EXPLORING THE ASSOCIATION BETWEEN HISPANIC MOTHERS' ACCULTURATION AND CHILDREN'S HEALTH OUTCOME IN THE UNITED STATES AND MEXICO: CONSIDERING FAMILY MEALTIME ROUTINES.

BY

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DISSERTATION

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**Abstract**

     Obesity has become a pressing issue for Hispanic populations in the United States (U.S.) as well as for the Mexican population in Mexico with prevalence steadily increasing over the last quarter century for both adults and children (Flegal, 2016; Skinner et al., 2018). Given these high obesity rates and the link between obesity and numerous health and psychosocial illnesses (Guh et al., 2009; Hales, Carroll, Fryar, Ogden, 2017; Pulgarón, 2013), understanding cultural and family level patterns could suggest promising interventions and health implications for addressing these health disparities. Therefore, these studies sought to examine how acculturation processes and the practice of routines affect dietary patterns and the risk for obesity among Hispanic children.

     **Study 1.** Focus group data were analyzed to understand the perspective of Hispanic mothers concerning their behaviors and routines around family mealtimes. This study compared families' experiences in two countries (Mexico and the United States). Through this comparison, an explanation of barriers and facilitators to maintain healthy family mealtimes and dietary patterns were presented. Findings showed three main themes, 1) Mom shops and cooks the food, but kids and fathers command the food, 2) Family meals are different than before, and globalization is a contributing factor, and 3) Family time has shifted to weekend endeavors eating out at restaurants and fast food chains. These findings gave insight into how globalization and acculturation play a role in family dynamics and rules around mealtime behaviors.

     **Study 2**. Due to past complex and equivocal findings in research examining unidimensional frameworks of acculturation, study two sought to test child health outcomes by understanding mediation and moderation effects of mealtime routines on maternal bidimensional acculturation. 189 immigrant mothers completed a questionnaire assessing bidimensional acculturation, household mealtime planning and frequency, child dietary behaviors, and body mass index was measured for mother-child dyads. Acculturation was significantly associated with their child's weight status, particularly for mothers with assimilated strategies regardless of their level of mealtime planning. Additionally, longer time in the U.S. was associated with lower levels of mealtimes planning. These findings have implications for how intervention programs discuss household routines and their importance in health outcomes.

     These studies complement each other and expand literature considering cultural influences on Hispanic health. With the increasing rates of obesity risk, these studies have implications for future directions and suggestions for continuing efforts in combating health disparities.

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**Chapter One: Introduction**

Hispanic families in the United States have been disproportionately impacted by the obesity epidemic (Flegal, 2016). According to the criteria set by the Centers for Disease Control and Prevention (CDC), 46% of Hispanic children ages 2-19 are overweight or obese, and 78% of Hispanic adults are overweight or obese; the highest of any racial and ethnic group (Flegal, 2016; Skinner, Ravanbackht, Skelton, Perrin, Armstong, 2018). This is important given that children and adults with obesity are at increased risk of experiencing detrimental physical problems such as cardiovascular disease, hypertension, diabetes, stroke, sleep apnea, liver, and gallbladder disease (Guh et al., 2009; Hales et al., 2017). In addition, they are at increased risk of psycho-social problems including low quality of life, internalizing disorders, poor school performance, and attention-deficit hyperactivity disorder (Pulgarón, 2013). Conversely, a wide range of family-related behaviors and factors influence a child's eating habits (Larson, Neumark-Sztainer, Hannan, & Story, 2007) and weight status (Wansink & van Kleef, 2014). Considering the recent emphasis on obtaining a better understanding of behavioral determinants of obesity, investigating how cultural and family level patterns relate to dietary quality and body mass index (BMI) could suggest promising interventions and policy implications to address adult and childhood obesity (Affenito, Franko, Striegel-Moore, & Thompson, 2012; Wansink & van Kleef, 2014).

Children learn cultural practices at an early age from the world around them including parents, peers, and environment (Kagitcibasi, 2017). However, individuals may be exposed to multiple cultures simultaneously or throughout their life span. Such exposure to new cultures can result in behavioral and belief changes (Berry, 2006). We know that culture plays a role in understanding one's own identities and values, while also influencing behaviors. Therefore, the way Hispanic immigrant families experience changes in their environment due to moving to a new country and the exposure to new cultures may change how families navigate their current routines compared to their past behaviors (Winham, Palmer, Armstrong Florian, & Shelley, 2018). This exposure to new and different cultural behaviors and products provides opportunities both conscious and unconscious transformations to their daily patterns in consumption, routines, time management, and health perceptions (Story, Neumark-Sztainer, & French, 2002). These new experiences may change the mother's knowledge and beliefs about family routines, particularly around mealtimes such as types of food consumed, the importance of mealtimes, and organization.

Quality family meals are a routine that may act as a protective factor against excessive weight gain and poor-quality diets; such as increasing fruits, vegetables, grains, and calcium-rich food consumption (Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003). *Protective factors* are positive variables that interact with risks to buffer or offset their impact and thus moderate the risk effects. Potential cultural changes due to environmental differences and adjustment may impact how families

conduct their meal preparation through mealtime completion, thus impacting this protective factor. For example, a focus group study suggests that when Hispanic families moved to the U.S. the increased burden of expenses, changes in food availability, time conflicts, and new food preferences due to cultural exposure were barriers that influenced the foods served at the mealtime, the frequency of mealtimes and the quality of the interactions (Villegas, Coba-Rodriguez, & Wiley, 2018).

Therefore, the goal of the two studies is to examine how the acculturation process and the adaption of new routines may affect dietary patterns and the risk for obesity in Hispanic families in the U.S. In study one, focus group interviews in three settings (Mexico and two locations in the U.S.) will be analyzed to compare and contrast consumer barriers and facilitators to maintaining healthy family lifestyles, particularly around mealtime routines and by dietary patterns. In study two, survey data will be used to understand the mechanism in which mealtime routines serve as a link between mother's acculturation, dietary quality, and weight status for Hispanic children.

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**Social Context**
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**Hispanics in the United States and Mexico**

The term *Hispanic* is currently used by the United States (U.S.) Census Bureau (Therrien & Ramierz, 2000), to refer to a broad group of people who have their roots in Latin American or the Iberian Peninsula (Cristancho, Garces, Peters, & Mueller, 2008; Rehm, 2003) particularly a person of Cuban, Mexican, Puerto Rican, South or Central American culture or origin (Allison & Bencomo, 2015). The U.S. Hispanic population has increased 20 times its size over the past half-century. However, there has been a recent slowing of Hispanic population growth due to immigration slowing down. Nonetheless, Hispanics remain the largest minority group in the U.S, making up 17.8% of the total U.S. population (Flores, 2017). The U.S. Hispanic population comes from a diverse mix of countries, with 63% coming from Mexico, 10% coming from Puerto Rico, and 15% coming from El Salvador, Cuba, Dominican Republic, Guatemala, and Colombia. The overall Hispanic population is the youngest of any racial and ethnic group considering they are a more recent immigrant group, with the median age being 30 in 2015, foreign-born (i.e., born outside the U.S.; Flores, 2017). For households, there are over 12 million Hispanic families with children living in the U.S., with 67% of those children living with two parents (U.S. Census Bureau, 2017).

