

**Linking Acculturation Patterns, Acculturative Stress, and Education Policies to Educational  
Competence among Mexican-American Children**

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## **ABSTRACT**

### **Linking Acculturation Patterns, Acculturative Stress, and Education Policies to Educational Competence among Mexican-American Children**

**Yoon Mi Kim**

The persistent educational underachievement of Latino children and adolescents has emerged as a public concern since they have become the fastest growing group of students in kindergarten through 12<sup>th</sup> grade in the U.S. This dissertation expands on what we already know about educational experiences among minority youth in general, and Mexican-American children in particular. Mexican-American children's acculturative experiences are examined in this study through the various lenses of Latino and Mexican-American history, sociopolitical contexts, theories, and quantitative analyses. This study focuses primarily on the educational trajectory of Mexican-American children who are more likely to experience a relatively slow path of cultural integration while they struggle with dissonant acculturation. Beyond acculturation, it also addresses the different influences of two education policies—English Immersion and bilingual education—on children's acculturation and educational achievement.

This dissertation is divided into seven chapters. Following the scope of the underachievement problem, Chapter 1 prioritizes research themes on the micro-level—Mexican-American children's identity and acculturative contexts related to their immigrant parents—to the macro-level, potentially elusive aspects such as anti-immigrant sentiment and changes in educational settings. Chapter 2 explores Latino and Mexican-American history to understand how Mexicans have become Americans. It also illustrates how Mexican Americans and their culture have been viewed by American society and then discusses identity formation of minority

youth based on the theories of identity, symbolic interactionism, stress and coping, and acculturation—all of which are incorporated to explain cultural adaptation and identity formation among Mexican-American youth. Delving deeper into their cultural adaptation, this chapter describes the acculturation process in terms of two competing theories—unidimensional and bidimensional acculturation models—and conceptualizes diverse acculturation patterns from the bidimensional acculturation perspective. Chapter 3 provides an extensive literature review on the relationships among acculturation factors, education policy, and educational achievement. It also includes an overview of the current use of unidimensional and bidimensional acculturation measurements.

In Chapter 4, research hypotheses and questions are proposed. The specific aims of this study are to 1) identify acculturation patterns; 2) to investigate whether any particular acculturation pattern affects educational achievement; and 3) to examine the impact of acculturation factors and education policy on educational achievement. Chapter 5 describes the sample of 295 Mexican-American children and provides preliminary analysis results. In Chapter 6, acculturation measurements are revised and validated by exploratory and confirmatory factor analyses. During this study, three acculturation patterns emerged from a cluster analysis, and a particular acculturation pattern (i.e., separated pattern) was found to be related to higher educational competence among Mexican-American children. This study found that a bidimensional acculturation approach was more helpful than a unidimensional acculturation approach in understanding the impact of acculturation on educational competence. With respect to education policy, bilingual education was shown to promote children's ability to maintain their Mexicanness. These culturally Mexican-oriented children showed higher educational competence than the highly Americanized children attending English Immersion schools.

English Immersion increased children's acculturative stress and general social stress, which negatively influenced their educational competence. In Chapter 7, implications and limitations of this study are discussed, and suggestions for future research and social work practice are presented.

## **CHAPTER 1: INTRODUCTION**

In 2011, American census estimates showed a historic demographic shift where the number of minority births surpassed Caucasian births for the first time. The well-being of minority children has become more important than ever to the nation's continuing prosperity. Of the U.S. minority children and youth population, Latinos are growing more rapidly than any other racial/ethnic group. Therefore, educational achievement among Latino students is the key to national prosperity. However, substantial research evidence suggests that the educational achievement of Latinos lags considerably behind that of other racial/ethnic groups (Gandara & Contreras, 2009; Glick & Hohmann-Marriott, 2007; Guzman, 2001; MacDonald, 2004; Pew Hispanic Center, 2010; Van Hook & Balistreri, 2002). Forty-one percent of Latino adults aged 20 and older do not have a high school diploma, compared with 23 percent of African American adults and 14 percent of Caucasian adults (Pew Hispanic Center, 2010). Latinos have a lower school enrollment rate (44%) than either their Caucasian (58%) or African American (53%) counterparts (Pew Hispanic Center, 2009). Furthermore, their likelihood of completing a college degree is 50% lower than among their Caucasian counterparts (Fry, Gonzales, & Center, 2008).

The consequences of educational underachievement have affected Latinos' socioeconomic status. The 2009 median weekly earnings of full-time wage and salary workers were \$529 for Latinos, compared with \$589 for African Americans, \$742 for Caucasians, and \$861 for Asians (U.S. Department of Labor, 2009). Latinos were less likely to obtain the highest paying jobs (e.g., management, professional, and related occupations) than were African Americans, Asians, and Caucasians (U.S. Department of Labor, 2009). There is substantial evidence for intergenerational transmission of low socioeconomic status. A higher percentage of Latino children are living in poverty (27 %) than the national percentage (18 %) (U.S. Census Bureau,

2011), and approximately 61% of Latino children are more likely to experience need and eligibility for public benefits and social services (Hernandez, Denton, & Macartney, 2008). For social workers and policy makers to respond to the group's need for educational and socioeconomic progress, more research on the educational underachievement of Latinos is imperative.

### *Scope of Problem*

According to the definition of “Latino” used in the U.S. Census Bureau (2010), “Hispanic or Latino” refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. In 2010, about three-quarters of the Latino population consisted of Mexican, Puerto Rican, and Cuban immigrant groups, and individuals of Mexican origin comprised 63% of the total Latino population in the United States. The U.S. Census Bureau (2010) predicts that, by 2025, one out of every four students will be Latino. This growing Latino population accounted for 56% of the nation's growth from 2000 to 2010. Among children ages 17 and younger, 23.1% of this age group are Latino, and Latinos comprise 16.3% of the entire population (Pew Hispanic Center, 2010). At present, Latinos make up more than 30 % of the entire population in four states: New Mexico, Texas, California, and Arizona (U.S. Census Bureau, 2010).

Education has long been viewed as an important predictor for future socioeconomic success of a nation's children. While Latinos have become the largest and fastest-growing ethnic population, they have attracted considerable attention because of pervasive educational underachievement. Twenty-one percent of Latinos aged 18 to 24 have not completed or have not enrolled in high school; this is the highest rate among racial/ethnic groups (U.S. Census Bureau, 2011). Fifty-two percent of foreign-born Latino adults were high school dropouts in 2010,

compared with 25% of the native-born. Forty-one percent of Latino adults aged 20 and older do not have a high school diploma, compared with 23% of African American adults and 14% of Caucasian adults (Pew Hispanic Center, 2010). The National Center for Education Statistics (2010) reports that Latino four-year-olds from the 2001 birth cohort have lower rates of proficiency in letter recognition than do Caucasian, African American, and Asian children. A smaller percentage of Latino high school students takes geometry, algebra II, and statistics than do Caucasian, African American, and Asian/Pacific Islander students (National Center for Education Statistics, 2010). The New York Times recently shed light on the educational crisis of Mexican-Americans, citing that 41 % of Mexican-American youth ages 16 and 19 in New York City drop out of school, more than four times the city average (Semple, November 24, 2011). This evidence indicates that educational underachievement is a persistent and widespread phenomenon among Latinos.

A large body of research provides several potential factors which may place Latino youth at risk of educational underachievement: limited English proficiency, lack of parental involvement, and socioeconomic hardships (Alexander, Entwisle, & Kabbani, 2001; Alva & Padilla, 1995; Delgado-Gaitan, 2001; Fry et al., 2008; Orfield, Frankenberg, & Lee, 2003; Portes & MacLeod, 1996; Rumbaut, 1995; Ryabov & Van Hook, 2007; Suarez-Orozco & Suarez-Orozco, 1995; Tinkler, 2002; Valencia, 2002). In addition to these factors, segregation has been considered to have a detrimental effect upon educational achievement because racially and ethnically segregated schools offer inadequate education and fewer college preparatory courses (Zarate, Bhimji, & Reese, 2005). Since more and more Latinos are living in segregated residential areas, Latino students are more likely to attend substandard schools with high



concentrations of poverty and less-qualified teachers (Darder, Torres, & Gutierrez, 1997; Frankenberg, Lee, & Orfield, 2003; Oakes & Rogers, 2007).

### *Research Issues in Latino Youth*

Although existing literature offers guidance for understanding Latinos' educational underachievement, the great majority of such studies have been incomplete in explaining the widespread occurrence of this phenomenon. Given that Latino youth are children of immigrant families or immigrants themselves, their cultural adaptation and its relationship to educational outcomes should be included in educational research on Latino youth. According to a 2009 survey by Pew Hispanic Center, almost half of Latino underachievers reported cultural conflicts and discrepancies between school environment and home environment as the major reasons for their educational underachievement. However, there is little discussion about school climate and educational policies and how these may deprive learners of educational motivation and delay cultural integration, which, in turn, may directly or indirectly link to the low educational achievement of Latino youth.

Furthermore, Latino youth may be susceptible to discrimination, since anti-immigration sentiment has largely been focused on Latino immigrants. Discussions in the media and politics contend that illegal immigrants, particularly Latinos, threaten security and jobs for U.S. citizens (Guyl, Madon, Prieto, & Scherr, 2010). This social atmosphere may lower self-esteem and increase emotional distress among Latino youth, who may perceive themselves as members of an inferior ethnic group, which could lead to an identity crisis. This pressure from the dominant culture may interfere with maintaining Latino culture and language, affecting Latino youth's self-esteem and ethnic pride. Hence, it is necessary to examine the struggle of Latino youth in

forming their own identities as members of their own ethnic group as well as members of the dominant society (Erikson, 1968; Shrake & Rhee, 2004).

The Latino labor force has grown faster than other populations due to growing birth rates and immigration. According to a recent report by the Pew Hispanic Center (2012), Latinos will represent almost a quarter of the nation's working-age adults by 2020. This demographic change and the scope of the problem presented in this study strongly support the need to expand educational opportunities for Latinos. Unfortunately, few interventions and services have been provided to support at-risk Latino students struggling within the American school system. Hence, social workers and researchers should be aware of the need to invest in high-quality research and evidence-based intervention programs, which focus on targeting potential risk and protective factors affecting Latino educational achievement.

Recognizing the significance of Latino underachievement, this study aimed to investigate possible relationships among identity formation, acculturation, acculturative stress, school contexts, and educational achievement in Latino youth, Mexican children in particular. This study described relevant theories of identity and acculturation to explain potential risk factors affecting Latinos' educational and psychological well-being. All research hypotheses were derived from theoretical considerations and empirical evidence. Latino and Mexican-American history and theoretical background are described in the following chapters.

## **CHAPTER 2: BACKGROUND AND REVIEW OF THEORIES**

### *Latinos/Latinas Who Became Americans*

American history includes many racial/ethnic groups who came to the United States from different parts of the world, each with its own history and culture. Native Americans who lived on the east coast of North America were ousted from their territories by Europeans. During the Spanish colonization of the Americas, racially and culturally diverse Spanish-speaking groups struggled to establish a communal settlement in the southwestern, southern coastal, and California Pacific coastal regions of the United States. The Spanish-speaking groups included the American-born European, Mestizo (mixed ethnic/racial heritage), various indigenous groups, and colonized citizens from Latin America (Novas, 2007). These Spanish-speaking peoples began to venture into North America and created their own cultural enclaves. As a result, even after the United States' victories in the Mexican-American War and the Spanish-American War, the Spanish culture left a deep mark on several states. For instance, the Spanish language provided the names for many of the rivers, towns, and counties that currently exist, and Spanish architectural concepts still flourish, particularly in California, Texas, and Florida (Maxwell, 1998). This early history indicates that what is now the present Southwest of the United States was dominated by the Spanish rather than the British.

The descendants of the region of Mexico underwent serious disturbances of the social order and suffered oppression after the Mexican-American War. Mexico lost one-half of its territory, which includes the present American Southwest from California to Texas (Novas, 2007). About 75,000 to 80,000 Mexicans had to choose either going back to Mexico or staying in the United States (Maxwell, 1998). If they didn't declare their choice, after a year they automatically became citizens of the United States (Weber, 2006).

Mexicans who lived in the southwest regions confronted dramatic changes in their lives and in their communities. Many of them lost their property and became foreigners in their own land. A saying goes, “The border crossed us; we did not cross the border” (Trueba & McLaren, 2000). Furthermore, discrimination has dogged Mexican-Americans far longer than it has any European immigrant group, which results in little opportunity for advancement in socioeconomic status. Mexicans who became Americans discovered that they had become second-class citizens in their own land.

### *Demonized Latino Cultural Heritage*

Mutual acceptance and respecting difference have become the collective experiences in the United States to forge a brand new country. At the national level, the issues of diversity and multiculturalism came to the fore throughout the late 1950s and early 1960s. The ever more globalized world and political climate influenced state educational policies, which incorporated culturally sensitive curricula and instruction for African American and Latino children to narrow the achievement gap (Johnson, 2003). Eleven states have enacted provisions for bilingual instruction and assessment for language-minority youth (Eisner, 2010), and U.S. schools have developed a variety of bilingual programs to instruct Spanish-speaking English learners in both Spanish and English (Tienda & Haskins, 2011).

Despite the recognition of diversity and multiculturalism, anti-immigrant sentiment has always existed along with a concern for national unity, in which the achievement of an American identity may be felt to be challenged by multicultural identities (Berry, 1998; Bibby & Wayne, 1990; Huntington, 2004). Sixty-four percent of non-immigrants believe immigrants may be changing the nature of the country in ways of which they do not approve (NPR/Kaiser/Kennedy School Immigration Survey, 2004). Such fears have continued to surface in discussions on

bilingual education and English-only instruction in many states. From 1998 to 2002, the residents of three states—Arizona, California, and Massachusetts— passed anti-bilingual education ballot initiatives and implemented English-only education (Mora, 2009).

Paradoxically, a true multicultural nation appears to be improbable for both non-immigrant and immigrant groups in America. The non-immigrant dominant group is afraid of the “menace” of diversity and multiculturalism, while the immigrant group has limited socioeconomic opportunities to integrate into mainstream society. Within the socioeconomic system, the dominant groups find a secure place and set residential boundaries between them and the others, while the others (e.g., minority and immigrant groups) inevitably live in racial/ethnic enclaves. Consequently, most immigrant minorities cannot be assimilated into mainstream culture instantly due to the difficulties related to socioeconomic status, segregation and discrimination. Nonetheless, the dominant groups urge immigrants’ assimilation through showing contempt for ethnic-cultural communities. In particular, Latino communities and enclaves are perceived as a major potential threat to the dominant groups:

Unlike past immigrant groups, Mexicans and other Latinos have not assimilated into mainstream U.S. culture, forming instead their own political and linguistic enclaves—from Los Angeles to Miami—and rejecting the Anglo-Protestant values that built the American dream. (Huntington, 2004, p. 30)

While Latino culture and language are negatively evaluated by the dominant group, it is unlikely that Latino youth will develop positive social and personal identities because of the inferior positions which they perceive themselves to hold (Côté & Levine, 2002). Given that identities involve social categorization that the dominant groups confer, Latino youth will likely encounter continual problems in developing self-esteem and self-concept. In this context,

healthy identity formation among Latino youth appears to be precarious, which in turn could lead them to experience emotional and behavioral problems in school. To explain the nexus between identity and emotional/behavioral problems, the following section begins the discourse by giving an overview of identity and acculturation theories.

### *Identity and Identity Role Theory*

Human beings identify themselves on the basis of difference and sameness in relation to others. The importance of difference is further underscored by the fact that perception of similarity to other people is not conceivable without the presence of others who have different traits. Therefore, one's identity is originally constructed through difference rather than commonality (Hall & Du Gay, 1996). Given this assumption, it can be argued that human beings develop their own identities through the existence of others who are dissimilar to them.

Since the United States comprises various racial and ethnic groups, individuals have memberships in a certain racial/ethnic or cultural group, depending on the degrees of their social engagement and circumstances, which will become a part of their total identity. Given the socio-historical discourse of Latinos and Mexican-Americans, the concept of identity and acculturation in this paper is formulated within their ethnic and cultural backgrounds.

One's identity is an essential element for understanding one's cognitive and behavioral differences in relation to others, which emerge from an unshared<sup>1</sup> environment. Identity role theory explains that each individual internally develops his own rank of role identities through the perceived rewards that are constrained by situational demands, social interactions, and

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<sup>1</sup> Environments are categorized into shared and unshared in explaining individual differences. The present study hypothesizes that unshared environmental variance (e.g., differential parenting, differential schooling system, and differential teacher relationships) causes differences in behavioral outcomes among people (Plomin & Daniels, 1987; Rowe & Plomin, 1981).

demographic factors (McCall & Simmons, 1978; Stryker & Serpe, 1982). Consider, for example, a student of Latino-descent who spends most of his time with culturally similar Spanish-speaking friends because he feels more comfort and psychological reward from being with Spanish-speaking friends than from being with English-speaking friends. In a condition in which he possesses two social selves as the members of the Latino immigrant group and the mainstream U.S. group, it is assumed that his identity as a Latino is positioned higher than his identity as an American. Likewise, the hierarchy of an individual's identity salience is developed through the dynamics of his multiple social selves associated with groups (e.g., male, father, and work place) to which he belongs, and the identity salience manifests in terms of his cognitive-behavioral patterns (Hogg, Terry, & White, 1995). Therefore, one's hierarchy of identity salience makes the person behave differently from other people in a given situation. In this sense, one's different cultural identities can be compared by observing his behaviors and role choices in a given situation whereby the motivation for the behavior or role choice emerge from the hierarchy of identity salience.

The discussion of identity encompasses various concepts and different theoretical contexts from the traditions of psychoanalysis to symbolic interactionism; however, these theories commonly emphasize "performing social/cultural norms and roles" as a key feature in understanding one's total identity. In the realm of symbolic interaction, Goffman (1963) develops the concept of identity in terms of personal identity, social identity, and ego identity. One's personal identity is formulated by the desire to be unique and differentiated from others, while social identity is formed by roles and behaviors based on the meaning of membership in social groups. The term, ego identity, can be traced to the Freudian legacy with the emphasis on the temporal internalization of one's past self and present self: what one has been in the past and

what one is presently (Bourn, 1978). Similar to Goffman's idea, Erikson (1968), greatly influenced by Freud and Mead, defines identity as the personal-social self who is variously ascribed by social roles that make the self act as the social self. In a similar vein, identity role theory conceptualizes that a person's identity is attached to multiple competing norms and roles related to particular memberships and situations (Stryker, 1980). For example, the identity of a Mexican-immigrant is attached to competing cultural norms and roles such as those of Mexican-oriented and American-oriented, and she<sup>2</sup> chooses a certain role and performs a particular cultural behavior in a given situation. Given this, identity is defined as a multidimensional set of personal-social selves that make a person perform certain types of behaviors, norms, and roles according to the groups to which the person belongs (Ashmore, Deaux, & McLaughlin-Volpe, 2004; Sedikides & Brewer, 2001; Simon, 1997).

### *Identity Development*

Performing multiple social roles is also useful to understand identity development. Many scholars have proposed a link between identity development and role performance as an artifact of interaction between the individual and society (Ashmore et al., 2004; Foote, 1951; Goffman, 1959; Scheff, 1970; Stryker, 1968). According to this view, identity is mainly formed through the social process, which both the individual and others mutually recognize their roles socially bestowed. On the other side, the Freudian tradition and Eriksonian perspective tend to view identity development as the internalizing process by which a person comes to realize what groups are significant for him and accepts the roles and labels as a part of his nature (Gleason, 1983). Each person internally and uniquely develops identity with the inner sameness and

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<sup>2</sup> The present study will use gender inclusive language, such as "he" and "she," interchangeably throughout the paper with sensitivity to the gender implications of the language.



continuity, even though slight inconsistency may be found due to various situations. Taken these two different views together, the identity development process consists of both the inner process and social process of an individual who has many social selves to internalize.

From the cognitive developmental perspective, a toddler at around the age of two becomes differentiated and develops a self-concept, and begins to distinguish between the actions of others and her own actions through social interaction around the early school years (Inhelder, Piaget, Parsons, & Milgram, 1958). The child gradually begins to analyze her identifications and construct her own personal role theories sometime between the ages of 11 and 15 (Lesser & Pope, 2006). In the nascent phase of identity formation, the young teen may neither decide how to act nor be much concerned about others who look or act differently. Some young teens may become blocked from identity formation or trapped constantly in difficulties in deciding how to act and what to do. Such a phase refers to the stage of identity diffusion or identity crisis (Erikson, 1968). In general, the teenager's identity is formed as continuously interacting with others in which she is given an opportunity for self-assertion and learning from others. In such a process, a young person becomes aware of the differentiation of her roles and positions from those of others. Upon entering the adult world, she constantly changes and modifies her personal theories about herself and others, while internally construing and negotiating information and the meanings of her roles and positions, which are created and recreated by others who influence and are influenced by her. As such, she is impressed in some way by others, and she simultaneously expresses herself to others which, in turn, other people are influenced by her.

Symbolic interactionism embraces the two aspects of identity development with emphasis on the fact that one's identification is given by self-interaction and interpersonal interaction.

Symbolic interactionism refers to “self-interaction and interpersonal interaction” as *social interactions* which involve both the internalizing process and the social process. From the symbolic interactionist perspective, the individual, others, and society participate in creating and recreating symbols (e.g., names and meanings) in relation to one’s position and group membership. Mead (1934) describes that the social interaction process is both interdependent (i.e., performing and expressing the self through interactions with others) and independent (i.e., each individual interprets and internalizes the meanings of the self and roles). In other words, the individual can influence himself through the internalizing process, while the individual, others, and society mutually influence each other through social interaction. Hence, identity development involves both the independent internalizing process and the interdependent social process. In summary, the general notion of identity development is the dual process wherein a person internally and socially deals with his multiple social selves in relation to the groups to which the person belongs.

#### *Conceptualizing Ethnic Identity, Mainstream Identity, and Acculturation*

Because an individual possesses as many selves as the number of social groups with which he interacts (James, 1890), an immigrant’s ethnic membership brings his ethnic identity into existence as one of his social selves. Tajfel (1981) defines ethnic identity as part of an individual's total identity which derives from his understanding of his membership in a certain ethnic group to which he is significantly and emotionally attached. Similar to the conceptualization of ethnic identity, an individual’s mainstream identity can be defined as part of the individual's total identity, which stems from his understanding of and attachment to his membership in the mainstream group after immigrating to the mainstream society.

Adapting to a new culture is accompanied by cognitive and behavioral changes as an immigrant perceives and learns about the new surrounding culture and people. For a recent immigrant, her mainstream identity begins to shape a part of her total identity as she perceives and learns the differences between her original ethnic culture and the current mainstream culture. In regard to the relative salience of her ethnic identity and mainstream identity, her ethnic identity upon recent arrival may be stronger and positioned higher than her mainstream identity; however, the hierarchy of her identity salience will change as she adapts to mainstream culture. Her cultural behavioral practices may not be immediately changed by contact with a new culture, but her cognitive process is instantly influenced by a new culture as she experiences and appraises the similarities and differences between her ethnic culture and mainstream culture. In other words, the initial adaptation to mainstream culture involves her cognitive space (i.e., the addition of mainstream identity to her pre-existing identity), and her cultural behavioral changes will occur later on as a consequence of the changes in her cognitive space and identity status. Therefore, adapting to a new culture involves the changes in one's cognitive space and behavioral practices, and this phenomenon is referred to as *acculturation*. In this context, the present study conceptualizes acculturation as immigrants' cognitive and behavioral changes as a result of adding a mainstream identity to their pre-existing identity, which occurs when they adapt and respond to new cultural surroundings.

Identity development of minority children and youth involves multiple socio-cultural domains. For immigrant youth, identity may include but is not limited to membership in certain racial/ethnic, national, gender, cultural and religious groups, depending on the degree of involvement in each membership. In terms of their cultural membership, immigrant youth generally manage two cultural affiliations, involving their ethnic/racial culture and mainstream

culture, thereby forming a dual-dimensional cultural identity. Several researchers discuss a series of steps of identity formation among minority individuals by considering the dynamics of ethnic/racial and mainstream cultures (Marcia, 1980; Phinney, 1989; Phinney, Cantu, & Kurtz, 1997). For example, Marcia (1980) proposed an identity-status model for minority youth who deal with their ethnic/racial membership and mainstream membership. Marcia's identity model consists of four different statuses: the foreclosed, the diffusion, the moratorium, and the identity-achieved statuses. The *foreclosed* status is an initial phase of identity development wherein minority youth have not explored or committed to ethnic/racial culture and mainstream culture. Foreclosed youth, in particular young children, tend to adopt the cultural values and roles that their parents preserve and favor. Such foreclosed youth likely demonstrate high levels of attachment to their parents, thus naturally developing a strong sense of racial/ethnic cultural membership. However, some minority youth experience the *diffusion* stage, especially when they hold a low level of attachment to their parents and fail to develop a sense of belonging to either their ethnic/racial or mainstream cultures. In this case, diffused minority youth tend to reject a commitment to identity achievement and become marginalized from both ethnic/racial and mainstream cultures. In contrast, youth in the *moratorium* stage actively engage in the process of seeking meaningful social/cultural roles and values. This moratorium stage allows youth to explore and understand both their ethnic and mainstream cultures, which may enable them to develop their own identities. The *identity-achieved* stage occurs when youth demonstrate firm commitments to, and internalization of, their ethnic/racial and mainstream cultures. Identity-achieved individuals differ from foreclosed individuals in terms of whether the individuals shape their identities through the moratorium stage. The identity-achieved youth are

more likely to set up meaningful life directions in their roles and commitments and to develop mutual interpersonal relationships with friends and parents (Kroger, 2006).

Based on Marcia's identity model, Phinney (1989) empirically showed various stages of ethnic identity. By assessing the degrees of role conflict and commitment to ethnic/racial culture, Phinney illustrated stages of ethnic identity development among African-American, Mexican-American, and Asian-American youth. In her study, ethnically/racially identity-achieved minority youth had the highest scores on an ego identity scale and a psychological adjustment scale. Phinney's findings were further supported by the study of Roberts et al. (1999) in that ethnic identity achievement has been strongly related to increased coping ability, self-esteem, and optimism, and to decreased loneliness and depression. Marcia and Phinney's identity development models have been widely used to explain the identity development of Latino and Asian immigrant youth in relation to their ethnic identity and mainstream identity. Since the minority youth's identity development involves cultural adaptation, the concept of identity development has been incorporated into acculturation theory. The following section reviews acculturation theory which considers immigrants' two cultural domains and conceptualizes immigrants' changes in identity status and cultural behavior.

### *Two Paradigms in Acculturation*

In the early stage of acculturation studies, researchers hypothesized acculturation as the assimilation process based on the premise that their cognitive and behavioral patterns are unavoidably assimilated into American society. As a result, assimilation has traditionally been used as a synonym for acculturation (Gordon, 1964; Trimble, 2003). Park (1930) and Gordon (1964), for example, assert that immigrants are generally considered to be assimilated into the host society. This dominant group perspective can be explained by functionalism, whereby the

assimilation of immigrants is functional and inevitable because it ensures the maintenance of mainstream society's equilibrium (Parsons, 1951). The parallel focus of both functionalism and the dominant perspective on acculturation presumes that immigrants should adopt the prevailing social and cultural practices of mainstream society in order to preserve the existing social system. In other words, dominant groups expect immigrants to be assimilated, and, consequently, *the immigrants are coerced to relinquish their native cultural practices*. Acculturation, and therefore assimilation, is conventionally conceptualized to be a linear function of the time of residence in mainstream society. Yet there has been an academic backlash against the conventional linear perspective. Researchers have criticized that the linear assimilation perspective confers a passive and limited role on immigrants and overlooks the variations in acculturation patterns across immigrant individuals and groups (Berry, 2003a; Birman, 1998; Cortes et al., 2003; Kim-Jo, Benet-Martinez, & Ozer, 2010; Trimble, 2003). In this context, contemporary theoretical frameworks on acculturation make distinctions between unidimensional and bidimensional or multidimensional theories<sup>3</sup>.

