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**Acculturation and Psychological Distress among First Generation
Asian Americans: The Roles of Acculturative Stress and
Social-cultural Resources**

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Social-cultural Resources**

by

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Acculturation and Psychological Distress among First Generation Asian Americans: The Roles of Acculturative Stress and Social-cultural Resources

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Most acculturation research has been focused on the direct relationship between acculturation and mental health (Yoon, Langrehr, & Ong, 2011; Salanta & Lauderdale, 2003; Koneru, Weisman de Mamania, Flynn, & Betancourt, 2007). However, less is known about the mechanisms for this relationship. Social-cultural resources such as friend and neighbor support may have a beneficial impact on mental health, and acculturative stress such as the level of family conflict and perceived racial discrimination would be expected to be risk factors (Kawachi & Berkman, 2001; Wolff & Agree, 2004; Gong et al., 2003; Kerr-Correa, Igami, Hiroce, & Tucci, 2007).

The present study investigated the mediating roles of acculturative stress and social-psychological resources in the relationship between acculturation and psychological distress among first generation Asian Americans. Data were from 1528 Asian Americans who participated in the National Latino and Asian Americans Study (NLAAS), a nationally representative study of the Asian immigrant population in the

U.S. Using structural equation modeling with latent variables, direct and indirect influences on Asian immigrant psychological distress were examined.

The findings indicate that higher acculturation was not directly associated with psychological distress for Asian immigrants, but there was an indirect pathway from higher acculturation to poorer mental health through acculturative stress. Asian immigrants with higher levels of acculturation experienced more acculturative stress, which contributed to more psychological distress symptoms. However, this finding was moderated by gender, holding only for women. On the other hand, while a higher level of acculturation was also associated with more perceived social resources, the expected protective effect of these resources was not present. The findings show the complex relationship between acculturation and psychological distress during the acculturative process of Asian immigrants.

Table of Contents

List of Tables	x
List of Figures	xi
Chapter One INTRODUCTION	1
Chapter Two LITERATURE REVIEW & CONCEPTURAL FRAMEWORK	6
Immigrants and Mental Health	6
Acculturation and Mental Health	8
Acculturative Stress and Mental Health	11
Discrimination	12
Family Cultural Conflict	13
Social-Cultural Resources and Mental Health	15
Social Support	15
Neighbor Trust and Support	16
Religion	17
Socio-demographic Factors and Mental Health	18
Socioeconomic Status	18
Gender	19
Age at Immigration	20
Theoretical Framework	21
Life-course Perspective	22
Acculturation Theory	25

Stress Process Theory	27
Summary	29
Reserch Qustions	30
Chapter Three METHODOLOGY	33
Sample.....	33
Measurement.....	33
Data Anlaysia	39
Chapter Four RESULTS	41
Chapter Five DISCUSSION	68
Appendix A Correlation of Latent Factors	79
Appendix B Measures of Latent Variables	82
Appendix C Intercorrelation for Latent Factors.....	84
Reference	85

List of Tables

Table 1:	Demographic Variables for Immigrant Asian Americans	42
Table 2:	The measurement invariance test procedure.....	53
Table 3:	Model Fit Indices for Measurement and Structural Invariance Tests for Gender Difference.....	61
Table 4:	Fit Statistics for the Two Group Path Models	61
Table 5:	Model Fit Indices for Measurement and Structural Invariance Tests for Age at Immigration.....	65
Table 6:	Fit Indices for Two Group Path Models	65

List of Figures

Figure 1:	Proposed conceptual model for Asian American's Mental health	32
Figure 2:	Standardized Final Confirmatory Factor Model	48
Figure 3:	Standardized Final Structural Model controlling for Demographic Characteristics	52
Figure 4:	Standardized Structural Model for the Asian immigrant men	58
Figure 5:	Standardized Structural Model for the Asian immigrant women ...	59

CHAPTER ONE: INTRODUCTION

Asian Immigration

Little is known about the mental health of ethnic minorities and immigrants in the United States. Among these immigrants, Asian Americans are the fastest growing immigrants in the United States. (U.S. Census Bureau, 2002). Despite the rapid growth of this population, it is surprising that the health problems of Asians are rarely examined and understood (Kandula, Kersey, and Lurie, 2004; Lin-Fu, 1988). In fact, studies on the mental health status among immigrants, especially Asian immigrants, remain limited and inconclusive (Kandula et al., 2004). Nevertheless, mental health is fundamental to overall health and is the basis for well-being (U.S. Department of Health and Human Services, 2000); therefore, examining the mental health status of immigrants is crucial, because the processes of migration may lead to emotional and psychological consequences (Ornelas & Perreira, 2011). Several studies have found Asian Americans to experience mental health problems due to the stress of immigration, minority status, and discrimination (Spencer, Chen, Gee, Fabian, & Takeuchi, 2010; Chen, Kazanjian, & Wong, 2009). There is need to develop a more understanding of the factors that contribute to poor mental health among Asian immigrants (Yoon, Langrehr, & Ong, 2011).

Acculturation and Mental Health

Since over 60% of the Asian American population is included in immigrants (U.S. Census Bureau, 2007), much of the past research on Asian immigrants and their US-born generation communities examines the relationship between immigration and health

(Breslau & Chang, 2006). Immigrants come from a particular culture and that culture remains with them when they move to their new country. As a result, most immigrants may experience the acculturation process, which involves life changes and numerous challenges that can affect the health of immigrants (Samaniego and Gonzales, 1999). Immigration, acculturation, culture and traditional values are important to understand when looking at mental health status for minority population.

The immigration literature that does exist on minority populations has focused mainly on Latino immigrants. Mental health research on Asian immigrant groups is significantly limited. Few studies conducted on Asian American populations have focused on specific age groups. Moreover, it is important to consider that acculturation may be different between younger age at immigration and older age at immigration and that gender and socio-economic status have been found to have impacts on the mental health status among immigrants and should be taken into consideration. Late migration is associated with poorer mental health outcomes because lack of English fluency and social support networks of later migrants may contribute to psychological stress (Angel et al., 2001). Asian women experience more depressive symptoms than Asian men and immigrants with lower social class show more severe mental disorders than those of higher social status (Lai, 2004a, 2005; Lai & Yuen, 2003).

Mediating Factors between Acculturation and Mental Health

Until recently, acculturation research has mostly focused on the direct relations to mental health (Yoon, Langrehr, & Ong, 2011). Without examining mediating variables,

the influence of acculturation on mental health remains unclear (Yoon, Lee, & Goh, 2008). Several previous studies that examined the relationship between acculturation and mental health were limited by considering only their direct relations (Salanta & Lauderdale, 2003; Koneru, Weisman de Mamania, Flynn, & Betancourt, 2007). Thus, acculturation research study should include mediating factors.

Previous research suggests that the relationship of acculturation to mental health outcomes is both positive and negative. Some research shows that acculturation has beneficial effects on health, whereas other studies demonstrate that acculturation has a negative relationship with health (Epstein et al., 2003; Michaels Miller et al., 2006; Gil, Wagner, & Vega, 2000). Whether the relationship is positive or negative depends upon several factors: how acculturation and mental health concepts are measured, the specific immigrant group studied, and the testing of the acculturation and mental health relationship.

When understanding mental health status among Asian Americans, it is important to examine possible contributing factors. Social-psychological factors such as friends and neighbor support and religiosity, particularly religious affiliation, impact mental health conditions, and ethnic and cultural factors such as the level of family conflict and racial/ethnic discrimination would be included as risk factors for mental illness (Kawachi & Berkman, 2001; Wolff & Agree, 2004; Gong et al., 2003; Kerr-Correa, Igami, Hiroce, & Tocchi, 2007).

This study examined the mediating factors (acculturative stress and social-cultural resources) in the relationship between acculturation and psychological distress among first generation Asian Americans. Applying Pearlin and colleagues (1981) theory of the stress process provides a theoretical framework for both the direct association between acculturative stress, such as unfair treatment, racial discrimination and family conflict, and mental health, and the positive relationship between social-psychological resources, such as social support and religion, and health. The life-course perspective also provides a flexible theoretical framework that can be used to investigate the effects of potential moderators, such as age at immigration and gender, on immigrants during the acculturation process.

The Present Study

To address the need for a comprehensive model, this study will propose and test a conceptual model of the relationship of acculturation to mental health status by integrating acculturative stress, including unfair treatment, perceived racial/ethnic discrimination and family cultural conflict, and social-cultural resources, including neighbor and friend social support and religious involvement, as potential mediators in the relationship between acculturation and mental health.

This study investigates the relation of acculturation to mental health among first generation Asian immigrant. Specifically, the following research questions guided this study:

1. What is the relationship between acculturation and psychological distress outcomes among first generation Asian immigrants?
2. Do acculturative stress mediate the relations between acculturation and psychological distress?
3. Do social-psychological resources mediate the relations between acculturation and psychological distress?

This study tested three hypotheses and explored the moderation of the hypothesized relations. The first hypothesis posits that a higher level of acculturation has direct positive effects on psychological distress. The second and third hypotheses posit that the relationship between acculturation and psychological distress is mediated by acculturative stress and social-cultural resources. In addition, the study explored the effects of two potential moderators (age at immigration and gender) on the strength of the hypothesized relations.

CHAPTER TWO: LITERATURE REVIEW & CONCEPTUAL FRAMEWORK

This chapter presents a review of relevant literature and the conceptual framework for the study. The first section provides a brief overview of immigration, acculturation, and psychological distress of first generation Asian Americans. It describes acculturation's relevance to the conceptualization of mental health and the mediating roles of acculturative stress and social-cultural resources for Asian immigrants.

In the next section, a review of literature on the relationship between acculturation and psychological distress, as well as related factors is presented. From a stress process perspective, it provides a theoretical framework for both the direct association between acculturative stress, including unfair treatment, racial/ethnic discrimination and family conflict, and mental health, and the positive relationship between social-psychological resources and psychological distress. The life course perspective also provides a flexible theoretical framework that can be used to investigate the effects of potential moderators, such as age at immigration and gender, on the relation of acculturation to mental health in Asian immigrants.

Immigrants and Mental Health

According to the Census Bureau's Current Population Survey (CPS), in 2003 approximately 33 million (11% of the total population) in the United States population were foreign-born. Although the population of Asian immigrants remains relatively small

compared to Latino and African Americans in the United States, Asian immigrants had the fastest growth rate (46%) of ethnic minority between 2000 and 2010. In 1970, the US-born Asian population totaled about 1.5 million. However, according to the U.S. Census Bureau, the Asian American had increased to roughly more than 17 million (U.S. Census Bureau, 2010). It is expected that the Asian American population will reach 40.6 million in 2050 (Passel & Cohn, 2008).

There is evidence to suggest that white, black, Hispanic, and Asian immigrants enjoy health advantage over their American-born ethnic counterparts. This is often called the “healthy immigrant effect” or “epidemiological paradox” (Rumbaut 1997a, 1997b). This advantage has been explained by the “Healthy Immigrant Hypothesis,” which basically states that immigrants are relatively healthy groups who can choose to migrate (Palloni & Morenoff, 2001; Palloni & Arias, 2004). In addition, “The salmon bias effect,” asserts that many immigrants tend to return to their home countries to live out the rest of their lives (Palloni & Arias, 2004). However, this explanation has been well-documented only for the Hispanic health paradox. The health problems of Asian Americans have been poorly understood and inadequately examined (Lin-Fu 1988).

In general, many Asian immigrants experience adaptation or adjustment difficulties in the host society and suffer from psychological distress (Pernice & Brook, 1996). Their mental health status is influenced by many factors, including nativity or generational status, the ability of the English language, ethnic contacts, socioeconomic status, and culture (Johnson et al., 1995). Although Asian immigrants and their decedents

are often characterized as "model minorities," some researchers believe the concept is quite misleading (Johnson et al., 1995). In contrast to their model minority image, Asian immigrants also experience difficulties in adjusting to the host society. In fact, Asians are more likely to be in poverty and receive less income return for their educational attainment than White Americans.

Acculturation and Mental Health

Traditional understanding posits that immigration has been perceived as a stressful experience. Embracing a new culture, learning a new language, and meeting new people while apart from family, relatives, and friends has proven to be daunting for immigrants (Lee et al., 2009; Frisbie, Parker, Cho, & Hummer, 2001). However, there is no agreement on the various impacts acculturation levels have on immigrants' mental health. The acculturation process can be either very detrimental or beneficial to immigrants' psychological well-being.

Generally, there are two perspectives regarding the relationship between acculturation and psychological distress among Asian Americans. The two aspects focus on both the problems and positive contributions of acculturation. One view claims that acculturation has been associated with good mental health. According to this view longer exposure to American society leads to greater experience with U.S. systems and improvement in English language ability, which in turn increase quality of life. That is, immigrants who have lived longer in the U.S. have had access to more health care services and other programs which help them not only meet daily needs but also live

fuller lives (Valencia-Garcia, Simoniet, Alegri'a, & Takeuchial, 2012). Furthermore, Shim and Schwartz (2008) believe that acculturation is beneficial to Asian immigrants. They examined the relationship between acculturation, adherence to Asian values, and mental health among Korean Americans and found that no single variable alone was related to mental health status. However, greater acculturation to the host country, less adherence to Asian culture, and higher levels of education from the host country predicted better psychological well-being. Additionally, Nguyen (2008) investigated the association of fathers' acculturation levels and mental health among Vietnamese American adolescents and found that adolescents who have more acculturated fathers showed higher levels of self-esteem and lower depressive symptoms. Research with Korean immigrants in New York City showed that immigrants with fluent English ability have lower levels of depressive symptoms because they feel more connected with mainstream culture and society (Bernstein et al., 2011)

Then there is the research which shows that acculturation can also lead to poorer mental health (Masten et al., 2004). Acculturation to the U.S. has been associated with increases in unhealthy behaviors among Asian and Latino Americans including violence, smoking, alcohol and drug use in some studies (Despues & Friedman, 2007; Gong et al., 2003;Hahm, Lahiff, & Guterman, 2003; Iwamoto & Liu, 2010; Yi & Daniel, 2001). Compared to those who speak English at home, adolescents who speak a native language at home are more likely to and to have less deviant peer associations (Saint-Jean, Martinez, & Crandall, 2008). Further, fluency in English allows immigrant children access to the broader community where they can encounter new situations where drugs are available (Saint-Jean,

Martinez, & Crandall, 2008). In fact, many studies showed that as foreign born immigrant youths become acculturated, they are at increased risk of substance use compared with US-born youths (Blake et al., 2001; Epstein et al., 2001). Immigrant populations show increased risk of substance use as they stay longer in the host society/culture (Unger, Reynolds, Shakib, Spruijt-Metz, Sun, & Johnson, 2004).