Historically, most Hispanic immigrants have moved to larger urban cities such as Los Angeles, CA (making up 40% of the city population), New York City, NY (42%), or Miami, FL (61%), yet in the last decade there has been a population shift toward rural destinations (Flores, 2017; Lichter, 2012; Raffaelli, Tran, Wiley, Galarza-Heras, & Lazarevic, 2012). Rural destinations offer employment opportunities in agricultural, service, and manufacturing industries. On the other hand, life in rural communities is fraught with a number of barriers such as transportation issues, lack of services, and often

heightened discriminatory environments (Cristancho et al., 2008; Raffaelli & Wiley, 2013). Population shifts and location changes toward rural communities provides background information for understanding the makeup and contextual transition of Hispanic families. Additionally, the term Hispanics is used broadly in references for any persons originated from Latin American, including those who have not emigrated to other regions or countries. Therefore this term will refer to both Hispanics living in the United States and in Mexico.

**Hispanic Cultural Components**

The family is an important component of the Hispanic cultures (Campos, Ullman, Aguilera, & Dunkel Schetter, 2014). Hispanic families highly value *familism* (Katiria Perez & Cruess, 2014) which is defined as a strong allegiance, loyalty, and attachment towards their immediate family and extended family (e.g., grandparents, aunts, uncles, cousins). *Familism* is often reflected in the desire to visit, share meals, and converse about daily life (Keefe, 1984). The patterns that stem from desiring close family relationships can shape health outcomes in both positive and negative ways. Shared family mealtimes are an example of a *familism*-focused pattern or routine (Campos & Kim, 2017). For instance, a higher frequency of getting together as a family to share meals and engage in consistent family time have been positively associated with nutritional health in children and adolescents (Hammons & Fiese, 2011). Although a study by McLaughlin and colleagues (2017) explains that close family ties can also have negative implications in trying to lose weight and eat healthier because of the pushback from family members. Their suggestions highlight the need to incorporate the entire family in healthy behaviors and emphasize support in various routines that can promote health (McLaughlin et al., 2017). Additionally, several studies suggest that the concept of *familism* can change with immigration and the process of acculturation (Bacallao & Smokowski, 2007; Schwartz et al., 2010). Suggesting that, orientation into mainstream U.S. culture can produce a shift in family values leading to abandoning or a devaluing of traditional family practices, such as the importance of shared mealtimes, and changes in dietary patterns.

Hispanic cultures commonly suggest that heavier weight status is a sign of good health and positive development, and is widely accepted belief (Mama et al., 2011; New, Xiao, & Ma, 2013). Believing that heavier weight status is a sign of good health and development has led to the lack of awareness of healthy weight levels and health risks that may be related to excess weight (Agne, Daubert, Munoz, Scarinci, & Cherrington, 2012). Therefore, perceptions of health and body image are influenced by Hispanic culture, showing that Hispanics are more likely to misperceive their weight, thinking they weigh less than they actually do (Caballero, 2011; Dorsey, Eberhardt, & Ogden, 2009). These cultural components of *familisim* and weight perceptions provide contextual information for understanding how Hispanics may think about family dynamics and weight.

Overall, it appears that aspects of Hispanic cultural factors can positively influence a range of health behaviors, although some aspects such as weight perceptions and beliefs can add to negative health outcomes. Though these factors influence health outcomes several individual characteristics such as age, sex, income, and educational attainment also contribute to weight status and dietary patterns (Boumtje, Huang, Lee, & Lin, 2005). For children, age is an important factor that contributes to the complexity of health outcomes; particularly there are critical timepoints throughout childhood and adolescents where social and biological factors play a unique role in development, behavior, and beliefs regarding health and weight status.

**Childhood through Adolescence**

Children are highly influenced by their parent's health behaviors yet also have some agency in their own choices, beliefs, and values (Larsen et al., 2015). Parents can influence their child's diet and weight status through food purchasing, meal preparation and creating certain food environments within the home through their food preferences, financial resources, cooking skills and knowledge (Patrick & Nicklas, 2005; Salvy et al., 2010). Children are also highly observant watching their parents, siblings, and peers' behaviors, choices, and attitudes on diet and weight (Cruwys, Bevelander, & Hermans, 2015), ultimately impacting what they do, choose, and believe (Birch, 1980; Salvy et al., 2010). A number of environmental influences (i.e., school, culture, societal norms) also contribute to children's dietary patterns through daily messages, norms, and availability of foods in those settings (Driessen, Cameron, Thornton, Lai, & Barnett, 2014). These influences shape the way children view food and the decisions they begin to make in school, at home, and in settings where they have the ultimate choice (i.e., when away from parents). Particularly for Hispanic children, the home food environment has been found to highly influence children's food intake and health behaviors (Santiago-Torres, Adams, Carrel, LaRowe, & Schoeller, 2014). Foods available at home, access to a variety of foods, and parents own preferences influenced children's eating behaviors. Additionally, mealtime distractions such as television watching were negatively associated with children's dietary quality (Santiago-Torres et al., 2014).

Behaviorally as children age, their agency grows, allowing for increased independence and choice. Youth begin to spend more time with peers and time with family and parents typically decreases (Larson & Richards, 1991). Less time spent with family can cause more conflict and discrepancies in family functioning, which has been associated with poor dietary intake and lack of physical activity (Lebron et al., 2018). Though there may be differences for Hispanic youth because Hispanic cultures tend to be collectivist, meaning that the needs and desires of the family take priority over those of the individual (Allison & Bencomo, 2015). Children, therefore, are raised to have strong loyalty and identity with their family, often asking to sacrifice individual ambitions. This may look like youth sacrificing time with their friends or extra-curricular activities to be at home with their family. In addition, research has

shown that positive health behaviors such as eating vegetables and participating in 60 minutes of physical activity weekly are least prevalent among Hispanic youth than other ethnicities (Kann et al., 2016). Therefore, examining the effects of family routines across childhood is an important factor to understand in order to gain a better understanding of how the mealtime context impacts Hispanic families. From this previous literature, we would predict that younger children are more susceptible to family level influences such as household routines whereas older children and youth begin to increase in independence and agency. Although due to the collectivistic nature of Hispanic families, the age of the child may not result in significant differences. Therefore, analyses incorporating age will be considered exploratory.