Unidimensional theory is congruent with the traditional assimilation perspective in that the acculturation process takes place along a single straight line, consisting of binary ends: one end indicates a recent immigrant's culturally-dissimilated status with the greatest degree of the ethnic identity, while the other end indicates the fullest assimilation with the greatest degree of the mainstream identity. Given this, unidimensional theory hypothesizes that the longer an immigrant is in the United States, the weaker his or her native culture becomes (Berry, 2003b; Ryder, Alden, & Paulhus, 2000). In contrast, bidimensional theory leaves open the possibility of diverse acculturation modes, irrespective of time of residence in the new society. In other words,

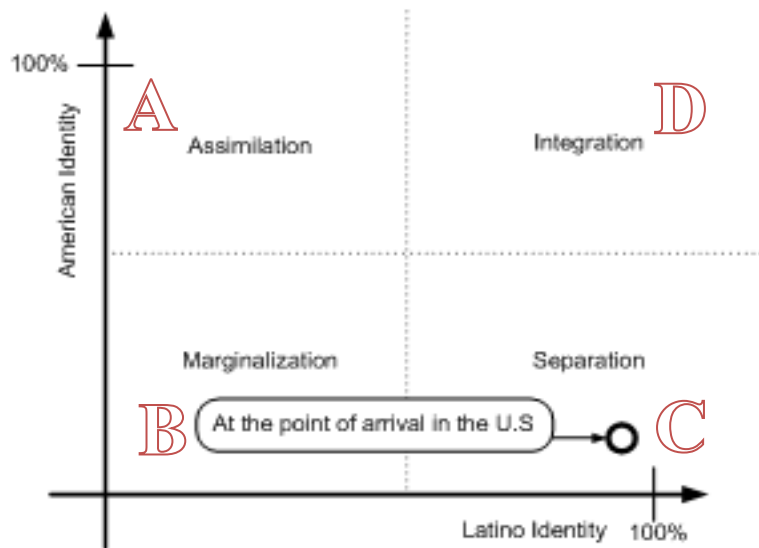
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<sup>3</sup> Hereafter, this paper uses the term "bidimensional theory" to refer to both bidimensional and multidimensional theories.

the acculturation process does not necessarily mean assimilation or the loss of an immigrant's cultural heritage. Therefore, in bidimensional theory, acculturation is differentiated from assimilation, which suggests that an immigrant may still maintain his ethnic identity simultaneously with either high or low degrees of American identity at any point after immigration.

Berry (1980) describes the detailed concepts of bidimensional acculturation theory by using four exemplary acculturation patterns— *assimilation*, *separation*, *marginalization*, and *integration*. “Assimilation” refers to the state whereby immigrants’ cognitive-behavioral patterns become similar or identical to mainstream culture as adopting new cultural practices while losing their native ethnic culture of heritage (quadrant A). “Marginalization” occurs when immigrants do not prefer or adhere to either culture, thereby weakening or rupturing social ties in both their native culture and mainstream culture (quadrant B). The “separation” pattern can be identified when immigrants maintain their native ethnic culture while avoiding mainstream cultural practices (quadrant C). Lastly, the “integration” pattern occurs when immigrants maintain their native culture while learning and participating in a new culture (quadrant D). In essence, Berry’s four acculturation patterns consider acculturation to be a matter of position-taking or role-taking in various situations, rather than a predetermined process as described by the unidimensional perspective. In addition, immigrants’ position-taking or role-taking patterns can be changed by various socio-cultural stimuli in a given situation. Hence, the acculturation process is defined as *a constantly changing phenomenon* reflecting the changes in an immigrant’s identity status and behaviors as the immigrant deals with the native ethnic culture and the mainstream culture.

Figure 1: Berry's four acculturation patterns



It is important to note that Berry's four acculturation categories should be regarded as an exemplary model of bidimensional acculturation theory. In other words, more or fewer acculturation patterns than Berry's four categories may exist across a variety of situations and diverse populations (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Two existing studies empirically tested the bidimensional model of acculturation using cluster methods (Bauman, 2005; Schwartz, Zamboanga, & Jarvis, 2007). Five acculturation categories (i.e., traditional, marginalized, bicultural, assimilated, and unclassified) were reported by Bauman's study (2005), using a sample of 116 elementary school-aged Latinos students in a southwestern state. More recently, Schwartz, Zamboanga and Jarvis (2007) identified six acculturation patterns (i.e., undifferentiated, assimilated, partial bicultural, American-oriented bicultural, separated, and full bicultural) with a sample of 436 Latino college students in Miami.



### *Two Psychological Outcomes of Acculturation*

The field of acculturation research has delineated two potential psychological outcomes that emerge from acculturation. The two outcomes are acculturative stress and perceived discrimination, which are considered to be pivotal dimensions in the psychology of minority immigrants and its potential consequences. Acculturative stress and perceived discrimination are especially important for predicting outcome variables in terms of a stress model. The stress model posits that perceiving oneself to be a target of being adjusted and changed and of being discriminated is a psychosocial stressor (Dion, 2002). Such a perception elicits cognitive appraisals of threat such that immigrants often encounter both predictable and unpredictable social stressors, entailing intense adaptation and resilience.

*Acculturative stress* is defined as emotional strain and heightened feeling, such as a state of alertness and anxiety, which occurs when immigrants perceive a given cultural adaptation as a threatening situation and believe that they are not able to cope with that threat. Acculturative stress includes such emotional and psychological outcomes as anger, anxiety, guilt, shame, sadness, envy, jealousy, and disgust (Lazarus, 1993). Marginalization is considered to be the most stressful acculturation pattern in that an immigrant cannot benefit and comfort from either cultures. However, all kinds of acculturation patterns can engender varying degrees of acculturative stress because cultural adaptation is ipso facto stressful (Berry, 1980). In addition, a same acculturation pattern under a same condition may not produce the same levels of acculturative stress because each immigrant may perceive the same circumstance in different ways due to individual traits and personality. One may feel a given situation as less stressful while another may feel the same situation as exceeding her resources and capacities.

In some cases, acculturative stress levels depend on how well an immigrant's acculturation pattern fits into a given circumstance. For example, a highly assimilated immigrant may experience severe acculturative stress within an ethnic enclave where her ethnic community members preserve their ethnic identity and adopt a separation pattern. However, she may feel less stressful in a predominantly white-American community where assimilation is encouraged and favorable. In this sense, acculturative stress is contingent on the compatibility between acculturation patterns and given contexts since a certain circumstance exerts the pressure to preserve (or relinquish) one of either the host culture or the ethnic culture.

*Perceived discrimination* is a stressor in a context where immigrants see themselves as a target of hostile attitudes and behaviors by dominant group members due to ethnic/racial prejudice (Brettell, 2011; Finch, Kolody, & Vega, 2000). Researchers highlight the negative outcomes of perceived discrimination—the greater perceived discrimination, the less successful an immigrant's integration into mainstream society (Dion, 2001). Several studies support the negative relationship between perceived discrimination and outcome variables in terms of psychological, behavioral, and attitudinal consequences, such as aggression, sadness, anxiety, and excessively strong ethnic/racial identity and pride (Dion & Earn, 1975; Hannah, 1974; Pak, Dion, & Dion, 1991). Based on the evidence and arguments of the prior studies, minority youth research discusses the influence of perceived discrimination in immigrant youth's health and educational outcomes. Immigrant youth may experience the feelings and thoughts include injustice, disadvantage, inequality, and deprivation as the members of the disadvantaged groups as encountering prejudicial and discriminatory treatment in mainstream society. Perceived discrimination includes such unpleasant feelings and emotional reactions that are generally considered to be detrimental to outcome variables.

With rising anti-immigrant sentiment toward Latinos, Latino youth have become more susceptible to perceived discrimination than other ethnic minority youth. As noted in the previous section, discussions in the media and politics continuously disseminate the negative messages of the Latino population on the issues of illegal migrants and border insecurity. Moreover, several states such as Arizona and Alabama have brought changes and conflicts in immigration law enforcement against Latinos. In this context, Latino youth may perceive discrimination by tone of voice, choice of vocabulary, facial expression, gesture, and attitude in their habitus (i.e., the media, communities, and schools), and these cumulative discrimination experiences may be related to their educational outcomes. According to Ogbu (1992), societal exclusion and discrimination lower educational aspirations among minority youth due to the increase of negative attitudes and thoughts toward mainstream society. Mickelson (1990) and Oskamp (2000) also assert that educational underachievement among minority students may be related to their pessimistic view that education is less important and less beneficial in socioeconomic success because they would be treated unfairly by the society, irrespective of their educational achievement.

In conclusion, Latino youth may experience double stressors that derive not only from cultural adaptation, but also from societal discrimination. Those stressors, i.e., acculturative stress and perceived discrimination, can result in psychological turmoil that necessitates their aptitude to adapt and cope with their acculturation. Because youth do not have the maturity to deal with overwhelmed emotion and feelings, the acute phase of acculturative stress and perceived discrimination may have a significant influence Latino youth's development. Accordingly, the following section discusses the potential consequences of acculturative stress and perceived discrimination.

### *The Consequences of Acculturative Stress and Perceived Discrimination*

According to stress-coping theory, acculturative stress may have an effect on school performance and educational outcomes among Latino youth. In fact, stress-coping theory was developed for evaluating the psychological outcomes of patients and health care workers coping with stressful events in the clinical settings, but the concepts of stress-coping theory are useful in conceptualizing the potential impact of stressors. In stress-coping theory, individuals take a certain attitude and behavioral strategy in order to cope with the internal and external demands of environments that are appraised as *stressful* (Lazarus & Folkman, 1996). However, Latino youth with a poorly supportive environment and incompatible acculturative pattern in a given context are at risk for experiencing severe acculturative stress, and they are more likely to develop poorly regulated behavioral strategies for coping with the stressful environment (Lazarus, 1993). Such poorly regulated coping patterns for acculturative stress manifests maladaptive and problematic academic behaviors, which can lead Latino youth to be at risk for poor educational outcomes. For example, some Latino youth with limited English proficiency may prefer to be marginalized at schools with predominantly English-speaking peers, particularly when they are overwhelmed by stressful cultural and linguistic adaptation, and they believe that adaptive resources are insufficient to support adjustment to the demanding situation (Dressler & Bernal, 1982). These students may develop such defenses as withdrawal, pessimism, and defiant attitudes at school, which lead to truancy, grade retention, dropout, and a lack of educational motivation.

Erikson (1968) explains that immigrant youth who experience segregation and discrimination are more likely to experience a prolonged identity crisis and emotional challenges which hinder their educational success and integration into mainstream culture. While youth spend a considerable amount of time and energy overcoming identity crisis, they are less likely

to concentrate on academic learning, social and adaptive skills as their mainstream counterparts do. According to stress-coping theory, some youth may develop poorly regulated behavioral strategies for coping with the sense of identity diffusion, and such poorly regulated behavioral strategies may include maladaptive and problematic academic behaviors. In a same vein, Gibson and Ogbu (1991) have discussed educational underachievement among minority youth in terms of minority youth's identity crisis, which occurs when they experience discrimination and societal exclusion. He refers to such an identity crisis as *oppositional identity* that leads to low educational aspiration and motivation among minority youth, which, in turn, affects their educational achievement. Experiencing a long spell of identity crisis and oppositional identity, minority youth are prone to choose to withdraw from roles and responsibilities as the student members of the U.S. schooling system and the members of mainstream society (Erikson, 1968). As a result, identity crisis and oppositional identity manifest in terms of dysfunctional academic behaviors (i.e., truancy and inattentiveness) and defiant attitudes towards U.S. institutions including schools. Some minority youth may not strive hard for academic success because they do not expect that educational success will bring socioeconomic success due to their disadvantaged positions in relation to structural and societal barriers. Others may not pursue educational success because they personify themselves as educational underachievers which mainstream culture assigns. Furthermore, they may not feel the necessity of learning or participating in mainstream culture because they consciously or unconsciously take the subordinate group category for granted and do not ascribe mainstream group members to themselves. As a result, they may be unable to fully demonstrate their academic competence and talent as much as their mainstream counterparts.

Such psychological outcomes that emerge from cultural adaptation and discrimination may undermine the healthy identity development among Latino youth, which, in turn, may hinder the ability to focus and engage in school activities and class participation. While Latino youth negotiate the stressors generated from cultural linguistic adaptation and societal discrimination at schools and communities, their motivation and aspiration for academic success may be at risk when they perceive that their resources to manage the stressful experiences are limited or depleted (Lazarus & Folkman, 1996). Within the current context with a rising anti-Latino sentiment, Latino youth are more likely to undergo acculturative stress and perceived discrimination which may negatively affect their educational outcomes. Hence, it is necessary to examine the influences of acculturative stress and perceived discrimination on educational achievement among Latino youth.

### *Summary*

The present study conceptualizes ethnic identity, mainstream identity, acculturation, and stressors related to acculturation as follows. First, ethnic identity and mainstream identity are part of one's total identity based on his understanding and attachment to memberships in his native ethnic group and mainstream group. Second, acculturation refers to an immigrant's cultural adaptation manifested by his position-taking or role-taking in relation to his ethnic culture and mainstream culture in a given situation. Third, bidimensional theory explains that acculturation consists of constantly changing coping patterns in accord with the changes in one's identity status and behavior toward the two social selves that emerge from one's native ethnic culture and mainstream culture. Fourth, acculturative stress and perceived discrimination are unpleasant emotional and psychological outcomes that occur when immigrants perceive their cultural adaptation and discriminatory experiences as threatening. Fifth, Latino youth are more

likely to deal with the double challenges which emerge from cultural adaptation and discrimination, and such a context may result in a prolonged crisis of psychosocial development, which is detrimental to their educational achievement. The following sections review empirical findings connecting ethnic identity, mainstream identity, acculturation patterns, acculturative stress, and perceived discrimination to educational achievement, thereby suggesting causal priority and relationships among the variables. In addition, the potential for relationships between education policies and educational achievement is discussed in order to develop research questions for the present study.

### CHAPTER 3: REVIEW OF LITERATURE

From the process of delineating the theoretical concepts of ethnic and mainstream identities, acculturation patterns, acculturative stress, and perceived discrimination, two questions are evoked: how are these concepts measured, and how do these factors influence educational achievement across a variety of situations? The present study reviews existing acculturation measurements and then provides empirical findings of the effects of identity status, acculturation patterns, acculturative stress, and perceived discrimination on educational achievement among Latino youth. This section concludes by discussing the nexus between education policy and educational achievement.

#### *Review of Acculturation Measurements*

Acculturation measurements for Latinos were developed during the past three decades and assessed Latino immigrants' preference and frequency in language use, identity orientation, and cultural behavior. The existing measurements are conceptually bifurcated into unidimensional and bidimensional scales. As with the unidimensional theoretical framework, unidimensional scales measure the degrees of assimilation on the basis of the theoretical assumption that the acculturation process is a zero-sum phenomenon in which an immigrant's gain (or loss) of his ethnic cultural orientation is exactly balanced by the loss (or gain) of his mainstream cultural orientation (Barona & Miller, 1994; Burnam, Telles, Karno, Hough, & Escobar, 1987; Deyo, Diehl, Hazuda, & Stern, 1985; Franco, 1983; Mainous, 1989; Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987; Norris, Ford, & Bova, 1996). As a result, unidimensional scales have been designed to lead immigrants to choose one cultural-orientation either American culture or Latino culture. For example, the Los Angeles Epidemiologic Catchment Area Acculturation Scale (LAECA) measured Latino immigrants' language use,



cultural behaviors, and ethnic identity, and the response categories of the LAECA indicate either Latino-oriented or American-oriented; therefore, respondents are forced to choose one of the two cultural orientations. Based on the total score, each immigrant is categorized by three linear levels of acculturation: low assimilation, medium assimilation, and high assimilation, thereby measuring the levels of assimilation (Burnam, Hough, Telles, & Escobar, 1987).

Bidimensional acculturation scales have been developed by many researchers with the non-zero-sum assumption in the acculturation process (Cortés, Rogler, & Malgady, 1994; Erkut, Alarcón, Coll, Tropp, & García, 1999; Marín & Gamba, 1996; Mendoza, 1989; Szapocznik, Kurtines, & Fernandez, 1980; Zea, Asner-Self, Birman, & Buki, 2003). The underlying construct of bidimensional scales is that ethnic culture and mainstream culture do not involve a competitive zero-sum trade. Immigrants' ethnic identity and mainstream identity are independent to each other, and the degrees of both cultural identities can continue to increase (or decrease) simultaneously, irrespective of length of residence in the U.S. Therefore, the questionnaires of bidimensional scales do not force immigrants to select a particular language or cultural behavior in a given situation because the amount or pattern of acculturation is not fixed and static. Accordingly, bidimensional scales assess each cultural domain separately, including language use, cultural attitudes and behaviors (Davis & Engel, 2010). For example, the American and Puerto Rican Cultural Involvement Scale (APRCIS) consists of nine items for Puerto Rican culture and nine items for American culture, thereby yielding two independent cultural scores (Cortés, Rogler, & Malgady, 1994).

However, none of the existing bidimensional scales provides applicable cutoff values in accordance with the bidimensional theoretical framework. The APRCIS, for example, classifies two groups of immigrants as low acculturation and high acculturation without specific cut-off

values. Moreover, almost all other bidimensional scales suggest unidimensional cutoff values for levels of assimilation. For example, the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) proposes unidimensional cutoff values, which indicate five linear levels of assimilation: very Mexican oriented, Mexican oriented to approximately bicultural, slightly American oriented bicultural, strongly American oriented, and very assimilated. In summary, a number of bidimensional acculturation scales have been developed for measuring various acculturation patterns, but the guideline for the use of the existing bidimensional scales is methodologically and theoretically inappropriate.

### *The Effects of Acculturation Patterns on Educational Achievement*

A number of studies using unidimensional acculturation scales report the relationship between acculturation status and educational achievement, but their empirical evidence has been inconclusive and mixed. A number of studies found greater ethnic cultural traits to be associated with better academic performance and motivation (Altschul, Oyserman, & Bybee, 2006; Matute-Bianchi, 1986; Perreira, Fuligni, & Potochnick, 2010; Rumbaut, 1995; Zarate et al., 2005). In contrast, substantial findings suggested that highly assimilated Latino students are more successful educational achievers than culturally Latino-oriented students (Castillo et al., 2006; Gonzales & Roll, 1985; Guzmán, Santiago-Rivera, & Hasse, 2005; Ibanez, Kuperminc, Jurkovic, & Perilla, 2004; Schneider & Ward, 2003). Taken together, the empirical evidence is inconsistent regarding which of the two orientations (i.e., Latino-orientation and American-orientation) is conducive to educational achievement.

A few studies used bidimensional acculturation scales to investigate the relationship between acculturation and educational achievement among Latino youth (Lopez, Ehly, & Garcia-Vasquez, 2002; Schwartz et al., 2007). Schwartz, Zamboanga, and Jarvis (2007) used a

bidimensional scale, but Latino students' acculturation patterns were unidimensionally interpreted as either American-oriented or Latino-oriented. In their study, the retention of ethnic identity was positively associated with academic competence of Latino youth. Similarly, Lopez, Ehly, and Garcia-Vazquez (2002) used a bidimensional scale, but they reported that strongly American-oriented students had higher mean GPAs than strongly Mexican-oriented students. Perez (2011) identified four acculturation patterns with a sample of Latino college students (i.e., assimilation, in-between, marginalization, highly Latino-oriented) by using a cluster analysis, and individuals in the "in-between" group had higher GPAs than those in other groups.

In summary, the research linking acculturation to educational outcomes has been somewhat inconsistent, and there have been very few studies incorporating the bidimensional perspective into acculturation and educational achievement of Latino youth. Most existing studies focused extensively on the unidimensional acculturation framework that led to binary distinctions: "Latino-oriented versus American-oriented" or "Spanish-speaking versus English-speaking." In other words, most research questions were based entirely on the linear assimilation perspective on acculturation, which is limited to discovering the potential effects of diverse acculturation patterns on educational achievement. Indeed, one existing study, i.e., Perez's study (2011), utilized the bidimensional acculturation scale, with a theoretically appropriate approach, in examining the link between acculturation and educational achievement among Latino youth. Even though Berry's four acculturation patterns would certainly be more interesting and powerful than unidimensional theory, researchers are prone to examine the effect of acculturation within the orbit of the unidimensional framework. This research gap may be due partly to the limitations on handling categorical variables, suggesting that using the four acculturation patterns may not be attractive for researchers. As a result, most studies measured

two acculturation patterns (i.e., assimilation and separation) and reported which of the two acculturation patterns was related to Latino youth's educational achievement. With the heavy reliance on unidimensional theory, the effects of various acculturation patterns on educational achievement have been inconclusive.

### *The Effects of Acculturative Stress and Perceived Discrimination on Educational Achievement*

A number of studies found that high levels of general stress were associated with negative educational outcomes among Latino youth (Alva & de Los Reyes, 1999; Bhugra, 2005; Carvajal, Hanson, Romero, & Coyle, 2002; Huynh & Fuligni, 2008; Organista, Organista, & Kurasaki, 2003; Ramos, 2005; Zajacova, Lynch, & Espenshade, 2005). For example, Huynh and Fuligni (2008) examined the effect of general daily stress on educational achievement with a sample of 601 twelfth-grade students from Asian, Latino, and European backgrounds in California. In their study, Latino students reported higher levels of stress and lower levels of educational achievement than students from Asian and European backgrounds. Using a general stress measurement, Alva and de Los Reyes (1999) assessed the impact of psychological distress on educational achievement with a sample of 171 ninth-grade Latino students in Los Angeles. They reported a strong association between an increase in psychological distress and a decrease in educational achievement. Although general stress and acculturative stress have been found to be positively correlated (Joiner & Walker, 2002), general stress among immigrants should be differentiated from acculturative stress. Given that acculturative stress is defined as the psychological discomfort and uneasiness that immigrants may face as they adapt to the host culture, immigration-related stress should be included and measured with a valid measurement. Indeed, there is one existing acculturative stress scale for the Latino population (i.e., the Societal, Attitudinal, Familial, and Environmental Acculturative Stress Scale-Children; Chavez, Moran,

Reid, & Lopez, 1997), which consists of three domains: general stress, acculturative stress, and perceived discrimination (Davis & Engel, 2011). The Societal, Attitudinal, Familial, and Environmental Acculturative Stress Scale (SAFE-C) was used in a few mental health studies and problematic behavior studies (Crockett et al., 2007; Roche & Kuperminc, 2012); however, none of the existing studies used the SAFE-C scale for examining the relationship between acculturative stress and educational achievement among Latino youth. In short, existing literature reports the negative association between acculturative stress and educational achievement among Latino youth, but a future study is needed for investigating the effect of acculturative stress by using a valid measurement.

Several studies have examined the general proposition that perceived discrimination may lead to diminished educational aspiration and achievement among minority students (Edwards & Romero, 2008; Huynh & Fuligni, 2008; Kuperminc, Wilkins, Roche, & Alvarez Jimenez, 2009; Martinez, DeGarmo, & Eddy, 2004; Pachter, Bernstein, Szalacha, & Coll, 2010). Using existing discrimination measurements which were developed for the minority youth population, these studies commonly assessed a Latino youth's appraisal of discriminatory treatment in his/her environment or from people with whom s/he interacts (e.g., "Feel that people treat you with less respect because of your race and ethnicity," "Feel that people fear you because of your race and ethnicity," and "Feel that other kids insult or call you names because of your race or ethnicity").

Huynh and Fuligni (2008) found that Latino students reported that they felt more discrimination than Asian and Caucasian peers, and such discrimination negatively affected their academic achievement. Martinez, DeGarmo, and Eddy (2004) also found that greater degrees of perceived discrimination showed lower educational achievement with a sample of 564 middle and high school students in Oregon. Findings of other research consistently reported the

negative association between perceived discrimination and educational achievement (Edwards & Romero, 2008; Kuperminc et al., 2009; Pachter, Bernstein, Szalacha, & Coll, 2010).

### *The Influences of Educational Policies on Educational Achievement*

According to the U.S Census Bureau (2010), sixty-nine percent of Latino elementary and secondary school students speak a language other than English at home. Eleven percent of Latino children are foreign-born, and a majority (52%) of Latino children are second generation, meaning that they are the U.S.-born offspring of at least one foreign-born parent (Pew Hispanic Center, 2009). These demographics suggest that Latino youth may experience different paces in language acquisition that can affect their educational outcomes. Given the likelihood that Latino youth may suffer from limited-English proficiency, many Latino-dominant schools offer bilingual and bicultural education which is designed to develop proficiency in both the native language and English through instruction in both languages (Slavin & Cheung, 2003). Bilingual instruction appears to be effective among Latino youth; there was a significant positive correlation between Spanish reading and English reading, suggesting that there are complex but supportive interdependencies in the type of language instruction and reading achievement outcomes of bilingual Latino students (Lindholm & Aclan, 1991; Lindholm-Leary, 2001).

Even though Spanish-bilingual programs are more available than those for other languages, Latino youth receive two different educational types (i.e., bilingual and English Immersion). For example, the state governments of California, Arizona, and Massachusetts have mandated English Immersion, which involves placing language minority youth immediately in English-only classes involving the exclusive use of English texts and English instruction. The English-only ideology became widespread in the 1980s and 1990s, particularly in areas with the highest influx of Latino immigrants and refugees (MacDonald, 2004). It was targeted against

Latino immigrants based on the conjecture that increased immigration may threaten a culturally unified America (Vazquez, 2009). Fennelly (2008) found that the non-immigrant dominant group felt particularly threatened by the presence of Spanish-speaking immigrants. Politics and the media attributed Latino immigrants' lack of English proficiency to their unwillingness to assimilate. Policy makers and the media disseminated the notion that the Spanish language impeded educational achievement of Latino immigrant students. Several legal and educational institutions support the English Immersion policy based on the belief that English-only education is more effective than bilingual and bicultural education (Arizona State Department of Education, 2009; New York City Board of Education, 2000).