Researchers should focus on the specific circumstances in which immigrants are embedded. For example, although smoking rates among Asian youth who are more acculturated are generally higher than among those who are less acculturated (Unger et al., 2000), parents who have lived in the United States longer (more acculturated) are more likely to prohibit their children's smoking in the household (Ma et al., 2004). Kim et al. (2006) studied the relationship between cultural marginality and depression among Asian American parents and adolescents and found that male parents' depressive symptoms are associated with marginalization in the host/Western culture, whereas among female parents marginalization in country of origin/Asian culture was related to depression. Considering family context, acculturation can lead to widely different outcomes. Likewise social and cultural contexts of immigrants contribute to different acculturation patterns, and their influences on mental health status will vary.

Given such inconsistent findings in previous studies, individual factors and social and cultural contexts such as acculturative stress due to family conflict, unfair treatment and racial discrimination, social-cultural resources, such as religiosity and social support, and social-demographic indicators, such as education, age at immigration, and gender, must be considered to determine the effect of acculturation on mental health. Strong

familial and social network cultures in Hispanic and Asian cultures should be protective of health. Accompanying the process of acculturation are greater exposures to acculturative stressors, such as perceived racial discrimination, unfair treatment, and family conflict.

Acculturative Stress and Mental Health

Acculturative stress is defined as the stress related to the reactions to intercultural contact and adaptation to a new culture and environment during the acculturation process (Berry, 2006). Berry's acculturative stress model (Berry, 1997) was conceptualized from Lazarus's stress theory (Lazarus, 1991) and the stress and coping model of Lazarus and Folkman (1984), which looks at stress as a relational concept. Berry (2006) noted that acculturative stress may motivate an individual's adjustment to the new culture and environment. However, when the stress is not well managed and the coping capability is exceeded, the level of acculturative stress will continue to increase and introduce significantly negative health consequences.

Acculturative stress is considered detrimental and thought to be the main mechanism for psychological distress among the immigrant population. Acculturative stress has been linked to psychological and health problems including depression, anxiety, alienation, identity confusion, and cultural marginality (Hwang et al., 2005; Roysircar-Sodowsky & Maestas, 2000) and has been found to reduce the well-being of Asian immigrants (Yeh, 2003; Ying & Han, 2006; Oh, Koeske, & Sales, 2002).

Acculturative stress may be influenced by social change, cultural conflicts, minority status/racism, new language, changing family roles, intergenerational conflicts, and other pressures encountered in adjusting to the new culture and host environment (Lee et al., 2000). Like other ethnic groups, Asians in the United States often contend with challenges of racism and discrimination, loss of extended family support, cultural and family conflicts, marginalization, and minority status. Among the most important sources of acculturative stress are unfair treatment, racial discrimination and family conflict (Castillo, Cano, Chen, Blucker, & Olds, 2008; Salgado de Snyder, 1987; Yip, Gee, & Takeuchi, 2008), all of which have been identified in the literature as highly relevant to Asian Americans.

Discrimination

Expressions of prejudice and acts of discrimination against Asian Americans increase when Asians are perceived as the model minority or the perpetual foreigner (Ancheta, 2000). Many Asian Americans experience and are perceived as the model minority. This model minority image portrays Asian Americans as living in better socioeconomic conditions than other ethnic groups. Perpetual foreigner racism implies that even those Asian Americans born in the U.S. are still treated as foreigners (Ng et al., 2007; Wong & Halgin, 2006; Yu, 2006). This stereotype assumes that Asian Americans are unable to fully assimilate into American culture and society (Liang, Li, & Kim, 2004; Wu, 2002). Both model minority and perpetual foreigner stereotypes enhance racial discrimination towards Asian Americans.

Discrimination is a stressor and risk factor for psychological distress among racially and ethnically diverse populations (Lee, 2003; Yip et al., 2008). A number of studies have examined the relationship between discrimination and mental health among African Americans and Hispanic Americans, but only a few have done so with Asian American samples (Gee, Delva, & Takeuchi, 2007; Chae et al., 2008). One study by Hahm et al. (2010) found that everyday experiences of unfair treatment were associated with mental and physical health outcomes among Asian Americans. In another study, Gee (2002) examined 1,503 Chinese Americans in Los Angeles and found that 21% of participants experienced discrimination (i.e., were treated unfairly because of their ethnicity, language barriers and accent) in their lifetime. Noh & Kasper (2003) also studied 180 Koreans in Canada and found that participants experienced discrimination (e.g., handled roughly, insulted, treated rudely) in their lifetime, a significant positive predictor of mental health. Finally, Gee, Spencer, Chen, Yip, & Takeuchi (2007) surveyed 2,047 Asian Americans ages 18 or older not institutionalized or living on military bases in the U.S. The authors found that those who experience discrimination are more likely to have mental health problems such as depression or anxiety disorders.

Family Cultural Conflict

As the most fundamental social environment, family has increasingly been recognized as an important factor affecting individuals' health status (Syme & Yen, 2000). In traditional Asian cultures, family unity is considered the central and most important domain of one's life, whereas the traditional Western society values

individualism and independence (Staveteig & Winston, 2000). However, in the Eastern society as collectivist structures, family members are expected to make sacrifices and decisions that are in the best interest of the family members not only one person (Mercado, 2000).

Research indicates that many Asian American families experience and struggle with intergenerational and cultural conflicts once they migrate (Buki et al., 2003). The acculturation process may lead to conflict in family relations. In particular, it appears that greater acculturation leads to more family conflict (Harachi, Catalano, Kim, & Choi, 2001) as family members attempt to integrate contrasting Asian and American cultural values (Bhattacharya, 2002; Buki et al., 2003).

With respect to mental health, families may impact the mental health. Marital conflict, parental separation, or parental divorce may have a negative impact upon family members. Bhattacharya (2002) found that family conflict was experienced as stressful and was associated with increased substance use. A nationally-representative sample of Latinos showed that family cultural conflict was associated with mental health (Rivera, et al., 2008). In sum, it appears that acculturation is often accompanied by experiences of racial/ethnic discrimination and cultural conflicts within the family during acculturation. Such stresses may lead to psychological distress and mental health disorders.

Social-cultural Resources and Mental Health

Social Support

Social support has been generally defined as emotional and instrumental aid available when one needs them. Social support can be obtained from informal and formal social ties such as family, friends, religious and institutional groups (Berkman, 1995). Social support can be classified into emotional, affirmative and tangible types based on the function of support. Emotional or affirmative support involves the use of social relations to offer care and concern, understanding, and companionship (Dean, Kolody, & Wood, 1990). Tangible or instrumental support is concrete assistance such as providing information, advice, financial resources, transportation, and assistance with home care (Lockery, 1991).

The effect of social support in relation to mental health has been well documented in the study of mental health (Kawachi & Berkman, 2001; Wolff & Agree, 2004; Badger & Collins-Joyce, 2000). Research suggests that people with higher levels of perceived and actual support show better mental health (Lin et al., 1999; Berkman & Kawachi, 2001). Badger and Collins-Joyce (2000) showed that a significant reverse relationship between depression and a personal and environmental resources among the elderly.

Not surprisingly, social support has been an important factor for acculturation and mental health in immigrant populations (Hovey, 2000). Individuals who have strong social support networks tend to adapt more effectively and with less psychological distress than those who have weaker social support (Thomson, Flood, & Goodvin, 2006),

and are less likely to engage in risky health behaviors (Cohen & Lemany, 2007; Green, Freeborn, & Polen, 2001). With respect to the relationship of acculturation and social support among Asian Americans, Bhattacharya (2005) conducted a qualitative study of acculturation and risky behavior among Indian Americans and found that social support was an influential contributor in decreasing risky behaviors. In addition, Gee (2002) found that social support was an important positive predictor of better mental health among Chinese Americans in Los Angeles. In a quantitative study design, Noh and Kaspar (2003) examined whether racial/ethnic discrimination, different types of coping strategies, and social support were associated with depression among Korean Americans. This study revealed a correlation between racial/ethnic discrimination, coping strategies, and social support in predicting depression.

Neighbor Trust and Support

Recent research asserts that individuals are affected by not only intimate social relationships, such as family and friend support but also outer-social relationships, such as neighbor support and community ties (Lin et al, 1999; Putnam, 2000). Community ties or neighbor support emphasize mutual trust and connection among community residents and neighbors, resulting in social cohesion and social and neighbor trust and connection and have a strong positive impact on individual well-being (Sampson et al., 1999).

Research consistently demonstrates the beneficial effect of neighbor and community support and social ties on mental health (Kawachi & Berkman, 2001; Berkman, Glass, Brissette, & Seeman, 2000; Lin, Ye, & Ensel, 1999). Living in a

community where there is trust between people has many positive benefits (Putnam, 2000), such as better access to social service and health resources (Hendryx & Ahern, 2001). In contrast, living in neighborhoods where there is low trust may miss an important source of community level support. Thus, neighbor and community support such as trust, religious and social participation protect individuals from stressors and have mental health benefits (Putnam, 2000).

Religion

Religious involvement provides more effective access to social resources in terms of the quantitative and qualitative aspects of resources (Bradley, 1995; Krause, 2008; Taylor, Chatters, & Jackson, 2007; Taylor, Chatters, & Levin, 2004). Religious groups offer comfort and valuable emotional support (Krause, 2008) and provide counseling programs or other forms of advising for members confronting life issues, such as marital or family problems, or emotional difficulties (Taylor, Chatters, & Levin, 2004).

Participation in religious activities can be an important means of developing new social networks (Garcia, 2005). In addition, religious institutions provide not only emotional support such as spiritual comfort to the immigrants but also informational and tangible support such as interpretational assistance and legal service advice.

Many research has given increasing attention to religious involvement in mental health-related outcomes and a large body of literature supports the positive effects of religious involvement on mental health problems (Chawla, Neighbors, Lewis, Lee, & Larimer, 2007; Gong et al., 2003; Kerr-Correa, Igami, Hiroce, & Tocchi, 2007; Yi &

Daniel, 2001). Attendance at religious services is associated with engagement in healthy behaviors, such as regular health check-up services, regular diet, exercise and sleep (Benjamins and Brown, 2004; Hill, Burdette, Ellison, & Musick, 2006; Hill, Ellison, Burdette, & Musick, 2007). In contrast, less religious individuals engage in more unhealthy and risky behaviors and lifestyle practices such as heavy and binge drinking, smoking, use of illegal drugs, and others more often than those who practice religion (Hill, Burdette, Ellison, & Musick, 2006).

In addition, there is growing empirical evidences for the protective effects of religion in regard to mental health problems in the Asian American population. For example, Asian American Christian leaders not only provide counseling services but also make referrals for mental health services within their communities (Yamada, Lee, & Kim, 2012; Lee et al., 2008).

Socio-demographic Factors and Mental Health

Socioeconomic Status

Socioeconomic status (SES) has been related to mental health status (Shen & Takeuchi, 2001; Muramatsu, 2003). Persons of higher socioeconomic status are more likely to have better mental health than people of lower statuses because they have more economic and social resources. Conversely, lower socioeconomic status is associated with poor mental health (Eaton & Garrison, 1992), as persons with low socioeconomic status generally experience more stresses and consequently more psychological disorders (Eaton & Garrison, 1992). Generally, education shows a positive relation to better health

(Williams & Collins, 1995). Greater education attainment leads to more sophisticated cognitive abilities, more secure career and better earnings and better social networking (Mirowsky & Ross, 1998).

Especially, socioeconomic status (SES) is a significant predictor of mental health among immigrants. SES is related to migrant adaptation that influence individuals' well-being and health (Evans-Campbell, Lincoln, & Takeuchi, 2007; Franzini & Fernandez-Esquer, 2006; Rumbaut, 1991). However, the influence of socioeconomic status on the mental health status of immigrants is complicated because it is embedded in the acculturation process.

Gender

Gender is another issue that might be related to the emotional well-being of immigrants. Generally, women are more likely to report psychological symptoms than men. Thoits (1982) has suggested that the women are psychologically vulnerable because they usually have less education, lower incomes, and less prestige, which can make them more prone to negative consequences of stressful events.

Among immigrants, many studies observed gender differences in psychiatric disorders. Asian women, especially, experience significantly more depressive symptoms than Asian men (Lai, 2004, 2005; Lai & Yuen, 2003). In addition to gender differences in mental health, many research studies have found that women and men are influenced by different sources of stress. Many researchers found that immigrant women's mental health may be more heavily influenced by family factors (Hovey & Magana, 2000; Hoitt,

Grzywacz, Arcury, & Quandt, 2006). Stress from separation from family in home country was especially associated with mental health status among immigrant women (Hoitt et al., 2006).

During the process of acculturation most women have more difficulty in assimilating than men because they might stay at home, not be encouraged to socialize due to cultural norms or they may not have the opportunities to socialize (Ong, 2003; Smith, 2006). Some researchers proposed that Asian women might experience greater cultural differences because of allowing less equal rights and opportunities for women than men (Ghuman, 2000). As a result of this social isolation, immigrant women tend to feel more alienated in new cultures and societies.

Age at Migration

Immigrating to a country can be a stress inducing process (Mui & Kang, 2006; Li, 2009), and the age at which one immigrates may have an impact on how much that stressor influences health. As such, age of immigration becomes a particularly important factor to consider when examining immigrant health.

The age when people immigrate may be an important factor that influences acculturation and mental health. The age when an immigrant moves to a new country influences the educational experience that person receives such as learning a new language (Fuligni, 2004; Rumbaut, 2004). Also, age at immigration can affect the opportunities to meet people so young immigrants have more chances to establishing a wide range of social networks (Zeng & Xie, 2004).

Some studies suggest that the age at which immigrants migrated to the United States is strongly associated with mental disorders (Takeuchi et al., 2007; Mossakowski, 2007). For example, research has found that individuals who migrate after the age of 35 (late migration) are far more likely to experience higher levels of emotional distress than immigrants who arrived at early age (Angel et al., 2001). In fact, Kuo, Chung, and Joseph (2008) reviewed literature on depression among Asian immigrants and found that Asian immigrants have more depression prevalence than their native-born counterparts. Also, Takeuchi et al. (1998) found that Chinese immigrants who arrive after their 20s are more likely to have major depression than those who migrate at younger ages.

