau's DataFerret, which has the additional feature of being able to make tables and perform basic analysis online. This tool is particularly useful for researchers who need a quick statistic or do not have access to statistical software. DataFerret is available at

http://www.census.gov/acs/www/Products/PUMS/acs_pums_download_via_ferrett.htm

V.) Analyzing PUMS data A. PUMS file structure The ACS questionnaire contains “household” items that are the same for all members of the household (such as the number of rooms in the home) and “person” items that are unique for each household member (such as age, sex, and race). The ACS PUMS files are made available in this same structure. Researchers who are analyzing only household-level items can use the household files, whereas those using only person-level variables can use the person-level files. Some data users will need to use household and person items together—for instance, to analyze how the number of rooms in a home varies by the race of the household. This type of analysis will require the merging of the household and person files. This merger must rely on the SERIALNO variable, which is the same in the household and person files. Below are instructions for merging the housing and population PUMS files, in the form of an italicized SAS program and pseudo-code. Use the variable SERIALNO to merge population and housing files. 1. First make sure the files are sorted by SERIALNO: *proc sort data=population; by serialno; run; proc sort data=housing; by serialno; run;* 2. Then merge the two files together using SERIALNO as a merge key. *data combined; merge population (in=pop) housing; /* In SAS, the 'in=' option will allow you to keep only those housing units that have people */ by serialno; /* This SAS statement keeps only those housing units that were in the population file */ if pop; run;* You should not merge the files unless the estimates you want require a merge. Note that there are many estimates that can be tabulated from the person file and from the household file without any merging. The suggested merge will create a person level file, so that the estimate of persons can be tallied within categories from the household file and the person weights should be used for such tallies. **Please note that housing characteristics cannot be tallied from this file without extra steps to ensure that each housing weight is counted only once per household.**

VI.) Weights in the PUMS The ACS PUMS is a weighted sample, and weighting variables must be used to generate accurate estimates and standard errors. The PUMS file includes both population weights and household weights. Population weights should be used generate statistics about individuals, and household weights should be used to generate statistics about housing units. The weighting variables are described briefly below. PWGTP - Person's weight for generating statistics on individuals (such as age). WGTP - Housing Weight for generating statistics on households (such as average household income). WGTP1-WGTP80 and PWGTP1-PWGTP80 - replicate weighting variables, used for generating statistics on individuals or households with the most accurate standard errors available. While PWGTP and WGTP can be used to generate both the point estimates and error for the characteristic variables, replicate weights can be used to create a even more accurate 5 estimates of just the standard error. Replicate

weights are used to calculate what we refer to as direct standard errors. Direct standard errors will often be more accurate than generalized standard errors, although they may be more inconvenient for some users to calculate. Each housing unit and person record contains 80 replicate weights. For any estimate X , 80 replicate estimates are also computed using the replicate weights. Using replicate weights leads to a better estimate of standard error than simply using the adjustments due to the person's or household weights.

To use the replicate weights to calculate an estimate of the direct standard error, first form the estimate using the full PUMS weight, then form the estimate using each of the 80 replicate weights--providing both the full PUMS estimate and 80 replicate estimates. These should then be plugged into the following formula, which is explained in more detail in the accuracy document (found at:

http://www.census.gov/acs/www/Downloads/data_documentation/pums/Accuracy/2009AccuracyPUMS.pdf): Where X_r is a replicate weight from X_1 to X_{80} , and X is the full PUMS weighted error. The technical explanation of the ACS replicate weights is in chapter 12 of the Design and Methodology document found at:

http://www.census.gov/acs/www/Downloads/survey_methodology/acs_design_methodology_ch12.pdf. For more information on the theoretical basis, please reference -Fay, R. and Train, G. (1995), "*Aspects of Survey and Model-Based Postcensal Estimation of Income and Poverty Characteristics for States and Counties*," **Proceedings of the Section on Government Statistics**, American Statistical Association, pp. 154-159, 1995." 6

V.) Additional Information

Some of the PUMS estimates will be different from the estimates for the same characteristics published in the American FactFinder and for Census 2000. For an explanation of these differences, see the 2009 Accuracy of the PUMS document located on the following URL:

http://www.census.gov/acs/www/Downloads/data_documentation/pums/Accuracy/2009AccuracyPUMS.pdf

After the release of the 2009 file, we may issue updates and corrections to the 2008 version of the PUMS. We will keep users aware of these updates via the ACS Alert from the ACS website and on the ACS errata page located on:

<http://www.census.gov/acs/www/UseData/Errata.htm>

2009 ACS 1-Year PUMS Variable Changes

Variables that changed from 2008 (See 2009 ACS PUMS data dictionary) Variables that have substantive changes: ADJINC, YBL, CITWP, MARHYP, YOEP, INDP, NAICSP, VPS Variables that have cosmetic changes: ADJHSG, AGS, CONP, FULP, MHP, MRGI, MRGP, MRGT, MRGX, RNTM, SMP, VALP, GRNTP, OCPIP, SMOCP, SMX, SVAL, TAXP, FACRP, FAGSP, FBATHP, FBDSP, FBLDP, FBUSP, FCONP, FELEP, FFSP, FFULP, FGASP, FHFLP, FINSP, FKITP, FMHP, FMRGIP, FMRGP, FMRGTP, FMRGXP, FMVP, FPLMP, FREFRP, FRMSPP, FRNTMP, FRNTP, FRWATP, FSINKP, FSMP, FSMXHP, FSMXSP, FSTOVP, FTAXP, FTELP, FTENP, FTOILP, FVACSP, FVALP, FVEHP, FWATP, FYBLP, CIT, COW, JWRIP, LANP, OCCP, POBP, POVPIP, SOCP Deleted Variables (See 2009 ACS PUMS data dictionary) UWRK New variables for 2009 (See 2009 ACS PUMS data dictionary) FOD1P, FOD2P, FHINS3C, FHINS4C, FHINS5C, WRK

National Latino and Asian American Study (NLAAS)

The Collaborative Psychiatric Epidemiology Surveys (CPES) were initiated in recognition of the need for contemporary, comprehensive epidemiological data regarding the distributions, correlates and risk factors of mental disorders among the general population with special emphasis on minority groups. This project joins together three nationally representative surveys: the National Comorbidity Survey Replication (NCS-R), the National Survey of American Life (NSAL), and the National Latino and Asian American Study (NLAAS).

The primary objective of the CPES was to collect data about the prevalence of mental disorders, impairments associated with these disorders, and their treatment patterns from representative samples of majority and minority adult populations in the United States. Secondary goals were to obtain information about language use and ethnic disparities, support systems, discrimination, and assimilation in order to examine whether and how closely various mental health disorders are linked to social and cultural issues.

The CPES surveys were developed under the sponsorship of the National Institute of Mental Health (NIMH), and the data collection was conducted by the Survey Research Center (SRC) of the Institute for Social Research at the University of Michigan from early 2001 through the end of 2003.

The National Latino and Asian American Study (NLAAS) is a nationally representative community household survey that estimates the prevalence of mental disorders and rates of mental health service utilization by Latinos and Asian Americans in the United States. The central aims of the NLAAS were threefold. First, to describe the lifetime and 12-month prevalence of psychiatric disorders and the rates of mental health services use for Latino and Asian American populations using nationwide representative samples of these groups. Second, to assess the associations among social position, environmental context, and psychosocial factors with the prevalence of psychiatric disorders and utilization rates of mental health services. Third, to compare the lifetime and 12-month prevalence of psychiatric disorders, and utilization of mental health services of Latinos and Asian Americans with national representative samples of non-Latino whites (drawn from the National Comorbidity Study-Replication (NCS-R) and African Americans (drawn from the National Survey of American Life (NSAL).

The NLAAS survey was administered to a sample of non-institutionalized Latino and Asian American adults aged 18 or older residing in households located in the coterminous United States. The NLAAS sample identified four Latino target survey populations (Cuban, Mexican, Puerto Rican, and other adults of Latino descent), four Asian American target survey populations (Chinese, Filipino, Vietnamese, and other adults of Asian American descent), and a control group of non-Hispanic, non-Asian white respondents. Recognizing that language barriers may discourage survey participation for minorities who do not speak English, or are not fluent in it, the NLAAS instrument was translated into four languages. The interviews took place between May 2002 and December 2003. For the most part, interviews were conducted using laptop computer-assisted personal interview methods in the homes of the respondents.

The NLAAS project yielded 4,864 adult interviews: 2,095 Asian respondents, 2,554 Latino respondents, and 215 non-Hispanic, non-Asian white respondents. Much of the information in this User Guide is derived from Special Issue 2 of the *International Journal of Methods in Psychiatric Research*, Volume 13, Number 4, 2004 entitled "The NIMH Collaborative Psychiatric Epidemiology Surveys Initiative: Designs, Methods, and Instrumentation" (<http://www3.interscience.wiley.com/cgi-bin/jissue/112542415>). See also Volume 13, Number 2, 2004 of the same journal for additional information (<http://www3.interscience.wiley.com/cgi-bin/jissue/112542416>).

The selection of a probability sample of respondents for each study's interview required a four-step sampling process – a primary stage sampling of U.S. Metropolitan Statistical Areas (MSAs) and counties, followed by a second stage sampling of area segments, a third stage sampling of housing units within the selected area segments, and concluding with the random selection of eligible respondents from the sample housing units.