**Chapter Two: Theoretical Framework and Literature Overview**

**Acculturation**

Common among Hispanic families, compared to other secondary/new cultural groups in the U.S., is the process of acculturation due to high rates of immigrant status and cultural differences. Acculturation is the process in which two or more different cultural groups come into contact allowing for changes and negotiations in one another's identity, values, and behaviors (Berry & Sam, 2016). Acculturation in this context is often experienced by the exposure to new cultures through the immigration process, relocation from one country to another for both "push" and "pull" reasons. For Hispanic immigrants in the U.S. "pull" reasons have involved migration from less economically advanced regions of Central and South America in pursuit of a better livelihood economically and educationally, whereas "push" reasons involve involuntary migration due to war, persecution, and violation of rights (Ferguson & Birman, 2016). Regardless of the reason behind immigration, the process can involve a number of hardships (i.e., language barriers, citizenship status, skill set, education) that likely influences individual and family-level changes (Bacallao & Smokowski, 2007). Second generation Hispanics, those who were born the U.S. but have a parent that was born outside the U.S., may also experience an acculturation process as their parents can pass down cultural values, beliefs, and practices during childhood and then become more bicultural or adopt other cultural behaviors later on.

Acculturation involves contact that takes place between cultural groups; these interactions can lead to psychological, consumer, and routine changes as well as more structural changes such as political, economic, and even physical changes of space (Berry & Sam, 2016). Typically, the contact between the groups has reciprocal influences, but the new culture can exert more influence due to power differences (i.e., economic power, political power, status, and rights). Additionally, acculturation can have influence in a remote nature (Ferguson & Bornstein, 2012). In which a second culture may influence one's first culture without this person migrating to a different country because of a globalized and deterritorialized world (Ferguson & Bornstein, 2012). Indirect and intermittent cultural contact with a second culture then occurs due to modern trade, media, and technology. Therefore, for the context of these studies, I will focus on Hispanics' acculturation process to European American culture in the U.S. as the new/second cultural group considering both local and remote acculturation processes.

**Unidimensional acculturation and measurement.** Early definitions of acculturation assume the process of only moving toward one culture and away from the other, described as losses occurring in their culture of origin because one is gaining another or the new culture (Gordon, 1964; see Figure 1). A unidimensional framework of acculturation implies preferences to adopt the new culture, in that it can diminish the role or maintenance of traditional practices (Thomson, & Hoffman-Goetz, 2009). This approach often measured through an acculturation scale puts the populations at study on a unidimensional

linear continuum. On one end of the scale, immigrants are highly *traditional* defined by maintaining one's origin of culture, with *biculturalism* at the midpoint of the continuum, and highly *assimilated,* or often termed *acculturated* at the other end defined by acquiring the values, practices, and behaviors of the new culture (Thomson & Hoffman-Goetz, 2009). Furthermore, there is an assumption of increased time or exposure to the new culture leading to increased adoption of the new culture. This process is even seen as continuing across generations until the offspring of immigrants are culturally indistinguishable (having no cultural differences) from the new cultural group (Ryder, Alden, & Paulhus, 2000). Family members from different generations may even have opposing acculturation levels due to timing and exposure differences.

In studying Hispanics' experiences, a review suggests that over two-thirds of its studies focusing on acculturation and health outcomes measured acculturation on a unidimensional scale (Thomson & Hoffman-Goetz, 2009). Studies using unidimensional scales report contradictory findings. Some studies find that higher orientation to U.S. culture (more *assimilated*), was associated with poorer quality diets and higher body mass index (BMI) (Abraído-Lanza, Chao, & Flórez, 2005; Lara et al., 2005; Pérez-Escamilla, 2011). In other studies, high orientation to the origin culture (more *traditional*) has predicted negative health outcomes of poor quality diets and struggles adjusting to new environments (Ayala, Baquero, & Klinger, 2008; Mazur, Marquis, & Jensen, 2003). One explanation of such contradictory findings is that when one uses a unidimensional framework, it might mask the possibilities of being orientated to both cultures or rejecting both cultures altogether.

**Bidimensional acculturation strategies and measurement.** The bidimensional acculturation model holds that maintenance of the origin culture (dimension 1) is independent of orientation towards the new culture (dimension 2; Berry & Sam, 1997). These two dimensions suggest that acquiring the identities, values, and behaviors of the new culture does not automatically mean the abandonment of the identity, values, and behaviors of their culture of origin (Berry & Sam, 2016); rather these two dimensions can vary independently (see Figure 2). This model assumes that individuals value culture and are capable of having multiple cultural identities, behaviors, or values (Ryder et al., 2000). With this in mind, using a unidimensional model would not allow the identification of bicultural individuals who strongly identify with both cultural groups or individuals who do not identify with any cultural group.

**Figure 1**. *Visual Model of the Unidimensional Framework of Acculturation*
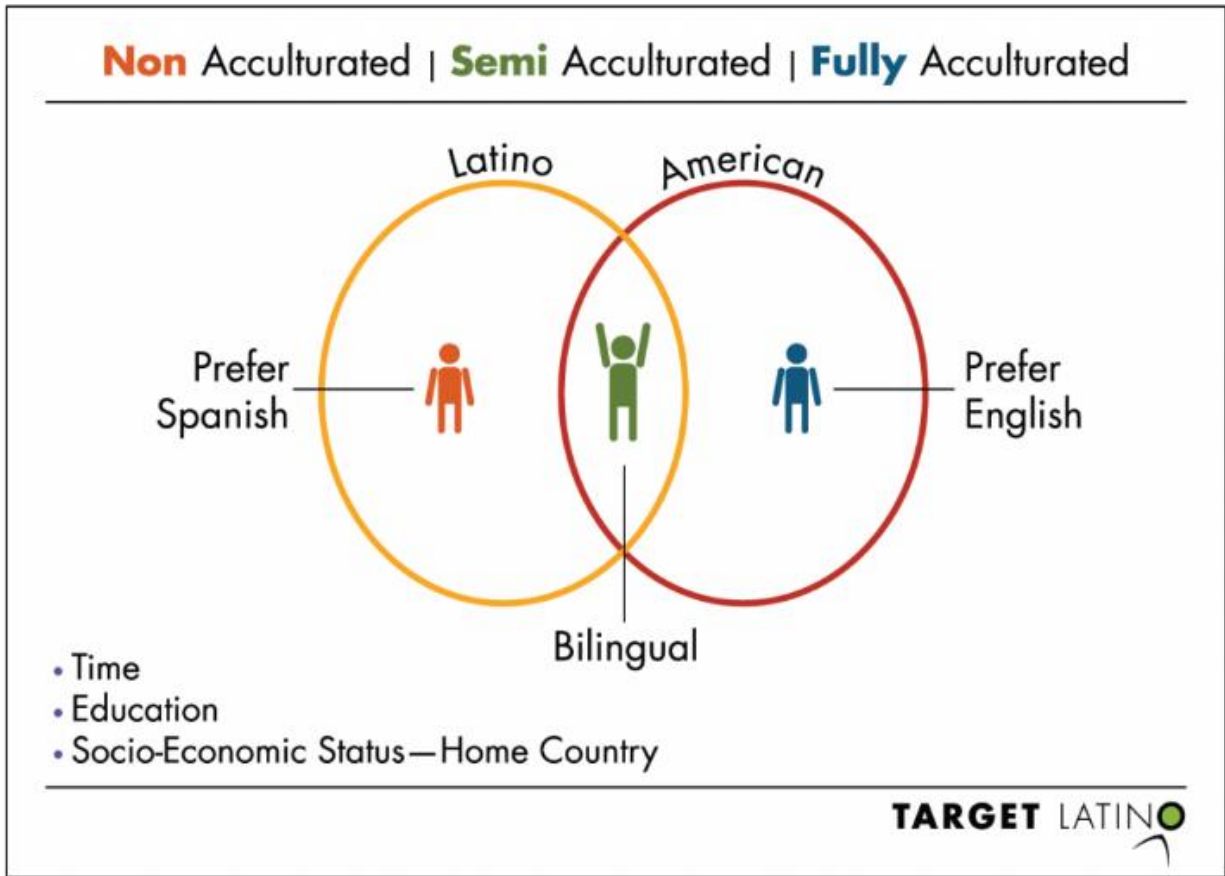
**Figure 2**. *Visual Model of the Bidimensional Framework of Acculturation*