Theoretical Framework

The main theoretical perspective used in this work is the stress process model as developed by Pearlin and colleagues (1981), where the main premise is that an individual's health is influenced by stress and psychological resources. Stress process theory provides a conceptual framework for understanding how immigration related acculturative stress translates into mental health for Asian Americans. Also, stressors have a negative impact on a person's health but psychological resources or supports and social ties or social capital can have positive influences on both physical and mental health. Moreover, while not explicitly tested in this work, acculturation theory and the life course perspective, a framework that was developed by Glen Elder (Elder 1994), guides design and implementation of both the study and the framing of the analysis. Combining a life-course perspective with acculturation theories will strengthen the

current study of acculturation and mental health consequences among Asian immigrant adults.

In short, both theoretical models provide useful insights into the Asian American acculturation process. Stress process theory provides a theoretical framework for both the direct association between acculturative stress, such as unfair treatment, racial/ethnic discrimination and family conflict and mental health, and the positive relationship between social-psychological resources, such as social support, trust, and religion and mental health. The life-course perspective also provides a flexible theoretical framework that can be used to investigate the effects that potential moderators, such as age at immigration and gender can have on immigrants during acculturation. By testing this theoretical framework using Structural Equation Modeling (SEM), greater insight into the stress process model and the life-course perspective, as well as the mental health of Asian Americans, can be gained.

Life-course Perspective

The life-course perspective views human life as a series of age-related stages that span from birth to death transitions (Elder, George, and Shanahan, 1996). The dynamics of the life course are characterized by the interlocking of multiple roles at the levels of individual, social interaction, organization, and subsystems of the society.

Transitions refer to the beginning and end of trajectories and each person experiences a number of transitions in roles: examples would include the transition from starting school, moving from primary school to secondary school, leaving school for

work, retiring, and so on. While transitions are discrete and bound by changes in status, trajectories refer to longer-term patterns of stability and change in multiple transitions. Trajectories reflect the changing level of individual participation within social structures.

The life course refers to the interplay of social structure and human and is socially and culturally constructed, experienced, and understood in different ways by different groups of people in different times and places (Elder, 1994; Elder, George, and Shanahan, 1996). Any immigrant's life is influenced by both the host's and the native country's social and historical factors. For immigrants as a group, migration is a big transition in the life course for all members. Migration might have different psychological impacts on people of different ages.

Glen Elder (1994) identified four dominant in the life course approach: interplay of human lives and historical time, timing of lives, linked or interdependent lives, and human agency in making choices.

The principle of interplay of human lives and historical times. Historical times that affect the nature of life events will affect individuals differently, even when they are experiencing the same event. An individual's life course is shaped by the historical times they experience according to the principle of time and places. For example, it makes a different life course patterns whether a migrant from India and South Africa settles in the UK or whether mass Vietnamese migration occurred to the United States after the end of the Vietnam War, and whether these early Vietnam immigrants were refugees fleeing their home country via boats during a historical time of war, persecution, and famine. The

host and native country's social, economic, and cultural, and political factors influence their lives.

The principle of the timing of lives. The social meaning of age refers to an age-related perspective of social roles and events. The timing of immigration, age at immigration, and acculturative stress are all factors that jointly influence how immigrants deal with different types of stressors and family conflicts. For example, after moving to a new country, family members may experience different gender role and social structures in the host country.

The principle of linked or interdependent lives. Human lives are strongly connected by social relationships with family members, friends and relatives across life spans, especially for immigrants. Personal and individual problems become intergenerational. Unfortunately, immigration tends to disrupt the interconnectedness of an individual's social world, such as friends and family and the disruption of this interconnectedness negatively affects health.

The principle of human agency in choice making. People construct their lives and make choices. Individual choices, such as when and where to migrate or whether to maintain their traditional culture or adopt the host culture, interact with changing environments, such as relocation from a native country to host country, to produce various behavioral and health outcomes.

Acculturation Theory

Acculturation has been defined as the sociocultural and psychological changes that occur as a result of continuing contact between two different cultural groups, such as an immigrant group and its host society (Berry and Kim, 1988). Acculturation is an important variable in studies of the well-being of ethnic minorities and immigrants (Trimble, 2003; Zane & Mak, 2003). The acculturation process involves many different constructs which include changes in the social, psychological, and cultural lives of ethnic minorities and immigrants as they are affected by the host society's language, identity, cognitive style, beliefs, values, attitudes and behaviors. The acculturation experience of new immigrants is also shaped by their country of origin and the circumstances of migration (Cabassa, 2003).

Models of acculturation. Acculturation models typically fall into two categories: linear or uni-dimensional models (e.g., Gordon, 1964; 1978) and bi- or multi-dimensional models (e.g., Berry, 1980). In a linear or unidirectional model, the assumption is that an immigrant's acculturation experience is a unidirectional, nonreversible process, with an end result of a highly acculturated state. In a multidirectional model, acculturation is conceptualized as a flexible and continuous process in which the adherence to the new, host culture is independent from the maintenance of one's traditional culture.

Uni-dimensional models and assessment of acculturation. The uni-dimensional approach suggests that the acculturation process is conceptualized as linear: a single continuum of acculturation from traditional culture to the dominant culture (Gordon,

1964; 1978). In this particular perspective, as immigrants adopt new behaviors and cultures of the host society, they will lose their traditional and original cultural identities and values. Gordon's (1964; 1978) uni-dimensional or assimilation model describes the process of absorption of immigrants into the dominant culture by a loss of traditional and original cultural identification. Gordon classified this assimilation into seven stages: cultural assimilation, structural assimilation, marital assimilation, attitudinal reciprocal assimilation, behavioral reciprocal assimilation, civic assimilation, and identificational assimilation. According to Gordon's theory, contact between immigrants and host members leads to extinction of the original cultural patterns and ethnic identity as the immigrants move through the assimilation stages.

Uni-dimensional acculturation measures include non-scale, or proxy measures and uni-dimensional scales. The non-scale, or proxy measurement approach is based on the assumption that degree of acculturation can be approximated by assessing the cultural minority member's amount of exposure to the dominant culture. A proxy measure typically consists of a response to a single or combination of questions concerning factors such as ethnic identity, duration, language proficiency, and generational status (Salant & Lauderable, 2003).

Unlike non-scale, or proxy measurements, uni-dimensional scales of acculturation typically include multiple items that cover a wide range of acculturation domains (Zane & Mak, 2003). These scales allow classification of individuals along a continuum ranging

from low to high levels of acculturation, depending on the degree to which they have absorbed values, attitudes, or behaviors of the host society's culture.

Stress Process Theory

Stress process theory was originally developed by Pearlin and colleagues (1981) and it described how health is influenced by the stress people experience in life and also how health is influenced by psychological resources such as social support and social capital. By emphasizing the highly complex nature of stressful circumstances on individuals within society, this perspective focuses on social structures including the stratification system of institutions or organizations, social roles in family and community/neighborhood contexts, and their stress-related consequences.

The stress process (Pearlin, 1981, 1999) provides a conceptual framework for understanding how immigration-related social and psychological stress (acculturative stress) translates into mental health for immigrant Asian Americans. The stress process model assumes that people's socioeconomic status, ethnicity, and gender create disparities in society (Pearlin, 1999). Furthermore, these inequalities may have a harmful effect on individuals' health and wellbeing.

Six major domains are included in the stress process framework: 1) status and inequality (social and economic statuses), 2) neighborhood context (ambient stressors), 3) primary stressors, 4) secondary stressors, 5) resources, and 6) mental health outcomes (Pearlin, 1999). For the current research, only four domains (social economic status, stressors, resources, and mental health outcomes) are incorporated in the model.

Social stratification and inequality. Health is not uniformly distributed among members of a society. Health can be stratified across multiple social class, race, ethnicity, and gender (Marmot & Wilkinson 2006). However, people with higher social status generally have better health than those with lower levels of social status. Minority individuals who have low occupational status or lower levels of education are more likely to experience depression and anxiety than higher socioeconomic status. Also, being female in U.S. society means being part of a minority group (Gittell, Ortega-Busamante, & Steffy, 2000) and females are more likely to experience depression and anxiety than men (Dressler, 1985; Turner & Marino, 1994).

Stressors. According to Pearlin (1999), there are two general types of stressors: life events and chronic strains. Life events have discrete onsets and disruptive natures, but their effect is generally short-lived (Pearlin, 1999). In contrast to stressful life events, chronic stressors tend to be more persistent over a long period of time and represent the consistent conflicts and problems that individuals confront in their daily lives (Pearlin, 1999). Important stressors for this study include racial discrimination and family conflict, which are two types of chronic stressors. The consequences and the process of immigration have a significant impact on the life and mental well-being of immigrants. As found in other studies, such stressors are important for understanding the well-being of racial/ethnic minority individuals and immigrants (Oh, Koeske, & Sales, 2002; Yip, Gee, & Takeuchi, 2008).

Resources. The role of social support has been investigated in a number of studies of mental health (Kawachi & Berkman, 2001; Lin et al., 1986; Wethington & Kessler, 1986) and is included in Pearlin's (1981, 1999) conceptualization of the stress process model. In fact, many research supports that higher levels of social support are associated with better mental health (Lin et al., 1999; Kawachi & Berkman, 2001). By participating in social groups and volunteer organizations and joining religious organizations, it is hypothesized that individuals will have better health outcomes (Putnam, 2000; Thoits & Hewitt, 2001). For this work, social support and religious affiliation will also be considered as such resources.

Mental health outcomes. The primary outcomes of the stress process model in sociological research continue to be various mental health measures (Pearlin, 1999). Mental health has focused the most on depression, anxiety, psychological distress in previous acculturation literature (Aneshensel & Stone 1982; Fitzpatrick et al., 2005; Mirowsky & Ross, 2003). Therefore, psychological distress will be considered as mental health outcome variable for the current work.

Summary

The current study investigates the effects of acculturation on mental health among Asian immigrants. The literature review presented acculturation, acculturative stress, social and neighbor/community support, and religious involvement as associated with mental health among Asian Americans. However, currently there is limited research that takes into consideration the role of mediating factors such as acculturative stress and

social-cultural resources on mental health. Few acculturation studies have been conducted based on adequate theoretical conceptualization that addresses the Asian immigrant experience. Most acculturation research fails to consider other important health factors such as gender and age at immigration as potential effect confounders. The present study is based on concrete theoretical conceptualizations of the relationship between acculturation and mental health among first generation Asian immigrants.

Research Questions

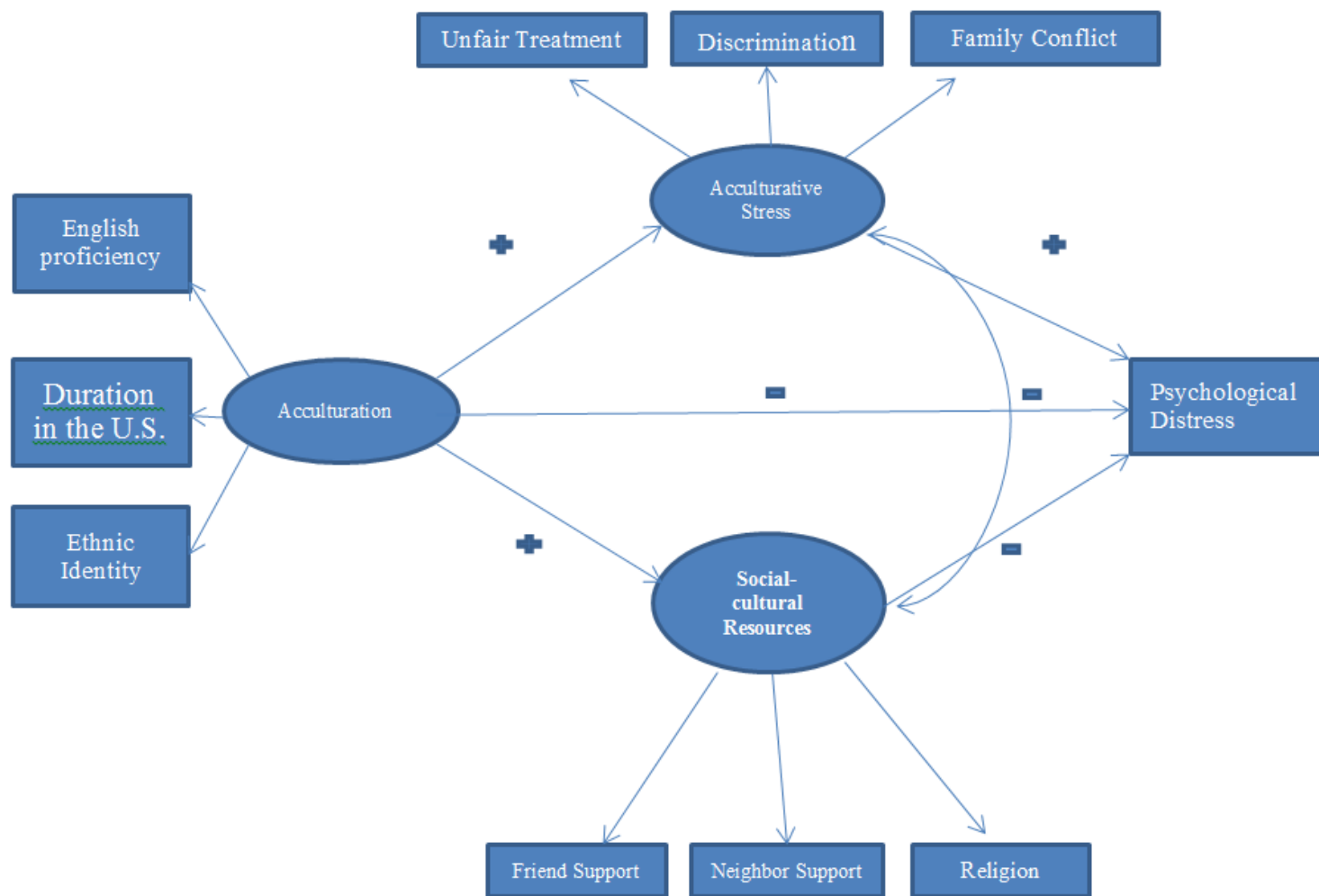
The research investigation examined whether acculturation levels were associated with better mental health; and if so, whether acculturative stress and/or social-cultural resources mediate relations between acculturation process and mental health outcomes. In addition, the study examined whether there were age at immigration- and gender-, related group differences in terms of the strength of the hypothesized relations.