However, there are divergent views on the effectiveness of bilingual education and English Immersion on educational achievement. English Immersion advocates assert that bilingual education is the least effective method for English learners (Porter, 1996, 2001) because it does not promote assimilation, which they claim is the best way to attain educational success (Jost, 2009). In contrast, supporters of bilingual education emphasize that such rapid English acquisition impedes the cognitive development in scholastic competence and harms psychological well-being among minority youth. MacDonald (2004) asserts that educational underachievement of Latino students is attributable to lack of Spanish-speaking teachers and English-only instruction. He explains that Latino students and their parents can be discouraged and dissatisfied with teachers who possess little knowledge of the Spanish language and Latino culture. Civil and Planas (2010) conducted a qualitative study examining Latino parents' views on education policy in their children's mathematics education. In the qualitative findings, many policy-makers and teachers assume that language is not important in mathematics education because mathematics involves numbers; however, education policy related to language plays a

key role in the teaching and learning of mathematics because mathematics textbooks often have activities that are quite language rich. Parents in the study of Civil and Planas (2010) reported the difference between bilingual instruction and English-only instruction as follows:

Candida: Well, I remember that they would give her homework in English and in Spanish, so I could help her a little more...but when it was all in English, no. Then, I couldn't. I felt bad. I would be very frustrated because I couldn't explain it to them, I would have liked to explain it to them and I couldn't. I was frustrated. (Civil & Planas, 2010, p. 141)

Veronica: I liked it while they were in a bilingual program, I could be involved...When he was in kindergarten it was easy to cut out things, pass out the projects to the kids, gather them up, I even brought work home to take for the teacher the next day. In first grade, I was the same thing, I went with him and because the teacher spoke Spanish, she gave me things to grade and other jobs like that. My son saw me there, I could listen to him, I watched him. By being there watching, I realized my things. And then when David went to second grade into English-only with a teacher that only spoke English, then I didn't go, I didn't go. (Civil & Planas, 2010, p. 142)

The parents' quotations suggest that Latino parents want to help their children with homework but may not know how to within the English-only schooling system.

The majority of recent research provides empirical findings about the efficacy of bilingual education (August & Hakuta, 1997; Buriel, Perez, DeMent, Chavez, & Moran, 1998; Curiel, Rosenthal, & Richek, 1986; Danoff, Coles, McLaughlin, & Reynolds, 1977; Dunn, 1988; Greene, 1998; Koyama & Bartlett, 2011; Linn, 1965; Matute-Bianchi, 1986; Ramirez, Perez, Valdez, & Hall, 2009; Rolstad, Mahoney, & Glass, 2005; Rosenthal, Baker, & Ginsburg, 1983; Thomas & Collier, 1998; White & Kaufman, 1997). However, most studies contain several



inherent methodological problems. They did not randomly assign Latino children to bilingual education or English Immersion, suggesting no evidence of initial achievement equality, and they did not follow students long enough to make a fair comparison (Slavin & Cheung, 2003).

There are only a few studies that meet the criteria; for example, random, experimental, longitudinal design. Huzar (1973) conducted a three-year follow-up study with a sample of Puerto Rican children (grades 1-3) in New Jersey. Huzar randomly assigned two groups to bilingual or English-only classes and found that children in bilingual classes scored higher than English-only classes in English reading, adjusting for IQ, socioeconomic status (SES), and initial achievement. Thomas and Collier (2002) provided longitudinal empirical evidence that Latino students (in grades K-12) who participated in 4-7 years of dual-language programs were more successful in educational achievement at the end of the school year when compared to students who received English Immersion, after controlling for initial academic score and SES. Given these randomized, longitudinal studies with control groups, bilingual education would seem to be conducive to educational achievement of Latino youth.

#### *Correlates among Acculturative Stress, Perceived Discrimination and Educational Policies*

Perceived discrimination is considered one of the primary stressors derived from immigration experiences. Therefore, perceived discrimination has been included in subscales of acculturative stress scales such as the Societal, Attitudinal, Familial, and Environmental Acculturative Stress Scale (Mena, Padilla, & Maldonado, 1987). As predicted, the perceived discrimination subscale has correlated positively with the acculturative stress subscale. A study found that perceived discrimination performed a mediating role in the link between risk outcomes (e.g., mental illness and risk behaviors) and acculturative stress (Lorenzo-Blanco, Unger, Ritt-Olson, Soto, & Baezconde-Garbanati, 2011). A number of studies reported a strong

tie between perceived discrimination and psychological distress (including acculturative stress) among Latino youth (Finch et al., 2000; Gomez, Miranda, & Polanco, 2011; Kulis, Marsiglia, & Nieri, 2009). Latino immigrants who maintain their cultural heritage may be less likely to intermingle with non-Latino whites, thereby decreasing exposure to cultural conflicts and being less likely to perceive discrimination. This may, in turn, reduce the likelihood of incidents of discrimination and also reduce levels of acculturative stress.

As previously noted, bilingual education is more likely than English Immersion to help Latino children and youth succeed in school, and to help them perform better with bicultural identity development (Portes & Hao, 2002). Bilingual education allows ethnic minority youth to form positive ethnic self-concepts and promote psychological well-being (Gouveia, 2010; Rumbaut, 1999). In contrast, English Immersion may create a hostile classroom climate wherein ethnic minority youth are confronted by overwhelming pressure to assimilate. Such a school context may increase daily social stress, acculturative stress, and increase the risk for mental disorder among Latino youth (Murphy, 1977; Vega, Kolody, & Valle, 1987). Moreover, institutional language enforcement can serve to justify the denigration of the linguistic and cultural characteristics of the Latino students (Gouveia, 2010).

Unfortunately, little is known about the relationship between educational policies and perceived discrimination and acculturative stress among Latino youth. However, existing mental health research on acculturation has provided guidance toward understanding the potential impact of educational policies on the psychological well-being of Latino youth. Several studies show that recent Latino immigrants with a strong ethnic identity report lower rates of mental disorder (e.g., anxiety and personality disorders) than highly assimilated U.S.-born Latinos (Grant, Stinson, Dawson, et al., 2004; Grant, Stinson, Hasin, et al., 2004; Vega,

Alderete, Kolody, & Aguilar-Gaxiola, 1998). This phenomenon is referred to as the “immigrant paradox,” where foreign nativity and native cultural traits seem protective against psychiatric disorders, despite the stressful experiences associated with immigration (Alegria et al., 2008; Burnam, Hough, Karno, Escobar, & Telles, 1987). The immigrant paradox hypothesis postulates that the exposure to American culture and the pressure to assimilate both negatively influence the mental health of Latinos. Similar to the immigrant paradox, Kao and Tienda (1995) also suggest that immigrant students whose parents are also immigrants have better educational outcomes than non-immigrant students because of immigrant parents’ stronger educational aspiration and greater optimism about their children’s chances for upward social mobility.

This phenomenon has been reliably observed, particularly for Mexican-Americans (Alegria et al., 2008; Jiménez, 2004; Padilla & Gonzalez, 2001). Findings suggest that the Mexican-cultural heritage itself (e.g., Spanish language proficiency and traditional family values) serves as a positive factor for both psychological and educational outcomes among Mexican-American immigrants (August & Hakuta, 1997; Cummins, 2000; Mathes, Pollard-Durodola, Cardenas-Hagan, Linan-Thompson, & Vaughn, 2007). It appears that immigrant children who maintain their cultural heritage experience fewer intergenerational cultural conflicts at home and interact more with their parents than Americanized children, especially when their immigrant parents preserve their ethnic native culture. Culturally Latino-oriented children would experience better communication and emotional support at home, which in turn leads to psychological well-being and better educational outcomes (Hiatt-Michael, 2001). This explanation is widely supported by previous work, particularly for young school children (Phillips & Lonigan, 2009; Reese, 1995; Schaller, Rocha, & Barshinger, 2007) in that a better parent-child relationship is associated with more home literacy activities and parental academic

support such as homework monitoring, book reading, and journal writing. In this sense, bilingual education is considered as a better educational practice for Latino children since children can benefit from their recently immigrated parents' maintenance of their ethnic cultural heritage.

In short, given that the goal of English Immersion is to promote a rapid assimilation, receiving English Immersion can be a risk factor for increased psychological distress among Latino youth. It may force Latino youth to disengage from their cultural heritage and may engender familial acculturative conflicts, and this process can beget severe acculturative stress. Thus, the present study postulates that Latino students who receive bilingual education would show lower levels of perceived discrimination and acculturative stress than those who receive English Immersion.

### *Summary*

Research on Latino's educational underachievement has been reviewed in terms of acculturative patterns, acculturative stress, perceived discrimination, and education policy. The review of empirical studies suggests that 1) the effects of various acculturation patterns on educational achievement have been inconclusive; 2) the negative relationship between acculturative stress and educational achievement has been reported by existing literature; 3) the impact of acculturative stress has been uncertain because existing studies used invalid measurements; 4) perceived discrimination negatively influences educational achievement; 5) perceived discrimination and acculturative stress are interrelated; 6) the potential relevance of educational policies (i.e., English Immersion and bilingual education) to educational achievement has been identified; 7) bilingual education appears to be associated with higher educational achievement than that of English Immersion; and 8) the English Immersion policy is

presumed to increase levels of perceived discrimination and acculturative stress among Latino youth. Given the empirical evidence, the following chapter outlines the goals of this study and proposes hypotheses.

## CHAPTER 4: PURPOSES AND HYPOTHESES

This dissertation seeks to contribute to the growing body of research on educational achievement of Latino youth through its focus on acculturation, acculturative stress, perceived discrimination, and education policy. As an exploratory journey, a unidimensional acculturation approach and a bidimensional acculturation approach are compared in order to complement the study's research questions.

The first set of research questions focuses on evidence of the bidimensional acculturation framework. From the bidimensional acculturation perspective, more or fewer patterns than Berry's four acculturation patterns may exist across a variety of situations and diverse populations (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Three existing studies have examined various acculturation patterns in a bidimensional approach with samples of Latino youth (e.g., Bauman, 2005; Schwartz & Zamboanga, 2008; Perez, 2011), while only one study (i.e., Perez, 2011) has investigated the association between bidimensional acculturation patterns and educational achievement. Given that very few studies have applied the bidimensional perspective for linking acculturation patterns to educational achievement, it is unknown what kinds of, and how many bidimensional acculturation patterns will emerge from this study. Thus, *a priori* hypotheses are not offered. The first exploratory aims are:

*Exploratory Aim 1:* What kinds of acculturation patterns among Latino youth are identified in a bidimensional approach?

*Exploratory Aim 2:* Is any particular acculturation pattern associated with higher educational achievement compared to other patterns?

The second set of research questions focuses on the effects of acculturative stress, perceived discrimination, and education policy on educational achievement among Latino youth. First, given stress-coping theory, highly stressed children are expected to manifest maladaptive academic behavior and to express negative academic competency as a type of poorly regulated coping pattern. Second, in light of Ogbu's theory, the present study expects that children perceiving discrimination will exhibit poorer educational outcomes than children who perceive less discrimination. Third, based on the previous research findings, this study expects that children who receive bilingual education will have better educational outcomes than children who receive English Immersion education. The dependent variable is educational achievement, and the following hypotheses will be tested to determine the relationships between the dependent variable and the independent variables (i.e., acculturative stress, perceived discrimination, and education policy):

*Hypothesis 1:* Among Latino youth, increased acculturative stress will be associated with decreased educational achievement, after controlling for other variables.

*Hypothesis 2:* Among Latino youth, increased perceived discrimination will be associated with decreased educational achievement, after controlling for other variables.

*Hypothesis 3:* Among Latino youth, those who receive bilingual education will have higher educational achievement than those who receive English Immersion, after controlling for other variables.

Few studies have employed the bidimensional acculturation framework and theoretically relevant measurements. This study explores both unidimensional and bidimensional acculturation strategies in a methodologically appropriate way and compares the results between the different acculturation approaches. In this context, the following research question is offered:

*Exploratory Aim 3:* Will similar results be found in different acculturation approaches?

After comparing the results, the present study will determine the most useful and desirable approach of acculturation, and further examine the effect of acculturation on educational outcomes, accounting for contextual factors such as education policy and demographics. It is expected that education policy will influence acculturation status or shape a particular pattern, because bilingual education encourages immigrant students to maintain their cultural heritage, whereas English Immersion discourages maintaining their cultural heritage. It was earlier hypothesized that bilingual education will be more conducive to educational outcomes than English Immersion (hypothesis 3). However, it cannot be determined whether, and to what extent, the relationship between education policy and educational outcomes will be affected by acculturation factors. Thus, *a priori* hypotheses are not offered.



## CHAPTER 5: METHOD

### *Sample Description and Demographics*

Data were obtained from a prior study by López (2009) that compared two groups of third- to fifth-grade students of Mexican descent in Texas ( $n = 165$ ) and Arizona ( $n = 130$ ). The researcher contacted 38 elementary school principals in the school districts via telephone, e-mail, and regular mail to request the schools' permission to recruit teachers, parents, and children in their schools for her study. Ten schools in the Texas school district and 5 schools in the Arizona school district participated in the study. The study instrument was administered to children who consented to participate in the study during regularly scheduled classes. Children could choose to complete either the English or Spanish version of the instrument. Parents who agreed to participate completed their children's demographic questionnaire at home and returned the questionnaire with their children to school.

The 295 children ranged in age from 9 to 11 years (female = 158; male = 137). Seventy percent of the sample was born in Mexico while 30% was born in the United States. In Texas, 99% of the respondents spoke Spanish at home whereas 77% of the respondents in Arizona reported the same. Eighty two percent of the children's parents had a high school diploma or higher, and most parents were born in Mexico (88%). The goal of the original study was to develop a new acculturation measure and compare it to an existing acculturation measure; Lopez noted that the existing measure heavily focused on language proficiency, while the new measure took into account behaviors with regard to choices in food, snacks, candy, and music. The present study will use both the existing measure and the new measure to explore acculturation patterns among the children.

There are three kinds of variables in the present study: dependent, independent, and control variables. The dependent variable is children's perceived educational competence, and the independent variables are education policy, acculturative stress, perceived discrimination, and acculturation patterns. The control variables are gender, parental marital status, parents' years of U.S. residence, parental educational level, child birthplace, and child's language at home. These demographics were completed by children's parents.

*Measure: Dependent Variable and Independent Variables*

*Perceived Educational Competence (Dependent Variable).* A ten-item self-report scale was used to measure children's educational competence, rather than employing actual grades, due to school district policies that prohibited the reporting of grades. Perceived educational competence is a psychological concept that refers to the sense of scholastic accomplishment and capability. The perceived educational competence scale consisted of the three different aspects of educational competence: cognitive competence subscale (6 items); reading competence subscale (2 items); math competence subscale (2 items).

The 6-item cognitive competence subscale used a four-point scale ranging from "not good," "sort of not good," "sort of good," and "very good." It included cognitive competence with school work, school performance, intelligence, speed of work, recall of what was learned, and participation in answering these questions: 1) I am good at school work; 2) I am doing well at school; 3) I am just as smart as others; 4) I finish school work quickly; 5) I remember things easily; and 6) I can figure out answers.

Using a four-point scale (i.e., "strongly NO," "slightly no," "slightly yes," and "strongly YES"), the additional four items addressed students' self-confidence in math and reading

(e.g., I am good at math; I am good at reading) and students' motivation in math and reading (e.g., I enjoy doing work in math; I enjoy doing work in reading).

Total scores were calculated by the sums of responses of the 10 items, which ranges from 10 to 40, and higher scores indicate higher levels of educational competence. The mean of the global summed scale was 29.19 ( $SD = 5.1$ ), and the means of the cognitive, math, and reading competence subscales were 16.42 ( $SD=3.79$ ), 6.72 ( $SD=1.77$ ), and 6.04 ( $SD=1.91$ ), respectively. Pearson's correlation coefficients were calculated among the cognitive competence subscale and the math and reading subscales. Significant positive correlations were found between the cognitive-competence subscale score and the math-competence subscale score ( $r = .24, p < .01$ ) and between the cognitive-competence subscale score and the reading-competence subscale score ( $r = .14, p < .05$ ). No correlation was found between the math-confidence and the reading-confidence subscales ( $p = .87$ ).

The internal consistency of the global 10-item scale in this study was found to be marginally acceptable ( $\alpha = .70$ ). Alpha coefficients for the subscales were .69, .82, and .85 for the cognitive competence subscale, the reading competence subscale, and the math competence subscale, respectively. The global summed scale and each subscale were further explored in the scale validation section.

### *Independent Variables*

*Education Policy.* Education policy was coded as a dichotomy (bilingual education versus English Immersion) by using a student's geographical location, which was coded 0 for Texas mandating bilingual education and 1 for Arizona mandating English Immersion.

*General Social Stress, Perceived Discrimination & Acculturative Stress.* The Societal, Attitudinal, Familial, and Environmental Acculturative Stress Scale for Children (SAFE-C)

was used to measure children's perceptions of discrimination and acculturative stress. The original SAFE was modified by Mena et al. (1987), and this modified version was re-modified for children between ages of 8 and 12 years (Chavez, Moran, Reid, & Lopez, 1997). The SAFE-C contains three subscales intended to capture different aspects of stressors: general social stress (16 items); perceived discrimination (6 items); acculturative stress (14 items). Chavez et al. reported a good internal consistency of the SAFE-C ( $\alpha=.86$ ) when this scale was administered to 71 children (45 Euramericans and 26 Latinos) between the ages of 8 and 10 years. Because of the limitations of the small number of Latino children in Chavez's study, the present study will conduct exploratory and confirmatory factor analyses in the result section.

In this study, Cronbach's alpha coefficient for the entire scale was .83. Significant strong correlations were found among the general social stress, the perceived discrimination, and the acculturative stress subscales. The general social stress subscale was related to the perceived discrimination subscale ( $r = .56, p < .01$ ) and the acculturative stress subscale ( $r = .64, p < .01$ ). The perceived discrimination subscale and the acculturative stress subscale were also strongly correlated with each other ( $r = .83, p < .01$ ).

- *General Social Stressors.* The general social stressors subscale measures stress that stems from children's relationships with family, peers, and school environment in general. This subscale consists of 16 items (e.g., It bothers me when someone in my family is very sick; It bothers me when my parents argue; I worry about having to take tests in school) based on a 5-point scale (i.e., doesn't bother me; almost never bothers me; sometimes bothers me; often bothers me; always bothers me a lot). A mean score for this subscale is obtained by summing

the individual items and dividing by 16, thereby ranged from 1 to 5. Higher scores indicate higher levels of general social stressors. Cronbach's alpha for the reliability of this subscale was .73 in the present study.

- *Perceived Discrimination.* The perceived discrimination subscale consists of 6 items focusing on the extent to which a child was bothered by discrimination (e.g., “I feel bad when others make jokes about people who are in the same group as me”; “Because of the group I am in, I don't get the grades I deserve”; “Because of the group I am in, I feel others don't include me in some of the things they do, games they play, etc.”). Each response is based on a 5-point scale with same response options of the general social stressors scale. A mean score for perceived discrimination is obtained by summing the individual items and dividing by 6, thereby ranged from 1 to 5. Higher scores indicate higher levels of perceived discrimination. The reliability alpha coefficient for the subscale of perceived discrimination was .71 in this study.
- *Acculturative Stress.* The SAFE-C included 14 items measuring acculturative stress (e.g., “People think I am shy, when I really just have trouble speaking English”; “I think a lot about my group and its culture”; “It bothers me that I have an accent”). Each response is based on the same 5-point scale. A mean score for acculturative stress is obtained by summing the individual items and dividing by 14 (thereby ranged from 1 to 5) with higher scores indicating higher levels of acculturative stress. Alpha for the acculturative stress subscale was .75 in this study.

*Acculturation Patterns.* Acculturation patterns were measured by the TAM (The Things About Me; Lopez, 2009) and the brief ARSMA–II (Brief Acculturation Rating Scale for Mexican Americans–II; Cuellar, Arnold, & Maldonado, 1995).

TAM (The Things About Me; Lopez, 2009): The strength of the TAM scale is that the questionnaire of the TAM does not contain cultural affiliations such as “American” or “Mexican or Spanish.” The TAM consisted of 15 open-ended items with three subscales (i.e., music, food, and snack or candy) which comprise 5 items each. The first five items asked students to report their favorite music artists. The responses were categorized as 2 = Latino if the music artist was listed under any category of the “Latino” genre; 1 = American if the music artist was listed under any mainstream majority culture category (e.g., Rock, Alternative, & Dance); and 0 = Unclassified or neutral if the music artist was listed under other specific genres that did not fall under either Latino or American (e.g., Rap, R&B, Soul, & Jazz). Next five items ask about students’ preferences in food and categorized 1 for Anglo, 2 for Mexican), and 0 for unclassified or neutral foods (i.e., cannot be determined to be either Mexican or American). Last five items asked about students’ preferences in snacks/ candy. The responses of these items were coded as 2 for Mexican (e.g., tamarindo, Mazapan, chicarrones, & horchata), 1 for American (e.g., Doritos, M&Ms, cake, & crackers), and 0 for unclassified or neutral snack/candy. Two graduate students scored the child responses independently to assess inter-scorer reliability with the principal investigator. This resulted in 98.0% and 96.9% exact agreement between the principal investigator and each coder.

*Bidimensional scoring method for TAM:* The original TAM scale was developed based on the unidimensional acculturation framework because children could not have high scores on both Mexican and American cultural traits. The present study proposes an alternative scoring strategy of using the TAM scale in the bidimensional approach. To derive two separate dimensions of Mexican cultural traits (TAM-MC) and American cultural traits (TAM-AC), the frequencies of each Mexican response and American response within the 15 items of the TAM were calculated. Possible TAM-MC and TAM-AC sub-scores ranged from 0 to 15 with higher scores indicating higher levels of cultural behavior. For example, if a student reported three Mexican-oriented responses and seven American-oriented responses (remaining responses were unclassified or neutral), his TAM-MC sub-score was coded 3 and his TAM-AC sub-score was coded 7. In this process, the present study generated bidimensional sub-scores from the TAM scale. These two sub-scores can be also used to create the unidimensional TAM score by subtracting TAM-MC from TAM-AC. In the sample of this study, the means of TAM-MC and TAM-AC were 2.07 (Minimum=0, Maximum=10) and 2.30 (Minimum=0, Maximum=10), respectively.

*Brief Acculturation Rating Scale for Mexican Americans-II (Brief ARSMA-II):* The 12-item Brief ARSMA-II is composed of 6 items for American identity (AI) and 6 items for Mexican identity (MI), and response categories are based on a 5-point format evaluating frequency or intensity from 1 (not at all) to 5 (almost always). In the present study, the Cronbach's alpha was .84 for the MI domain and .68 for the AI domain. The 12 items of the Brief ARSMA-II are as follows.

Table 1: Items of Brief ARSMA–II

1	I speak Spanish	MI
2	I speak English	AI
3	I enjoy speaking Spanish	MI
4	I associate with Anglos	AI
5	I enjoy listening to English language music	AI
6	I enjoy Spanish language TV	MI
7	I enjoy Spanish language movies	MI
8	I enjoy reading books in Spanish	MI
9	I write letters in English	AI
10	My thinking is done in the English language	AI
11	My thinking is done in the Spanish language	MI
12	My friends are of Anglo origin	AI

A significant negative correlation was found between the MI subscale and the AI subscale ( $r = -.23, p < .01$ ). There was a statistically significant correlation between the Brief ARSMA-II scale and the TAM scale. TAM-MC was positively associated with the Brief ARSMA-II's Mexican identity ( $r = .24, p < .01$ ), and TAM-AC was positively associated with the Brief ARSMA-II's American identity ( $r = .31, p < .01$ ). In addition, TAM-MC was negatively associated with the Brief ARSMA-II's American identity ( $r = -.29, p < .01$ ), and TAM-AC was negatively associated with the Brief ARSMA-II's Mexican identity ( $r = -.23, p < .01$ ).

The Brief ARSMA–II was developed for measuring acculturation patterns in terms of both the unidimensional and bidimensional frameworks. The AI sub-score and the MI sub-score were used separately as a bidimensional approach. In a unidimensional approach, the MI subscale score was subtracted from the AI subscale score (= the AI subscale score – the MI subscale score), which indicates linear assimilation levels.



Creating bidimensional clusters by using Brief ARSMA–II and TAM: Using a clustering procedure, the present study explored an alternative bidimensional approach. Although using the separate cultural sub-scores for the ARSMA-II and TAM scales are considered as a bidimensional approach, this approach does not demonstrate diverse or particular acculturation patterns as Berry proposed. It was expected that by using the clustering procedure, more or fewer than Berry’s four acculturation groups would emerge. The Brief ARSMA–II items and the two TAM sub-scores were entered to the clustering procedure to generate acculturation groups without a *priori* hypothesis. Children in the same acculturation group would exhibit more similar to each other to those in other groups in terms of cultural identity, behavior, and preference wherein the Brief ARSMA–II and the TAM scales measured.

### *Demographic Variables*

Child’s gender, parental marital status, child’s place of birth, child’s language at home, length of U.S. residence, and parental educational level were completed by children’s parents. Parents who agreed to participate completed their children’s demographic questionnaire at home and returned the questionnaire with their child to school. There were a number of missing data within the demographics, which resulted in an overall usable N = 197 cases when controlling for the following demographic variables.

- Child’s gender is coded 1 for males and 2 for females.
- Parental marital status was coded 1 for single family and 2 for two-parent family.
- Child’s language at home was coded 1 for English and coded 2 for Spanish.
- Child’s place of birth was coded 1 for U.S.-born and 2 for foreign-born.

- Length of U.S. residence was also reported by parents, which indicates parent's time having lived in the United States ( $M = 14.8$ ;  $SD = 10.15$ ,  $Range = .15 \sim 43.85$  years).
- Parents responded on two categories: less than high school education (coded 1; 46%) and having a high school diploma or a college education (coded 2; 54%)

Table 2: Summary of Variables

Uses of Variables		Names of Variables	Types of Variables
Dependent	Global educational competence	cognitive competence	Continuous
		math competence	
		reading competence	
Independent	Mexican identity of Brief ARSMA-II (MI)		Continuous
	American identity of Brief ARSMA-II (AI)		Continuous
	Unidimensional assimilation levels (AI – MI)		Continuous
	TAM-Mexican cultural score (TAM-MC)		Continuous
	TAM-American cultural score (TAM-AC)		Continuous
	Unidimensional assimilation levels (TAM-AC – TAM-MC)		Continuous
	Bidimensional acculturation patterns (clustering method)		Nominal
	General social stress of SAFE-C		Continuous
	Acculturative stress of SAFE-C		Continuous
	Perceived discrimination of SAFE-C		Continuous
Demographic	Education policy		Nominal
	Gender		Nominal
	Parental marital status		Nominal
	Parents' years of U.S. residence		Continuous
	Parental educational level		Nominal
	Child birthplace		Nominal
	Child's language at home		Nominal

## CHAPTER 6: RESULTS

The present study has been designed to investigate the effects of acculturation patterns, acculturative stress, perceived discrimination, and education policy on educational achievement among Mexican-American children. Based on the hypotheses and the given sample, the present study explores theoretical acculturation frameworks in which the proposed scoring methods for the acculturation measures are compared. In addition, the present study expects to find whether the relationship between acculturation and educational achievement shows similar patterns when employing the different measurement strategies and theoretical acculturation approaches.

This chapter is divided into the five sets of data analyses. Part 1 reports the results of missing data analyses, and Part 2 describes the scale validation processes for the perceived educational competence scale, the brief ARSMA–II scale, and the SAFE-C scale. Part 3 and 4 tested the hypotheses and exploratory aims, and compared the different acculturative measurement strategies. Part 5 reported other findings beyond the hypotheses to explore emergent questions derived from Part 4.