The cultural maintenance orientation

+ +                                        −

The contact and participation orientation

Integration          Assimilation

Separation          Marginalization

−
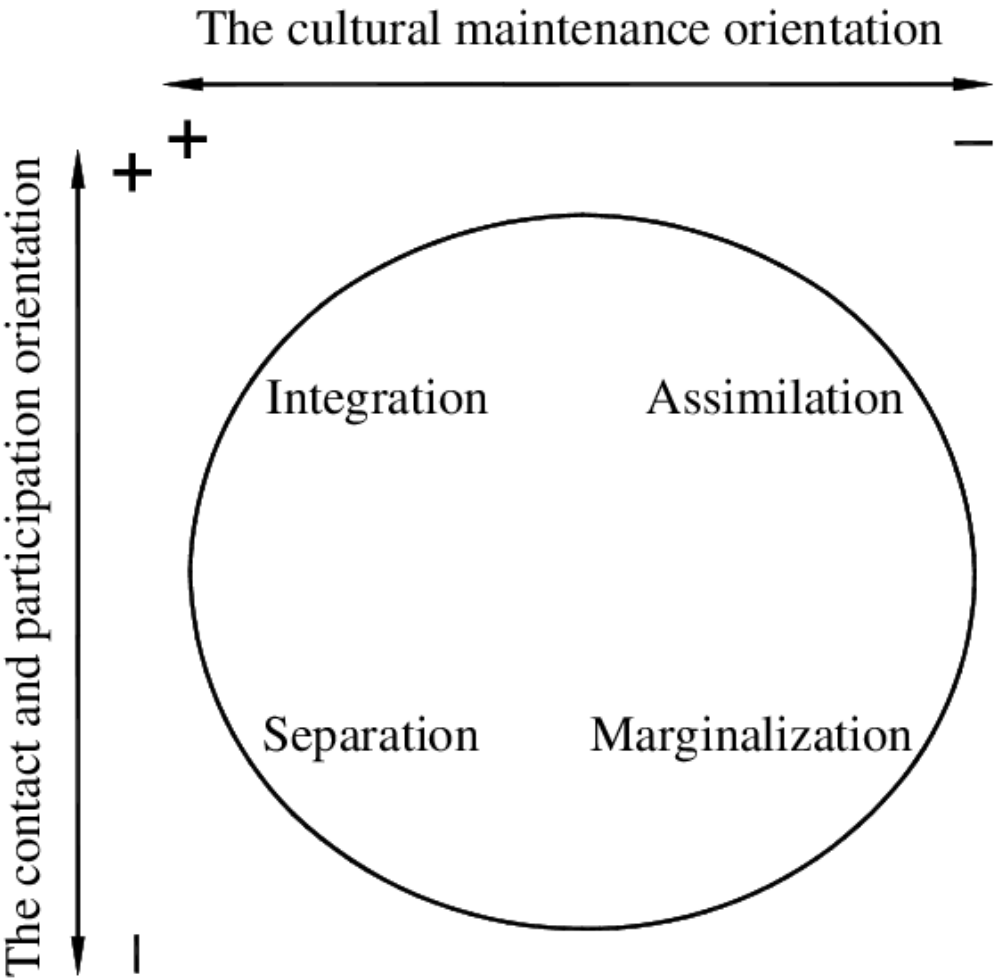
Berry & Sam, 2016

The bidimensional model proposed by Berry and Sam (1997), presents four acculturation strategies for individuals based on quadrants defined by two dimensions. *Integration* is when individuals have a high orientation to both origin and new cultures. *Assimilation* is when individuals have a high orientation to the new culture without maintaining the origin culture. *Separation* occurs when individuals maintain their origin culture while rejecting the new culture. *Marginalization* is defined by having no interest in the maintenance of their origin culture and no interest in the new culture.

Previous literature has examined the relationship between these acculturation strategies and psychosocial health outcomes such as depression, anxiety, and hostility showing that *integration* was associated with the most adaptive functioning (Abu-Rayya & Sam, 2017; López & Contreras, 2005), while those with either *assimilated* or *separated* strategies showed slightly worse adaptive functioning such as increased levels of depression in Hispanic adults (Torres, 2010; Wei et al., 2010). Those who are *marginalized* had the worst outcomes (Fox, Merz, Solorzano, & Roesch, 2013).

**Acculturation and Health Outcomes**

Immigration and the acculturation process have been shown to affect health outcomes and behaviors; such as increased risk of smoking, alcohol use, body mass index, decreased consumption of low-fat foods and decreased physical activity levels (Abraído-Lanza, Echeverría, & Flórez, 2016; see Table 1 for more examples). This process is influenced by interacting elements rooted in the country of origin (i.e., traditional gender roles, language use, national holiday traditions), the new culture (i.e., work obligations, consumerism, ethnic identity), and the acculturation process itself. In this context, some of these interrelating elements can act as risk factors while others serve as protective factors (Sam, Jasinskaja-Lahti, Ryder, & Hassan, 2016). For instance, mothers who have migrated may still feel the pressure to maintain traditional gender roles by taking responsibility for the house cleaning, cooking, and childcare although with new work obligations and a desire to fit in with the new culture, these increased obligations and time constraints may act as a risk factor towards maintaining healthy eating patterns. On the other hand, strong ethnic identity may serve as a protective factor because of pride and sense of unity with their traditional values may encourage immigrants to continue to maintain healthy eating patterns (Greaney, Lees, Lynch, Sebelia, & Greene, 2012; Greder, Romero de Slowing, & Doudna, 2012).

Table 1.