This study addressed the major research questions by testing the following three hypotheses and conducting exploratory moderator analyses:

1. Higher scores for indices of acculturation are associated with significantly better mental health conditions among Asian American immigrants.
2. Acculturative stress mediates the relation between acculturation levels and mental health status among Asian American immigrants.
3. Perceived social-cultural resources mediate the relations between acculturation levels and mental health outcomes among Asian American immigrants.

4. The study explores the effects of potential moderators (age at immigration and gender) on the strength of the hypothesized relations.

Figure 1. Proposed Conceptual Model for Asian Americans' Mental Health



CHAPTER THREE: METHODOLOGY

Sample

The data are based on a nationally representative, community based household survey, the National Latino and Asian American Study (NLAAS). In brief, the NLAAS is part of the Collaborative Psychiatric Epidemiology Study (CPES), which was designed to provide psychiatric epidemiological information on different U.S. ethnic populations (Alegria et al., 2004). It is the first national study to use translation services to obtain comprehensive mental illness and mental health services utilization data among Asian Americans. The NLAAS collected information between May 2002 and December 2003 from all non-institutionalized Asian Americans, aged 18 years or older (Pennell et al., 2004). The original study was administered to 2,095 Asian and 2,554 Latino respondents; however, the current study only reports on the first generation Asian immigrants (approximate N=1,639). In order to identify immigrant Asians, U.S. born Asian respondents were excluded.

Measurement

Psychological Distress

The construct of mental health outcome was measured by using a 10-item Kessler Psychological Distress Scale (K10) used to assess the level of anxiety and depressive symptoms in the most recent 30 day period (Kessler et al., 2002). The scale consists of 10 questions on non-specific psychological distress: (1) Did you feel tired out for no good

reasons?; (2) Did you feel nervous?; (3) Did you feel so nervous that nothing could calm you down?; (4) Did you feel hopeless?; (5) Did you feel restless or fidgety?; (6) Did you feel so restless that you could not sit still?; (7) Did you feel depressed?; (8) Did you feel that everything was an effort?; (9) Did you feel so sad that nothing could cheer you up?; (10) Did you feel worthless? Response values ranged from 1 (a little of the time) to 5 (all of the time). The Cronbach's Alpha reliability of the scale in the current sample was .87 with a higher scores indicating more psychological distress.

Acculturation

The construct of acculturation was measured using items from three measures – English proficiency, duration/stay in the U.S., and ethnic identity.

English proficiency. Three questions were used to assess respondents' ability to speak, read and write in English. Each item has four possible choices scaled as 1 (poor), 2 (fair), 3 (good), and 4 (excellent), with higher scores indicating higher-level proficiency (Felix-Ortiz, Newcomb, & Myers, 1994). The Cronbach's Alpha reliability of the scale in the current sample was over .96.

Ethnic identity. Ethnic identity was measured by four items from the National Comorbidity Survey-Replication. (Kessler, et al., 2003): (1) how closely do you identify with other people who are of the same racial and ethnic descent as yourself?; (2) how close do you feel, in your ideas and feelings about things, to other people of the same racial and ethnic descent?; (3) if you could choose, how much time would you like to spend with other people who are of your same racial and ethnic group?; (4) how

important do you think it is for people who are from your same racial and ethnic group to marry other people who are also from this group? Response values ranged from 1 (very closely, a lot, or very important) to 4 (not at all, none, or not important at all). The items were reverse scored. Higher scores represented higher levels of acculturation to mainstream American culture. The Cronbach's Alpha reliability of the scale in the current sample was .66.

Duration/stay in the U.S. Duration/stay in the U.S. measured the length of time the respondent spent in the United States. The assumption is that immigrants who spend more time in the U.S. become more acculturated. In this study, duration of stay is recoded into five categories 1 (less than 5 years), 2 (5-9 years), 3 (10-20 years), 4 (over 20 years), and 5 (U.S. born).

Acculturative Stress

The construct of acculturative stress was conjointly assessed using items from three measures – unfair treatment, racial/ethnic discrimination, and family cultural conflict.

Unfair treatment. Items from a 9-item scale of unfair treatment drawn from the Detroit Area Study (Williams, Yu, Jackson, & Anderson, 1997) were designed to measure the experiences of everyday unfair treatment and discrimination. The items addressed the following concerns: you are treated with less courtesy than other people; you are treated with less respect than other people; you receive poorer service than other people at restaurants or stores; people act as if they think you are not smart; people act as

if they are afraid of you; people act as if they think you are dishonest; people act as if you are not as good as they are; you are called names or insulted; you are threatened or harassed. Each item had possible response values ranging from 1 (everyday experiences) to 6 (never). The items were reverse scored. Higher scores indicated greater levels of discrimination. The Cronbach's Alpha reliability of the scale in the current sample was .90.

Exposure to racial/ethnic discrimination. Items from a 3-item scale originally developed for measuring acculturative strain for use in a longitudinal study of adolescent drug use by Vega and colleagues (1993) were used to measure the frequency of discrimination because of race and ethnicity. The questions included: "How often do people treat you unfairly because you are . . .?"; "How often have you seen friends treated unfairly because they are. . .?"; and "How often do people dislike you because you are?". Response values were on a 4-point scale of 1 (never), 2 (rarely), 3 (sometimes), 4 (often). Higher scores indicated the more exposure to racial/ethnic discrimination. The Cronbach's Alpha reliability of the scale in the current sample was .86.

Family cultural conflict. Items from a 5-item scale derived from the Family Cultural Stress subscale of the Hispanic Stress Inventory (Cervantes, Padilla, & Salgado de Snyder, 1991) provided measures of cultural and intergenerational conflict with families. The items are as follows: (1) You have felt that being too close to your family interfered with your own goals; (2) Because you have different customs, you have had

arguments with other members of your family; (3) Because of the lack of family unity, you have felt lonely and isolated; (4) You have felt that family relations are becoming less important for people that you are close to; (5) Your personal goals have been in conflict with your family. Responses were based on a 3 point Likert scale, with responses of 1 (hardly ever), 2 (sometimes), and 3 (often). Higher scores represented a higher level of family cultural conflict. The Cronbach's Alpha reliability of the scale in the current sample was .75.

Social-Cultural Resources

The construct of social-cultural resources was measured using items from three measures — religious involvement and friend and neighbor support.

Religiosity. Religiosity was assessed by attendance at religious services. Religious attendance measured the self-reported frequency of attendance at religious services scaled as, 1 (more than once a week), 2 (once a week), 3 (one to three times a month), 4 (less than once a month), and 5 (never). The item was recoded so that higher scores indicated high levels of religious attendance.

Friend support. Friend support was measured by four items, which assessed respondents' ability to rely on extended friends for emotional support. To measure friend support respondents were asked: how often they talk on the phone or get together with friends; how much they can rely on friends for help with a serious problem; how much they can open up to friends and talk about their worries; and when they have a problem or worry, how often they let their friends know about it? Respondents used a 4-point scale

with response ranging from 1 (not at all) to 4 (a lot). Higher scores indicated that persons had more support from friends. The Cronbach's Alpha reliability of the current sample was .57.

Neighbor trust and support. Neighbor trust and support was measured using four items, which assessed whether people in the neighborhood: (1) can be trusted; (2) get along with each other; (3) help in an emergency; and (4) look out for one another (Bearman, Jones, & Udry, 1997). Responses ranged from 1 (very true) to 4 (not at all true). The items were recoded with higher scores indicating more neighborhood social cohesion. The Cronbach's Alpha reliability of the scale in the current sample was .81.

Demographic and Control Variables

Socio-demographic characteristics included gender, age, education, employment status and ethnicity. In NLAAS, gender was coded as 0 = male, 1 = female. Age refers to the respondent's age at time of the interview and measured as a continuous variable. Age at immigration reflected the age at which the individual immigrated to the United States and categorized as two groups: immigrants who arrived as adolescents (age < 18 years) and immigrants who arrived as adults (age > 18 years). Ethnicity was self-reported as Chinese, Vietnamese, Filipino, and Other Asian. Education was measured by asking respondents to indicate the highest level of education that the respondents had received as a continuous variable. Employment status was divided into two categories (0 = currently not employed, 1 = currently employed). Income was asked by annual household income ranging from no income to \$ 150, 000 and above measured as a continuous variable.

Data Analysis

This study examined the relationship of acculturation to psychological distress among Asian immigrants accounting for the role of acculturative stress (unfair treatment, racial discrimination, and family conflict) and social psychological resources (friend, neighbor, and religious support). For the final sample of the study, immigrant Asians who answered different reasons of discrimination such as sexual orientation, age, weight, etc. were excluded in order to examine the hypotheses proposed in this study. After screening cases using this criterion, 1528 first generation Asian immigrants were included for the present study.

The analyses were conducted in four parts: descriptive statistics, confirmatory factor analysis, structural model, and multiple group analysis. First, descriptive and correlational analyses were employed to examine the demographic characteristics of the sample and describe the patterns of measured variables, indices of acculturation, acculturative stress, social psychological resources, and mental health status of Asian immigrants. In addition, structural equation modeling (SEM) was used to evaluate structural relationships among acculturation, acculturative stress, social-cultural resources, and mental health. Finally, to test the moderating effects of socio-demographic factors (gender and age at immigration) on the relation of acculturation to mental health, multi-group modeling was employed to explore possible group differences on the structural paths. These analyses were conducted using *Mplus* version 5.2 (Muthen & Muthen, 2007).

Structural Equation Modeling

Structural equation modeling is a statistical technique that combines confirmatory factor analysis and path analysis and it is used to analyze the structural relationship between measured variables and latent constructs (Kline, 2005). In the present study, SEM was used to specify and estimate the direct and indirect relationships among psychological distress, acculturation, acculturative stress, social resources, and psychological distress. The two primary purposes of SEM are to estimate the model parameters and determine the goodness of fit of the model to the data. An important feature of SEM is the use of latent constructs, which represent theory and such abstract social and psychological variables as “acculturation”, “acculturative stress”, “social psychological resources”, and “mental health outcome.” The structural models were examined to investigate how Asian immigrants’ psychological distress is related to acculturation, acculturative stress, and social psychological resources.

Multiple group analyses were conducted to determine whether the overall model obtained for the total sample was equivalent across gender and age at immigration. The first multiple group analysis was conducted for gender. The second multiple group analysis was conducted with two groups: younger age at immigration (before age 18) and older age at immigration (age 18 or older). Immigrants who came to U.S. before age 18 experienced more formal education in the United States which may influence the acculturation process.

CHAPTER FOUR: RESULTS

Preliminary Analyses

Descriptive statistics were employed to describe the characteristics of the sample and the patterns of measured variables using SPSS 19. Table 1 shows demographic information for the Asian immigrant sample used in the study. The total sample for this study ($N = 1528$) was 47.9% male, 76.1% married, and 64.7% currently employed. Vietnamese respondents comprised the largest ethnic group in the sample (31.5%), followed by Chinese (28.3%) and Filipino (20.4%). Other Asian respondents accounted for 19.8 % of the sample. The average age of respondents was 42.72 years ($SD = 14.23$), with a range from 18 to 95 years. The respondents were highly educated; 41.8% had a college degree and 19.2% had at least some graduate college education and more. Most respondents immigrated to the United States after the age of 18 (78.9%).

Table 1. Demographic Variables for Immigrant Asian Americans (N =1528)

Variable	N	%
Gender		
Male	732	47.9
Female	796	52.1
Age		
<25	127	8.3
25 – 34	375	24.6
35 – 44	375	24.6
45 – 54	362	24.7
55 – 64	163	10.7
65 & Over	126	8.2
Marital Status		
Married	1163	76.1
Others	365	23.9
Ethnicity		
Chinese	433	28.3
Pilipino	311	20.4
Vietnamese	482	31.5
All other Asian	302	19.8
Education		
Less than High School	289	18.9
High School Graduate & Some College	599	39.3
College Graduate and More	639	41.8
Employment Status		
Employed	989	64.7
Others	314	20.5
Age at Immigration		
Under 18	323	21.1
18 years of age or older	1205	78.9

Correlational Analyses

The correlation tables were generated in SPSS 19 to show the associations among the variables for each latent factor (acculturation, acculturative stress, social-cultural resources, and psychological distress) and were presented in Appendix A.

Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) integrates confirmatory factor analysis (CFA) and path analysis. CFA was used to develop a measurement model and then full structural model was assessed. Specifically, with the measurement models, confirmatory factor analysis (CFA) was conducted to define and measure the constructs relating to Asian immigrants' psychological distress. The structural models were examined to further investigate how Asian immigrants' mental health may be influenced by the effects of predictive variables such as acculturation, acculturative stress and social-cultural resources. The statistical software Mplus was used for the current analysis.

In order to examine the fit of the models to the data, the most common goodness of fit index is the chi-square statistic. The chi-square statistic reported in the current project is the Satorra-Bentler scaled chi-square (Satorra & Bentler, 1988), which is a chi-square test of overall model fit for continuous non-normal outcomes. The adjusted chi-square difference test with the Satorra-Bentler Scaled chi-square (Satorra & Bentler, 1994) was used to calculate chi-square difference tests between two nested models. If the χ^2 difference between two nested models is significant, the one with more parameters is preferred. However, χ^2 can be influenced by sample sizes ($n > 200$, Kline, 2005) and the

distribution of variables (Beauducel & Wittmann, 2005; Hu & Bentler, 1999). Thus, four indices can also be used to assess goodness of fit for the measurement model: 1) the Comparative Fit Index (CFI), 2) the Tucker-Lewis Index (TLI), 3) the Root Mean Square Error of Approximation (RMSEA), and 4) the Standardized Root Mean Square Residual (SRMR) as suggested by Hu and Bentler (1999), Tucker and Lewis (1973) and Quintana and Maxwell (1999).