### *Part 1: Preliminary Analysis for Missing Data*

#### *Missing demographic data*

Demographics were completed by parents. Separate-variance *t*-tests and cross tabulation tables showed that there was a systematic pattern between responding parental groups and non-responding parental groups (missing). The non-responding groups tend to exhibit a lower reading competence, a higher degree of American identity and a higher level of acculturative stress compared to those of responding parental groups (non-missing groups) (see Table 3). Cross-tabulation tests among the demographic variables showed that parents' information on years of U.S. residency was missing more often for children who speak English at home than for

children who speak Spanish,  $\chi^2 (1, N = 295) = 204.12, p = .00, \phi = .83$ . This finding showed that whether children spoke Spanish or English at home strikingly affected whether parents completed the survey at home. In addition, Arizona parents were missing more often than Texas parents,  $\chi^2 (1, N = 295) = 37.02, p = .00, \phi = .35$ . Little's MCAR test confirmed that the data are not missing at random ( $\chi^2 = 146.471, df = 85, p < .01$ ). These findings suggest that what caused the data to be missing may depend upon regions (different education policies) and children's language use at home.

#### *Missing data in perceived discrimination and perceived educational competence*

The proportion of missing cases in the continuous variables was less than 1%, except for perceived discrimination and perceived educational competence. About 10 % of the children reported "I don't know" to the items of the perceived discrimination subscale. T-tests between missing group and non-missing groups of perceived discrimination revealed systematic patterns in terms of Mexican identity, acculturative stress, and general stress (see Table 4). Those who had high degrees of Mexican identity were less likely to report their perceived discrimination compared to those who had low degrees of Mexican identity. This finding suggests that the perceived discrimination items have been skipped more often by strongly Mexican-oriented children. This missing pattern is probably because Mexican-oriented children may not have been exposed to discriminatory experience, or they have not thought about discrimination.

The data for perceived educational competence contained the "I don't know" response category, which led about 10 % missing responses in the four items of math and reading competences (the educational competence scale consisted of the 6-item cognitive competence subscale, the 2-item math subscale, and the 2-item reading subscale). T-tests were conducted to identify whether the missing values of the four reading and math items may influence other

quantitative variables. A systematic pattern was found between the non-missing groups and missing groups in terms of their 6-item cognitive competence. It appeared that cognitively low achievers were less likely to report their math and reading competences. There was a significant difference in the cognitive competence scores for math missing cases ( $M=14.83$ ,  $SD=3.08$ ) and math non-missing cases ( $M=16.60$ ,  $SD=3.83$ );  $t(41.7)=2.9$ ,  $p = .005$ . There was a significant difference in the cognitive competence scores for reading missing cases ( $M=15.05$ ,  $SD=3.12$ ) and reading non-missing cases ( $M=16.71$ ,  $SD=3.86$ );  $t(85.3)=3.3$ ,  $p = .002$ . The results of Little's MCAR test showed that the data were marginally significant as *not* missing at random (NMAR),  $\chi^2 = 47.839$ ,  $df = 33$ ,  $p = .046$ .

To minimize the potential bias of the NMAR data, this study created a new variable—missing—indicating whether or not demographics were missing. Although there were a number of likely sources of error due to the missing cases, this likelihood of error was partially controlled and considered acceptable in this way.

Table 3: Separate variance t-tests of missing parental and non-missing parental groups

		MI	AI	Acculturative stress	Perceived Discrimination	General stress	Cognitive Competence	Reading Competence	Math Competence	Length in US
Length of residence in U.S.	<i>t</i>	2.4	-2.6	-3.9	-4.5	-1.7	1.1	2.1	-.3	.
	<i>df</i>	181.7	215.5	206.0	201.9	211.6	186.4	171.9	176.3	.
	<i>p</i>	.01	.01	.00	.00	.09	.28	.04	.76	.
	# Present	185	185	182	183	182	186	156	172	186
	# Missing	109	109	108	108	108	109	88	92	0
	<i>Mean</i> (Present)	3.49	2.99	1.90	1.42	2.23	16.61	6.39	6.75	14.80
	<i>Mean</i> (Missing)	3.13	3.27	2.28	2.03	2.41	16.09	5.86	6.82	.
Birth Place	<i>t</i>	1.7	-2.2	-3.7	-4.1	-1.4	.9	1.8	-.5	.
	<i>df</i>	148.4	166.0	163.4	158.1	173.3	149.4	130.6	141.0	.
	<i>p</i>	.087	.02	.00	.00	.17	.37	.07	.60	.
	# Present	201	201	198	199	198	202	169	187	185
	# Missing	93	93	92	92	92	93	75	77	1
	<i>Mean</i> (Present)	3.44	3.01	1.92	1.46	2.25	16.56	6.35	6.74	14.84
	<i>Mean</i> (Missing)	3.17	3.27	2.30	2.05	2.40	16.10	5.86	6.87	8.00
Language At home	<i>t</i>	1.8	-2.6	-3.9	-4.2	-1.3	.5	2.2	-.9	.
	<i>df</i>	142.6	163.2	158.6	152.9	165.3	144.5	125.3	138.5	.
	<i>p</i>	.07	.01	.00	.00	.18	.59	.03	.38	.
	# Present	203	203	200	201	200	204	171	189	186
	# Missing	91	91	90	90	90	91	73	75	0
	<i>Mean</i> (Present)	3.44	3.00	1.92	1.46	2.25	16.50	6.38	6.71	14.80
	<i>Mean</i> (Missing)	3.16	3.30	2.31	2.07	2.40	16.23	5.78	6.93	.
Parental Education	<i>t</i>	1.6	-2.3	-3.5	-3.5	-1.6	.7	2.3	-.9	-.3
	<i>df</i>	174.9	197.4	189.2	182.5	203.0	179.7	154.1	169.5	9.6
	<i>p</i>	.123	.02	.00	.00	.10	.46	.02	.38	.80

	# Present	191	191	190	190	189	192	160	178	177
	# Missing	103	103	100	101	101	103	84	86	9
	M(Present)	3.44	3.00	1.92	1.48	2.24	16.54	6.41	6.71	14.77
	M(Missing)	3.20	3.27	2.26	1.97	2.41	16.18	5.80	6.91	15.44
Marital status	<i>t</i>	1.7	-2.2	-3.6	-3.9	-1.3	.5	2.2	-.9	-.9
	<i>df</i>	157.5	180.6	171.8	167.2	184.3	161.6	141.8	151.6	3.2
	<i>p</i>	.08	.03	.00	.00	.18	.63	.02	.35	.45
	# Present	197	197	195	195	194	198	165	184	182
	# Missing	97	97	95	96	96	97	79	80	4
	Mean(Present)	3.44	3.01	1.92	1.46	2.25	16.50	6.40	6.71	14.72
	Mean(Missing)	3.18	3.26	2.28	2.03	2.39	16.25	5.79	6.93	18.50

Table 4: Separate variance t-tests of missing and non-missing groups in acculturation and educational scales

		Acculturative			Perceived	General	Cognitive	Reading	Math
		MI	AI	Stress	Discrimination	Stress	Competence	competence	competence
Perceived	<i>t</i>	-2.05	1.88	9.86	.	5.25	-1.85	.68	-.38
Discrimination	<i>df</i>	35.71	33.85	37.02	.	30.29	36.69	26.73	28.54
	<i>p</i>	.05	.07	.00	.	.00	.07	.50	.71
	# Present	265	265	265	266	265	266	220.00	239
	# Missing	29.00	29.00	25.00	.00	25.00	29.00	24.00	25.00
	<i>Mean</i> (Present)	3.32	3.13	2.13	1.81	2.37	16.30	6.24	6.77
	<i>Mean</i> (Missing)	3.75	2.79	1.09	.	1.58	17.52	5.92	6.92
Math	<i>t</i>	1.6	.5	.1	-.2	.8	2.9	-.1	.
Competence	<i>df</i>	36.9	36.4	36.0	29.7	37.2	41.7	21.6	.
	<i>p</i>	.11	.61	.95	.81	.40	.005	.924	.
	# Present	263	263	259	239	259	264	224	264
	# Missing	31	31	31	27	31	31	20	0
	<i>Mean</i> (Present)	3.39	3.10	2.04	1.80	2.31	16.60	6.20	6.78

	<i>Mean(Missing)</i>	3.03	3.01	2.03	1.86	2.18	14.83	6.25	.
Reading	<i>t</i>	1.5	-1.3	-1.2	-1.7	-1.2	3.3	.	-.4
Competence	<i>df</i>	76.0	76.8	72.6	62.1	72.5	85.3	.	55.5
	<i>p</i>	.14	.20	.25	.09	.24	.002	.	.713
	# Present	243	243	239	220	239	244	244	224
	# Missing	51	51	51	46	51	51	0	40
	<i>Mean(Present)</i>	3.40	3.06	2.01	1.75	2.27	16.70	6.20	6.76
	<i>Mean(Missing)</i>	3.15	3.24	2.16	2.06	2.42	15.05	.	6.87



## *Part 2: Scale Validations*

The present study conducted exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) for the perceived educational competence scale, the brief ARSMA–II scale, and the SAFE-C scale. EFA was conducted to examine whether the scales have the same dimensions that the scale developers previously reported. CFA was then performed to test whether the data fit the underlying construct of the scales.

### *Perceived Educational Competence Scale*

The perceived educational competence scale was not validated in previous work (Lopez, 2010). The KMO measure of sampling adequacy statistics was used to examine whether the partial correlations among variables are small. KMO values above .60 ~ .70 are considered adequate for factor analysis (Netemeyer, Bearden, & Sharma, 2003). The KMO value was 0.61, indicating that correlation patterns were reliable and acceptable. Bartlett's test of sphericity showed that the correlation matrix was not an identity matrix.

An exploratory factor analysis was performed on 10 items of the perceived educational competence scale with oblique rotation. A three-factor solution was adopted based on a scree plot, the eigenvalue-greater-than-one rule, and theoretical dimensionality. All of the items loaded on their own factor greater than .35, and the three-factor solution accounted for 52.35% of the total variance. The first factor (6 items), which explained 23.58% of the variance of items, measured cognitive competence on school work. The second factor, which explained 14.75% of the variance of items, measured math competence by 2 items. The third factor, which explained 10.05 % of the variance of items, measured reading competence by 2 items.

A second-order confirmatory factor analysis for the three factor solution was conducted by using STATA. There was a significant difference between observed and model correlation

matrix,  $\chi^2 (32, N=295) = 58.84, p < .01$ . However, since the model  $\chi^2$  is sensitive to sample size, three fit indices were examined to test model fit. All three model fit indices indicated a good fit,  $CFI = .96$ ,  $RMSEA = .05$  (95%  $CI = .03 \sim .07$ ) and  $SRMR = .04$ . As previously noted, the internal consistency of the global scale was found to be marginally acceptable ( $\alpha = .70$ ) (Nunnally, 1978).

Table 5: Reliability coefficient of the subscales of perceived educational competence

Construct	Number of items	$\alpha$
Cognitive competence	6	.68
Math competence	2	.85
Reading competence	2	.82

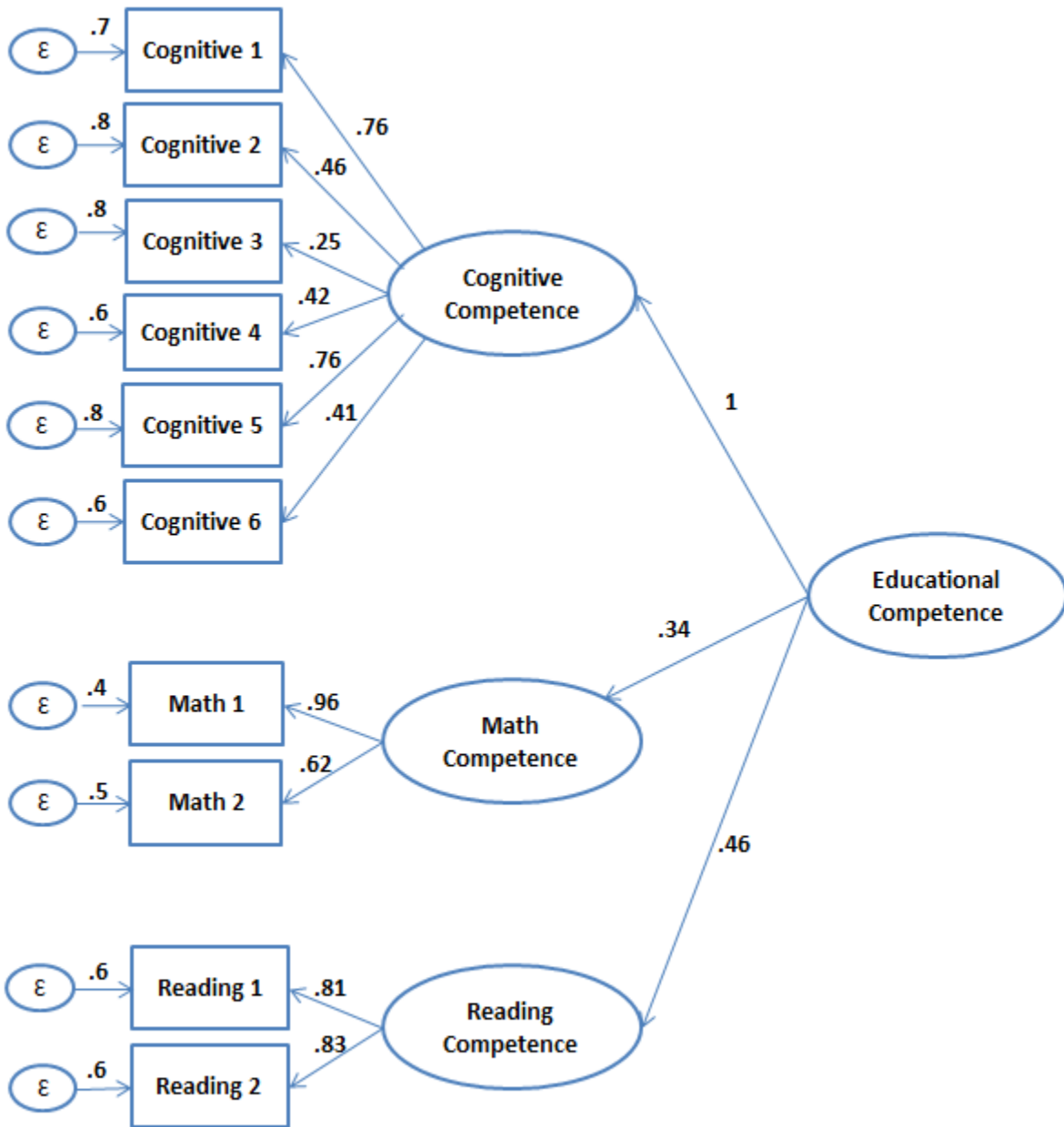
Note. The ten-item global scale's  $\alpha$  is .70 ( $N=295$ ).

Table 6: Factor loadings for perceived educational competence

Item	Factor		
	1	2	3
Good at school work	.719		
Success with school work	.706		
Intelligence	.547		
Answering questions in school	.479		
Remember what was learned	.459		
Work Speed	.356		
I am good at math		.884	
I enjoy doing work in math		.822	
I am a good reader			.892
I like reading and talking about books			.762

Note. Oblique solution

Figure 2: Factor loadings of second-order CFA of perceived educational competence with standardized estimates



Each subscale-score (cognitive, math, and reading subscales) of the perceived educational competence violated the assumption of normality: the p-value for Shapiro-Wilk test for the

cognitive subscale was .02, and the math and reading subscales were less than .01. The present study tried to overcome the non-normality problem, particularly for the math and reading subscale scores, through different transformation methods, but the non-normality problem was not resolved ( $p < .01$ ). With a concern for the violation of normality, using each subscale as dependent variables was deemed unacceptable.

Given the results of the confirmatory factor analysis, the use of total composite scores was regarded as appropriate. However, the assumption of normality for the global 10-item perceived educational competence scale was also violated; Shapiro-Wilk test for the global perceived educational competence was significant ( $p < .01$ ). The data of the 10-item global perceived educational competence scores was negatively and moderately skewed (skewness = -.80; kurtosis = 1.1) as in Figure 3. The present study reduced the non-normality problem of the global perceived educational competence by applying the following transformation to the data. The transformed perceived educational scores ranged from 4.26 to 9 ( $M=6.46$ ,  $SD=.91$ ), where higher scores indicated higher levels of educational competence:

Transformed perceived educational competence score =  $10 - \text{SQRT}[(\text{the highest possible score} + 1) - \text{original score}]$  (Tabachnick, Fidell, & Osterlind, 2007).

The normality problem was resolved, and the Shapiro-Wilk statistic was reported as  $W=.99$ ,  $df=295$ ,  $p = .09$ , with skewness of .10 ( $SE = .14$ ) and kurtosis of -.06 ( $SE = .28$ ). Therefore, the present study decided to use the transformed global perceived educational competence as the dependent variable.

Figure 3: Histogram for original perceived educational competence

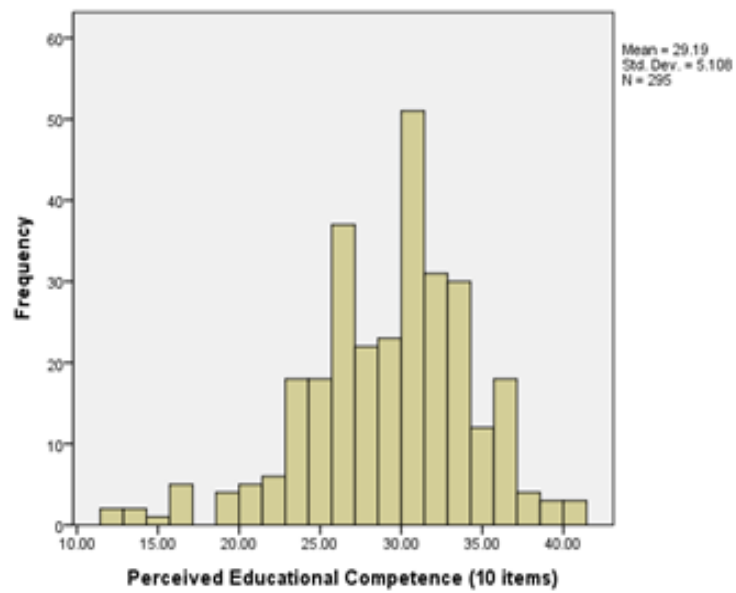
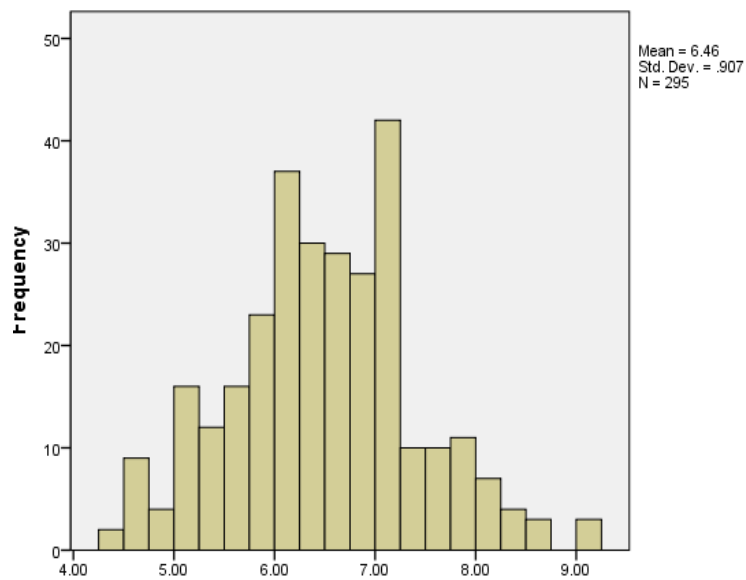


Figure 4: Histogram for transformed perceived educational competence



### *Brief Acculturation Rating Scale for Mexican Americans-II*

The KMO measure was 0.79, indicating that the correlation matrix among the items of the Brief ARSMA–II scale was strong and reliable. Bartlett's test of sphericity was statistically significant ( $p < .001$ ), showing that a factor analysis was appropriate. An exploratory factor analysis was performed on 12 items of the Brief ARSMA–II scale with orthogonal and oblique rotations. This study expected to obtain two factors: the Mexican identity domain and the American identity domain. An oblique rotation was selected according to the moderate correlations among the factors, ranging from  $-.29$  to  $.22$ . Three-factor solution was suggested based on the scree plot and the eigenvalue-greater-than-one rule. All of the items loaded on their own factor greater than  $.60$ , and the communalities were all above  $.40$ .

The three-factor solution accounted for 59.96% of the total variance. The first factor (6 items), which explained 33.21% of the variance of items, measured Mexican identity. The second factor, which explained 16.53% of the variance of items, measured American identity by 4 items. The third factor, which explained 10.23 % of the variance of items, measured the friendship with Americans by 2 items (i.e., My friends are of Anglo origin; I associate with Anglos).

Table 7: Rotated factor matrix for the 12-item Brief ARSMA–II scale

Item		Component			Cronbach's $\alpha = .59$
		1	2	3	
Factor 1	I speak Spanish	.779			$\alpha = .84$
	I enjoy speaking Spanish	.704			
	I enjoy Spanish language movies	.668			
	I enjoy Spanish language TV	.667			
	I enjoy reading books in Spanish	.637			
	My thinking is done in the Spanish language	.616	-.428		
Factor 2	I write letters in English		.714		$\alpha = .75$
	I enjoy listening to English language music	-.317	.690		
	My thinking is done in the English language		.647		
	I speak English		.613		
Factor 3	My friends are of Anglo origin			.640	$\alpha = .57$
	I associate with Anglos			.640	

Note. Extraction Method: Principal Axis Analysis.

Rotation Method: Obimin with Kaiser Normalization.

The three-factor solution was inconsistent with the bidimensional theoretical construct of the Brief ARSMA–II scale. Since bidimensional acculturation scales comprise two independent cultural subscales with same numbers of items, this study explored two possible options. The first option was “keeping the original twelve items of the Brief ARSMA–II” by forcing a two-factor solution: 6-item of Mexican identity and 6-item of American identity. The second option was “removing two items (the third factor) involving American friends.” This second option was reasonable because the third subscale showed the lack of theoretical dimensionality and reliability ( $\alpha = .57$ ).

First, a confirmatory factor analysis was performed to obtain model fit statistics for the first option. The result of the confirmatory factor analysis for the first option did not fit the data well,  $CFI = .82$ ,  $SRMR = .08$  and  $RMSEA = .11$ . Next, the second option was explored. In the

second option, the two items from the third factor involving American friends were removed, which subsequently caused the Mexican domain to contain two more items than the American domain. In connection with reducing the numbers of items of the Mexican domain, the items “My thinking is done in the Spanish language” and “I enjoy reading books in Spanish” were regarded as sensible to render exclusion preferable due to the relatively small loadings. In doing so, the total number of the Brief ARSMA–II items would be 8, and the scale was expected to emerge two factors: the 4-item of MI and the 4-item of AI.

A confirmatory factor analysis for the 8-item set with maximum likelihood method was performed. The  $\chi^2$  value for the model was statistically significant ( $p < .01$ ), but model fit statistics showed a good model fit except for the root mean squared error of approximation index (RMSEA):  $CFI = .94$ ,  $SRMR = .05$  and  $RMSEA = .08$  (95%  $CI = .05 \sim .09$ ). Based on the CFA result, this study chose this revised 8-item Brief ARSMA–II scale as shown in Figure 6.

The reliabilities for the revised two subscales were found to be good; the Cronbach’s alpha coefficients for the MI subscale (4 items) and the AI subscale (4 items) were .87 and .75, respectively. The two subscales were negatively related to each other ( $r = -.29$ ,  $p < .001$ ). The means of the MI score and AI score were 3.47 ( $SD = 1.22$ ) and 3.42 ( $SD = 1.34$ ), respectively.



Figure 5: Scree plot for the revised 8-item Brief ARSMA-II

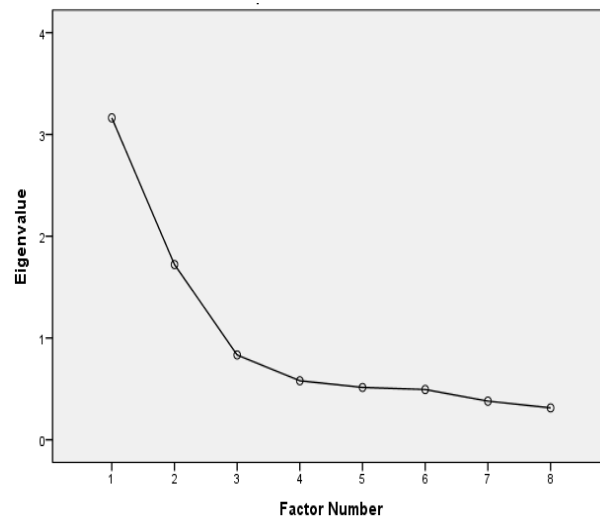
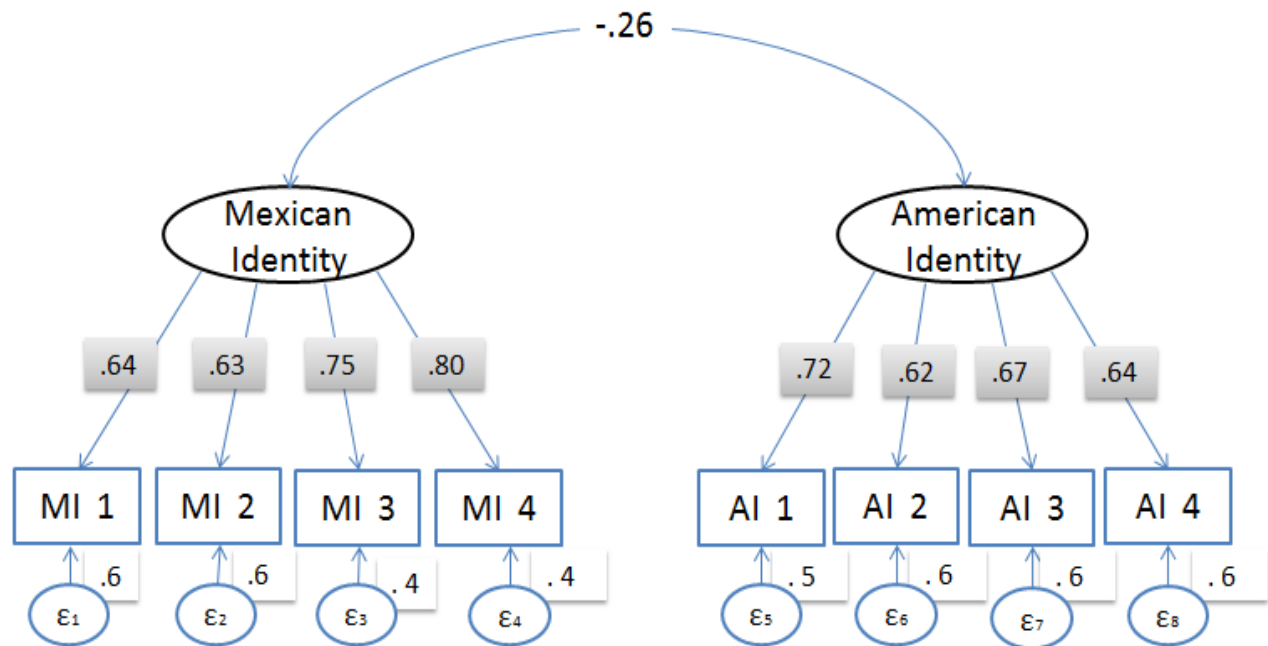


Table 8: Factor loadings with oblique solution for the revised Brief ARSMA-II

Item	Factor		Communalities
	Mexican $\alpha=.87$	American $\alpha=.75$	
TV I enjoy Spanish language movies	.759		.58
I enjoy Spanish language	.710		.50
I enjoy speaking Spanish	.701		.49
I speak Spanish	.675		.45
I write letters in English		.718	.52
My thinking is done in the English language		.655	.44
I enjoy listening to English language music		.654	.43
I speak English		.634	.41

Figure 6: Diagram of the revised Brief ARSMA-II with standardized estimates



*Societal, Attitudinal, Familial, and Environmental Acculturative Stress Scale*

The KMO measure was 0.77, indicating that correlation patterns were strong and reliable. Bartlett's test of sphericity was statistically significant ( $p < .01$ ), showing that a factor analysis was appropriate. The SAFE-C consisted of three subscales intended to capture different aspects of stressors: general social stress (16 items); acculturative stress (14 items); perceived discrimination (6 items). An exploratory factory analysis with oblique rotation resulted in 12 factors, and the complex pattern of the factors accounted for 37.63% of the total variance. The first factor explained 13.42% of the variance of items, and the other factors explained less than 5% of the variance of items. After forcing 3~5 factors to extract, less than 21% of the total variance were explained, and the items loading values varied between .10 and .51. Table 9 indicates the complex structure of the SAFE-C scale when forcing the three-factor solution which was the underlying structure of the SAFE-C scale. The items of each subscale were mixed—particularly

the items of acculturative stress and perceived discrimination—and any meaningful memberships did not emerge. Therefore, the communality and factor loading of each item was examined, and the wordings of each item were also reviewed in regard to whether each item measured the relevant aspects of the underlying construct of the scale.