*Literature Summary of the Association Between Assimilation in a Unidimensional Framework and Health Outcomes.*

| Health Outcomes | Assimilation | References |
|---|---|---|
| Dietary Fat | ⊘ | (Gardner et al., 1995; Harley et al., 2006; Neuhouser et al., 2004; Norman et al., 2004) |
| Fast foods & snacks | + | (Kasirye et al., 2005; Norman et al., 2004) |
| Fried foods | - | (Otero-Sabogal et al., 1995; Balcazar et al., 1995) |
| Fruit | - ⊘ | (Otero-Sabogal et al., 1995; Kasirye et al., 2005; Balcazar et al., 1995; Fitzgerald et al., 2006) |
| Vegetables | + - ⊘ | (Otero-Sabogal et al., 1995; Kasirye et al., 2005; Balcazar et al., 1995, Sharma et al., 2004) |
| Total Energy | - ⊘ | (Ayala et al., 2004; Gregory-Mercado et al., 2007; Sharma et al., 2004, Harley et al., 2005) |
| Sugar Beverages | + ⊘ | (Fitzgerald et al., 2006; Himmelgree et al., 2005) |
| Weight Status | + ⊘ | (Isai et al., 2015; McLeod et al., 2016) |

Note: "+" means there is a positive association between the two variables. "-" means there is a negative association between the two variables. "⊘" means there is no association between the two variables.

Studies show that Hispanic immigrants' health status is often better than their European American and U.S.-born Hispanic counterparts, and in fact, they arrive practicing healthier behaviors (Pérez-Escamilla, 2011; Sam et al., 2016). This phenomenon is known as the immigrant paradox or the *Latino Health Paradox*, in that despite having social disparities such as lower socioeconomic status or lack of health care, recent immigrants are physically healthier than their U.S.-born counterparts (Acevedo-Garcia & Bates, 2008). Common explanations for this paradox are due to cultural and social protective factors such as social support, *familism*, and norms related to diet. Therefore, with increased time spent in the U.S. and across generations an erosion of these protective factors results in a deterioration of health outcomes (Acevedo-Garcia & Bates, 2008). Thus, immigrants' health can begin to decline because of the acculturation process or assimilation to the new culture. Studies also indicate that cultural maintenance early on in the immigration process can serve as protective factors, particularly with respect to social support, the importance given to family unity (*familism*), and norms related to diet. Although acculturation strategies have been a widely used predictor of adjustment outcomes, environmental and consumer aspects of acculturation processes may also influence behaviors impacting health.

**Consumer acculturation.** Pre-migration lifestyles can contribute to some aspects of unhealthy behaviors, but environmental and consumer changes occur post-migration creating additional barriers to healthy behaviors and choices. In a cultural context, food is more than just a means of sustenance; it also serves as an expression of cultural practice (Peñaloza, 1994). Immigration may start the process of changing learned experiences, particularly in consumer choices (Luedicke, 2011). Immigrant families often live between two worlds, as shown in previous studies with Hispanic immigrants (Bacallao & Smokowski, 2007; Castañeda et al., 2015). Some can be quick to adopt European American consumer styles and are more likely to purchase low-cost and high-visibility items (e.g. fast food and/or highly advertised products) commonly consumed by highly influential people such as peers, media stars, cartoon characters, and family. Others, however, may maintain traditional consumer patterns which rely on symbolic cultural and family ties (Peñaloza, 1994) such as shared family mealtimes or the maintenance of strong allegiance and loyalty toward their family (*familism*) (Katiria Perez & Cruess, 2014). Consumer acculturation theory, described as "the general process of movement and adaptation to the consumer cultural environment in one country by persons from another country" (Peñaloza, 1994, p. 33), is an important component that fosters behavioral changes.

Behavioral changes stemming from immigration and the implications of geographic, environmental changes can raise barriers to healthy lifestyle patterns. Previous research describes that post-migration schedules were defined by new work obligations; there is less time to make traditional meals or cook from scratch (Evans et al., 2011; Lindsay, Sussner, Greaney, & Peterson 2011). Families

also describe not having access to the same foods and flavor options and they recognize differences in market resources making it difficult to cook traditional meals upon moving to a new geographic location (Greaney et al., 2012; Greder et al., 2012; McArthur, Anguiano, & Nocetti, 2001). These cultural changes in consumer practices such as food availability may translate to frustration and lack of confidence in how to substitute flavors or prepare foods that are palatable to family members, resulting in opting for "quick and easy meals," fast food, or discontinuation of family meals.  If issues such as these occurred, but mothers were able to utilize local ingredients and seasonal patterns to help them plan menus and budgets, these mealtime routine elements could protect against negative health outcomes. Along with these consumer practices, there are cultural influences that directly impact acculturation strategies. The cultural dimensions (origin culture and host culture) influence the elements of mealtime routines and health outcomes. Therefore, acculturation strategies and consumer practices influence one another post-migration creating both risks and opportunities that affect health behaviors (mealtime routine elements) and outcomes (dietary patterns and weight status). These consumer changes and acculturation processes create opportunities that influence behaviors leading families to either make positive or negative changes for their daily routines.

The current studies seek to understand how cultural changes impact mealtime behaviors and address the equivocal links of acculturation by looking at acculturation processes through a bidimensional framework and measuring self-reported acculturation and years in the U.S. While most studies have used a unidimensional measure of acculturation, this study will add to the question of how and why recent immigrants may be healthier by understanding protective behaviors within the household. Consistent and quality routines have been associated with positive adjustment outcomes for the entire family (Denham, 2003). Specifically, mealtimes are an important routine that is at the intersection of communication efforts, structure and organization, dietary and cultural norms that has a unique emphasis on health outcomes in both parents and children (Fiese, Hammons, & Grigsby-Toussaint, 2012).

**Routines**

Family routines are "day-to-day repetitive activities that occur within the family unit in a predictable manner" (Keltner, Keltner, Farren, Hanson, & Anderson, 1990, p. 161) and are often viewed as behaviors that accomplish a task and include significant patterns of social interaction (Fiese, Foley, & Spagnola, 2006). Families typically have their definitions of what constitutes a routine, since it can be personalized and individualized to a particular family (Fiese et al., 2002). However, routines are observable, repeated events or activities that define usual roles and responsibilities, organize daily life, and reflect family characteristics (Boyce et al., 1983; Denham, 2002) often with no particular unique or special meaning attached.

Routines have shown to influence a number of general health outcomes for family members. Structured and more predictable routines within a household increase parents' confidence in their parenting abilities and children's adjustment outcomes (Fiese et al., 2002). Certain routines directly shape and influence dietary and weight status health outcomes. In particular, family mealtime routines are a context in which families demonstrate social interactions and cultural norms while making decisions on what to eat and how to communicate about dietary patterns (Fiese et al., 2012). Furthermore, shared mealtimes are more than just the meal itself. There are elements of planning, predictability, emotional regulation, communication, and organization for shared mealtimes that all influence the quality and the experience of healthy engagement with other family members (Fiese et al., 2012).