The CFI and TLI range from 0 to 1 and should be above .95 for a good-fitting model, although a value of .90 is considered acceptable (Hu & Bentler, 1999). A RMSEA value of .05 or lower is considered to be an indicator of a “good” fit, and fit values below .08 are generally considered to represent “acceptable” fit (McDonald & Ho, 2002). A SRMR value of less than .08 indicates a good fitting model (Hu & Bentler, 1999).

Measurement Model/Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted to assess the measurement model before estimating the casual relationships by the structural equation model. Initially four latent variables and a total of 44 indicators were used to conduct the CFA. The resulting chi-square statistic ($\chi^2 = 7259.34$; $df = 896$; $p = .00$) and other evidence showed that the measurement model did not fit to the data well (CFI = .698; TLI = .681; RMSEA = .068; SRMR = .087). Since an initial model did not fit the data, an attempt was made to subsequently modify the confirmatory factor analysis (CFA) model. A data-driven strategy in combination with theoretical considerations (Kline, 2005) was used for respecification to capture underlying constructs of acculturation, acculturative stress, and

social-cultural resources. Appendix B presents a table with the original and final indicators for each latent variable.

First, factor loadings were evaluated by Tabachnick and Fidell's (1996) minimum threshold of .32. If any indicator is below the threshold, the indicators can be assigned to a different factor or the indicators can be deleted (Kenny, 1999; Kline, 2005). Three items showed very low and non-significant factor loadings; the factor loading from acculturation to ethnic identity 3 (standardized path coefficient = .05) and the factor loadings from social-cultural resources to friend support 3 (standardized path coefficient = -.01) and religious service attendance (standardized path coefficient = .08). Also, items regarding unfair treatment (5, 6, 8, and 9) and racial/ethnic discrimination (1 and 3) were chosen to be removed because their factor loadings were low, ambiguous and contained confusing wording.

The factor loadings from acculturative stress to family conflict (1, 3, and 4) were low with standardized path coefficients of .29, .26, and .31. Since the items of the measure of family conflict are also related to those of the measure of psychological distress, an attempt made to reload the family conflict indicators (1, 3, and 4) on the psychological distress factor to improve model fit by dropping items showing large modification indexes for cross-loadings. Therefore, family conflict indicators (1, 3, and 4) were deleted from the model.

Another factor loading from acculturation to duration was also low, with a standardized coefficient of .14. However, this path was retained since living in the U.S. is

cited in the literature as an important indicator of an immigrant's acculturation level (Takeuchi, Zane, Hong, Chae, Gong, & Gee 2007; Wong et al., 2007).

Second, several changes were made based on modification indices (M.I) that were theoretically justifiable by reducing the chi-square value and implemented one by one (Kline, 2005). Among the many possible paths suggested by modification indices, eleven pairs of measurement errors were allowed to covary. First, the seven largest modification indices suggested to add error covariances. Second, the errors of the years in the United States (Duration) and English proficiency (Engpro1) were allowed to covary. These correlated errors are theoretically reasonable since more time spent in the U.S. can be reasonably associated with English speaking proficiency. Third, the errors of ethnic identity 4 (How important do you think it is for people who are from your same racial and ethnic group to marry other people who are also from this group?) and 2 (How close do you feel, in your ideas and feelings about things, to other people of the same racial and ethnic descent?) belong to acculturation and the errors of ethnic identity 4 and 1 (How closely do you identify with other people who are of the same racial and ethnic descent as yourself?) belong to acculturation and were allowed to covary. It is also reasonable to allow these errors to covary because members of the same ethnic and racial groups are related to each other as significant others.

After eliminating a total of 12 indicators and adding 10 covariance paths, the final model used four latent variables with 32 total indicators. Figure 2 shows the standardized final measurement model. The fit of the modified CFA model was adequate (chi-square = 1096.27; $df = 4$; $p = .000$; CFI = .956; TLI = .952; RMSEA = .031; SRMR = .063).

All indicators specified for each latent variable (acculturation, acculturative stress, social-cultural resources, and mental health) resulted in significant factor loadings for the latent factor. All factor loadings were statistically significant. However, according to Tabachnick and Fidell (1996), loadings of .71 and higher are considered excellent, loadings of .63 to .70 are considered very good, loading of .55 to .62 are good, loadings of .45 to .54 are fair, loadings .32 to .44 are low, and loadings below than .32 are poor. Moreover, standardized loadings for the latent variable “acculturation” ranged from .09 to .97, and specifically, the loadings from acculturation to English proficiency (.91 - .97) were excellent. The ones from acculturation to duration and ethnic identity (.09 - .15) were poor. The magnitude of the loadings for the latent variable “acculturative stress” ranged from .30 to .80. Specifically, the loadings from acculturative stress to unfair treatment (.68 - .80) was very good and racial discrimination (.50) fair. The factor loadings from acculturative stress to family conflict (.30 and .31) were poor. Standardized loadings for the latent variable “social-cultural resources” ranged from .09 to .80. The loadings from social-cultural resources to neighbor support (.59 - .80) were good, and friends support (.09 - .12) were poor. Lastly, the magnitudes of the standardized loadings for the latent variable “mental health outcomes” ranged from .52 to .67 and were good.

As the model does not include any cross-loadings, the standardized factor loadings can be interpreted as the correlation between the indicator and the latent variable it loads onto. The intercorrelations among the latent factors are shown in Appendix C.

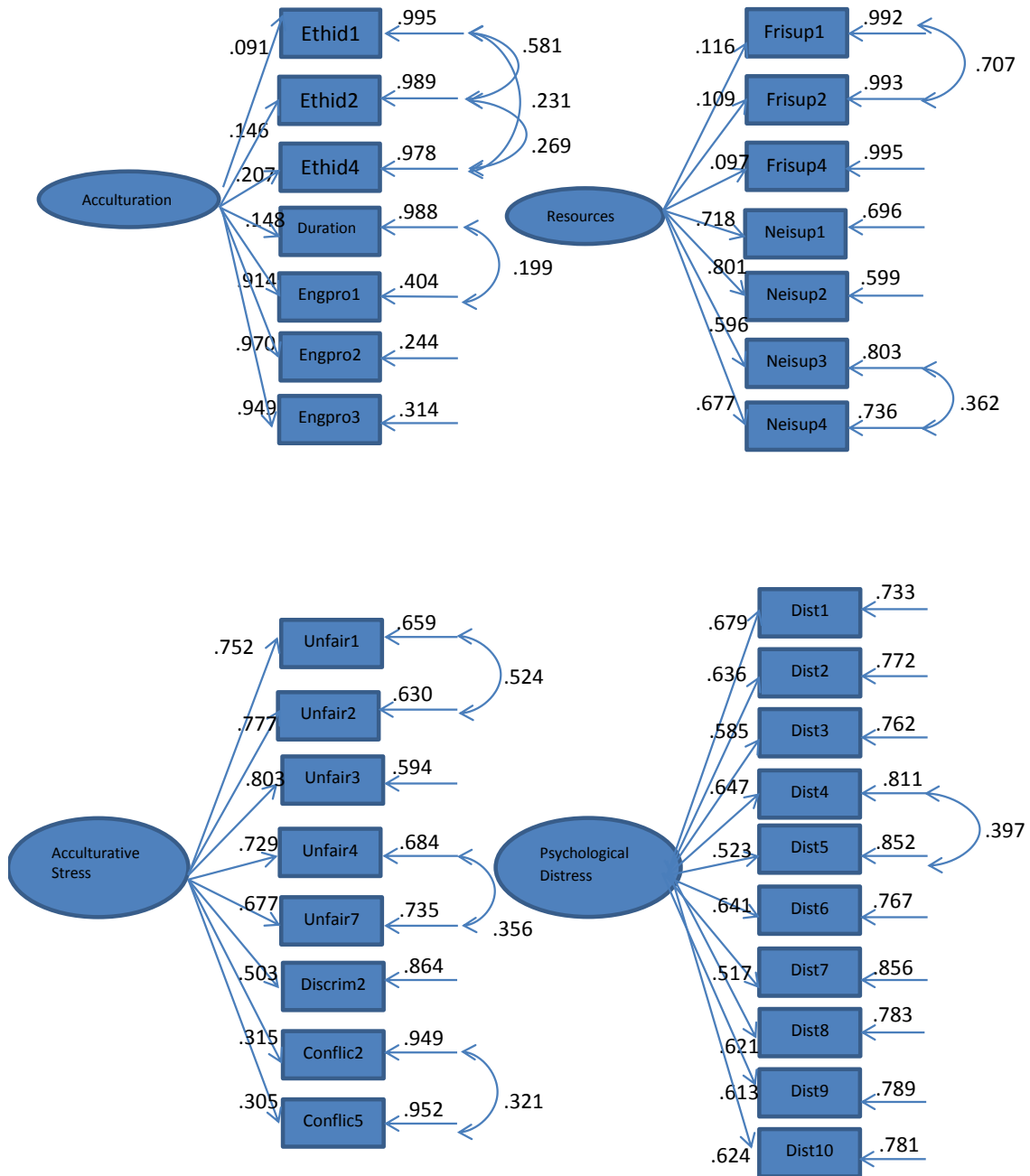


Figure 2. Standardized Final Confirmatory Factor Model

The Structural Models

The structural model is presented in Figure 3. The structural model consists of the measurement and structural parts of the model. The initial structural model was created based on the final measurement model to examine research hypotheses. Specifically, the structural model attempted to test the direct and indirect effects of acculturation on psychological distress through acculturative stress and social-cultural resources. The goodness-of-fit indices of the initial structural model indicated good model fit ($\chi^2 = 2098.52$; $df = 616$; $p = .00$; CFI = .915, TLI = .905, RMSEA = .040, SRMR = .065), which would be expected given the adequate fit of the measurement model. Thus, the initial structural model was the final structural model.

In the final structural model, a direct path between a higher level of acculturation (more acculturation to the U.S.) and psychological distress was not statistically significant (standardized coefficient = -0.072, $p = .094$) (Fig. 3). Instead, the association between acculturation and psychological distress was explained by the indirect pathway through acculturative stress. The level of acculturation was positively associated with acculturative stress (standardized coefficient = 0.098, $p = .015$), which in turn contributed to more psychological distress symptoms (standardized coefficient = 0.30, $p < .001$). Thus, higher level of acculturation was indirectly associated with higher level of psychological distress (standardized coefficient = 0.017, $p = .017$). While the level of acculturation positively was associated with higher social resources (standardized coefficient = 0.194, $p < .001$), the presence of higher social resources was not

significantly associated with psychological distress (standardized coefficient = -0.074, $p = .058$), and the indirect pathway through social resources was not statistically significant. Acculturative stress and social resources were significantly negatively correlated (standardized coefficient = -.019, $p < .01$).

Multiple Group Analyses

The last part of the analyses was conducted to determine whether the overall model obtained for the total sample was equivalent across gender and different age groups at immigration. Using multiple group analyses, this study further investigates moderating effects of gender and age at immigration on causal relationship in a hypothesized model. First multiple group analysis was conducted for gender (male, $n = 732$ and female, $n = 796$). The second multiple group analysis for age at immigration was conducted with two groups: younger age (before age 18, $n=323$) and older age at immigration (age 18 or older, $n = 1205$).

Multiple group analyses involve generally evaluating invariance of measurement, structural as well as path coefficients. Testing for measurement invariance and structural invariance involves a fixed sequence of model comparison tests, comparing the current model with the previous one using a chi-square difference test (Byrne, 2001). All analyses were estimated with the Maximum likelihood parameter estimates with standard errors and a chi-square test statistic (MLR). The chi-square difference test in the current study was performed using the Satorra-Bentler scaled chi-square (Satorra & Bentler,

1988), which is a chi-square test of overall model fit for continuous non-normal outcomes.

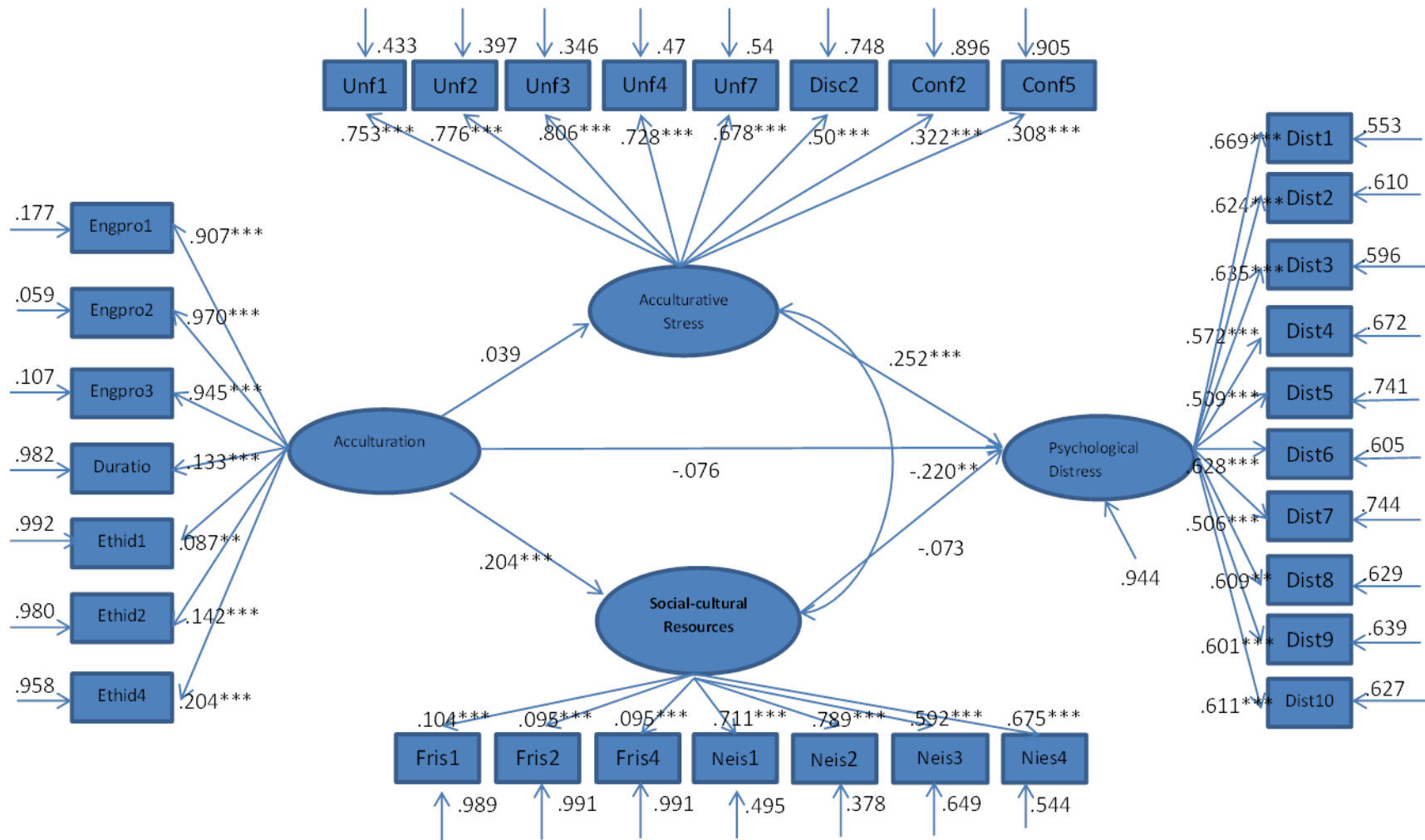


Figure 3. Final Structural Model Controlling for Demographic Characteristics (Standardized).