Table 9: Complex pattern of the 36-item SAFE-C by forcing three-factor solution

	G: General daily stress	AC: Acculturative stress	D: Perceived discrimination stress	Factor		
				1	2	3
AC	I often feel like people who are supposed to help are really not paying any attention to me.			.510		
D	Because of the group I am in, I feel others don't include me in some of the things they do.			.500		
AC	I don't feel at home here in the United States.			.465		
AC	It bothers me that I have an accent.			.463		
D	Because of the group I am in, I don't get the grades I deserve.			.460		
AC	It's hard to be away from the country I used to live in.			.452		
D	People think badly of me when I practice customs or I do the "special things" of my group.			.432		
AC	I have a hard time understanding what others say when they speak.			.407		
AC	I often feel that people purposely try to stop me from getting better at something			.396		
AC	People think I am shy, when I really just have trouble speaking English.			.342		
AC	People in my family who I am close to have plans for when I grow up that I don't like			.340		
D	It's hard for me to "show off" my family.			.323		
G	I worry that other kids won't like me.			.321	-.321	
AC	I think a lot about my group and its culture.			.314		
G	The thought of my family and I moving to a new place bothers me.			.310		
AC	I have more things that get in my way than most people do.			.276		
AC	It bothers me that people in my family who I am close to don't understand the things that I think are important, that are new to them.			.242		
G	I worry that other kids are making fun of me.				-.665	
AC	It bothers me when people force me to be like everyone else.				-.513	
G	It bothers me when my parents argue.				-.489	
G	It bothers me when some countries of the world don't get along.				-.451	
G	It bothers me when I am not with my family.				-.442	
G	I worry about what other kids think about me.				-.434	
G	It bothers me when I argue with my brother/sister.				-.428	

G	I worry about getting my report card	-.358
D	I feel bad when others make jokes about people who are in the same group as me.	-.351
D	Many people believe certain things about the way people in my group act, think, or are, and they treat me as if those things are true.	-.333
G	It bothers me when someone in my family is very sick.	-.318
G	I worry about being sick	-.315
AC	It's hard for me to tell my friends how I really feel.	-.226
G	I worry about having enough money	-.128
AC	I don't have any close friends.	.413
G	It's hard for me to ask questions in class.	.321
G	I worry about having to take tests in school.	.311
G	It's hard to talk with my teacher	.282
G	It's hard for me to talk to new kids.	.239

Note. Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization.

After conducting exploratory factor analyses, three items were excluded due to low communalities (less than .30): “I feel bad when others make jokes about people who are in the same group as me”; “I have more things that get in my way than most people do”; “It bothers me when some countries of the world don’t get along”. In addition, a review of the items suggested that the wording of several items was potentially confusing and counterintuitive. With respect to the items related to acculturative stress, several items were vaguely related to acculturation experiences; for example, “I often feel like people who are supposed to help are really not paying any attention to me” and “I often feel that people purposely try to stop me from getting better at something.” These items were also excluded due to the low communalities ( $< .40$ ).

After deleting those 5 items, factor analysis of 31 items resulted in a five-factor solution. First and second factors consisted of mixed items (12 items) of acculturative stress and perceived discrimination, and a third factor (12 items) reflected general social stress. A fourth factor (3 items) involving the teacher-child relationship and school work was not sufficiently reliable ( $\alpha = .46$ ) as a subscale score. A fifth factor (4 items) involving stressors derived from health and

financial hardship was also unreliable ( $\alpha = .41$ ). Therefore, 7 items from the fourth and fifth factors were discarded because these items did not have a meaningful membership and insufficient internal consistency.

By an oblique rotation, factor analysis of the remaining 24 items yielded a three-factor solution, accounting for 25% of the total variance. The communalities were all above .35. The item, “Because of the group I am in, I feel others don't include me in some of the things they do, games they play, etc.” had the lowest communality at .37.

The first factor (11 items), which explained 16% of the variance of items, reflected children's general social stress. Of these 11 items, the two items (“It bothers me when people force me to be like everyone else”; “It's hard for me to tell my friends how I really feel”) were originally categorized as acculturative stress by the SAFE-C scale developer. The exploratory factor analysis in this study classified the two items into general stress, which is consistent with the items' actual construct. The factor loadings ranged .23 to .78. Four items were excluded because their factor loadings were less than .35. Therefore, the number of the general social stress items was 7.

The second factor, which explained 6% of the variance of items, measured both acculturative stress and perceived discrimination with 8 items, except for two items, “It's hard for me to talk to new kids” and “It bothers me when some countries of the world don't get along.” These items were excluded due to the low factor loading ( $< .35$ ). Other two items, “I often feel that people purposely try to stop me from getting better at something” and “People in my family who I am close to have plans for when I grow up that I don't like” were additionally deleted due to the low communalities, factor loadings, and irrelevant concepts. However, the item, “It bothers me that I have an accent,” was included despite the low factor loading (.33), because this

item seemed to measure an important aspect of acculturative stress. After deleting 4 items, the total item number of the second factor was 4.

The third factor, which explained 3 % of the variance of items, also reflected both acculturative stress and perceived discrimination by 6 items. The item, “Many people believe certain things about the way people in my group act, think, or are, and they treat me as if those things are true” was excluded because the factor loading was less than .35. After excluding the item, the second factor (4 items) and the third factor (5 items) were merged into one subscale: thereby, the 9-item acculturative/discrimination stress subscale.

Finally, an exploratory factor analysis of the remaining 16 items was conducted by an oblique rotation. It yielded a two-factor solution, accounting for 23 % of the total variance. All of the items loaded on their own factor greater than .33 (Table 12). Factor 1 was named *general social stress*. It accounted for 16 % of the variance and item loading values varied between .38 and .78. Among the seven items, five items were originally developed for the general social stress subscale by the SAFE-C scale developer. The other two items (“It bothers me when people force me to be like everyone else”; “It’s hard for me to tell my friends how I really feel”) were originally developed to reflect acculturative stress; however, it was verified as the general social stress construct during the factor analysis. Cronbach’s alpha for the 7-item general social stress scale was .71.

Factor 2 was named *acculturative/discrimination stress*. It accounted for 7 % of the variance with 9 items, and item loading values varied between .32 and .53. All items were originally developed to reflect either the acculturative stress construct or the perceived discrimination construct. Cronbach’s alpha for the 9-item acculturative/discrimination stress subscale was .68.

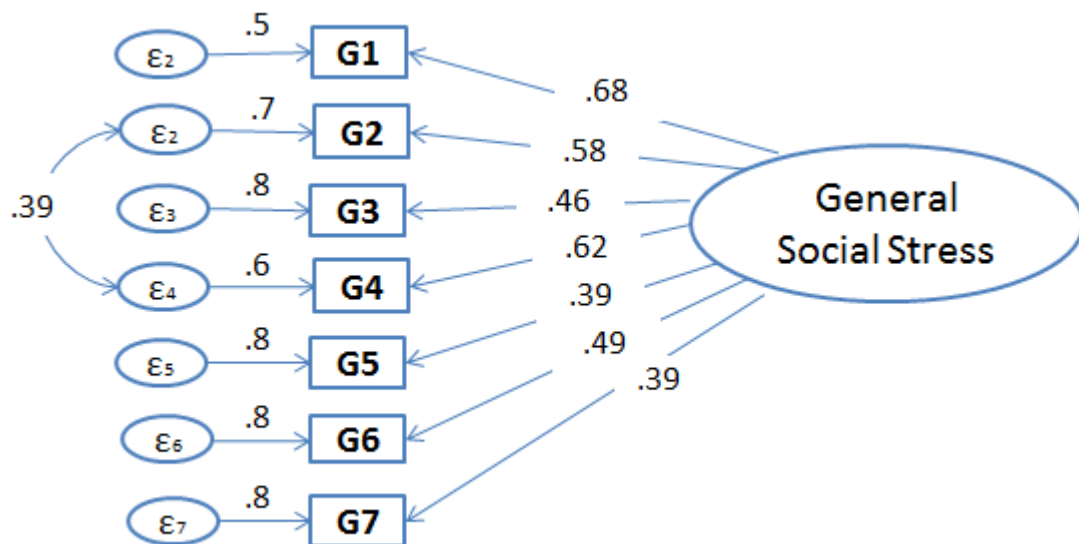
The means of general social stress (GS) and acculturative and discrimination stress (AC-DIS) were 2.71 ( $SD = 1.01$ ) and 1.57 ( $SD = .91$ ), respectively. The GS subscale and AC-DIS subscale scores were correlated at .48. The final items of the modified SAFE-C scale were summarized in Table 10.

Table 10: Two dimensions of the modified 16-item SAFE-C scale

Dimension		Item
General Social Stress ( $\alpha=.71$ )	1	I worry that other kids are making fun of me.
	2	It bothers me when people force me to be like everyone else.
	3	It bothers me when my parents argue.
	4	I worry about what other kids think about me.
	5	It bothers me when I argue with my brother/sister.
	6	I worry that other kids won't like me.
	7	It's hard for me to tell my friends how I really feel.
Acculturation/Discrimination Stress ( $\alpha=.68$ )	1	I have a hard time understanding what others say when they speak.
	2	I don't feel at home here in the United States.
	3	People think badly of me when I practice customs or I do the "special things" of my group.
	4	Because of the group I am in, I don't get the grades I deserve.
	5	It bothers me that I have an accent.
	6	People think I am shy, when I really just have trouble speaking English.
	7	It's hard for me to "show off" my family.
	8	I think a lot about my group and its culture.
	9	It's hard to be away from the country I used to live in.

CFA of the 7-item GS subscale did not fit the data well. The  $\chi^2$  value for the model was statistically significant ( $p < .01$ ), and  $CFI$  was .90 ( $SRMR = .05$ ;  $RMSEA = .08$ ). Modification statistics suggested that errors between items 2 and 4 are correlated (i.e., It bothers me when people force me to be like everyone else; I worry about what other kids think about me). This correlated error covariance suggests that the constructs of the two items may covary because children's social sensitivity and emotional disturbance depend on their peer relationship. After adding a path between these error terms, the model fit statistics showed a good model fit,  $CFI = .99$ ,  $SRMR = .03$  and  $RMSEA = .03$  (95% CI = .01 ~ .07).

Figure 7: CFA diagram of the revised General Social Stress subscale of SAFE-C with standardized estimates

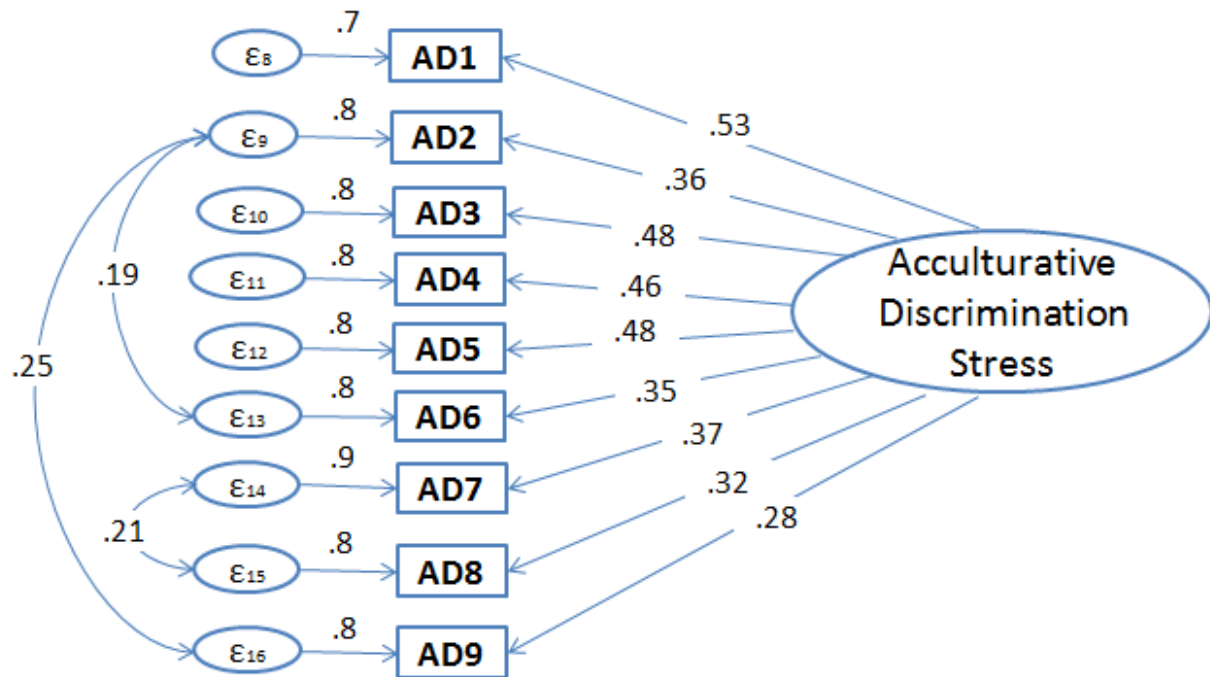


CFA of the 9-item AD-DIS subscale did not fit the data well. The  $\chi^2$  value for the model was statistically significant ( $p < .01$ ), and  $CFI$  was .89 ( $SRMR = .05$ ;  $RMSEA = .06$ ). Modification statistics suggested that errors between “item 2 and item 6”, “item 2 and item 9”, and “item 7 and 8” were correlated. These correlated error terms suggest that children’s



acculturative stress depends mainly on language use. It is interesting that the measurement error for “It's hard for me to show off my family” was associated with children’s limited English proficiency. After adding paths between these error terms, the model fit statistics showed a better model fit,  $CFI = .93$ ,  $SRMR = .04$  and  $RMSEA = .05$  (95%  $CI = .02 \sim .07$ ). Item 9 (It's hard to be away from the country I used to live in) showed a low factor loading (.28), but the present study included the item because the item construct seems to be important to reflect the psychological aspect of acculturation.

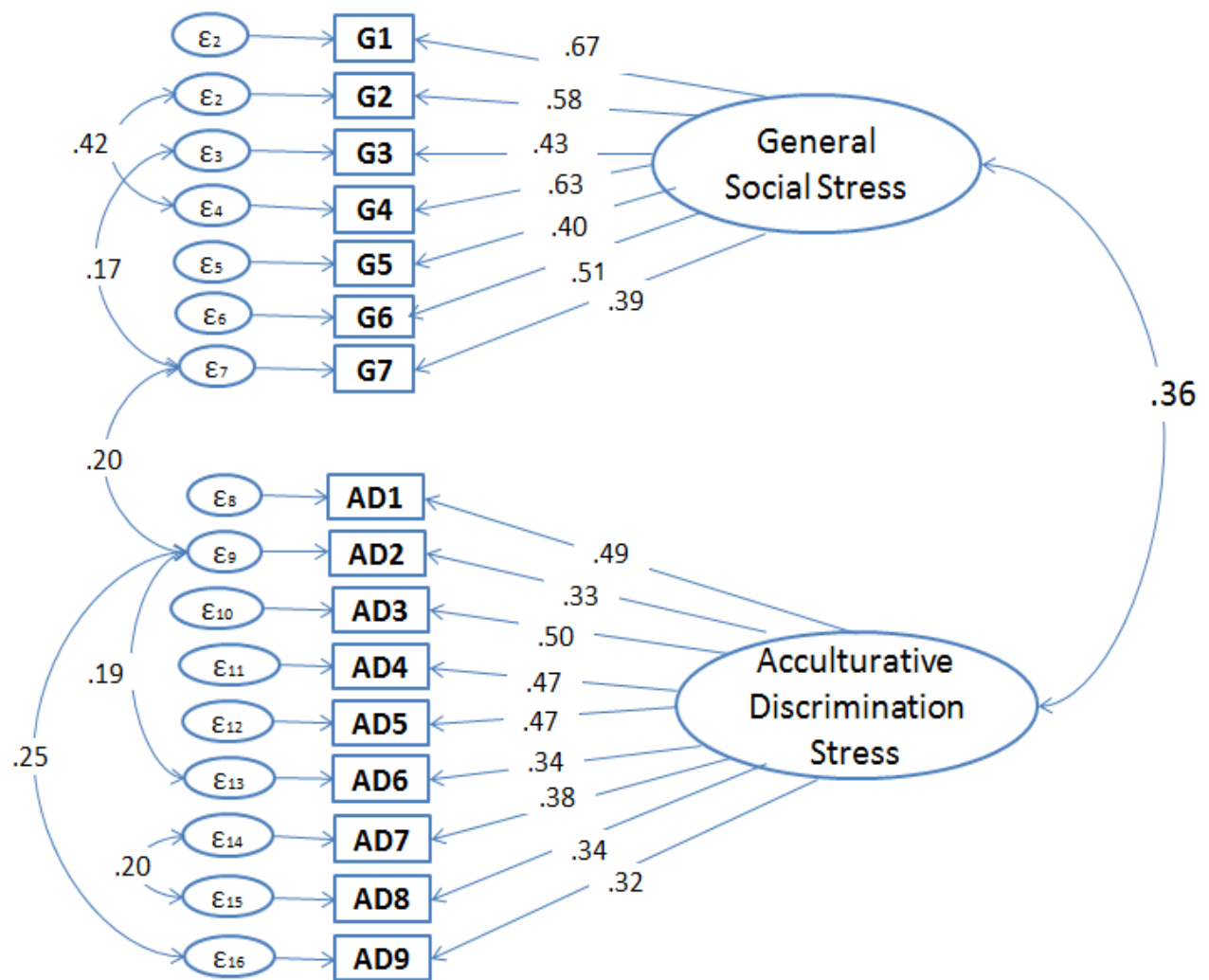
Figure 8: CFA diagram of the revised Acculturative/Discrimination Stress subscale of SAFE-C with standardized estimates



Next, CFA of the revised 16-item SAFE-C scale was performed with the two factor solution. The 16-item scale did not fit the data well. The  $\chi^2$  value for the model was statistically

significant ( $p < .01$ ), and  $CFI$  was .88 ( $SRMR = .06$ ;  $RMSEA = .05$ ). Modification statistics suggested that errors between the GS's item 7 and the AC-DIS's item 2 were correlated. Similar to the previous explanation, this correlated error term suggests that children's general stress from peer relationship was derived from their language use. Thus it is conceptually plausible that the error terms might be correlated. In addition, modification statistics suggested that the error terms between GS item 3 and GS item 7 should be connected. After adding error paths, the data fit the model adequately,  $CFI = .92$ ,  $SRMR = .05$  and  $RMSEA = .04$  (95%  $CI = .02 \sim .05$ ).

Figure 9: CFA diagram of the 16-item SAFE-C with standardized estimates



### Final summary for dependent and independent variables

Based on the data screening and scale validation procedures, the present study created a new variable and also modified the Brief ARSMA-II and the SAFE-C scales. As a result, the final variables to be analyzed are summarized as follows.

1. The dependent variable: transformed educational competence score.
2. From the processes of data screening, a new variable, *missing*, was created. This new variable was coded 1 for demographic missing and 2 for non-missing.
3. In the scale validation process, the four independent variables from the acculturation scales were modified as follows:
  - 1) The 4-item Mexican Identity of the revised Brief ARSMA-II (MI),
  - 2) The 4-item American Identity of the revised Brief ARSMA-II (AI),
  - 3) The 7-item general social stress of the SAFE-C (GS), and
  - 4) The 9-item acculturative and discrimination stress of the SAFE-C (AC-DIS).
4. The two subscales of the TAM scale were used as independent variables:
  - 1) Mexican Cultural Score (TAM-MC) and
  - 2) American Cultural Score (TAM-AC).
5. Six control variables were child's gender, parental marital status, child's place of birth, child's language at home, parental length of U.S. residence, and parental educational level.

### *Part 3: Exploring Bidimensional Acculturation*

For an exploratory purpose, the present study conducted a cluster analysis for identifying homogenous acculturation groups, without any assumption regarding the kind of acculturation mode that would be derived. The present study decided to use each 8 item of the Brief ARSMA–II, rather than the two MI and AI subscale scores in order to identify detailed acculturation patterns among children. Two-step clustering and k-means clustering procedures were carried out by using the 10 grouping variables: 4 items of MI (Brief ARSMA–II), 4 items of AI (Brief ARSMA–II), the TAM-MC score, and the TAM-AC score.

Results from the two-step clustering procedure suggested three clusters from the 10 grouping variables by indicating the smallest value of Bayes Information Criterion (BIC= 1780.52, see Table 11). Next, a k-means cluster analysis was run twice by forcing three- and four-category solutions each at a time, regarding the grouping variables. A three-cluster solution was finally chosen based on three criteria: 1) the fit of the clusters' solution as evaluated by the BIC, 2) the theoretical interpretation of bidimensional acculturation, and 3) the number of cases in each cluster.

Table 11: Solutions by auto-clustering

Number of Clusters	Schwarz's Bayesian		Ratio of BIC Changes	Ratio of Distance Measures
	Criterion (BIC)	BIC Change		
1	2062.509			
2	1836.357	-226.152	1.000	2.010
3	1780.520	-55.838	.247	1.934
4	1806.151	25.632	-.113	1.175
5	1844.781	38.629	-.171	1.425

Note. The lower the BIC value, the better the fit of the cluster solution.

A one-way MANOVA was conducted to assess the means of the grouping variables among the three acculturation cluster memberships. The assumptions of multivariate normality and homogeneity were not met (Mardia's  $p = .04$ ; Box F's  $p = .001$ ). The test of overall differences among the acculturation clusters was statistically significant,  $F(20, 542) = 51.32$ ,  $p < .001$ ; Wilk's  $\lambda = 0.46$ ,  $\eta^2 = .66$ . As presented in Table 15, all clusters had enough cases to be meaningful. The three acculturation clusters were termed "assimilated," "separated," and "integrated" patterns.

*Exploratory Aim 1: What kinds of acculturation patterns among Latino youth are identified in a bidimensional approach?*

Three acculturation patterns were identified among Mexican-American children: assimilated pattern, separated pattern, and integrated pattern. The assimilated pattern showed a culturally Americanized preference in American food and music. In contrast, the separated pattern presented a strong preference in Mexican food and music. The integrated pattern exhibited the high scores in both cultural domains with the exception of TAM-Mexican food and music.

Table 12: Cluster centroids

Grouping Variables		Clusters (N=295)		
		Assimilated (n=83)	Segregated (n=103)	Integrated (n=109)
American	TAM-American cultural score (food and music)	<b>2.70</b>	1.14	<b>3.06</b>
	I speak English	<b>4.08</b>	2.74	<b>4.25</b>
	My thinking is done in the English language	<b>3.73</b>	1.92	<b>4.03</b>
	I write letters in English	<b>3.53</b>	1.96	<b>4.25</b>
	I enjoy listening to English language music	<b>4.14</b>	2.73	<b>4.35</b>
Mexican	TAM-Mexican cultural score (food and music)	.75	<b>3.52</b>	1.40
	I speak Spanish	2.49	<b>4.51</b>	<b>4.44</b>
	I enjoy speaking Spanish	2.15	<b>4.39</b>	<b>4.28</b>
	I enjoy Spanish language TV	1.76	<b>4.13</b>	<b>3.68</b>
	I enjoy Spanish language movies	1.50	<b>3.92</b>	<b>3.49</b>

*Exploratory Aim 2: Is any particular acculturation pattern associated with higher educational achievement compared to other patterns?*

In order to find the pattern of differences on perceived educational competence among the three acculturation patterns, an ANOVA was performed first, *without controlling for other variables*. The assumptions of homogeneity of variance and normality were met. The means of educational competence for the assimilated, separated, and integrated groups were 6.22 ( $SD=.85$ ), 6.65 ( $SD=.76$ ), and 6.44 ( $SD=1.03$ ), respectively. There was a significant difference in educational competence among the acculturation patterns with a very small effect size,  $F(2, 294) = 5.15$ ,  $p = .01$ ,  $\eta^2 = .04$ . Post hoc pairwise comparisons using the Tukey HSD adjustment were performed. The separated group showed significantly higher levels of educational competence than the assimilated group,  $p = .01$  (see Table 13). There was no significant difference on

perceived educational competence between the integrated group and the assimilated group and between the separated group and the integrated group.

Table 13: Multiple comparisons among the groups in their educational competence scores

Comparisons	Mean Difference	S.E.	Sig.	95% CI	
				Lower	Upper
Separated – Assimilated	.42	.13	<b>.01</b>	.11	.73
Separated – Integrated	.20	.12	.21	-.08	.49
Assimilated – Integrated	-.21	.13	.22	-.52	.09

Note. Bold numbers indicate statistical significance at the 0.05 level.

#### *Creating Acculturation Dummy Variables*

Although using the separate sub-scores for the ARSMA-II and TAM scales are considered as a bidimensional approach, this approach does not demonstrate diverse or particular acculturation patterns as Berry proposed. To identify the effects of the three acculturation clusters on educational competence in regression analysis, the three acculturation clusters were recoded into dummy variables. The separated group was coded as 0 to serve as a reference group because I am interested in comparing the separated pattern to other patterns. Using the  $k - 1$  rule, two dummy variables were created: “integrated” and “assimilated.” These two dummy variables will allow for contrasts between combinations of the acculturation clusters at a time in multiple regression analysis.



#### *Part 4: Hypotheses Testing*

The intra-class correlation coefficient was calculated to check if the data for children is organized at more than one level. If the proportion of the overall variation in perceived educational competence is attributable to the fact that children were drawn from 15 different schools, the data must be analyzed by a multilevel model. The variance components procedure showed that the variance of perceived educational competence was negligible ( $\rho = .026$ ), suggesting that a 2-level model (student level and school-level) was unnecessary.

Before conducting multiple regression analysis, this study checked the tolerance and VIF values of the independent variables to detect the existence of any possible multicollinearity problem which might affect the estimation of the regression model as well as interpretation of the results. The tolerance and VIF values of the independent and control variables (ranging from .27 to .85 and from 1.12 to 4.03, respectively) were all acceptable. The  $\chi^2$  value for the Breusch-Pagan /Cook-Weisberg test was 1.39,  $p = .23$ , indicating that heteroskedasticity was also not a problem. No outliers were detected, and no non-linearity problems were found.