Through consistent healthy mealtimes, increased connection can lead to several positive health outcomes due to the growing acceptance of family rules, role modeling, and development of healthful attitudes or behaviors that have been integrated into the family life (Welsh, French, & Wall, 2011). As mentioned before, mealtimes do require a number of organizational skills such as planning, minimizing stress, and developing disciplinary strategies that help manage family chaos. Without these skills, mealtimes can lead to negative outcomes due to higher stress and increased distractions (Fiese, Gundersen, Koester, & Jones, 2016; Fiese, Jones, & Jarick, 2015). Therefore, beyond just the frequency of family mealtimes, communication, commitment, continuity, and family cohesion are key components in creating positive health outcomes through mealtimes.

### Elements of Mealtime Routines

There are three elements (communication, commitment, and continuity) that are used to describe aspects of family routines including mealtime routines (Fiese, Foley, & Spagnola, 2006). Additionally, cohesion and chaos are often seen as important contributors to healthy routines.

**Communication.** Routine communication is typically conveyed through the exchange of information, direction and instrumental instruction, which can be indirectly or directly stated (Fiese et al., 2006). In the context of family mealtimes, the purpose of routine communication can be to assign roles during the mealtime process, such as placing dishes on the table or gathering drinks for one's family members. Additionally, mealtimes can be a place where general conversation occurs; parents can communicate to children about future plans or tasks done from the day. Another example of mealtime communication can be how parents and children talk about manners, eating patterns such as 'picky' eating or trying new foods, and portion control. The methods of positive or negative means of communication especially around food can influence and alter how children view their relationship with food and the pressure to eat (Godfrey, Rhodes, & Hunt, 2013; Offer, 2013).

**Commitment.** Routine commitments focus on the task itself. In terms of mealtimes, commitment is reaching the goal of getting the family fed and seen by how the meal begins and ends

(Fiese et al., 2006). Commitment can be seen maintaining structure, organization, and planning the mealtime from start to finish. These varying degrees of commitment during mealtimes can range forcing children to eat particular foods, opening the opportunity for conflict between the child and parent or planning for when a child may start a tantrum. Less structured or chaotic mealtime environments can have an ambiguous start and end times due to continued disruption or distraction. In which, chaotic and distraction-filled mealtimes have been associated with increased unhealthy snacking (Fiese, Jones, & Jarick, 2015).

**Continuity.** Routine continuity is the repetitive nature of the routine over time. For shared mealtimes, this may be the frequency of meals in a given week, repeated seat placement at the dinner table, or family behavior monitoring over time. To maintain routine continuity, planning is a key component that influences how often meals will occur. Routines that are more consistent have often been associated with healthier outcomes.

**Cohesion and chaos.** Family cohesion can be defined as the bond that family members have towards one another. Too much *or* too little cohesion can have negative implications for adopting and maintaining the frequency of mealtimes and the healthful behaviors included during meals such as healthy eating (Welsh, French, & Wall, 2011). For Hispanics, cohesion may be a synonym for *familism*, described earlier as maintaining family ties and desire for closeness.

Chaotic mealtime environments are described as hectic, lacking routine, unpredictable, noisy, and filled with distractions (Fiese, Jones, Jarick, 2015). Children raised in such environments are more likely to consume unhealthier food options such as cookies (Fiese et al., 2015; Vartanian, Kernan, & Wansink, 2017) and are at an increased risk of becoming overweight or obese (Evans, Fuller-Rowell, & Doan, 2012). These four elements play a role in how and when mealtimes occur, and the quality of the routine.

The optimal mealtime routines have clear and direct communication, where conversation and instructions are acknowledged. They are flexible, having smooth transitions, and is deliberate enough to have efficient planning. Furthermore, parents are able to control and manage chaos during the mealtime, creating opportunities to develop family cohesion and connection. These intersecting elements then influence not only dietary intake but also how parents and children understand emotional eating patterns, social and cultural norms, and the practicalities of shopping and cooking.

**Why Mealtime Routines Matter for Health**

Research has shown an increased frequency of shared mealtimes is associated with positive health outcomes such as reduced risk for eating disorders, increased consumption of fruits and vegetables, less calorie intake for dense foods, and lower risk for childhood obesity (Fiese, Hammons, & Grigsby-Toussaint, 2012). In particular, sharing three or more meals per week reduced the odds of being overweight by 12% (Fiese et al., 2012). Furthermore, the lack of quality and cohesion during shared

mealtimes can have negative implications. An experimental study looking at noise distractions found that mealtimes with more noise and distractions were associated with children engaging with distractions, parents eating more cookies, and exhibiting more controlling and critical communication (Fiese et al., 2015). If there are constant distractions, families are less likely to engage in positive and encouraging communication, model healthy eating, and limit unhealthy food advertisements which have been associated with children's weight status and diet (Fiese & Bost, 2016; Fiese et al., 2012; Harrison, Liechty & The STRONG Kids Program, 2012). As previously mentioned, mealtimes are a routine in which planning, communication, and eating occur. For these reasons, family mealtimes are an optimal routine for parents and children to engage in and learn healthy dietary patterns and health behaviors that affect weight status.

## Proposed Studies

In the next two chapters, two distinct studies will seek to answer exploratory and confirmatory questions to then, therefore, verify and generate theory (Creswell & Creswell, 2017; Teddlie & Tashakkori, 2003). In the first study, I use focus group data to understand the perspective of Hispanic mothers in Illinois, U.S., California, U.S., and San Luis Potosi, MX on mealtime routines and healthy eating barriers in reflection of their past experiences. In the second study, I analyze survey data to understand the association between acculturation on parent-child health outcomes taking into account how mealtime routines influence the association. Since facets of the current studies are exploratory (the process of consumer practices in the context of mealtime routines), while others are more confirmatory (direct, indirect, and interaction effects of mealtime planning and acculturation on weight status and dietary patterns), both quantitative and qualitative methods are needed. Moreover, the second study was needed to enhance the primary study especially given that one data source may be insufficient (Creswell & Clark, 2007). Each study includes its own introduction and literature review.