All chi-square difference tests were conducted by employing a series of calculations (Satorra & Bentler, 1994). The Satorra-Bentler scaled (SB) chi-square difference between the unconstrained model and the constrained model is examined for significance ($p < .05$). If the SB chi-square difference test is non-significant, a parsimonious (with more constrained) model can be used for comparing each adjacent two models. Also, if the SB chi-square difference test is significant, the next step is to identify the source of non-invariance across groups based on the modification indices (MI). Then, the non-invariance should be estimated freely one by one, with the fit of the model re-assessed after each constraint was released (Kline, 2005).

Table 2. The Measurement Invariance Test Procedure

Step	Description
Measurement Invariance Test	
1	Configural Invariance
2	Metric/Weak Invariance (factor loadings)
3	Scalar/Strong Invariance (factor loadings + intercepts)
4	Strict/Residual Invariance (factor loadings + intercepts + residuals)

The test for measurement invariance is conducted by a four-stage process and the sequence of the testing is summarized in Table 4. The first model is called the configural invariance model (a model without any invariance). The fit of this model imposes the same factor structure on all groups with fitting a two-group, freely estimated CFA model and this model can be used as a baseline for comparison to test for invariance. The second model is called weak/metric invariance and this model constrained the factor loadings of the same items to be equal across groups. The third model is strong/scalar invariance and the factor loadings and intercepts for each observed variable are constrained to be equal across groups, allowing factor

means and covariance to be different across groups. The fourth model is strict/residual invariance and this model holds the residual variances equal across group. After the measurement invariance across groups has been established, the structural invariance test is carried out, including invariance of factor means and structural path coefficients (Meredith, 1993).

Gender Multiple Group Analysis

The configural invariance model (model1) (Table 5) includes specification of two groups (male and female) with no cross-group constraints. That means all factor loadings and thresholds were freely estimated across groups. This model served as the baseline model for subsequent invariance tests. This initial model provided an adequate fit to the data according to the fit specified by Hu and Bentler (1999), CFI= 0.951, TLI=0.945, and RMSEA= 0.033.

In the weak or full metric model (model 2), all factor loadings were equally constrained across two groups. The fit of this model was compared to the fit of the configural (equal form) model which allowed all loadings to be freely estimated across the groups. Results indicate that the fully equal factor loadings model did not significantly reduce overall model fit according to the SB chi square difference test (20.32, $p > .10$), which means that the baseline model (model 1) was not significantly different from the full metric/weak model (model 2). In other words, full metric invariance for invariant factor loadings was achieved, indicating the factor loadings were equal for Asian immigrant men and women.

The scalar or strong invariance model (model 3) involves the inclusion of equivalent intercepts across groups. Results did not support equivalent intercepts, as these equality constraints significantly reduced model fit according to the SB chi square difference test (62.49, $p < .001$) for comparison of model 3 and model 2. Modification indices from this model were

used to locate six non-invariant thresholds (how often talk on the phone or get together with friends, how much rely on friends for help, and let friends know about it, treated with less respect than other people, because of different customs, have arguments with other family members, and feel tired out for no good reasons) using the criterion of a modification index of 3.84 or greater. Freeing the non-invariance of those thresholds, a partial strong invariance was examined by comparing a partial strong invariance model (model 3a) and model 2. The SB chi-square difference test (22.13, $p > .10$) was not statistically significant which means a parsimonious model (model 3a) can be used and a partial strong invariance was achieved. Specifically, Asian women and men have the same factor loadings and intercepts with the exception of six non-invariant thresholds.

The strict or residual invariance model (model 4) constrained all residual variances across the groups while non-invariant thresholds were freely estimated across the groups. The SB chi-square difference test result indicated that residual invariance was achieved. The fit of model 4 was adequate (SB chi-square difference test (35.50, $p > .10$), CFI=.953, TLI=.952 and RMSEA=.031). Therefore, partial invariance of measurement was achieved.

After the measurement invariance across groups had been established the structural invariance test was conducted in the following order: invariance of factor variances and structural path coefficients (Meredith, 1993). In the factor variance invariance model, the variances of the latent variables held equivalent across groups was compared to the partial metric invariance model; results indicate the absence of a significant decline in model fit when variances were held equal (SB chi square difference test 2.50, $p > .10$), indicating equivalent variances in the latent variables for the two groups. These data supporting invariances allow for

the examination of the hypothesis of equivalent variance across the two groups. Thus, Asian immigrant men and women had equivalent amounts of individual differences in the acculturation, acculturative stress, social-cultural resources, and psychological distress. Model fit indices are reported in Table 3.

When the structural model is examined, all constraints placed upon the measurement model in the previous steps remain in the structural model. Thus, all factor loadings, intercepts, residuals, and variances constrained to equality between the two groups remain constrained when testing the structural path model.

In order to assess whether the path model was invariant between males and females, all path coefficients were freely estimated in the unconstrained (model 1) and all structural paths were equally constrained across the two groups in the fully constrained structural model (model 2). The difference in SB chi-square difference test was statistically significant (SB $\Delta\chi^2 = 602.69$, $df=7$, $p < .001$). Thus, constraining all paths to be equal suggested that some path coefficients were non-equivalent across two groups.

A specification search was conducted to find non-equal structural paths by freely estimating, one by one based on the theory, with the fit of the model re-assessed after each constraint was released. First, women may be more psychologically susceptible to stress than men, and Asian immigrant women, especially, experience significantly more depressive symptoms than Asian men (Lai, 2004, 2005; Lai & Yuen, 2003) during the acculturation process. These two structural direct paths, from acculturation to acculturative stress and from acculturative stress to mental health, were freely estimated for both Asian immigrant men and women. Also, Asian immigrant men work outside of the home more than Asian women, so the

men tend to have more friends and neighbor support than the women who spend most of the time with family members (Mirsky, Baron-Draiman and Kedem, 2002). Thus, one structural direct path from acculturation to social-cultural resources was freely estimated for both Asian immigrant men and women. Finally, after allowing one correlation of errors (acculturative stress and social-cultural resources) to be freely estimated for both Asian immigrant men and women, the partially constrained model (model 3) resulted in a non-significant decrease in fit relative to the unconstrained structural model (model 1) ($SB \Delta\chi^2 = 3.26, df=2, p > .10$). The fit indices of the partially constrained structural model were acceptable. The CFI equaled .911, the TLI was .908 and RMSEA was .040.

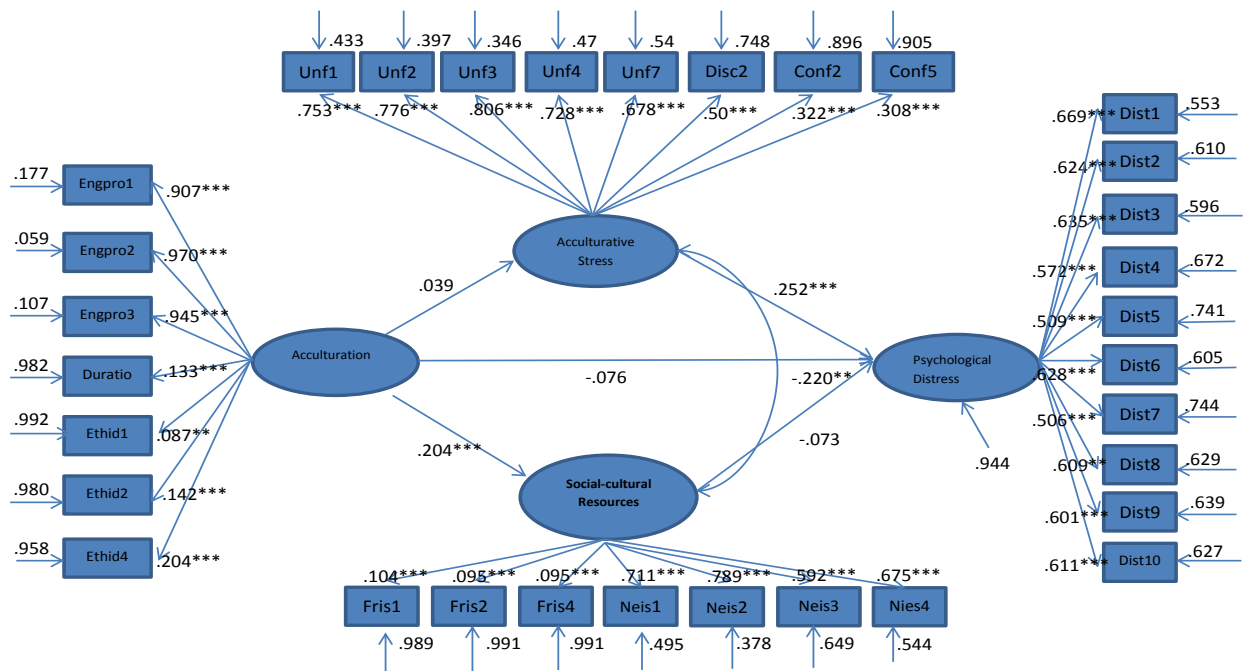


Figure 4. Structural Model for the Asian Immigrant Men (Standardized).

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

These statistics indicate the partially constrained structural model had a good fit to the data. All path coefficients were assessed after controlling for control variables which were age, ethnicity, and level of education.

The standardized structural model for the Asian immigrant men is presented in Figure 4 and the results indicate that only acculturative stress had a direct effect on psychological distress ($\beta = .252$, $p < .001$).

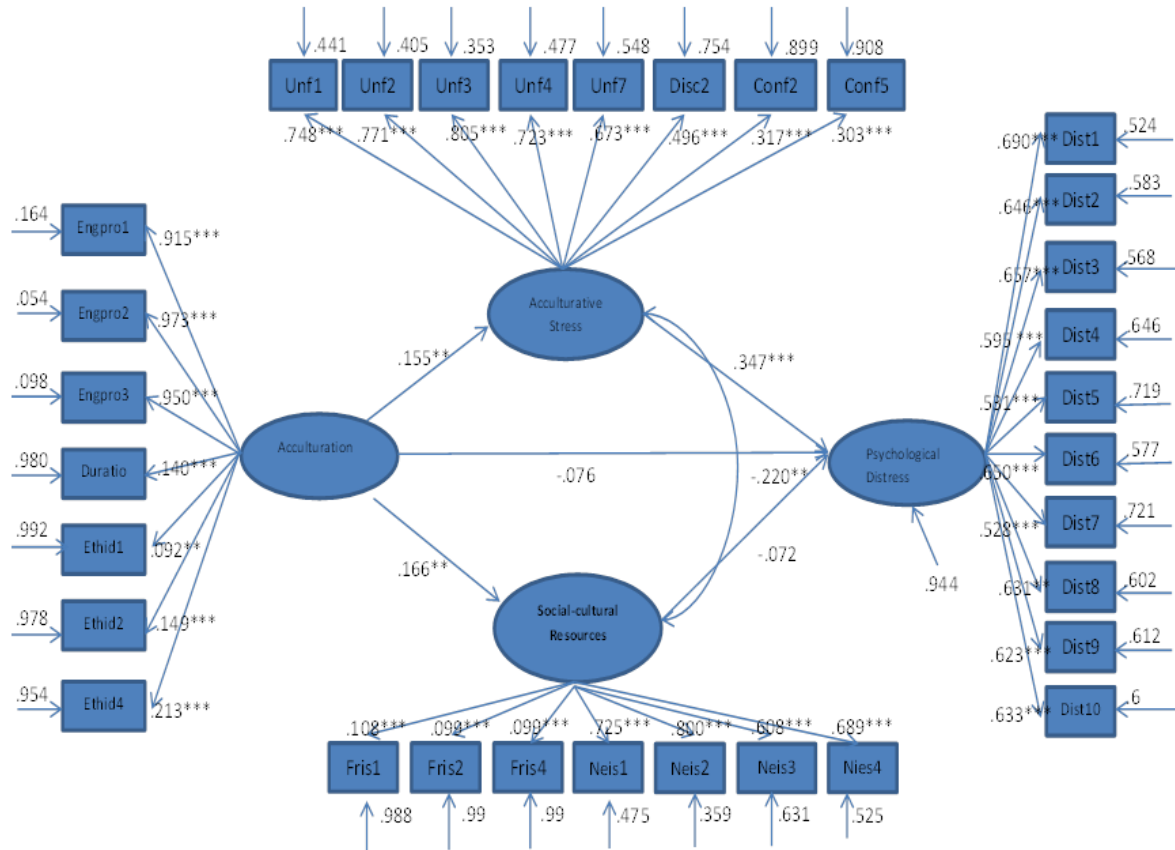


Figure 5. Structural Model for the Asian Immigrant Women (Standardized).

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

The level of acculturation was positively associated with social-cultural resources among Asian immigrant men ($\beta = .204$, $p < .001$). Acculturative stress was negatively correlated with social-cultural resources ($\gamma = -.220$, $p < .001$).

The standardized structural model for the Asian immigrant women is presented in Figure 5. The results indicate that acculturation did not have direct effect on psychological distress among Asian immigrant women, whereas acculturation was found to be positively associated with acculturation stress ($\beta = .155$, $p < .01$), which in turn predicted psychological distress ($\beta = .347$, $p < .001$). Thus, higher level of acculturation was indirectly associated with more

psychological distress symptoms ($\beta = .031, p < .05$). Acculturation was associated with social-cultural resources ($\beta = .166, p < .01$). Acculturative stress and social-cultural resources were negatively correlated ($\gamma = -.255, p < .01$).