There was a significant prediction of educational competence by education policy, demographics GS, AC-DIS, MI, AI, TAM-MC, and TAM-AC,  $F(13, 156) = 2.88$ ,  $p < .01$ ,  $R^2 = .18$ , adjusted  $R^2 = .12$ . The contributions of the predictors are shown by the semi-partial correlations ( $sr^2$ ) in Table 14. None of the demographic variables significantly predicted perceived educational competence. Based on the regression analysis results, Hypotheses 1, 2, and 3 were answered as follows.

Table 14: Summary of regression analysis for predicting educational competence

All variables are entered (N=170)	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	<i>sr</i> <sup>2</sup>
Education Policy	-.66	.17	-.35	-3.79	.00	.07
Gender	-.20	.14	-.12	-1.41	.15	.01
Parental Marital Status	.12	.13	.07	.93	.34	0
Child Birth Place	-.02	.14	-.01	-.18	.85	0
Parental Time in US	-.00	.00	-.10	-1.23	.22	.01
Language Use at Home	-.35	.31	-.09	-1.12	.26	.01
Parental Education	.04	.12	.02	.33	.73	0
Mexican Identity	.04	.06	.05	.71	.47	0
American Identity	.08	.07	.11	1.25	.21	.01
TAM-Mexican Cultural Score	.05	.03	.14	1.76	.08	.02
TAM-American Cultural Score	.01	.04	.02	.32	.74	0
General Social Stress	-.07	.05	-.10	-1.21	.22	.01
Acculturative/Discrimination Stress	-.17	.08	-.18	-2.20	.02	.03

*Hypothesis 1: Among Latino youth, there will be a negative relationship between the level of acculturative stress and educational achievement after controlling for other variables.*

*Hypothesis 2: Among Latino youth, there will be a negative relationship between the level of perceived discrimination and educational achievement after controlling for other variables.*

These hypotheses could not be tested separately after re-validating the SAFE-C scale. Given the strong positive relationship between the acculturative stress and perceived discrimination constructs, the two subscales were merged into one, i.e., acculturative/discrimination stress (AC-DIS).

Acculturative/discrimination stress significantly negatively predicted educational competence even after controlling for other predictors and demographic variables in the multiple regression analysis. Therefore, hypotheses 1 and 2 are supported in this study.

*Hypothesis 3: Among Latino youth, those who receive bilingual education will have higher educational achievement than those who receive English Immersion after controlling for other variables.*

The results of the regression analysis support this hypothesis. Mexican-American children who received bilingual education (Texas) exhibited higher levels of perceived educational competence than those who received English Immersion education (Arizona) even after controlling for children's demographics and acculturation factors.

To further examine the relationships among education policy, acculturation scales, and educational competence, multiple regression analyses were conducted, excluding the nonsignificant demographics. Perceived educational competence was regressed on GS, AC-DIS, MI, AI, TAM-MC, TAM-AC, and education policy. There was a significant prediction of educational competence by GS, AC-DIS, MI, AI, TAM-MC, TAM-AC, and education policy,  $F(7, 279)=8.86, p <.001, R^2 =.18, \text{adjusted } R^2 =.16$ . There were significant predictions of educational competence by general social stress ( $\beta = -.14, t(279) = -2.55, p <.05, sr^2 = .02$ ), TAM-MC ( $\beta = .15, t(279) = 2.68, p <.05, sr^2 = .02$ ), and education policy ( $\beta = -.31, t(279) = -4.84, p <.01, sr^2 = .07$ ). These findings suggest that general social stress has a negative effect on perceived educational competence and that TAM's Mexican cultural behavior positively influences perceived educational competence among Mexican-American children after adjusting for other predictors. It is interesting that acculturative/discrimination stress no longer predicted

educational competence when excluding the demographic variables. Bilingual education (0 = bilingual education; 1 = English Immersion) was found to promote perceived educational competence after adjusting for other predictors.

Table 15: Summary of regression analysis for predicting educational competence

Model without demographics (N=287)	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	<i>CI</i>	<i>sr</i> <sup>2</sup>
General Social Stress	-.11	.04	-.14	-2.54	<b>.01</b>	(-.19, -.02)	.02
Acculturative/Discrimination Stress	-.04	.05	-.04	-.73	.46	(-.15, .07)	.00
Mexican Identity	.06	.04	.09	1.57	.11	(-.01, .15)	.01
American Identity	.07	.05	.09	1.48	.13	(-.02, .17)	.01
TAM-Mexican Cultural Score	.06	.02	.15	2.68	<b>.01</b>	(.01, .12)	.02
TAM-American Cultural Score	.03	.02	.08	1.38	.16	(-.01, .08)	.00
Education Policy	-.57	.11	-.31	-4.84	<b>.001</b>	(-.81, -.34)	.07

Next, a forward stepwise multiple regression analysis with educational competence as the dependent variable, and GS, AC-DIS, MI, AI, TAM-MC, TAM-AC, and education policy serving as predictors was performed to achieve the best model (entry criteria  $p = .10$ , removal criteria  $p = .20$ ). The order of variable selection was determined by zero-order correlations at the beginning, and then independent variables with the highest partial correlations were entered after the first step. Since education policy was found to have the highest zero-order correlation with the dependent variable, it entered first.

Table 16: Summary of forward stepwise regression analysis for predicting educational competence

Model(N=287)		$R^2(p)$	$B$	$SE$	$\beta$	$t$	$p$	$sr^2$
1	Education Policy	.12 ( $p<.01$ )	-.62	.10	-.34	-6.11	.01	.12
2	Education Policy	.14 ( $p<.001$ )	-.60	.10	-.33	-5.98	.01	.11
	General Social Stress		-.10	.04	-.13	-2.48	.05	.02
3	Education Policy	.16 ( $p<.01$ )	-.52	.10	-.28	-4.98	.01	.07
	General Social Stress		-.11	.04	-.15	-2.77	.01	.02
	TAM-Mexican Cultural Score		.06	.02	.15	2.74	.01	.02
4	Education Policy	.17 ( $p<.01$ )	-.59	.11	-.32	-5.26	.01	.08
	General Social Stress		-.11	.04	-.15	-2.86	.01	.02
	TAM-Mexican Cultural Score		.07	.02	.17	3.01	.01	.03
	American Identity (ARSMA)		.08	.05	.10	1.68	.09	.01

The final model of the forward stepwise multiple regression, Model 4, showed that education policy, general social stress, TAM Mexican behavior, and American identity were predictive of perceived educational competence, with  $\beta$ s of -.32, -.15, .17, and .10, respectively. Model 4, comprised of these four predictors, accounted for 17% of the variance in perceived educational competence, with education policy making the greatest contribution (8%) to predicting perceived educational competence. The findings suggest that bilingual education, American identity, and TAM Mexican behavior are positively associated with educational competence. In contrast, increased general social stress was negatively related to educational competence. The R-square change was tested between the models, and the significance F-change test showed that the variables added into each model significantly improved the

prediction ( $p < .01$ ) except for the final model. The F-change test result for the final model indicated that adding American identity did not significantly increase R-square ( $p = .09$ ). Though marginally significant at a .10 significance level, American identity did positively influence children's educational competence.

The previous regression analyses employed the scores for the Mexican and American subscales of the ARSMA-II and TAM scales separately. Although this approach can be regarded as a bidimensional approach, it did not present diverse or particular acculturation patterns as Berry proposed. Instead, in connection with bidimensional acculturation theory, this study derived the three acculturation clusters and created the two dummy variables in the previous section. In the unidimensional approach, I created the two linear assimilation levels—ARSMA-II's assimilation level and TAM's assimilation level—subtracting the ARSMA-II's MI score from the AI score ( $= AI - MI$ ) and subtracting the TAM-MC score from the TAM-AC score ( $= TAM-AC - TAM-MC$ ). The aim of the different score strategies was to answer the last research question as to whether a unidimensional acculturation approach and a bidimensional acculturation approach would yield similar results. Next, I conducted multiple regression analyses to compare the unidimensional approach and the bidimensional cluster approach. The results of these two approaches were also compared to the results of the four-score acculturation strategy in the next section.

#### *Multiple regression analyses for unidimensional acculturation approach*

First, perceived educational competence was regressed on GS, AC-DIS, ARSMA-assimilation ( $AI - MI$ ), TAM-assimilation ( $TAM-AC - TAM-MC$ ), and education policy. There was a significant prediction of educational competence by GS, AC-DIS, ARSMA-assimilation,

TAM-assimilation, and education policy,  $F(5, 281)=9.22$ ,  $p <.001$ ,  $R^2 =.14$ , adjusted  $R^2 =.13$ . There were significant predictions of educational competence by general social stress ( $\beta=-.13$ ,  $t(281)= -2.00$ ,  $p<.05$ ,  $sr^2=.01$ ) and education policy ( $\beta = -.50$ ,  $t(281)= -4.46$ ,  $p<.01$ ,  $sr^2=.06$ ). When comparing this unidimensional result to the previous results (with MI, AI, TAM-MC, and TAM-AC), the effect of TAM acculturation became insignificant, (TAM-assimilation:  $\beta = -.05$ ,  $t(281)= -.77$ ,  $p=.44$ ), and the model yielded a slightly smaller  $R^2$ .

Next, a forward stepwise multiple regression analysis with educational competence as the dependent variable, and GS, AC-DIS, ARSMA-assimilation, TAM-assimilation, and education policy serving as predictors was used to achieve the best model (entry criteria  $p =.10$ , removal criteria  $p =.20$ ). The final model (2) showed that education policy and general social stress were predictive of perceived educational competence, with  $\beta$ s of  $-.33$  and  $-.14$ , respectively. No acculturation variables significantly influenced children's educational competence. The R-square change was tested between the models, and the significance F-change test showed that the variables added into each model significantly improved the prediction ( $p < .01$ ). According to the final model, education policy made the greatest contribution (11%) to predicting perceived educational competence (see Table 17). It seems that the unidimensional approach shows a disadvantage when compared to the four-acculturation score strategy (by using MI, AI, TAM-MC, and TAM-AC) because none of the acculturation factors showed significance when using the unidimensional acculturation approach, while the four-acculturation score strategy indicated that TAM-MC does have a significant effect.

Table 17: Summary of forward stepwise regression analysis for predicting educational competence in a unidimensional acculturation approach

Model ( $N=287$ )	$R^2(p)$	$B$	$SE$	$\beta$	$t$	$p$	$sr^2$
1 Education Policy	.12 ( $p<.01$ )	-.62	.10	-.34	-6.12	.01	.12
2 Education Policy	.14 ( $p<.001$ )	-.61	.10	-.33	-5.98	.01	.11
General Social Stress		-.10	.04	-.13	-2.48	.05	.02

Multiple regression analyses for bidimensional cluster approach

Perceived educational competence was regressed on GS, AC-DIS, integration dummy (separation vs. integration), assimilation dummy (separation vs. assimilation), and education policy. There was a significant prediction of educational competence by GS, AC-DIS, integration dummy, assimilation dummy, and education policy,  $F(5, 284)=10.13$ ,  $p <.001$ ,  $R^2 =.15$ , adjusted  $R^2 =.14$ . There were significant predictions of educational competence by general social stress and education policy at the .05 significance level. These findings were same as the previous unidimensional result in that no acculturation variables significantly contributed to predicting perceived educational competence at the 95% confidence level.

Next, another forward stepwise multiple regression analysis with educational competence as the dependent variable, and GS, AC-DIS, integration dummy, assimilation dummy, and education policy serving as predictors was performed to achieve the best model (entry criteria  $p=.10$ , removal criteria  $p=.20$ ). The final model in Table 21 showed that education policy, general social stress, and the assimilation dummy were predictive of perceived educational competence, with  $\beta$ s of -.56, -.11, and -.20, respectively. The R-square change was tested between the models, and the significance F-change test showed that the variables added into each model significantly improved the prediction ( $p < .01$ ), except for the final model. The



F-change test result for the final model indicated that the assimilation dummy did not significantly increase R-square ( $p = .08$ ). Though marginally significant ( $p = .07$ ), assimilated children exhibited lower levels of perceived educational competence than that of separated children. In this regard, the bidimensional cluster approach appeared to be slightly better at capturing the acculturative impact on educational competence than the unidimensional acculturation approach.

Table 18: Summary of forward stepwise regression analysis for predicting educational competence in a bidimensional acculturation approach

Model ( $N=290$ )	$R^2(p)$	$B$	$SE$	$\beta$	$t$	$p$	$sr^2$
1 Education Policy	.12 ( $p<.01$ )	-.63	.10	-.34	-6.11	.01	.12
2 Education Policy	.14 ( $p<.001$ )	-.61	.10	-.33	-6.06	.01	.11
General Social Stress		-.10	.04	-.14	-2.50	.05	.02
3 Education Policy	.15 ( $p<.01$ )	-.56	.10	-.31	-5.48	.01	.09
General Social Stress		-.11	.04	-.14	-2.62	.01	.02
Assimilation dummy		-.20	.10	.15	-1.77	.07	.01

In summary, the results of the regression analyses for the three acculturation approaches indicated that education policy made the greatest contribution to predicting perceived educational competence. General social stress made the second greatest contribution to predicting perceived educational competence after adjusting for education policy.

To illustrate the statistical outputs of the three different approaches, Table 19 summarized the previous regression analyses by adding acculturation variables in sets into the model already containing the other predictors (i.e., education policy, general social stress, and

acculturative/discrimination stress). Education policy, general social stress, and acculturative/discrimination stress were first entered into the model as a first block, and then, each variable set of the three different approaches was added into the model as another block. Although the three regression models with different numbers of independent variables cannot be directly compared, the model with the four acculturation variables (MI, AI, TAM-MC, and TAM-AC) appeared to be the most advantageous in terms of the reflection of potential acculturation factors.

Further, the entire set of all acculturation variables (MI, AI, TAM-MC, TAM-AC, ARSMA-assimilation, TAM-assimilation, integration dummy, and assimilation dummy) and education policy, general social stress, and acculturative/discrimination stress were entered into the model at the same time. A similar pattern was found,  $F(9, 277)=6.82$ ,  $p < .001$ ,  $R^2 = .18$ , adjusted  $R^2 = .16$ , and education policy, general social stress, and TAM-MC were still statistically significant. Again, this provides a possible point that using the four acculturation scores separately may help more fully understand the acculturation factors—in particular TAM-MC—which influence children's perceived educational competence. Taken together, the four-score strategy is seen as the most desirable approach to reflect acculturation effects, while the unidimensional strategy was shown to be the least desirable. Given that the four-score strategy can be viewed as a bidimensional approach (because it employs two cultural domains independently), the present study provides evidence that a bidimensional approach is more useful than a unidimensional approach (although not absolute evidence) in assessing the impact of acculturation on outcome variables. Based on the results of regression analyses, the last research question of the present study was answered as follows.

Exploratory Aim 3: Will a similar pattern of results be found in different acculturation approaches?

The different acculturation approaches similarly showed that bilingual education and decreased general social stress were positively associated with perceived educational competence. However, different results were found in the different acculturation approaches. In the unidimensional approach, when the acculturation variables (i.e., ARSMA-assimilation level and TAM-assimilation level) were added to the regression model, the effects of acculturation disappeared, whereas the effects of acculturation were still significant in the four-acculturation score approach. That is, the effects of the ARSMA-assimilation level and the TAM-assimilation level on educational competence were statistically insignificant after controlling for education policy and general social stress in the unidimensional approach. However, when using the MI, AI, TAM-MC, and TAM-AC scores separately (the four-acculturation score approach), TAM-Mexican cultural behavior scores were positively related to children's educational competence even after controlling for other variables. Interestingly, the bidimensional cluster approach (using the assimilation dummy and the integration dummy) showed somewhat different results from the four-acculturation score results. Though marginally significant (at the .10 significance level), the bidimensional cluster approach revealed that separated children (with high levels of both Mexican identity and Mexican cultural behavior) exhibited higher levels of perceived educational competence than that of assimilated children.

Table 19: Regression models of three acculturation approaches for predicting educational competence

Model without acculturation variables					
$F(3, 283)=15.13, p < .001, R^2 = .14$					
Independent variables	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>
Policy	-.58	.10	-.31	-5.59	.00
General Social Stress (GS)	-.09	.04	-.11	-2.02	.04
Acculturative/Discrimination Stress (AC-DIS)	-.06	.05	-.06	-1.05	.29

When adding acculturation variables (gray variables) as a second block



1. Four acculturation variables					2. Unidimensional Approach					3. Bidimensional Cluster Approach				
$F(7, 279)=8.62, p < .001, R^2 = .18$					$F(5, 281)=6.65, p < .001, R^2 = .14$					$F(5, 284)=10.13, p < .001, R^2 = .15$				
$R^2_{adjusted}=16, p\text{-value for } \Delta F = .01$					$R^2_{adjusted}=13, p\text{-value for } \Delta F = .64$					$R^2_{adjusted}=14, p\text{-value for } \Delta F = .16$				
	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>		<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>		<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>
Policy***	-.57	.11	-.31	-4.84	Policy***	-.53	.12	-.29	-4.46	Policy***	-.57	.11	-.31	-4.98
GS*	-.11	.04	-.14	-2.54	GS*	-.08	.04	-.11	-2.00	GS*	-.09	.04	-.12	-2.20
AC-DIS	-.04	.05	-.04	-.73	AC-DIS	-.06	.05	-.06	-1.11	AC-DIS	-.05	.05	-.06	-1.03
MI	.06	.04	.09	1.57	ARSMA- Assimilation (=AI – MI)	-.01	.03	-.01	-.22	Integration- dummy	.08	.12	.04	.69
AI	.07	.05	.09	1.48	TAM- Assimilation (=AC – MC)	-.02	.02	-.04	-.77	Assimilation- dummy	-.15	.13	-.07	-1.09
TAM-MC**	.06	.02	.15	2.68										
TAM-AC	.03	.02	.08	1.38										

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

## *Part 5: Other Findings*

### *Correlations among predictor and demographic variables*

There was a positive significant correlation between general social stress (GS) and acculturative/discrimination stress (AC-DIS),  $r = .32, p < .01$ . Decreased general social stress were correlated with longer residence in the U.S.,  $r = -.14, p < .05$ . Female children were more likely to experience general social stress,  $r = .20, p < .01$ , more likely to maintain TAM-Mexican cultural behavior,  $r = .26, p < .01$ , and less likely to speak English at home,  $r = -.34, p < .01$  than male children. Children who received bilingual education and children whose parents lived longer in the U.S. were less likely to experience acculturative/discrimination stress. Children whose parents participated in this study (missing: coded 1 for demographic missing and 2 for non-missing) were less likely to experience acculturative/discrimination stress,  $r = -.26, p < .01$ . General social stress and acculturative/discrimination stress were not significantly related to either cultural identities or TAM cultural behavior.

Under the condition that the four-acculturation-score strategy may be the best among the three acculturation approaches, the present study found that (1) education policy contributed the most to predicting educational competence, (2) education policy was significantly associated with Mexican identity, TAM-Mexican behavior, general social stress, and acculturative/discrimination stress in the bivariate correlation results, and (3) TAM-Mexican behavior and general social stress significantly predicted educational competence after controlling for education policy. Given these findings, it is worth examining a mediation model to determine whether the acculturation factors help to explain the relationship between education policy and educational competence. Because the acculturation factors, in particular TAM-Mexican behavior, may mediate or intervene in the relationship between education policy and

educational competence, it is necessary to investigate the direct and indirect effects of education policy on educational competence accounting for the acculturation factors.

### Mediation analysis

To specify the relationships and patterns among the variables, a sequential multiple regression analysis was conducted by adding variables to the model with education policy already included. Table 21 summarized the values of  $B$ ,  $SE$ ,  $\beta$ ,  $t$ , and  $p$  of education policy when adding other predictors to the model one at a time. The effect of education policy on educational competence was slightly reduced when each variable was added to the model. Specifically, the effect of education policy on educational competence appeared to be reduced when TAM-Mexican behavior was added to the model. That is, the higher educational competence for children who received bilingual education might be partially explained by these children's higher levels of TAM Mexican behavior. Similarly, the higher educational competence for children who received bilingual education might be partially explained by these children's lower levels of acculturative and discrimination stress. To further investigate these results, the present study tested a mediation model as shown in Figure 10.

Table 20: Summary of Pearson correlation of the variables

	1	2	3	4	5	6	7	8	9	<b>10</b>	11	12	13	14	15	16
1. GS	1															
2. AC-DIS	<b>.32</b>	1														
3. MI	-.01	.05	1													
4. AI	.06	.06	<b>-.26</b>	1												
5. TAM-MC	.06	-.10	<b>.24</b>	<b>-.29</b>	1											
6. TAM-AC	.08	-.05	<b>-.23</b>	<b>.31</b>	<b>-.14</b>	1										
7. Integration	.09	.08	<b>.27</b>	<b>.53</b>	<b>-.13</b>	<b>.28</b>	1									
8. Assimilation	-.04	.00	<b>-.79</b>	<b>.16</b>	<b>-.39</b>	<b>.12</b>	<b>-.47</b>	1								
9. Policy	.08	<b>.23</b>	<b>-.27</b>	<b>.45</b>	<b>-.30</b>	<b>.27</b>	<b>.23</b>	<b>.24</b>	1							
<b>10. Edu-Comp</b>	<b>-.16</b>	<b>-.17</b>	<b>.17</b>	-.10	<b>.24</b>	-.01	-.10	<b>-.16</b>	<b>-.34</b>	1						
11. Gender	<b>.20</b>	-.04	.08	-.04	<b>.26</b>	.04	.02	-.11	-.02	-.06	1					
12. Time in US	<b>-.14</b>	<b>-.28</b>	<b>-.31</b>	<b>.19</b>	<b>-.17</b>	.13	-.03	<b>.26</b>	-.03	.01	.07	1				
13. Marital Status	-.04	-.13	.07	.11	.03	.07	<b>.18</b>	<b>-.14</b>	.01	.04	<b>.19</b>	.09	1			
14. Birth Place	.01	.13	.06	-.07	.10	-.02	.05	-.06	.01	-.02	-.08	<b>-.24</b>	-.03	1		
15. Language	.04	-.02	<b>.33</b>	<b>-.25</b>	<b>.16</b>	-.13	.10	<b>-.30</b>	<b>-.38</b>	.12	.03	<b>-.30</b>	<b>.14</b>	<b>.14</b>	1	
16. P-Education	.01	.01	-.04	.12	-.05	.08	.01	.03	.11	.02	.08	.10	.08	-.05	<b>-.16</b>	1
17. Missing	-.06	<b>-.26</b>	.10	<b>-.13</b>	<b>.23</b>	<b>-.13</b>	-.03	<b>-.16</b>	<b>-.36</b>	.11	.05	-.01	.05	.11	<b>.26</b>	-.09

Note. Bold numbers indicate statistical significance at the 0.05 level.

GS: General social stress

AC-DIS: Acculturative/discrimination stress

MI: Mexican identity

AI: American identity

TAM-MC: Mexican cultural score by TAM

TAM-AC: American cultural score by TAM

Integration: Dummy for Separation (0) versus Integration (1)

Assimilation: Dummy for Separation (0) versus Assimilation (1)

Edu-Comp (Dependent Variable): Perceived educational competence

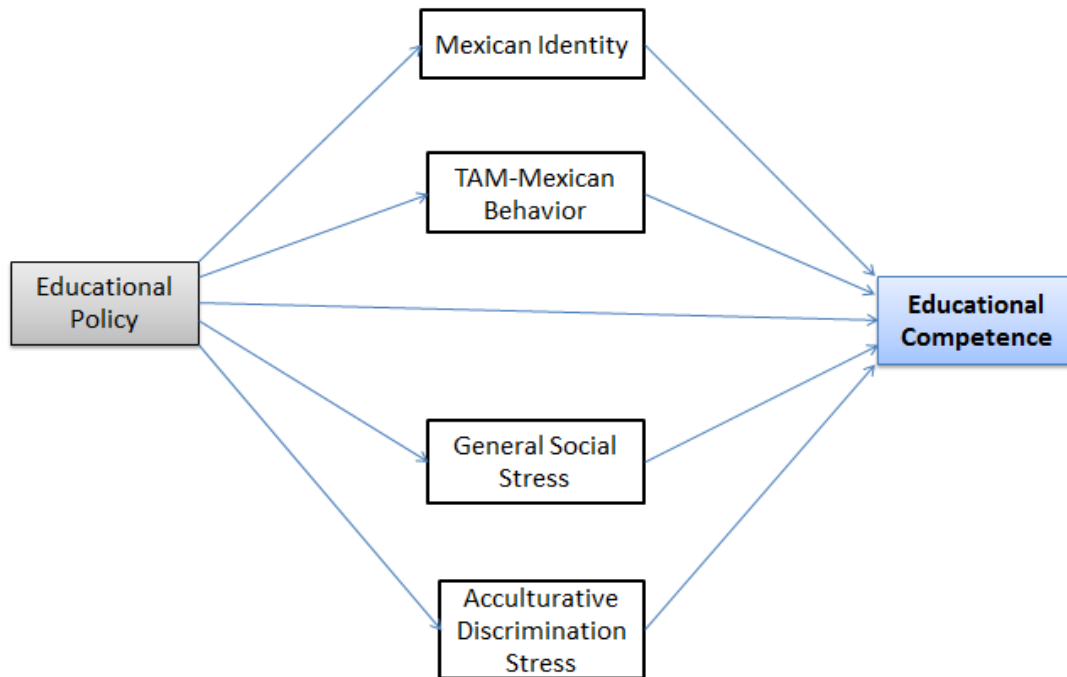
P-Education: Parental educational level

Table 21: Effect of education policy on educational competence, controlling for other variables

Model = EP + variable added	Education policy (EP)'s $B$ , $SE$ , $\beta$ , $t$ , $p$ when adding other variables				
	EP's $B$	$SE$	$\beta$	$t$	$p$
1 = EP	-.61	.10	-.33	-6.14	.000
2 = EP + MI	-.57	.10	-.31	-5.48	.000
3 = EP + AC-DIS	-.59	.10	-.32	-5.69	.000
4 = EP + GS	-.60	.10	-.32	-5.94	.000
5 = EP + TAM-MC	-.53	.10	-.29	-5.13	.000



Figure 10: Proposed mediation model

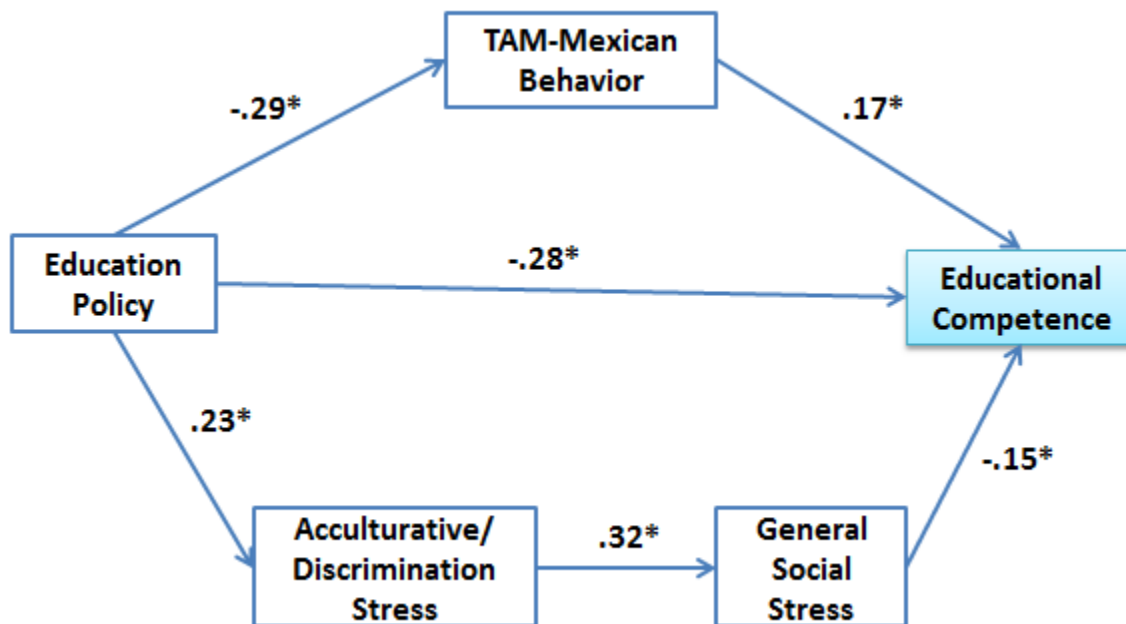


Structural equation modeling was performed by using EQS 6.1. The covariance matrices were used as input and solutions were generated through Maximum-Likelihood Estimation (MLE). The MLE Chi-square, the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA) were selected to investigate a model fit. A model whose CFI is greater than .95 and whose RMSEA is less than .06 is considered to have a good model fit .