## Chapter Three: Study 1:
## A Comparison Among Hispanic Mothers in Two Countries: Perceptions of Cultural Factors Influencing Mealtime Routines and Healthy Lifestyles

**Introduction**

Obesity has become a pressing issue for Hispanic populations in the United States (U.S.) with prevalence steadily increasing over the last quarter century for both adults and children (Ogden, Carroll, Fryar, & Flegal, 2015; Ogden et al., 2016). National data show that Hispanic populations have the highest overweight and obesity rates compared to all other racial or ethnic groups (Wang & Beydoun, 2007). Several studies attribute this increase of weight status over the years to the acculturation process that suggests an overall decline in health outcomes for first-generation Hispanics living in the U.S. over time (Abraído-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999). First-generation Hispanics have attributed the influence of U.S. culture as a contributing factor to their unhealthy behaviors and weight gain (Abraído-Lanza, Chao, Flórez, 2005). Obesogenic influences in the United States are said to be a key factor for obesity risk since there is a push to deviate from traditional dishes and adopt a more "Westernized" or "Americanized" diet (Wiley et al., 2014). Several qualitative studies suggest families encounter new barriers as they emigrate from their home countries, forming unhealthy habits (Greaney et al., 2012; Sussner, Lindsay, Greaney, & Peterson, 2008). Though according to the Center for Disease Control and Prevention (CDC) and the Organization of Economic Co-operation and Development (OCED), more than 70% of adults are overweight in Mexico and 32% are obese, with one in three children being overweight. This percentage is higher than any other country studied under the OCED (Astudillo, 2014, OCED, 2014). Projection data also shows drastic increases in obesity prevalence for the Mexican population in the next thirty years predicting between 40-60% obesity rates for adults (Rtveladze et al., 2014). These data suggest a disconnect between families' perceptions and their actual behavior from their lives in their home country and their lives in the U.S. Therefore, I will explore how cultural components and consumer practices differ among Hispanic families living in Mexico and Hispanic families living in the U.S. regarding mealtime routines and dietary patterns.

**Literature Review**

Though there have been discrepancies on the reported cultural causes of increased risk of obesity, immigrant and nonimmigrant families' face a number of challenges as they navigate cultural differences and new life in a different country. The acculturation process has been shown to produce negative health implications, in that families who assimilate to U.S. culture and shed their traditional culture have lower diet quality and higher BMI compared to those who reject U.S. culture (Ayala et al., 2008; Pérez-Escamilla, 2011). Because mealtime routines are directly involved with food patterns, they can act as a protective factor if done with continual frequency and are of high quality. Although other factors can be at play, such as income level, education, and accessibility to healthy food options, the acculturation process

is often common among Hispanic families. Since there is a process of changing physical spaces with immigration (i.e. moving to a different country), old behaviors and habits once done in a particular place may change.

Living in a specific geographical environment provides families with cultural messages of how things are done and the ability in which behaviors can come to completion (Miyamoto, Nisbett, & Masuda, 2006). In other words, before coming to the U.S. immigrant parents and individuals had a cultural way of life in their country of origin. Cultural practices were passed down from their parents and their country of origin based on availability (accessibility) regarding foods, marketing, cultural norms, and social cues (Umaña-Taylor & Fine, 2004). Once the geographical environment changes, their lifestyles can adapt to their surroundings, described as consumer acculturation (Peñaloza, 1994). Beyond geographical changes, globalization, a concept explaining how cultural ideas, norms, beliefs, and practices around the world create social and economic changes due to global communication, domestic and transnational migration, and advances in technology (Chen, 2015; Ferguson & Bornstein, 2012; Prilleltensky, 2012; Thompson, 2012). Exposure to these different cultural beliefs and practices can then become a part of the lives of families (Chen, 2015) allowing for normalcy in behaviors not originating from one's culture. Specifically for families born and raised in Mexico who do not migrate, remote acculturation stemming from globalization may be an increasing influence implicitly and explicitly impacting behaviors, beliefs, and values (Ferguson & Bornstein, 2012). Remote acculturation is "the exposure of nonmigrants to remote cultures in which they have never lived" often through indirect and/or intermittent cultural contact due to modern trade, media and technology (Ferguson & Bornstein, 2012; Ferguson, Tran, Mendez & van de Vijver, 2017, p. 157). Such that cultural components related to food preferences, highly-visible food chains, and mealtime patterns can be influenced indirectly through media, contact with foreigners such as tourists, or communication with relatives aboard (Ferguson et al., 2017). Furthermore, in the context of mealtimes, the literature shows that positive protective factors of mealtimes include continuity of the routines (high frequency of shared mealtimes), positive communication whether that be in talking about food or about one's day (family cohesion and connection), and commitment to the task (maintaining structure, organizing, and planning from start to finish; Fiese et al., 2006). Maintaining both cultural components and healthy elements of a mealtime routine can protect against unhealthy living seen through diet quality and weight status.

When it comes to continuity of mealtime routines, Hispanic mothers discuss the importance of wanting and valuing family dinners, but it is not always possible for families to eat together (Davis, Cole, Blake, McKenney-Shubert, & Peterson, 2016). Changes in employment status for mothers have altered how parents share household chores and responsibilities such as cooking and food preparation (McArthur et al., 2001). Though many immigrant mothers wish to maintain traditional mealtime routines, in the U.S.

time constraints have hindered them from doing so (Greaney et al., 2012). These increased time constraints included aspects of working longer hours, having less energy, and being given less time to prepare and eat food throughout the day (Greaney et al., 2012). Mothers noted that they and their husbands worked longer hours than they used to back in the home country, not allowing them to have the same schedule (McArthur et al., 2001). Although Hispanic immigrant mothers in these studies described increased time constraint due to changes once they moved to the U.S., several studies suggest high rates of shared mealtimes. In one study of Hispanic immigrant families, 78.3% of families ate dinner with their family every day (Fleishman, 2009). Although these families reported eating more meals together in their home country when in their country of origin families describe eating breakfast together three to four times which decreased to 40% of families continuing that routine. Additionally, 62% reported they ate lunch every day with their families which dropped down to 21% once they had moved to the U.S. (Fleishman, 2009). Although a majority of the families still eat together every day they are not sharing as many total meals as they once had. There are no studies examining the frequency of shared mealtimes with families in Mexico, therefore, the current study will fill the gap in comparing a population in Mexico and Hispanics in the U.S., moving beyond measures that only include self-reflection of past behaviors.

Positive communication fosters family cohesion and connection (Cook & Dunifon, 2012). For parents to continue such mealtime routines after their lives have changed due to immigration or cultural differences, they likely had some connection or had given meaning to these routines in the past. For instance, mothers that reported positive memories of childhood family mealtimes wanted to continue that tradition with their own children (Fruh, Fulkerson, Mulekar, Kendrick, & Clanton, 2011; Fulkerson, Neumark-Sztainer, & Story, 2006). Furthermore, positive communication that is clear, direct, and age-appropriate fosters quality mealtimes leading to better psychological well-being and physical health outcomes (Hammons & Fiese, 2011; Speith et al., 2001). In the context of Hispanic families, communication may look differently, as families have varied language skills where children may not understand everything the parents are saying or there is miscommunication due to language barriers, increased distractions with TV viewing or phone usage (Petty, Escrivao, & de Souza, 2013), and lower levels of communication (Fulkerson et al., 2010). These barriers may make it difficult to maintain effective and positive communication during mealtimes creating opportunities for unhealthy dietary patterns (Fiese et al., 2012; Kong et al., 2013; Patton et al., 2009).