Table 3. Model Fit Indices for Measurement and Structural Invariance Tests for Gender Difference

Model	$S-B \chi^2$	Df	MLR Scaling	CFI	TLI	RMSEA	$\Delta SB \chi^2$	Δdf	P -value
First Step :Measurement Invariance									
Model1. Configural Invariance	1648.441	899	1.152	.951	.945	.033			
Model2. Weak Invariance	1658.798	927	1.163	.952	.948	.032	20.32	28	P > .10
Model3. Strong Invariance	1719.016	952	1.159	.949	.947	.032	62.49	25	P < .001
Model3a. Partial Strong Invariance*	1682.434	946	1.160	.951	.949	.032	22.13	19	P > .10
Model 4. Strict Invariance	1697.358	978	1.199	.953	.952	.031	35.50	32	P > .10
Second Step: Structural invariance									
Model 5. Factor Invariance	1699.235	979	1.198	.952	.952	.031	2.50	1	P > .10

* six non-invariant thresholds (how often talk on the phone or get together with friends, how much rely on friends for help, and let friends know about it, treated with less respect than other people, because of different customs, have arguments with other family members, and feel tired out for no good reasons) were freely estimated for both groups.

Table 4. Fit Statistics for the Two Group Path Models (N = 732 for Asian immigrants male; N = 796 for Asian immigrants female)

Model	$S-B \chi^2$	Df	MLR Scaling	CFI	TLI	RMSEA	$\Delta SB \chi^2$	Δdf	p-value
Model1. Hypothesized model (Baseline model)	2812.798	1259	1.158	.873	.868	.048			
Model2. Fully constrained structural model	3506.599	1266	1.159	.872	.868	.048	602.693	7	P < .001
Model3. Partially constrained structural model*	2816.262	1261	1.158	.911	.908	.040	3.46	2	P > .10

* Three structural direct paths (from acculturation to acculturative stress and to social-cultural resources, and from acculturative stress to psychological distress) and on correlation of errors (acculturative stress and social-cultural resources) were freely estimated for both Asian immigrant men and women.

Age at Immigration Multiple Group Analysis

The multiple group analysis for age at immigration was conducted with two groups: younger age at immigration (under 18, N = 322) and older age at immigration (18 years of age or older, N = 1205).

In the configural invariance model (model 1), all factor loadings and thresholds were freely estimated with no cross group constraints. This model was run to serve as the baseline model for the following invariance test. According to the fit specified by Hu and Bentler (1999), this initial model provided an adequate fit to the data, CFI= 0.950, TLI=0.945, and RMSEA= 0.033.

In the full metric invariance/weak invariance model, the factor loadings were equivalently related to the latent factors across two groups. The fit of this model was compared to the fit of the baseline model, the configural invariance model. Results indicated that the fully equal factor loadings model did not significantly reduce overall model fit according to the SB chi square difference test (40.17, $p > .05$.) indicating that measurement invariance at the level of factor loadings held between two groups.

The strong invariance model (model 3) involves the inclusion of equivalent intercepts across groups. Results did not support equivalent intercepts, according to the SB chi square difference test (231.98, $p < .001$) for comparison of model 3 and model 2. Based on the LM test/Modification indices, six thresholds (English speaking, reading, and writing, duration in the U.S., how often talking on the phone or getting together with friends, and how much relying on friends for help with a serious problem) were non-invariant across groups. After allowing the six thresholds specified above to be freely estimated for both groups, the SB chi-square difference

test result indicated that partial scalar invariance was achieved. The fit of model 3a was adequate according to the SB chi-square difference test (23.68, $p > .10$), CFI=.950, TLI=.948 and RMSEA=.03.

The residual invariance model (model 4) constrained all residual variances across the groups while non-invariant thresholds from model 3a were freely estimated across the groups. The SB chi-square difference test result did not support residuals invariance (SB $\Delta\chi^2 = 71.48$, $df=32$, $p < .001$). LM test/Modification indices from this model were used to find the specific residuals that were not invariant across groups. Four residuals (personal goals have been in conflict with family members, years in the U.S., feel hopeless, and feel that everything was an effort) were non-invariant across groups. The fit of model 4a was adequate with the SB chi-square difference test (26.69, $p > .10$), CFI=.951, TLI=.950 and RMSEA=.031. Therefore, the partial invariance of measurement was established and the structural invariance test was conducted including invariance of factor variances and structural path coefficients.

In the factor invariance model, the variances of the latent variables were held equivalent across groups and the model was compared to the partial strict invariance model. The SB chi-square difference test result supported factor variance invariance (SB χ^2 diff 4.53 $df=3$, $p > .10$), indicating equivalent variances in the latent variables for the two groups. Thus, younger age at immigration group and older age at immigration group had equivalent amounts of individual differences in the acculturation, acculturative stress, social-cultural resources, and psychological distress.

In order to determine whether the structural paths were invariant across the two age groups (younger and older age at immigration), two models were compared in the same process of the

measurement invariance test procedure: all path coefficients were freely estimated in the unconstrained (model 1) and all structural paths were equally constrained across the two groups in the fully constrained structural model (model 2). The difference in SB chi square test was not statistically significant (SB $\Delta\chi^2 = 4.97$, $df = 5$, $p > .10$). The fit indices of the fully constrained structural model were acceptable. The CFI was .896, the TLI was .891 and RMSEA was .043. Thus, the all constrained structural model had a good fit to the data, suggesting that all structural path coefficients were equal across younger age at immigration and older age at immigration groups.

Table 5. Model Fit Indices for Measurement and Structural Invariance Tests for Age at Immigration

Model	<i>S-B X²</i>	Df	MLR Scaling	CFI	TLI	RMSEA	Δ SB X ²	Δ df	P -value
First Step :Measurement Invariance									
Model1. Configural Invariance	1641.866	899	1.127	.950	.945	.033			
Model2. Weak Invariance	1663.316	927	1.140	.950	.947	.032	40.17	28	P > .05
Model3. Strong Invariance	1883.110	952	1.138	.937	.935	.036	231.98	25	P < .001
Model3a. Partial Strong Invariance^a	1687.143	946	1.138	.950	.948	.032	23.68	21	P > .10
Model 4. Strict Invariance	1770.986	978	1.172	.947	.946	.033	71.48	32	P < .001
Model 4a.Partial Strict Invariance^b	1696.285	974	1.164	.951	.950	.031	26.69	28	P > .10
Second Step: Structural invariance									
Model 5. Factor Invariance	1696.460	977	1.167	.952	.951	.031	4.53	3	P > .10

^a 6 non-invariant thresholds (English speaking, reading, and writing, duration in the U.S., how often talking on the phone or getting together with friends, and how much relying on friends for help with a serious problem) were freely estimated.

^b 4 non-invariant residuals (personal goals have been in conflict with family members, years in the U.S., feel hopeless, and feel that everything was an effort) were freely estimated for both groups.

Table 6. Fit Indices for Two Group Path Models (N = 323 for under 18 and N = 1205 18 years or older age at immigration)

Model	<i>S-B X²</i>	Df	MLR Scaling	CFI	TLI	RMSEA	Δ SB X ²	Δ df	p-value
Model1. Hypothesized model (Baseline model)	3201.056	1314	1.129	.893	.888	.043			
Model2. Fully constrained structural model	3204.364	1319	1.130	.893	.888	.043	4.97	5	P > .10

Summary of Results

Hypothesis 1 posits that higher scores for indices of acculturation were associated with better mental health conditions among Asian American immigrants. Results showed that a direct path between a higher level of acculturation (more acculturation to the U.S.) and psychological distress was not statistically significant (standardized coefficient = -0.072, $p = .094$).

The second hypothesis posits that acculturative stress mediates the relation between acculturation levels and mental health status among Asian American immigrants. Results showed that a higher level of acculturation was positively associated with acculturative stress (standardized coefficient = 0.098, $p = .015$), which in turn contributed to more psychological distress symptoms (standardized coefficient = 0.30, $p < .001$). Thus, the relationship of acculturation to mental health was mediated by acculturative stress (standardized coefficient = 0.017, $p = .017$). However, this finding was moderated by gender, holding only for women.

The third hypothesis posits that perceived social-cultural resources mediate the relations between acculturation levels and mental health outcomes among Asian American immigrants. Results showed that while the level of acculturation was positively associated with higher social resources (standardized coefficient = 0.194, $p < .001$), the presence of higher social resources was not significantly associated with psychological distress (standardized coefficient = -0.074, $p = .058$), and the indirect pathway through social resources was not statistically significant.

The fourth research question examined whether gender and age at immigration moderated the hypothesized relations. Results showed that gender had a moderating effect on the relationship between acculturation and mental health among Asian immigrants. However, results showed that the relationship of acculturation and mental health was not different between younger and older age at immigration.

CHAPTER FIVE: DISCUSSION

This chapter summarizes and discusses the findings of the study. First, the main findings are presented. Next, the results of the Structural Equation Modeling (SEM) analyses are discussed in terms of the predicted and expected results. Finally, the limitations of the study are addressed and the implications of this study for future research in this area are discussed.

Summary of Findings

The purpose of this study was to examine a mediational model of the relationship between acculturation and mental health problems among first-generation Asian American immigrants. It was hypothesized that the relationship between acculturation level and mental health status is mediated through both acculturative stress and social-cultural support. Also, in this study the possible moderation of effects by age at immigration and gender were explored.

The results of the current study documented significant relations of acculturation, acculturative stress, social cultural resources, and mental health outcomes among Asian immigrants. Evaluation of structural equation modeling (SEM) analyses identified a significant positive path between acculturation and acculturation stress and a significant positive path between acculturation stress and psychological distress such that the relationship between acculturation and mental health were mediated by acculturative stress; however, this finding was moderated by gender, holding only for women. In

addition, there was a significant positive path between acculturation and social-cultural resources. However, there was no significant path between social-cultural resources and psychological distress. Thus, social-cultural resources did not mediate the relationship between acculturation and mental health. Subsequent multi-group SEM analyses confirmed the significant moderating influence of gender for several paths in the final SEM model. However, age at immigration did not significantly moderate these relations.

Acculturative Stress and Social-cultural Resources as Mediating Factors

The main results partially supported the hypothesized mediation model. As expected, model results indicated direct significant paths from acculturative stress to the mental health outcome for women, indicating that higher levels of acculturative stress were associated with an increased level of psychological distress. This finding is consistent with those reported in the prior research. Both Hwang and his colleagues (2005) and Roysircar-Sodowsky and Maestas (2000) documented that acculturative stress is considered detrimental and thought to be the main mechanism for mental health problems including depression, anxiety, psychosomatic problems, alienation, identity confusion, and cultural marginality for immigrants. Also, it has been well documented in the literature that Asian Americans confront challenges of racism and discrimination, loss of extended family support, cultural and family conflicts, and minority status (Castillo, Cano, Chen, Blucker, & Olds, 2008; Salgado de Snyder, 1987; Yip, Gee, & Takeuchi, 2008), all of which have been found to reduce the well-being of Asian immigrant populations (Yeh, 2003; Ying & Han, 2006; Oh, Koeske, & Sales, 2002).

As expected, the direct effect of acculturation on acculturative stress was significant, indicating that a higher level of acculturation was associated with a higher level of acculturative stress, which in turn contributed to more psychological distress symptoms. Past research has shown that a higher level of acculturation is associated with greater perceptions of discrimination (Portes 1984; Portes, Parker, and Cobas 1980). Acculturation related changes in lifestyles, family cultures, and perceptions, and experiences lead to an erosion of mental health among immigrants.

However, there were no significant direct associations between acculturation and mental health. Instead, the association between acculturation and psychological distress was explained by the indirect pathway through acculturative stress. The current findings thus provide evidence for a mediational model in which a higher level of acculturation was associated with more acculturative stress, which, in turn, was related to increased psychological distress. These findings are consistent with previous research suggesting that higher acculturation contributed to depression symptoms among Chinese Americans only through an indirect acculturative stress pathway (Shen & Takeuchi, 2001).

Acculturation also had a positive direct effect on social-cultural resources, meaning that a higher level of acculturation was associated with greater social-cultural supports. Unexpectedly, the assumption that social-cultural support would mediate the relation between acculturation and mental health outcomes was not supported. The presence of higher social resources was not significantly associated with psychological distress, and the indirect pathway through social resources was not statistically significant. The finding that perceived social-cultural support did not relate significantly

to psychological distress is quite surprising because many other research studies have addressed the significant role of social-cultural resources in alleviating mental health symptoms (Kawachi & Berkman, 2001; Wolff & Agree, 2004; Badger & Collins-Joyce, 2000; Lin et al., 1999; Gee, 2002; Noh & Kaspar, 2003).

One possible reason for the failure to find mediating effects of social-cultural resources may be that for this study, social support was only assessed with two measures of friends and neighbor support, which may not have been adequate to represent social-cultural resources. Generally, as people become more acculturated to U.S. society, social-cultural support may increase but family support starts to erode. However, in Asian cultures, family unity is considered the central domain of one's life (Staveteig & Winston, 2000). The acculturation process may lead to conflict in family relations (Harachi, Catalano, Kim, & Choi, 2001) but the family is still an important source of support. Also, the friend and neighbor support may come from the same ethnic/race groups. Culturally sensitive instruments that better measure the familial and friend social-cultural resources among Asian immigrants may help to identify the mediating effects of social-cultural resources related to family and friends between acculturation and psychological distress that this study failed to find. Future studies may explore the buffering effects of social-cultural resources on the relationship between acculturative stress and psychological distress. In addition, religion support was only assessed with one question, religious attendance. The measurement may have been inadequate to capture the supportive dimension of religion for these Asian immigrants.

The current study confirmed the epidemiological paradox (Scribner, 1996) among first-generation Asian American immigrants. The higher level of acculturation seems to have a paradoxical effect on mental health. The results showed that Asian Americans with higher levels of acculturation tend to experience more acculturative stress, which contributes to elevated psychological distress symptoms.