The primary stage units (PSUs) of SRC's National Sample are either MSAs, single counties, or a grouping of geographically contiguous counties with small populations. In each CPES sample design, PSUs are assigned to explicit sampling strata based on MSA/non-MSA status, PSU size, geographic location, and population characteristics. Depending on the CPES study sample design, from 12 to 20 of the primary stage strata contain only a single self-representing (SR) metropolitan PSU. Each SR PSU is included in the sample with certainty in the primary stage of selection. The remaining non-self-representing (NSR) primary stage strata in each design contain more than one PSU. From each of these NSR strata, one PSU is sampled with probability proportionate to its size measured in occupied housing unit counts reported at the most recent census.

The designated second-stage sampling units (SSUs) in each CPES sample design are termed area segments. Area segments were formed by linking geographically contiguous census blocks to form units with a minimum number of occupied housing units (typically 50 to 100 based on the needs of the study). Within primary stage units, area segments were stratified at the county level by geographic location and race/ethnicity composition of residents' households. The race/ethnicity stratification of area segments played a particularly important role in the NSAL and NLAAS sample designs where it was used both to improve the sampling precision of the design and as a basis for more cost-effective oversampling in area segments with higher densities of households for targeted race and ethnicity subpopulations. Within each second stage stratum, the actual probability sampling of area segments was performed with probabilities proportionate to census counts of the occupied housing units for the census blocks that comprise the area segment.

The SRC field staff conducted an up-to-date enumeration or 'listing' of all housing units located within the physical boundaries of the selected area segments for each CPES sample design. A third-stage sample of housing units was then selected for screening interviews according to a predetermined sampling rate.

The third stage sampling rate was computed for each selected area segment in the CPES sample design. This rate was then used to select a systematic random sample of actual housing units from the area segment listing. Each sample housing unit was contacted in person by an interviewer. Within each cooperating sample household, the interviewer conducted a short screening interview with a knowledgeable adult to determine if household members met the study eligibility criteria. If the informant reported that one or more eligible adults lived at the sample housing unit address, the interviewer prepared a complete listing of household members and proceeded to randomly select a respondent for the study interview. The random selection of the respondent was performed using a special adaptation of the objective household roster/selection table method developed by Kish (1949).

National Latino and Asian American Study (NLAAS) Sample Design

The survey populations for the NLAAS study included all Latino and Asian American adults who resided in households in the US states and Washington, DC. Latinos were divided into four strata of interest: Mexican, Puerto Rican, Cuban, and all other Latinos. The Asian American survey population was also stratified based on eligible adults' ancestry or national origin:

Chinese, Filipino, Vietnamese, and all other Asians. This stratification of the NLAAS survey populations relied on self-reports by household members at the time of the household screening. In cases where a member of the survey population reported belonging to more than one Latino or Asian American target population, the following order of priority was used to assign individuals to a single group for the purpose of the stratified sample selection:

1. Vietnamese;
2. Cuban;
3. Filipino;
4. Puerto Rican;
5. Chinese;
6. Mexican;
7. other Asian; and
8. other Latino.

Institutionalized persons including individuals in prisons, jails, nursing homes, and long-term medical or dependent care facilities were excluded from the study populations. Military personnel living in civilian housing were eligible for the study, but due to security restrictions residents of housing located on a military base or military reservation were excluded.

The NLAAS is based on a stratified probability sample design that includes multiple area probability sample components:

An NLAAS Core sampling of PSUs, area segments, and housing units that is designed to be nationally representative of all US populations including Latinos and Asians

The NLAAS High Density (HD) supplemental samples, targeted oversamples of geographic areas with greater than 5% residential density for individual national origin groups of interest in the NLAAS

The NLAAS Core sample is designed to provide a nationally representative sample of Latinos and Asian Americans without regard to geographic residential patterns. The price for the national representation under the NLAAS Core sample design was a high per unit cost of data collection for eligible respondents. This high cost per interviewed case was due to the fact that many area segments in the Core sample had very low density of the populations of interest in NLAAS and there was a need to screen large numbers of households to identify the targeted samples of Latinos and Asians. Even for the more prevalent and widely distributed Mexican or Chinese ancestry groups, it was very costly to screen a general national area probability sample to identify and interview a large nationally representative sample of eligible adults. Survey costs would have been prohibitively high if this method alone had been used to obtain desired numbers of sample observations of less prevalent national origin groups (such as Puerto Ricans, Cubans, Filipinos, and Vietnamese).