There was a significant difference between the observed and model covariance matrices ( $\chi^2(6, N=289) = 47.14$  and  $p < .001$ ), and the fit indices for the proposed model indicated a poor fit,  $CFI=.72$  and  $RMSEA=.15$ . There were no significant predictions of educational competence by Mexican identity ( $B=.05$ ,  $z=1.30$ ,  $p > .05$ ) and acculturative/discrimination stress ( $B=-.06$ ,  $z=-1.11$ ,  $p > .05$ ). The Lagrange Multiplier Test (LM test) and the Wald test suggested that the largest reduction in chi-square would be created by omitting the path from Mexican identity to

educational competence and by omitting the path from acculturative/discrimination stress to educational competence. In addition, the path from education policy to general social stress was omitted, and a path from acculturative/discrimination stress to general social stress was added to the model. Revision of the model in accordance with the results suggested by the LM test and the Wald test led to the following model as shown in Figure 11.

Figure 11: Structural model of relationships between education policy, TAM-Mexican behavior, acculturative/discrimination stress, general social stress, and educational competence



Note. All paths were significant (\*  $p < .01$ ). Coefficients are standardized estimates.

The final model fit the data very well,  $\chi^2(4, N=289) = 3.39, p = .41, CFI = 1, SRMR = .02$ , and  $RMSEA = 0$ . Perceived educational competence was explained by education policy, general social stress, and TAM-Mexican behavior with 17% of the variance ( $R^2 = .17$ ). Arizona children

who received English Immersion showed lower perceived educational competence than Texas children who received bilingual education,  $\beta = -.28$ ,  $z = -5.02$ ,  $p < .01$ . Increased general social stress was related low levels of perceived educational competence,  $\beta = -.15$ ,  $z = -2.81$ ,  $p < .01$ . Children who preferred Mexican food and music (TAM-Mexican behavior) showed higher levels of perceived educational competence than children who preferred American food and music,  $\beta = .17$ ,  $z = 2.96$ ,  $p < .01$ . Arizona children who received English Immersion were less likely to Mexican food and music than Texas children who received bilingual education,  $\beta = -.29$ ,  $z = -5.23$ ,  $p < .01$ . Increased acculturative/discrimination stress was associated with increased general social stress,  $\beta = .32$ ,  $z = 5.71$ ,  $p < .01$ . Arizona children who received English Immersion were more likely to experience higher levels of acculturative/discrimination stress than Texas children who received bilingual education,  $\beta = .23$ ,  $z = 3.98$ ,  $p < .01$ .

To test whether TAM-MC carries the influence of education policy to perceived educational competence, Sobel's mediation test was employed. The Sobel test found a significant partial mediation in the model ( $z = -2.60$ ,  $p = .009$ ). That is, TAM-Mexican cultural behavior partially mediates the relationship between education policy and perceived educational competence.

To examine whether there would be indirect effects from education policy to perceived educational competence through acculturative/discrimination stress and general social stress, a bootstrapping approach for multiple mediator analysis recommended by Shrout and Bolger (2002). The indirect effects were tested using an EQS simulation option and SPSS macro with 1000 bootstrapping samples drawn. Ninety-five percent confidence intervals were used to evaluate the significance of the indirect effects. The results indicate that the indirect effects was significant (95% *CI* [-.04, -.01] ), suggesting that acculturative/discrimination stress and general

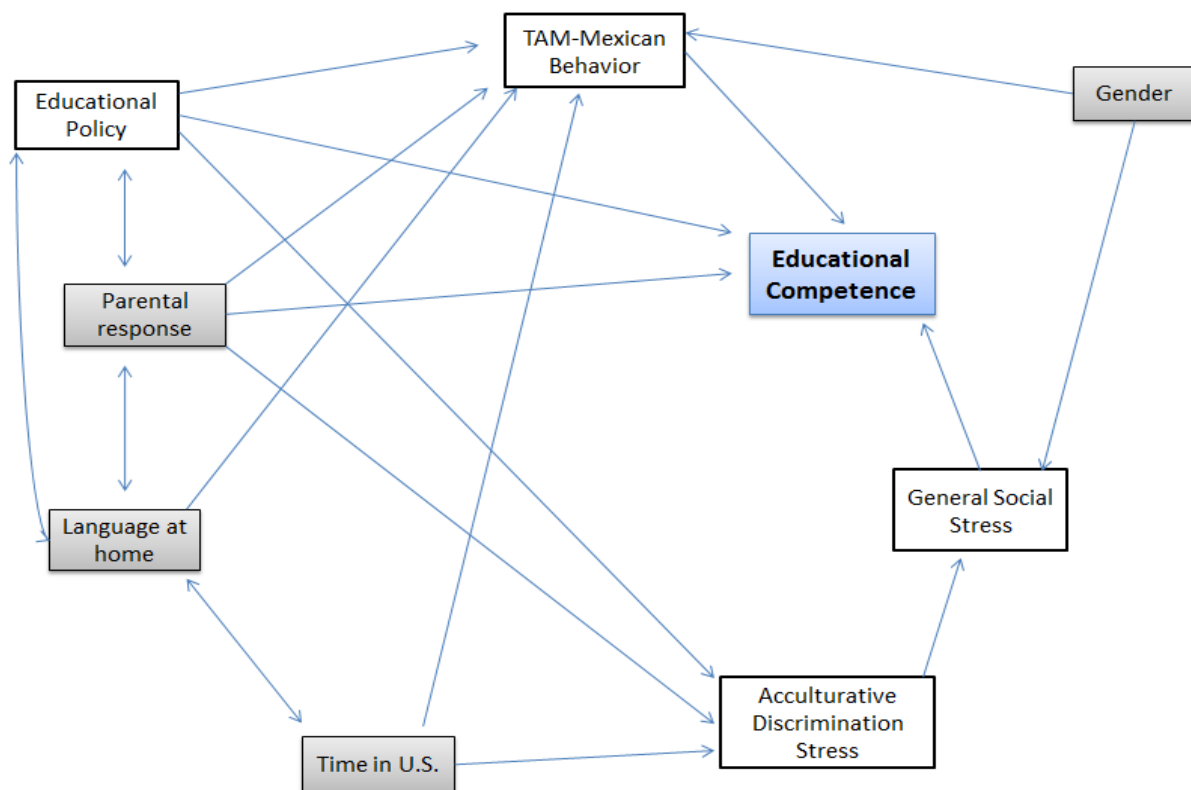
social stress intervene in the path between education policy and educational competence. In other words, education policy significantly influences children's stress levels, and their stress levels affect their educational competence. This significant intervening path (education policy → acculturative/discrimination → general social stress → perceived educational competence) suggests that English Immersion increases acculturative/discrimination and general social stress, which leads to low educational competence among Mexican-American children.

#### Testing the final model controlling for demographics

Based on the previous results, the demographic variables were added into the final path model. Although the demographics were not associated with children's educational competence, there were significant correlations among missing response, gender, language use at home, parental time in the U.S., and acculturation variables. Based on the empirical findings from the correlation results in this study, the paths from the demographics to TAM-Mexican behavior, education policy, stress variables, and educational competence were added into the final model. Parental missing response was linked to TAM-Mexican behavior, education policy, and acculturative/discrimination stress. Although parental response was not significantly related to educational competence in the correlation results, the path from parental response to educational competence was added to the model to control for the potential impact of the systematic missing pattern on educational competence. Based on the correlation results, the path from a child's language use to TAM-Mexican behavior (language use → TAM-MC) was added, and education policy and language use were allowed to covary (education policy ↔ language use). The paths from gender to TAM-Mexican behavior (gender → TAM-MC) and to general social stress (gender → general social stress) were added to the model. The path from parental time spent in

the U.S. to TAM-Mexican behavior (parental time → TAM-Mexican behavior) and to acculturative/discrimination stress (parental time → acculturative/discrimination stress) were added to the model. Although parental time spent in the U.S. was correlated with general social stress in the correlation results, this path (parental time spent in the U.S. → general social stress) was not added to the model because parental time spent in the U.S. was posited to be related to acculturative stress. Therefore, the path model with demographics (Figure 12) consisted of five exogenous variables (education policy, parental response, language use, parental time in the U.S., and gender) and one endogenous variable (educational competence), with TAM-Mexican behavior, acculturative/ discrimination stress, and general social stress as mediating constructs.

Figure 12: Final model with demographic variables



The model with the demographics also fit the data very well,  $\chi^2(19, N=182) = 13.94$ ,  $p = .78$ ,  $CFI = 1$ ,  $SRMR = .03$ , and  $RMSEA = 0$ . Arizona children who received English Immersion reported lower levels of perceived educational competence than Texas children who received bilingual education,  $\beta = -.31$ ,  $z = -4.19$ ,  $p < .01$ . Children who experienced low levels of general social stress showed higher perceived educational competence than children experiencing high levels of general social stress,  $\beta = -.17$ ,  $z = -2.50$ ,  $p < .01$ . Higher levels of TAM-Mexican behavior was marginally significantly related to greater levels of perceived educational competence,  $\beta = .13$ ,  $z = 1.88$ ,  $p = .06$ .

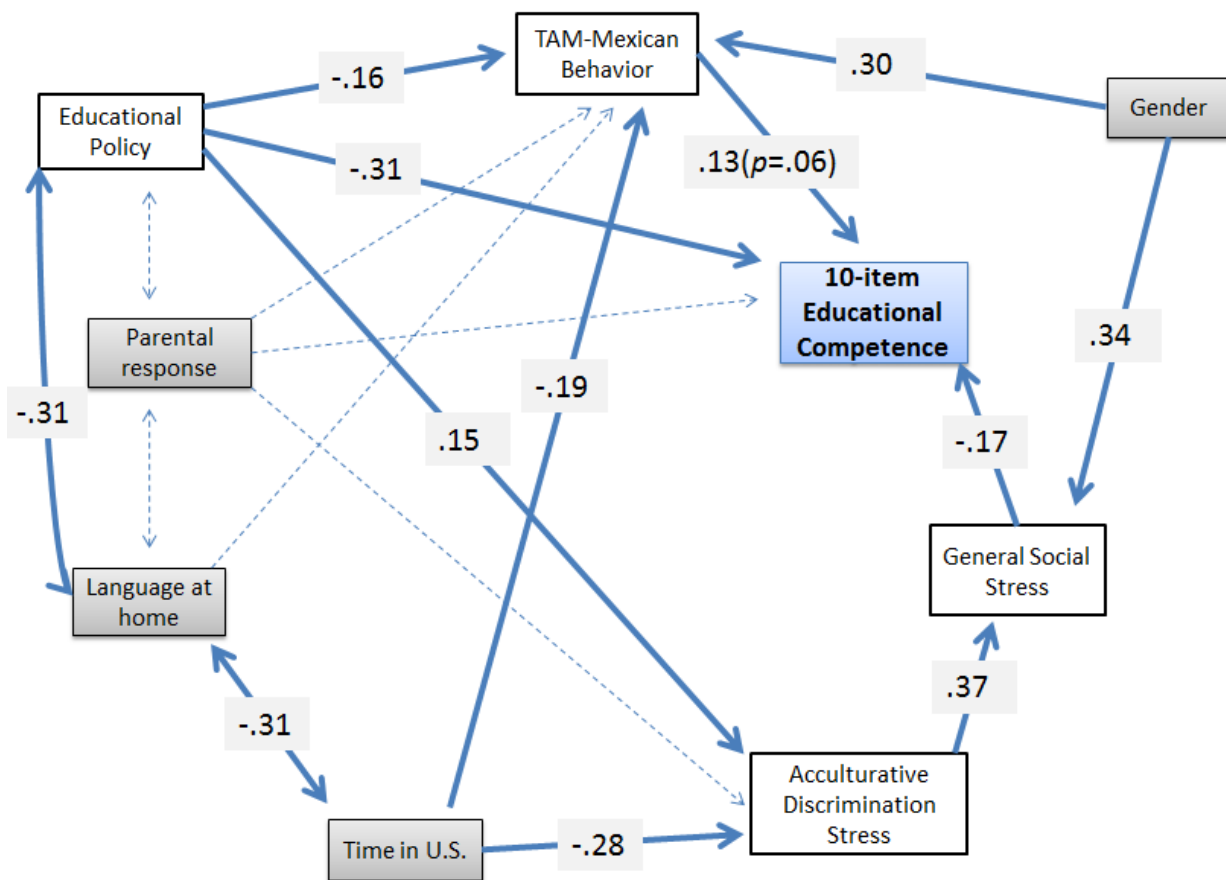
TAM-Mexican behavior was explained by education policy, parental response, language-use, gender, and parental time spent in the U.S. with 15% of the variance ( $R^2=.15$ ). Arizona English Immersion lowered TAM-Mexican behavior,  $\beta = -.16$ ,  $z = -2.22$ ,  $p < .01$ . Female children were more likely to develop high levels of TAM-Mexican behavior than male children,  $\beta = .30$ ,  $z = 4.45$ ,  $p < .01$ . Children whose parents lived longer in the U.S. showed lower levels of TAM-Mexican behavior than children whose parents were recent immigrants,  $\beta = -.19$ ,  $z = -2.65$ ,  $p < .01$ .

General social stress was explained by acculturative/discrimination stress and gender with 25% of the variance ( $R^2=.25$ ). Acculturative/discrimination stress was positively related to general social stress by,  $\beta = .37$ ,  $z = 5.74$ ,  $p < .01$ . Female children were more likely to experience higher levels of general social stress than male children,  $\beta = .34$ ,  $z = 5.25$ ,  $p < .01$ .

Acculturative/discrimination stress was explained by education policy, parental response, and parental time spent in the U.S. with 10% of the variance ( $R^2=.10$ ). Arizona children who received English Immersion education experienced higher levels of acculturative/discrimination stress than Texas children who received bilingual education,  $\beta = .15$ ,

$z = 2.14, p < .01$ . Children whose parents lived longer in the U.S. reported lower levels of acculturative/discrimination stress than children whose parents were recent immigrants,  $\beta = -.28$ ,  $z = -3.40, p < .01$ .

Figure 13: Structural model of relationships between demographics, education policy, TAM-Mexican behavior, acculturative/discrimination stress, general social stress, and educational competence



Note: Dotted lines represent the insignificant paths. The solid lines are significant ( $p < .05$ ). Coefficients are standardized estimates. Coefficients for insignificant paths are not presented.

To test whether TAM-MC carries the influence of education policy to perceived educational competence, Sobel's mediation test was employed. This partial mediation was not significant ( $z = -1.66, p = .096$ ), suggesting that TAM-MC does not mediate the prediction of perceived educational competence by education policy when controlling for gender and parental time in the U.S.

To examine whether there would be indirect effects from parental time in the U.S. to perceived educational competence through acculturative/discrimination stress and general social stress (parental time in the U.S.  $\rightarrow$  acculturative/discrimination  $\rightarrow$  general social stress  $\rightarrow$  perceived educational competence), the 1000 bootstrapping method was used. Ninety-five percent confidence intervals were used to evaluate the significance of the indirect effects. The results indicate that the intervening effect from parental time in the U.S. to perceived educational competence was significant (95% *CI* [.001, .003] ). This finding suggests that children whose parents lived longer in the U.S. are less likely to experience acculturative/discrimination, which is related to lower levels of general social stress, which in turn leads to greater educational competence in Mexican-American children.

The indirect effects of education policy on perceived educational competence through acculturative/discrimination stress and general social stress (education policy  $\rightarrow$  acculturative/discrimination  $\rightarrow$  general social stress  $\rightarrow$  perceived educational competence) were also tested by the bootstrapping method. The intervening path was not statistically significant (95% *CI* [-.045, .001] ).



## CHAPTER 7: DISCUSSION

The purpose of this dissertation was to investigate the impact of education policy, acculturation, and general and acculturative stress on educational competence among Mexican-American children. Findings from the multiple regressions reveal the significance of education policy, Mexican cultural behavior, general social stress, and acculturative and discrimination stress to children's educational competence. Results from the path analyses suggest that the relationship between education policy and educational competence is partially mediated by Mexican cultural behavior. The research findings, implications, and conclusions drawn from this study are discussed in this chapter.

### *Scale Validation*

The stages of data screening and scale validation encountered unexpected findings that necessitate further evaluation of the self-report scales. The structure of the 10-item global educational competence scale by factor analysis consisted of three factors (i.e., cognitive, reading and math competencies), suggesting that the three subscales were clearly interpretable and relevant to the scale's underlying construct. The reliability and validity for the global educational competence scale were satisfactory.

The dimensionality of the 12-item Brief ARSMA–II scale was partially confirmed. The number of items on the Brief ARSMA–II scale was reduced based on two cultural constructs: Mexican identity (4 items) and American identity (4 items), indicating that revisiting the Brief ARSMA–II scale supports the bidimensional acculturation theory. The construct validity for the overall scale was ascertained, and the reliability for each subscale was adequate.

The structure of the 36-item SAFE-C scale failed to identify underlying constructs that explained sufficient variance in general social stress, acculturative stress, and perceived

discrimination. Exploratory factor analyses revealed that 20 items were loaded on irrelevant factors or indicated ambiguous wording with low factor loadings. After excluding these 20 items, this study substantiates the two sub-dimensions of the SAFE-C scale with 16 items: general social stress and acculturative/discrimination stress. Because the acculturative items did not differ from the discrimination items, the acculturative stress construct and the perceived discrimination construct were merged into one construct. These findings lend further support to previous research findings in terms of the relationship between perceived discrimination and acculturative stress (Finch et al., 2000; Gomez et al., 2011; Kulis et al., 2009). In summary, the dimensionality of the SAFE-C scale was only partially confirmed. The reliability for the two subscales was acceptable. Further scale development and validation are needed to improve the wording of the scale items and confirm the sub-dimensions of the scale.

#### *Children's Acculturation Status and Parental Non-Response*

The study found that children whose parents did not (or were not able to) respond to the survey held a stronger American identity compared to children whose parents responded. In addition, parents whose children spoke Spanish at home were more likely to respond to the survey compared to parents whose children spoke English at home. These findings support the notion that children's language-use and acculturation patterns may be the key determinants of parent-child communication and parental involvement in school activities (August & Hakuta, 1997; Cummins, 2000). Considering that 90% of the parents in this study were foreign-born immigrants, it is expected that these parents would be Spanish-speaking and culturally Mexican. If the shared cultural and linguistic patterns between these immigrant parents and their children positively affect the quality of parent-child interaction, culturally-Mexican children may have been able to further engage their parents in the survey than Americanized children who spoke

English at home. If this was indeed the case, the systematic pattern of missing data on language-use and acculturation between parents and children is not surprising.

Findings on the missing data suggest that the kind of education children receive may be associated with children's language-use, identity, and acculturation, which in turn may have influenced the different parental response rates between the Texas (bilingual education) and Arizona (English Immersion) groups. Results of the correlation analysis suggest that Texas children who received bilingual education exhibited a stronger Mexican identity and culturally-Mexican orientation than Arizona children who received English Immersion. In contrast, Arizona children exhibited a stronger American identity and Americanized orientation than Texas children. Perhaps this is because bilingual education encourages Texas children to maintain their cultural heritage, while English Immersion education positions Arizona children to develop an American identity and to interact more with mainstream American culture. As such, Texas children may have benefited from their strong "Mexicanness," which would match their parents' acculturation patterns. Children's language-use and acculturation seem to be influenced by education policy, and Texas children's Spanish language use and Mexican-cultural patterns appear to facilitate the collaborative parent-child process of survey completion.

#### *Variability in Acculturative/Discrimination Stress by Education Policy*

The findings suggest that Texas children who received bilingual education showed a lower level of acculturative/discrimination stress than Arizona children who received English Immersion. The study's findings support the notion that English Immersion creates a hostile classroom climate, wherein ethnic minority children perceive an overwhelming pressure to assimilate into mainstream culture (Murphy, 1977; Vega et al., 1987). The previous findings for Texas children's stronger Mexican orientation may explain these children's low

acculturative/discrimination stress in relation to predominantly Latino school contexts. Acculturative/discrimination stress occurs when immigrants perceive a given cultural adaptation and discriminatory experience as a threatening situation and believe that they are not able to cope with that threat. In this study, both Texas and Arizona children attended segregated schools and lived with Mexican-oriented immigrant parents (92% of the children spoke Spanish at home). Within the home environment and segregated school contexts, it appears that bilingual education helped these Mexican-oriented children to share positive interactions with their parents at home, and develop cooperation, leadership, assertiveness, and friendships with their Mexican-oriented peers at school, thus averting identity crises and acculturative stress. In contrast, some Arizona children in English Immersion schools might have felt their acculturation to be more stressful because of the culturally dissonant contexts: their assimilationist-school context versus segregated surroundings with Mexican-oriented parents and peers. Considering that English Immersion education cultivates Americanness and mainly focuses on a rapid assimilation through English-only instruction, regardless of children's developmental differences (e.g., ages, language-skills, and home environment), Arizona children are more likely to develop a greater sense of American cultural competency. However, they are less likely to benefit from emotional support from either their parents or Mexican-oriented peers, which may generate psychological turmoil that necessitates their intense resilience and effective coping skills to negotiate their culturally-incongruent environments. Thus, these children's higher acculturative stress may reflect their risks for identity confusion derived from their role conflicts within their dissonant surroundings (Erikson, 1968; Sirin & Ryce, 2009).

### *Comparison of Unidimensional and Bidimensional Theories*

This dissertation investigated the existence of bidimensional acculturation patterns among Mexican-American children in a methodologically appropriate way. Then, the bidimensional results were compared to the unidimensional results and the four-score results, to determine which of the acculturation approaches would be more applicable to explain the relationship between acculturation and perceived educational competence. Three meaningful acculturation patterns were freely identified through the clustering process, providing empirical evidence of bidimensional acculturation theory. Similar to Berry's typology, the three acculturation clusters were termed "separated," "assimilated," and "integrated" patterns. A "marginalized" pattern (i.e., the lowest degrees of both Mexican and American cultural involvement) did not emerge from the sample of this study.

The three acculturation clusters were meaningful and differentiated in terms of the degrees of cultural involvement, such as language-use, media exposure, and food/music choices. Separated children reported the greatest degree of Mexican-cultural patterns, while showing the lowest degree of American-cultural patterns. Findings also indicated that Texas children were more likely to develop the separated pattern than Arizona children, suggesting that education policy is associated with children's acculturation patterns. Assimilated children exhibited the lowest degree of Mexican-cultural patterns among the three groups. The last cluster, integrated children, showed high degrees of both Mexican and American orientation. However, it is surprising to find that these integrated children are bilingual but do not prefer Mexican food and music. Given that more Arizonian children were classified as integrated, perhaps integrated children may have been exposed to American food and music at school while they interacted with their parents and peers in both English and Spanish. Integrated children's weak preference

for Mexican food and music may be attributed to the English Immersion school climate. This finding does not resonate with the concept of Berry's integration pattern: that integrated individuals have high levels of both ethnic and mainstream cultural domains.

With respect to educational variability, the bidimensional cluster results suggest that, when other factors are *not* controlled, separated children perceived higher educational competence than assimilated children. However, when other factors were controlled, the difference in educational competence between the two acculturation patterns became marginally significant; only education policy and general social stress significantly predicted educational competence, suggesting that the mediating role of general social stress decreases the effects of acculturation patterns.

A similar pattern was found in the results of the unidimensional approach. When education policy and general social stress were controlled, none of the unidimensional acculturation patterns (assimilation levels) significantly predicted perceived educational competence. In comparison to the unidimensional and bidimensional cluster results, the four-score strategy showed a similar pattern; yet it proved a better level of prediction of educational competence based on acculturation factors with a greater proportion of variance explained. In the four-score results, Mexican food/music preference significantly predicted children's perceived educational competence even after adjusting for education policy and general social stress. These findings suggest that the four-score strategy appears to be the most desirable method for reflecting acculturation effects, while the unidimensional strategy is shown to be the least desirable. Since the four-score strategy can be regarded as a bidimensional approach, the present study concludes that researchers may benefit more from a bidimensional approach than a unidimensional approach in capturing acculturation effects on outcome variables.

Based on the four-score strategy, the study speculated about the possible mediating roles of acculturation factors in the relationship between education policy and perceived educational competence. In an attempt to understand the relationships among the variables, the path analysis was further tested focusing on the possible indirect effects of education policy, acculturation factors, and demographics on perceived educational competence.

#### *Variability in Educational Competence by Education Policy, Stress, and Acculturation Patterns*

This study found that education policy exerted the most pervasive effects, influencing children's perceived educational competence, as well as their acculturation patterns and stress levels. When it comes to the direct association between education policy and perceived educational competence, bilingual education in Texas was associated with higher levels of perceived educational competence than English Immersion education in Arizona. This relationship supports previous work and further highlights the importance of education policy for immigrant students (August & Hakuta, 1997; Buriel et al., 1998; Curiel et al., 1986; Danoff et al., 1977; Dunn, 1988; Greene, 1998; Koyama & Bartlett, 2011; Linn, 1965; Matute-Bianchi, 1986; Ramirez et al., 2009; Rolstad et al., 2005; Rosenthal et al., 1983; Thomas & Collier, 1998; White & Kaufman, 1997). Importantly, even after controlling for demographic variables, education policy still directly affected acculturative/discrimination stress. Furthermore, increased acculturative/discrimination stress was related to increased general social stress, which negatively affected perceived educational competence among Mexican-American children. Highly stressed children's lower educational competence is not surprising given that Latino students often cite psychological distress as being detrimental to their educational outcomes (Alva & de Los Reyes, 1999; Bhugra, 2005; Carvajal et al., 2002; Huynh & Fuligni, 2008; Organista et al., 2003; Ramos, 2005; Zajacova et al., 2005).

One interesting finding from the present study is that acculturative/discrimination stress was significantly predicted by education policy and only indirectly affected perceived educational competence through general social stress, especially when demographics were not adjusted. These findings suggest that it is not acculturative stress or discriminatory experiences per se that causes educational underachievement, but rather it is children's general social stress—which is differentially influenced by acculturative/discrimination stress within the different school contexts—that causes this educational underachievement. This intervening effect through stress disappeared when demographics were controlled. The insignificant intervening effect may be caused by the smaller sample size (due to missing demographic responses) which led to an insufficient statistical power. Given that none of the demographic variables were directly associated with children's perceived educational competence, further research is needed to build more substantial evidence with a larger sample size.