This finding is consistent with mental health disorder findings among Latinos (Finch, Kolody, & Vega, 2000; Pe´rez, Fortuna, & Alegria, 2008) which suggest that more acculturated Latino immigrants perceived more everyday discrimination than less acculturated immigrants. As Latinos become more acculturated, they may have a greater sensitivity to differential treatment and unfairness compared to their less acculturated counterparts. Also, less acculturated immigrants who are still embedded in their native cultures may encounter fewer contact situations with non-Asian White Americans. In this way, a lower level of acculturation is associated with less perceived discrimination. Not only studies of Latinos but also studies of Asian immigrants found a similar epidemiological paradox. Many studies showed that increases in time in the U.S. correlated with the experience of discrimination among Asian immigrant groups (Frisbie, Cho, & Hummer, 2001; Hwang, Chun, Takeuchi, Myers, & Siddarth, 2005; Goto, Gee, & Takeuchi, 2002).

Gender and Age at Immigration as Moderating Factors

Subsequent structural equation modeling analyses conducted with a multiple-group analysis showed that there was a gender difference between Asian immigrant

males and females in the relationship between the acculturation process and mental health outcomes. The multiple-group analysis showed that the effect of acculturation on acculturative stress was greater in Asian immigrant women than in Asian immigrant men. Specifically, this path was strong for Asian immigrant women, while it was not statistically significant for Asian immigrant men. Previous research has found that, during the process of acculturation most women have more difficulty in assimilating to mainstream society than men because they might stay at home, not be encouraged to socialize due to cultural norms or they may not have the opportunities to socialize (Ong, 2003). Some researchers proposed that Asian women might experience greater cultural differences because of greater conservatism within traditional roles allowing less equal rights and opportunities for women than men (Ghuman, 2000). Thus, Asian American women showed a significant positive relationship between acculturation and acculturative stress.

As expected, the path that connected acculturative stress with mental health outcomes had a significantly higher positive path coefficient value for Asian immigrant women compared to Asian immigrant men. Many immigrant studies have observed gender differences in mental health issues. In line with the previous literature, women reported more perceived stress and psychological symptoms than men. Previous studies suggest that Asian women experience more depressive symptoms than Asian men because of acculturative stress (Lai, 2004, 2005; Lai & Yuen, 2003). In addition, many researchers found that immigrant women's mental health may be much more influenced

by family factors (Hovey & Magana, 2000; Hoitt, Grzywacz, Arcury, & Quandt, 2006) such as stress from separation from family and family conflicts which are associated with elevated anxiety and depression symptoms among immigrant women (Hoitt et al., 2006).

The age at which one immigrates may have a moderating effect on the relationship between acculturation and psychological distress. It was expected that there would be a stronger relationship between acculturation and psychological distress among first-generation Asian American immigrants who arrived at older age, compared with those who arrived at an earlier age. However, in the current study, age at immigration did not moderate these relations. One possible reason may be that the age of immigration cut off may have masked important difference among individuals in the reference groups. Based on the life course perspective, other ages such as, 25 or 35 years, may show different developmental trajectories for immigrants. Applying different cut-off points may provide better understanding of the acculturation process to mental health among Asian immigrants.

Observing only age at immigration could not capture whether the effects of age at immigration differ for a 20 year old who came to the United States at age 18 compared with a 60 year old who also moved to America at age 18. Gee, Kobayashi, and Prus (2004) found that recent immigrants aged 65 and older had poorer health compared with the same recent immigrants aged 45-64. The joint effect of age and age at immigration may capture the complex relation of the acculturation process to mental health among Asian immigrants.

Limitations and Future Research Directions

This study has the strength of using data from a nationally representative sample of Asian immigrants; thus the results of this study may be generalized to the Asian population living in the United States. However, there are several limitations as well.

First, the current study is based on a cross-sectional study design, thus this study cannot establish causal relationships of acculturative stress, social-cultural support, and psychological distress. With longitudinal data in the future, it would be possible to verify the directionality of the influence among the acculturation, acculturative stress, social-cultural support, and psychological distress and the causal process among the relationships. In addition, a mixed-method approach may be needed to appropriately integrate qualitative research to examine the process regarding how acculturation interacts with socioeconomic status or age at immigration and affects one's mental health to gain better understanding of the complex relationship between acculturation and mental health.

The immigration context, such as the unique social, cultural, political, and historical context of each immigrant group arriving in the United States, may lead to different acculturation experiences. This study did not examine in detail how the immigration circumstances may influence mental health status. Especially, immigrants who come to the United State unintentionally, such as those who are refugees, may be more at risk for acculturative stress and mental disorders than are general immigrants.

However, the current study did not consider the differences between voluntary and involuntary immigrants.

Limited research has investigated the SES-health relationship among Asian immigrants. Most studies on immigrant health focus on social and cultural factors that are particular to immigrant status, such as perceived discrimination and level of acculturation, and consider SES factors as only control variables. Thus, future research should examine the relationship among socioeconomic status, acculturation and mental health among Asian immigrants.

The measures of acculturation, acculturative stress, social-cultural resources and mental health status in this study were self-reported from the Asian American immigrants. The limitations associated with self-report bias reduce the validity of the data. For example, first-generation Asian American immigrants may underreport their mental health status because of cultural taboos. Thus, the ratings provided by the Asian American immigrants may underreport mental health disorders.

The construct and measurement of acculturation may also be a limitation given the measures used in the current study. Acculturation measures vary in conceptualization and operationalization using different strategies for classification and assessment. For this study, the acculturation construct applied a linear, uni-dimensional approach to measure acculturation to the United States. Higher acculturation in this study was viewed as increased adoption of American culture. The latent variable of acculturation employed various aspects of adaptation to American cultures (e.g., such as language, ethnic

identity, and length of stay) for the current study. In recent research, language competence, a uni-dimensional measure, has been shown to be a more accurate indicator of acculturation among Asian Americans than other more comprehensive acculturation measures (Mui, & Kang, 2006); thus researchers may still find a uni-dimensional measure of acculturation to be useful. In fact, many researchers continue to conceptualize and measure individual acculturation in a uni-dimensional way in their empirical studies (Gong, Takeuchi, Agbayani-Siewert, & Tacata, 2003; Takeuchi, Zane, Hong, Chae, Gong, & Gee 2007; Wong et al., 2007).

However, current trends in the measurement of acculturation are toward multi-dimensional measurement. Acculturation may be measured in a wide range of domains, such as language proficiency and preference, cultural specific values and behaviors (e.g., preference for food, media and celebrating holidays), and social interactions. It is suggested that future research expand the conceptualization and use multiple indicators measuring levels of acculturation to both original and new cultures. Therefore, a more comprehensive understanding of the different aspects of acculturation and their impacts on mental health may be examined.

Findings from the current study suggest that practitioners require culturally competent practices and awareness of the unique protective and risk factors for acculturation and mental health problems among Asian immigrants. Furthermore, more research is needed to better understand the role of social-cultural resources as potential buffering factors for acculturative stress on psychological distress.

Conclusion

In conclusion, this study contributes to the existing literature, the issue of immigrants' acculturation and mental health among Asian Americans. Previous research did not capture a dynamic process of how acculturation affects mental health, especially, the possible mediational effects of the risk or protective variables (acculturative stress and social-cultural resources) that may underlie the relation of acculturation to its mental health outcomes among first generation Asian American immigrants. In addition, the current study bolsters the literature on the moderating effect of gender on psychological distress among Asian immigrants by showing that the association among acculturation, risk and protective factors vary by gender and reflect differing levels of acculturation and acculturative stress.

This study may support the findings of other studies of the psychological mechanisms of acculturation that are general to different cultural groups who all share similar immigration experiences. Much work remains to be done to more fully investigate how acculturation may influence psychological distress and how age at immigration and other immigration-related factors may moderate this association.

When studying acculturation and mental health, it is important to consider risk and protective factors. By incorporating relevant social and psychosocial factors, the unique role of acculturation may be better understood, and the social and psychological processes during the acculturation process by which immigrants adjust to the new environment can be examined more accurately and comprehensively.

APPENDIX A: Correlation of Latent Factors

Table 1. Correlation Matrix for the Acculturation Factor

Variables	1	2	3	4	5	6	7	8
1.Speaking English	1							
2.Reading English	.886**	1						
3.Writing English	.868**	.921**	1					
4.Duration in US	.216**	.138**	.148**	1				
5. Identify	.097**	.096**	.066**	.071**	1			
6.Ideas/Feelings	.148**	.147**	.120**	.083**	.586**	1		
7.Time spent	.067**	.055**	.030	.099**	.386**	.423**	1	
8.Marriage	.186**	.209**	.183**	.031	.244**	.292**	.265**	1

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 2. Correlation Matrix for the Social-Cultural Resources Factor

Variables	1	2	3	4	5	6	7	8	9
1.Trust	1								
2.Get along	.571**	1							
3.Help	.418**	.486**	1						
4.Look out	.503**	.539**	.619**	1					
5. Religious Attendance	.025	.038	.081**	.075**	1				
6. Talk with Friends	.080**	.092**	.132**	.039	.100**	1			
7.Rely on Friends	.062*	.115**	.084**	.018	.066*	.711**	1		
8. Open up to Friends	-.041	-.064*	.018	-.003	.062*	.270**	.25**	1	
9.Let know problems	.071**	.052*	.068**	.090**	.048	.148**	.155**	.086**	1

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3. Correlation Matrix for the Acculturative Stress Factor

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.Treated w/ less Courtesy	1																
2.Treated w/ less respect	.802**	1															
3.Poor Services	.603**	.628**	1														
4.Not Smart	.543**	.555**	.610**	1													
5.Afraid of	.438**	.438**	.505**	.537**	1												
6. Dishonest	.444**	.502**	.502**	.582*	.604**	1											
7.Better than you	.508**	.539**	.536**	.675**	.515**	.644**	1										
8. Insulted	.458**	.483**	.490**	.501**	.483**	.586**	.523**	1									
9.Treatened	.384**	.089**	.084**	.045	.038	.528**	.466**	.633**	1								
10.Diskined	.352**	.016	.002	-.008	.054*	.300**	.342**	.252**	.213**	1							
11.Treated Unfairly	.386**	.396**	.394**	.355**	.287**	.306**	.378**	.242**	.204**	.781**	1						
12.Friends unfairly	.336**	.195**	.234**	.200**	.163**	.311**	.335**	.259**	.226**	.594**	.676**	1					
13.Interfered	.220**	.194**	.234**	.200**	.163**	.146**	.186**	.159**	.113**	.163**	.157**	.151**	1				
14.Argue with family	.242**	.244**	.216**	.226**	.175**	.167**	.220**	.174**	.169**	.182**	.192**	.185**	.401**	1			
15.Isolated	.191	.196	.151	.155	.125	.138	.157	.166	.136	.108	.122	.136	.284	.376**	1		
16.Less important	.205**	.186**	.184**	.212**	.200**	.176**	.217**	.200**	.173**	.135**	.156**	.137**	.260**	.332**	.564**	1	
17.Conflict	.256**	.244**	.217**	.201**	.214**	.155**	.206**	.210**	.160**	.152**	.168**	.180**	.399**	.386**	.412**	.420**	1

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

Table 4. Correlation Matrix for the Psychological Distress Factor

Variables	1	2	3	4	5	6	7	8	9	10
1.Depressed	1									
2.Nothing cheer up	.553**	1								
3. Feel Hopeless	.446**	.515**	1							
4.Restless/ fidgety	.400**	.322**	.392**	1						
5.Restless could sit	.217**	.439**	.347**	.570**	1					
6. Tired for no reason	.432**	.440**	.401**	.410**	.377**	1				
7.Everything an effort	.342**	.247**	.282**	.324**	.243**	.380**	1			
8.Feel worthless	.422**	.435**	.442**	.318**	.318**	.384**	.323**	1		
9.Nervous	.041**	.369**	.361**	.382**	.282**	.383**	.363**	.390**	1	
10.Nothing could calm	.406**	.573**	.574**	.357**	.483**	.454**	.253**	.497**	.446**	1

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

APPENDIX B: Measures of Latent Variables

Original Items	Final Items
Acculturation	
- How closely do you identify with other people who are of the same racial and ethnic descent as yourself?	Ethid1
- How close do you feel, in your ideas and feelings about things, to other people of the same racial and ethnic descent?	Ethid2
- How much time would you like to spend with other people who are of your same racial and ethnic group?	Dropped
- How important do you think it is for people who are from your same racial and ethnic group to marry other people who are also from this group?	Ethid4
- Years in the United States	Duration
- How well do you speak English?	Engpro1
- How well do you read English?	Engpro2
- How well do you write English?	Engpro3
Social-Cultural Resources	
- How often they talk on the phone or get together with friends?	Frisup1
- How much they can rely on friends for help with a serious problem?	Frisup2
- How much they can open up to friends and talk about their worries?	Dropped
- How often they let their friends know about it?	Frisup4
- Whether people in the neighborhood can be trusted?	Neisup1
- Whether people in the neighborhood get along with each other?	Neisup2
- Whether people in the neighborhood help in an emergency?	Neisup3
- Whether people in the neighborhood look out for one another?	Neisup4
- How often do you usually attend religious services?	Dropped
Acculturative Stress	
- You are treated with less courtesy than other people	Unfair1
- You are treated with less respect than other people	Unfair2
- You receive poorer service than other people at restaurants or stores	Unfair3
- People act as if they think you are not smart	Unfair4
- People act as if they are afraid of you	Dropped
- People act as if they think you are dishonest	Dropped
- People act as if you are not as good as they are	Unfair7
- You are called names or insulted	Dropped
- You are threatened or harassed	Dropped
- How often do people treat you unfairly because you are . . . ?	Dropped
- How often have you seen friends treated unfairly because they are. . . ?	Discrim2
- How often do people dislike you because you are?	Dropped
- You have felt that being too close to your family interfered with your own goals	Dropped

- Because you have different customs, you have had arguments with other members of your family	Conflic2
- Because of the lack of family unity, you have felt lonely and isolated	Dropped
- You have felt that family relations are becoming less important for people that you are close to	Dropped
- Your personal goals have been in conflict with your family.	Conflic5

Appendix C. Intercorrelation Matrix for the Latent Factors

Variables	1	2	3	4
1.Acculturation	1			
2.Acculturative stress	.296***	1		
3.Social-Cultural Resources	.091***	-.225***	1	
4.Psychological Distress	-.057*	.264***	-.151***	1

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

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