To maximize the statistical efficiency of comparisons between the NLAAS survey populations and the larger US adult population, the primary and secondary stages of the NLAAS Core national sample design were completely integrated with the National Comorbidity Survey Replication (NCS-R) national sample design. The NLAAS Core and NCS-R designs shared

the same 62 primary areas representing the MSA and non-MSA strata for the 48 coterminous United States (see Tables 2 and 5). Since full representation of Asian ancestry populations was critical to the NLAAS, the Honolulu HI MSA was added to the primary stage sample as a metropolitan self-representing PSU, bringing the total number of NLAAS National Sample

PSUs to 63. The second stage of the NLAAS national sample design component was also fully integrated with the second stage of the NCS-R national sample. The two designs did not share exactly the same area segments and housing unit listings; however, each selected NLAAS Core area segment was paired with an NCS-R area segment and the paired segments from the two samples were physically adjacent to one another - maximizing the 'geographical/ecological correlation' of the two samples (Kish, 1987). The decision to introduce geographic 'overlap' with the NCS-R to the NLAAS Core national sample was based on statistical aims for the NLAAS. A primary aim of the NLAAS was to enable comparisons of mental health characteristics both among the NLAAS survey populations of Latinos and Asians and with the larger US population. Full geographic linkage of the NLAAS national sample area segments to the NCS-R maximized the geographic and socio-economic correlation of the two samples. Since both the NCS-R and the NLAAS Core were designed to be nationally representative, this 'correlation of designs' produced no major inefficiencies for stand alone analysis of the NLAAS survey data but significantly reduced the variance of statistical analyses designed to contrast the populations from the two studies. For the purpose of statistical efficiency in comparing the NLAAS survey population and the larger US adult population, the primary and secondary stages of the NLAAS Core national sample design

were integrated with the National Comorbidity Survey Replication (NCS-R) national sample design.

Comparison of Results in ACS with and without the Use of Replicate Weights

Without Weights:

```
Iteration 0:  log likelihood = -9842.6815
Iteration 1:  log likelihood = -8087.1485
Iteration 2:  log likelihood = -7734.5879
Iteration 3:  log likelihood = -7726.2418
Iteration 4:  log likelihood = -7726.2342
Iteration 5:  log likelihood = -7726.2342
```

```
Logistic regression                               Number of obs   =       22096
                                                    LR chi2(17)     =       4232.89
                                                    Prob > chi2     =       0.0000
Log likelihood = -7726.2342                       Pseudo R2      =       0.2150
```

```
-----+-----
disable_dum | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
ethnic |
      2 |   2.081976   .1236146    12.35  0.000     1.853262   2.338916
      3 |   1.613055   .1028398     7.50  0.000     1.423578   1.827752
      4 |   1.06431    .074717     0.89  0.375     .927496    1.221306
      5 |   1.001434   .1083066     0.01  0.989     .8101464   1.237887
      |
fgender |   1.0145     .0463123     0.32  0.753     .9276714   1.109455
married |   .6095335   .02871     -10.51  0.000     .5557823   .6684832
lgpincp |   .9649085   .0065603    -5.25  0.000     .9521359   .9778526
      sch1 |   .9722188   .0038135    -7.18  0.000     .9647731   .979722
citizen |   1.246092   .0770538     3.56  0.000     1.103862   1.406648
```


	SDR					
disable_dum	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
-----+-----						
ethnic						
2	1.81042	.1464077	7.34	0.000	1.545052	2.121365
3	1.480378	.1182621	4.91	0.000	1.265823	1.731299
4	.9360919	.0751598	-0.82	0.411	.7997875	1.095626
5	.9135125	.1295508	-0.64	0.524	.6918316	1.206226
fgender	1.001477	.0511131	0.03	0.977	.9061449	1.106839
married	.5996398	.0318134	-9.64	0.000	.540419	.6653503
lgpincp	.9696139	.0082025	-3.65	0.000	.9536698	.9858245
schl	.9746505	.0051382	-4.87	0.000	.9646317	.9847733
citizen	1.234861	.0984438	2.65	0.008	1.056233	1.443698
agearrive	1.032881	.0041714	8.01	0.000	1.024737	1.041089
moreequal15	1.731156	.1891886	5.02	0.000	1.397375	2.144665
agegroup						
1	1.889546	.1356096	8.87	0.000	1.641603	2.174938
2	4.712474	.4813758	15.18	0.000	3.857441	5.757031
engspk	.7253097	.0301427	-7.73	0.000	.6685731	.786861
n_lngi	.90179	.0597744	-1.56	0.119	.7919254	1.026896
newwave						
0	3.130164	.5638553	6.33	0.000	2.199049	4.455527
1	1.713447	.2192603	4.21	0.000	1.333359	2.201882

_cons	.0462284	.013718	-10.36	0.000	.0258417	.0826984
-------	----------	---------	--------	-------	----------	----------