One major finding from this study is that children's Mexican food/music preference mediated the relationship between education policy and perceived educational competence, especially when demographics were not adjusted. That is, bilingual education promotes children to maintain culturally-Mexican oriented patterns, and these Mexican-oriented children are more likely to show higher educational competence than are Americanized children. Although this mediating effect became insignificant after adjusting for demographics, the result of this change may be due to the smaller sample size with missing responses as mentioned previously. The insignificant mediating effect after controlling for demographics can be explained: for example, if all children have the same parental background and same pattern of language use, the indirect effect of English Immersion or bilingual education—which form children's acculturation



patterns—on educational competence does not exist. However, again, further research is needed to build more substantial evidence on this mediating effect with a large sample size.

It is important to point out that the present study found the indirect effect of parental residence time in the U.S. on children's educational competence. The significant intervening effect of acculturative/discrimination stress and general social stress on the path between parental residence time and educational competence suggests that the effect of stress on educational competence will decrease as parents spend more time in the United States. Because this study did not measure children's U.S. residence time, it is hard to draw a conclusion from the findings. However, these findings provide further insight concerning children's familial backgrounds: recent immigrant children or children of recent immigrant parents are more vulnerable to perceptions of discrimination, acculturative stress, and general social stress, which put the children at increased risk for educational underachievement. This interpretation is concordant with the previous discussion on the systematic patterns of parental responses in that parental acculturation seems to be one of the important factors for children's educational competence.

The children's background in this study—they are from immigrant families in severely segregated school districts where approximately 90% of the student population is comprised of Latino youth—signals their acculturative predisposition to their ethnic cultural orientation. The direct effect of education policy on acculturation patterns can be explained by their parents, the segregated schools, and communities the children reside in. It appears that bilingual education encourages these segregated children to maintain their cultural heritage, and bilingualism (or biculturalism) makes these children feel more comfortable participating in school activities and interacting with their peers at school and with their parents at home. In contrast, English Immersion education discourages maintaining children's cultural heritage, and such a school

climate makes it harder for children to adjust to their surroundings. Given the segregated context in which the children reside, culturally Mexican-oriented children may have particular ease fitting in and being accepted and affirmed by surrounding peer groups, whereas Americanized children may face more difficulties adjusting in the same context. In this context, bilingual education may be more advantageous to segregated Mexican-American children because it provides more developmental opportunities for parents and peers who can support children's educational progress. More research is needed to further confirm and explain acculturation's mediating roles in the relationship between education policy and educational outcomes.

### *Study Limitations*

The limitations of the present study should be noted for directions in future research. First, the present study findings should be interpreted cautiously because the present study's subjects included only children of Mexican descent within severely segregated Latino communities. Segregated minority schools are often schools of concentrated disadvantage, and this situational factor limits generalizability of the findings.

Second, the restrictions of a cross-sectional design using a small sample size necessitate subsequent longitudinal research using a larger sample. Cross-sectional research designs do not explain the long-term trajectory of child development, causal links, and possible nonlinear relationships among entangling environmental contexts, acculturation patterns, and outcome variables. In our study sample, the children were at an early developmental stage where they would have been exploring or seeking meaningful social/cultural roles and values. Given the children's age in this study, their identity or acculturation patterns are likely to change as they transition into adolescence. In addition to the possible variation over time, the cross-sectional design does not provide a strong basis for making causal inferences. One would claim that

reverse causation is possible, i.e., low educational competence may cause their general social stress and acculturative stress. Hence, it is necessary to explore the reverse causation between educational achievement and stress measures, and to track a potential change in the relationships between acculturation, identity status, and educational achievement.

Third, the study results should be interpreted within the bounds of the study's self-report data from elementary school children. The study relied on a self-report scale to measure children's educational achievement, which might not reflect the children's actual educational achievement. In addition, the degree to which children might be influenced by social desirability or acquiescent propensity may have affected the accuracy of their reports. The possibility of reporting bias points to the caution needed in interpreting the "integrated" children, who answered "strongly yes" in both cultural subscales, because these children may have tended to agree with the statements in the questionnaire items. With respect to the education policy measure, the state and community where the children reside may be contributing factors to variation in the educational outcome, rather than education policy per se. Arizona children may have been exposed to a more discriminatory and anti-immigrant atmosphere than Texas children, which may increase acculturative stress and therefore decrease educational motivation regardless of education policy.

Fourth, it is important to note that the study results would be influenced by the disproportionate number of the Mexican-oriented children who speak Spanish at home and whose parents were more likely to respond to the survey. Although parental non-response was unrelated to children's educational competence, it is not possible to know if the study findings relate to limitations of the data or to the true absence of relationships. Considering that parents who agreed voluntarily to participate in the survey might be more likely to be involved in their

children's school activities than parents who did not complete the survey, the lack of information about the relationship between parental involvement and educational competence in the study data is a critical problem.

### *Implications of Research Findings*

These limitations notwithstanding, the snapshot into the children's development provided by this study revealed several significant relationships that have implications for acculturation, psychological well-being, educational practice, and educational achievement, particularly in relationship to segregated young Latino children. With respect to acculturation theory, the research findings from the bidimensional acculturation approach demonstrate the presence of diverse acculturation patterns as theorized by Berry's bidimensional acculturation framework. By utilizing Berry's bidimensional model, the present study did not simply link Latino children's assimilation levels to their perceived educational competence. Instead, the clustering procedure without *a priori* hypothesis allowed the study to uncover the three emergent acculturation patterns, and then the study investigated the relationship between acculturation patterns and educational competence. At the same time, the comparison of the unidimensional and bidimensional acculturation approaches provides an advantageous alternative for this area of research. In a bidimensional acculturation approach, a separate-score approach using two independent cultural scores has more advantages than other acculturation approaches.

The study's findings related to the path analysis demonstrate that there are links among education policy, acculturation pattern, acculturative/discrimination stress, general social stress, and educational competence. The findings suggest that policy makers, teachers, and school social workers need to make concerted efforts to build an environmentally and developmentally appropriate education in Latino immigrant children's schooling. For the segregated young

children in this study, bilingual education—which encourages them to preserve their cultural heritage—was not an impediment to their educational achievement. Instead, bilingual education appeared to be a valuable means of promoting Latino children’s psychological and educational well-being since they would likely benefit from parents and peers sharing a congruent path of acculturation. Positioning young children as English-only Americans poses challenges for immigrant parents residing in a low-income segregated community because it may lead to these parents becoming disengaged and disinterested in their children’s education. Parents may feel estranged from their children and experience communication difficulties, while children may suffer from a lack of communication, affection, and support from their parents.

Children in English Immersion schools are more likely to experience emotional and social adjustment problems due to the acculturation gap among their peer groups. Within the English Immersion context, a majority of their peers becomes Americanized rapidly, while some immigrant children may experience a relatively slow path of assimilation. These children’s belated Americanization can lead to alienation from peers, and they will have fewer opportunities to develop a positive relationship with their peers. Furthermore, the dissonant acculturation experience and peer conflicts can negatively affect children’s identity and psychosocial development (Massey& Sánchez, 2010). Given the research findings and discussions, the present study provides modest support for the positive influences of bilingual and bicultural education on the educational and psychosocial well-being of segregated Latino children.

Social workers in school and community-based programs should understand the mechanisms of school contexts and acculturation in the educational trajectory of immigrant children and youth. The effects of education policy and culturally-sensitive curricula should be

embedded in the delivery of social work intervention. This study found bilingual/bicultural education not only helpful to children's educational competence but also conducive to their psychosocial well-being. Social workers can provide valuable support for bilingual and bicultural programs, in terms of provisions of various school activities, community-based services, and the encouragement of school teachers and administrators to continue development in culturally-sensitive curricula and policy.

### *Conclusion*

As Latino children and adolescents comprise the fastest growing group of students in kindergarten through 12<sup>th</sup> grade, their persistent educational underachievement has emerged as a public concern. Therefore, it is imperative that researchers continue to investigate the experiences and progress of Latino children and adolescents within and across developmental and environmental contexts. The results of this study expand on what we already know about Latino youth in general, and segregated Mexican-American children in particular. The salience of education policy and acculturation patterns has informed theoretical and practical recommendations for reducing the achievement gap in Latino students.

This study is unique in its extensive screening of missing data and for having a rigorous multi-step process for scale validation. This study is also unique in its attempt to investigate and discuss key conceptual and methodological considerations in existing acculturation theoretical frameworks. To my knowledge, this is the first study to compare the unidimensional and bidimensional acculturation approaches in Mexican-American children.

This study provides evidence that the way Mexican-American children interact with their surroundings is the key element in understanding acculturation's effect on educational

achievement. Given that environmental factors incorporate children's acculturation, psychosocial development, and educational competence, researchers should take into account the environmental contexts in which children acculturate. The findings indicated that education policy was associated with children's acculturation pattern and psychological well-being, which in turn influenced their educational competence. The Mexican-American children who received bilingual education and who maintained Mexican-cultural traits fared well educationally and psychologically because they could develop consonant acculturation patterns that were congruent with their surroundings. Within bilingual and bicultural school climates, children were better able to achieve and perceive academic competence compared to the children in English Immersion schools. These findings suggest that bilingual education appears to create a positive educational trajectory for segregated Mexican-American children because the bilingual education pedagogy matches the children's home and school environments. To summarize, this study provides tentative evidence that compatibility between education policy and environmental contexts enables segregated Mexican-American children to achieve high levels of educational achievement.

The research findings show how education policy decisions directly and indirectly affect children's development and educational achievement and how social workers can advocate for the needs of Mexican-American children. The present study is possibly significant given the lack of acculturation research on Latino youth education for grades 3-5. Although this study has focused on the acculturation experiences and educational achievement of Mexican-American children, the lesson learned from this study is that all immigrant minority children need supportive environments at both micro- and macro-levels to promote their psychological and educational well-being.





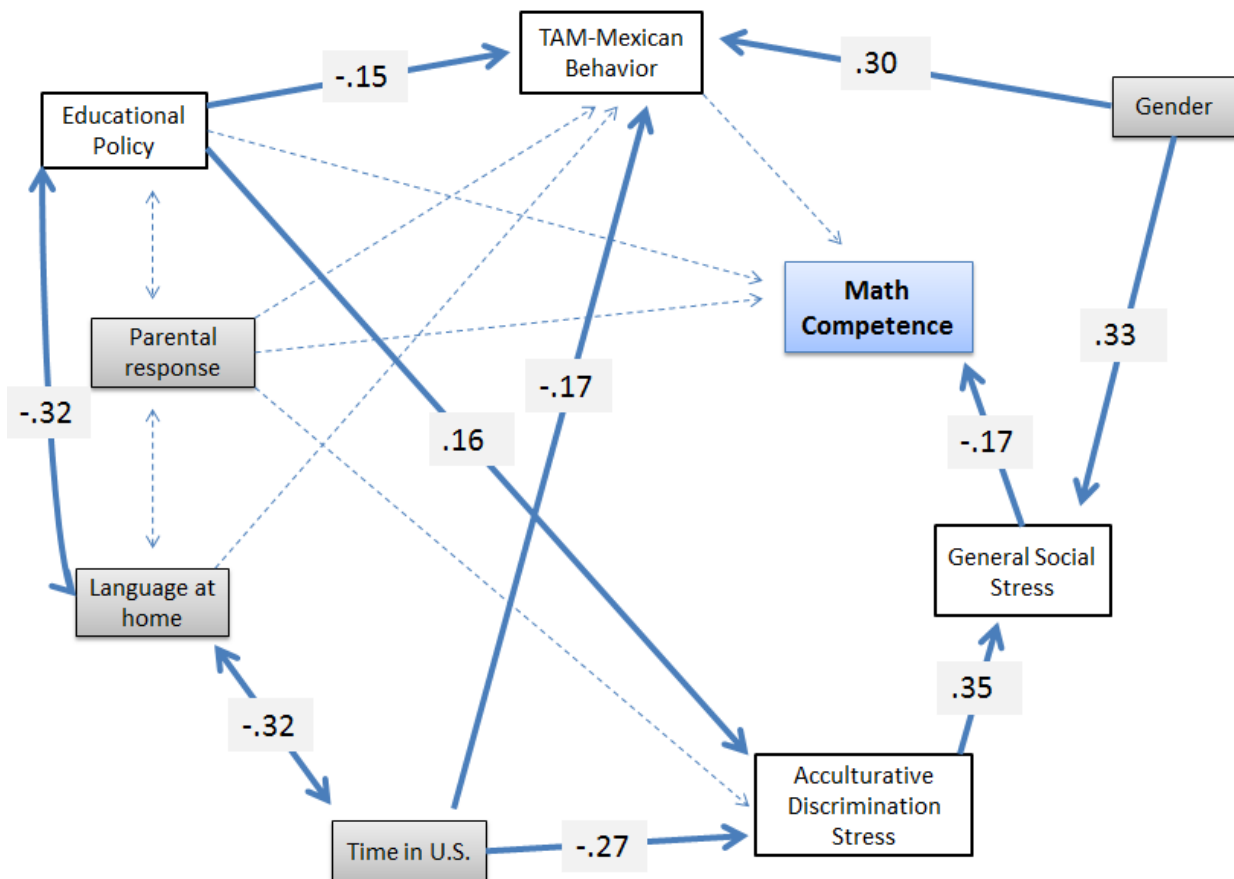
## **ADDENDUM**

In this addendum, the present study provides further examination into the previous path model by taking math and reading competences into account separately. The research findings point to the circumstantial evidence that bilingually educated children would be more successful in both math and reading achievement than the comparison group children, and this conclusion holds true in existing education research examining reading/mathematics achievement (e.g., Cazabon, Nicoladis, & Lambert, 1998; Curiel et al., 1986; Lindholm-Leary, 2001; Lindholm-Leary & Borsato, 2001; Thomas & Collier, 2002). However, it is important to note that these empirical studies were conducted with middle- and high-school Latino students, and research on young Latino children is scarce. In addition, it is possible that education policy and acculturation may have differential influences on math competence and reading competence. More specifically, researchers found that there was a significant positive correlation between Spanish reading and English reading (Lindholm & Aclan, 1991; Lindholm-Leary, 2001), and this evidence suggests that bilingual education and biculturalism may promote children's overall reading competence, but not their math competence. Taken together, it is unclear whether separate path analyses with respect to the math and reading subscales will show the same results. Therefore, it may be worth exploring potential variation in math and reading competence scores. In addition to the results of the path analysis models for the 2-item math and the 2-item reading competences, the results of the 6-item cognitive competence model will be provided in this addendum section.

Data for math, reading, and cognitive competence showed a violation of the multivariate-normality assumption. Mardia's normalized Z-statistic indicated significant positive kurtosis values for math and reading data: Mardia's coefficient for the math competence data was 13.39; Mardia's coefficient for the reading competence data was 10.05; Mardia's coefficient for the

cognitive competence data was 12.28. Bentler (2005) has suggested that data where the values of Mardia's estimate are greater than 5 is considered to be non-normally distributed. To adequately evaluate non-normal data, Satorra and Bentler (1998) developed a method by incorporating a scaling correction for the  $\chi^2$  statistic. Using the Satorra-Bentler  $\chi^2$  statistic, the following path models for math and reading competence were yielded by selecting the EQS program's ROBUST option.

Figure 14: Structural model of relationships between math competence, education policy, TAM-Mexican behavior, acculturative/discrimination stress, and general social stress



Note: Dotted lines represent the insignificant paths. The solid lines are significant ( $p < .05$ ). Coefficients are standardized estimates. Coefficients for insignificant paths are not presented.

The math competence model fit the data well,  $S-B\chi^2(19, N=182) = 24.52, p = .11, CFI = .93$ , and  $RMSEA = .05$ . Of all the paths to math competence, only one path, from general social stress to math competence, was statistically significant,  $\beta = -.17, z = -2.55, p < .01$ , while other paths were insignificant.

Arizona English Immersion decreases the levels of TAM-Mexican behavior by,  $\beta = -.15, z = -2.15, p < .01$ . Female children were more likely to develop TAM-Mexican behavior than male children,  $\beta = .30, z = 4.25, p < .01$ . Children whose parents lived longer in the U.S. showed lower levels of TAM-Mexican behavior than children whose parents were recent immigrants,  $\beta = -.17, z = -2.28, p < .01$ .

General social stress was positively related to acculturative/discrimination stress,  $\beta = .34, z = 5.76, p < .01$ , and female children experienced higher levels of general social stress than male children,  $\beta = .33, z = 4.94, p < .01$ .

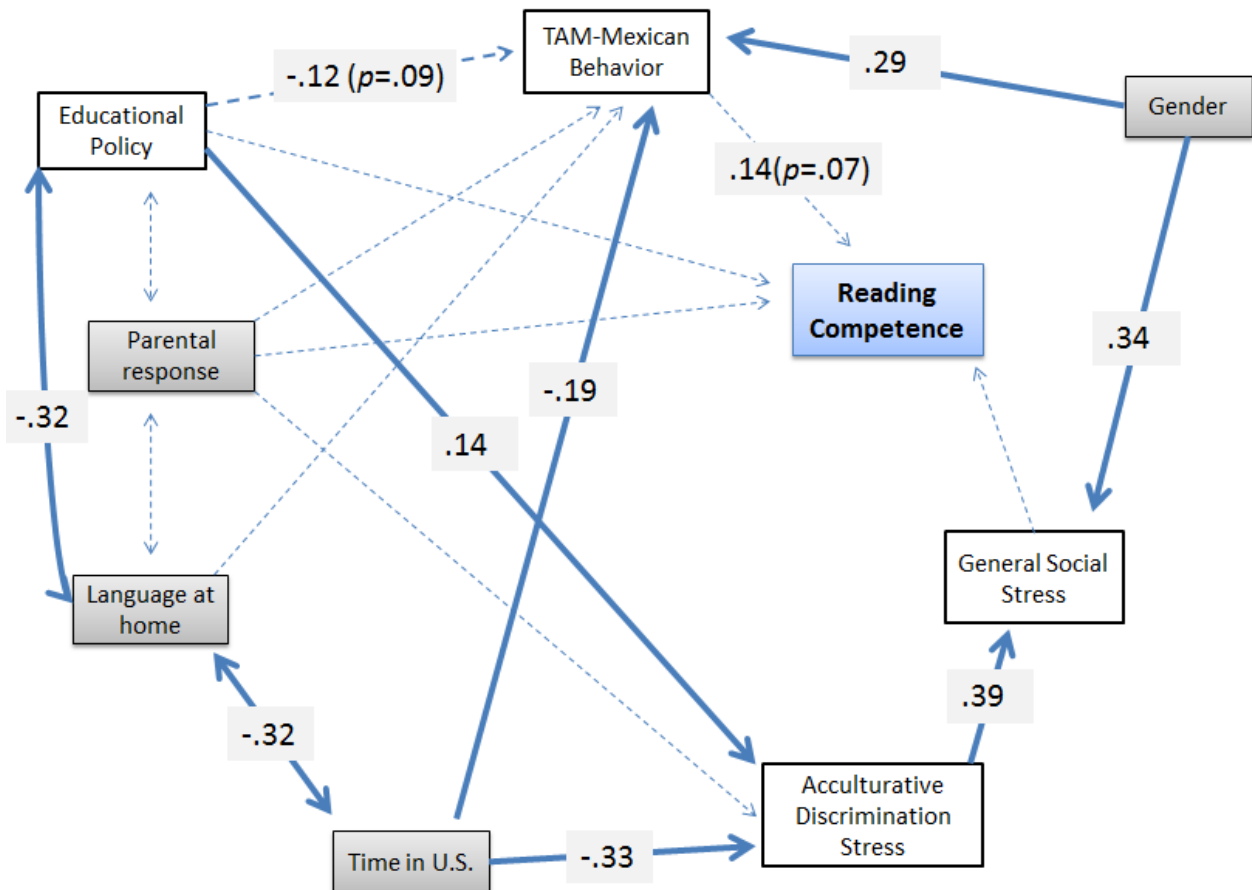
English Immersion increases acculturative/discrimination stress,  $\beta = .16, z = 2.19, p < .01$ . The longer parents have lived in the U.S., the lower children's acculturative/discrimination stress is,  $\beta = -.27, z = -3.83, p < .01$ .

The total effect of education policy on math competence was insignificant,  $z = -.99, p = .32$ . The indirect effects (education policy  $\rightarrow$  acculturative/discrimination  $\rightarrow$  general social stress  $\rightarrow$  math competence) were tested using an EQS simulation option and SPSS macro with 1000 bootstrapping samples drawn. Ninety-five percent confidence intervals were used to evaluate the significance of the indirect effects. The indirect effects were significant (95% CI [-

.10, -.01] ), suggesting that acculturative/discrimination stress and general social stress intervene in the path between education policy and math competence. In other words, education policy significantly influences children's stress levels, and their stress levels affect their math competence. This significant intervening path (education policy → acculturative/discrimination → general social stress → math competence) suggests that English Immersion increases acculturative/discrimination and general social stress, which leads to lower math competence among Mexican-American children.

The indirect effects from parental U.S. residence time → acculturative/discrimination → general social stress → math competence were also tested by the bootstrapping method. There was a significant intervening path from parental U.S. residence time to math competence through acculturative/discrimination and general social stress (95% *CI* [.001, .006]). This intervening path suggests that the longer parents live in the U.S., the lower children's acculturative/discrimination and general social stress becomes, which leads to higher math competence among Mexican-American children.

Figure 15: Structural model of relationships between reading competence, demographics, education policy, TAM-Mexican behavior, acculturative/discrimination stress, and general social stress



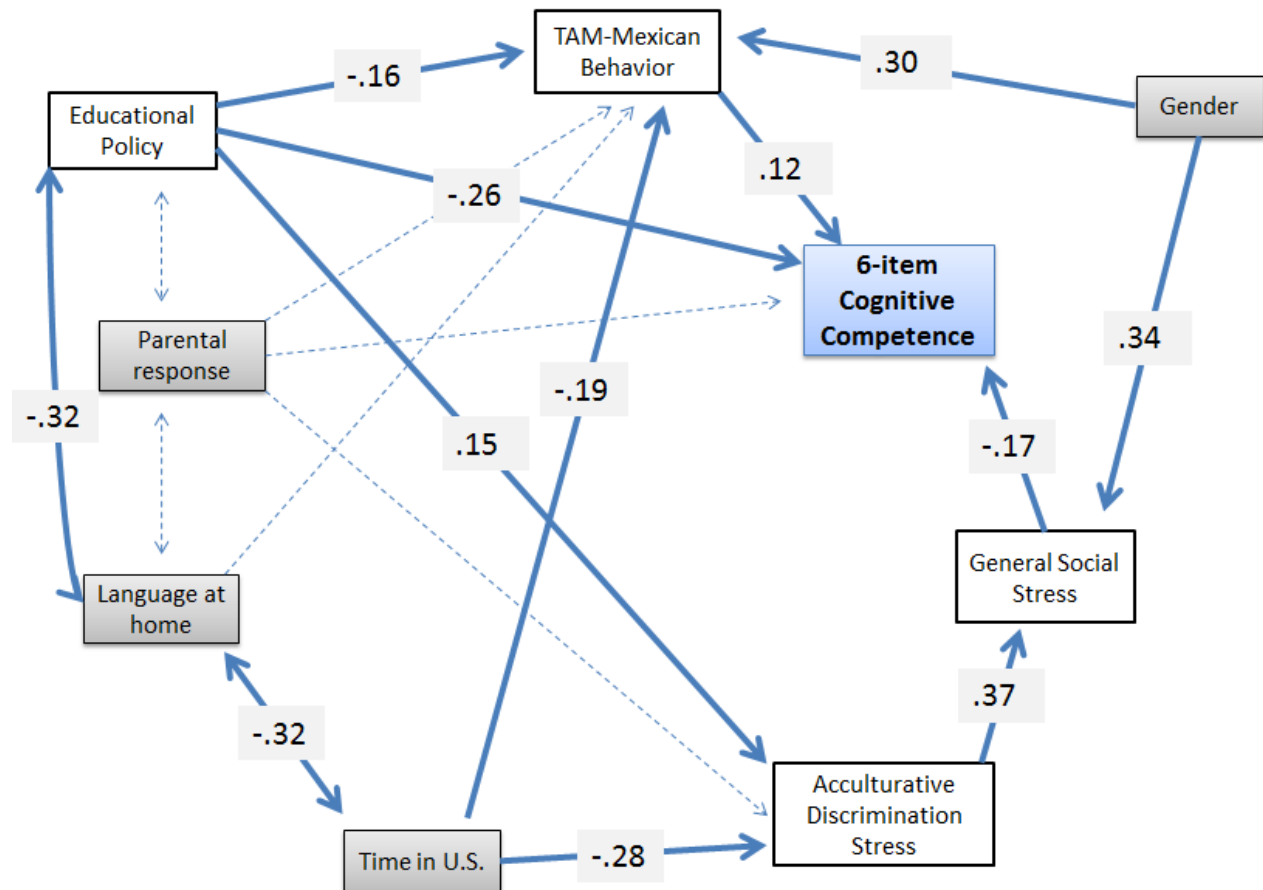
Note: Dotted lines represent insignificant paths. The solid lines are significant ( $p < .05$ ). Coefficients are standardized estimates. Coefficients for insignificant paths are not presented.

The reading competence model fit the data well,  $S-B\chi^2(19, N=182) = 9.96, p = .91, CFI = 1$ , and  $RMSEA = 0$ . All paths to reading competence were either marginally significant or insignificant. Education policy marginally predicted TAM-Mexican behavior ( $p < .10$ ), and TAM-Mexican behavior also marginally predicted reading competence ( $p < .05$ ). The other paths showed similar results.

The differences between the math competence and reading competence results are that, in the reading competence model, the path of education policy  $\rightarrow$  TAM-MC became marginally significant ( $p=.09$ ), and the path of general social stress  $\rightarrow$  reading competence became insignificant ( $\beta = -.09$ ,  $z = -1.18$ ,  $p = .23$ ). In addition to these, reading competence was not statistically significantly influenced by any indirect effects. These findings suggest that children's math competence is more likely than their reading competence to be indirectly affected by education policy via acculturative/discrimination stress and general social stress.

Finally, the 6-item cognitive competence model was tested. The model fit the data very well,  $S-B\chi^2(19, N=182) = 12.96$ ,  $p = .73$ ,  $CFI = 1$ , and  $RMSEA = 0$ . Sobel's mediation tests and other bootstrapping methods also showed the same results as obtained from the 10-item global competence model. There was a slight difference between the 10-item global competence model and the 6-item cognitive competence model with respect to the path between TAM-MC and educational competence. In the 10-item global competence model, the path from TAM-MC to the 10-item global educational competence was marginally significant at the .10 significance level, while the path from TAM-MC to the 6-item cognitive competence was significant at the .05 significance level. All other results of the 6-item cognitive competence model were the same as the results of the 10-item global competence model.

Figure 16: Structural model of relationships between cognitive competence, demographics, education policy, TAM-Mexican behavior, acculturative/discrimination stress, and general social stress



Note: Dotted lines represent the insignificant paths. The solid lines are significant ( $p < .05$ ). Coefficients are standardized estimates. Coefficients for insignificant paths are not presented.

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