One of the biggest barriers to a commitment to mealtime routines is difficulty finding time and scheduling conflicts with family members (Giray & Ferguson, 2018; Harrison et al., 2012). Commitment to completing quality mealtime routines can bring extra challenges for Hispanic families. Often Hispanic families struggle with financial resources, which has been associated with difficulty allocating time and energy to execute daily meals (Jarosz, 2017). Food insecurity also disproportionately affects Hispanic

Americans with rates as high as 22.4% compared to national levels at 14% (Coleman-Jensen et al., 2016; Rabbitt, Coleman-Jensen, & Smith, 2016), with these increased rates of food insecurity families are more likely to live in highly chaotic and stressed environments reporting disorganized mealtime planning (Fiese, Gundersen, Koester, & Jones, 2016). Reflecting on these three components of mealtime routines (continuity, communication, and commitment), barriers such as time constraints, increased work conflicts, mealtime media distractions, and socioeconomic stressors play a role in executing quality mealtimes among Hispanic families. Although, if there is a focus on maintaining quality and frequent mealtimes; some of these acculturation influences could be mitigated. If mothers feel obliged to conform to the new culture because of the barriers described above, then healthy practices of planning, organizing, and valuing shared mealtimes may fall to the wayside.

Therefore, cultural and family level differences are important factors to explore and understand. This study seeks to understand the perspective of Hispanic mothers from three different locations: Illinois (U.S), California (U.S.), and San Luis Potosí (Mexico). By comparing Hispanic mothers' perspectives from the sample in San Luis Potosí to the sample in Illinois and California, we can begin to unfold the different barriers and facilitators to maintaining healthy family lifestyles, particularly mealtime routines and dietary patterns.

## Methods

### Study Participants

The study participants came from a larger study, called "Abriendo Caminos" a multi-site health promotion intervention program. Data came from pre-intervention time points in Illinois and California and a substudy without the intervention program in Mexico. Six bilingual and bicultural trained research assistants conducted the focus groups. The facilitators were familiar with the protocol and presented the prompts in a conversational tone that elicited active participation, with special attention to encouraging reticent participants. Additionally, one of the six researchers and two trained bilingual and bicultural undergraduate students assisted in the analysis. The 41 participants ranged in age from 18 to 72 years, with the 72-year-old outlier being a grandmother with full custody of the target child. Twenty-six mothers were married (63%), nine were single, and six were divorced or widowed. More than half of the participants were full-time stay at home mothers (59%), with a higher percentage of working mothers in the U.S. compared to Mexico. All of the mother's country of origin was Mexico despite generational status. Mothers in Illinois and California who were born in Mexico had been in the U.S for 21.9 years, on average (see Table 2).

In the California and Illinois Education Attainment report from the U.S. Census Bureau (2018), we see the number of high school graduation rates between the two states. In Fresno, CA the overall graduation rate was 74.70% while in Champaign, IL the graduation rate was 95.10%. When looking

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specifically at graduation rates by race and ethnicity, Hispanic students are graduating at lower rates compared to their white counterparts. In California, the U.S. Census Bureau (2018) reports Hispanic students graduating at rates of 80% compared to White students who are graduating at rates of 88%. However, in Illinois, the gap between White and Hispanic students are wider where White students are graduating at rates of 90% compared to Hispanic students at 81%. In the current sample, only 17% of the sample from Illinois and 37.5% of the sample in California graduated from high school. This is significantly lower than what is reported nationally. Considering income, the Small Area Income and Poverty Estimate (SAIPE) describes the income levels in Champaign, IL, and Fresno, CA. The average income level for Champaign and Fresno was $51,466 (+/-$15,000) annually in 2017. The current sample is significantly lower than the area averages. In that, the Illinois sample has an average income of $20,000 USD annually and California participants have an average income of $30,000 USD annually.

       For families living in San Luis Potosi, Mexico, an educational study from the early 2000's reports on school attendance, drop-out rates, and the average number of years in school by state in Mexico (Novelo, 2001). For the state of San Luis Potosi, 93.5% of the population in the year 2000 was enrolled in school however 17.2% of those enrolled were failing. The average number of completed school years by the age of 15 was 7.8 years (Novelo, 2001). For our sample in Mexico, 47.6% completed secundaria, which equates to 9 years of education with 28.6% only completing primaria up to six years of education. Mexico is the third smallest partner country among the Organization for Economic Cooperation and Development (OECD) in student enrolment for education beyond secundaria with only 53% enrolled (Valle, Normandeau, & González, 2015). Considering only 23% of our sample attained education beyond secundaria, we recognize that educational attainment among our sample was low. According to the Secretary of Labor and Social Welfare in the Mexican Republic, the average income per day for those living in San Luis Potosi was 326.80 pesos a day which equates to $17 USD ("Pro Mexico," 2019). This would average to approximate 7,190 pesos monthly when working an average of 22 days in a given month. For our sample, 30% made less than 3,000 pesos a month, 35% made between 3,001 and 7,000 pesos monthly, 20% made between 7,001 and 15,000 pesos monthly, and 15% made more than 15,001 pesos monthly.  Approximately 65% of the sample made less than the average income in San Luis Potosi.

Table 2.

*Demographic Characteristics of Focus Group Participants (n = 41)*

| | San Luis Potosí, MX (*n* = 21) | Illinois, USA (*n* = 12) | California, USA (*n* = 8) |
|---|---|---|---|
| Characteristic    *N* (%) | | | |
| Mother's Age (in years; *M*±*SD*) | 34.9 ± 6.4 | 38.8 ± 13.1 | 35.6 ± 9.1 |
| Mother's U.S. Education level | | | |
| None | NA | 10 (83.0) | 3 (37.5) |
| Elementary School | NA | 0 (0.0) | 1 (12.5) |
| Middle/Jr. High School | NA | 0 (0.0) | 1 (12.5) |
| High School | NA | 2 (17.0) | 3 (37.5) |
| More than high school | NA | 0 (0.0) | 0 (0.0) |
| Mother's Country of Origin Education level | | | |
| None | 0 (0.0) | 4 (33.3) | 2 (25.0) |
| Primaria (Elementary equivalence) | 6 (28.6) | 4 (33.3) | 2 (25.0) |
| Secundaria (Middle school equivalence) | 10 (47.6) | 3 (25.0) | 4 (50.0) |
| Preparatora (High school equivalence) | 2 (9.5) | 1 (8.4) | 0 (0.0) |
| More than Preparatora | 3 (14.3) | 0 (0.0) | 0 (0.0) |
| Number of household members (*M*±*SD*) | 4.6 ± 1.6 | 3.4 ± 0.9 | 4.7 ± 0.9 |
| Married/ living with partner | 17 (85) | 4 (33.0) | 5 (62.5) |
| Single | 2 (7.5) | 5 (42.0) | 2 (25.0) |
| Divorced/Widowed | 2 (7.5) | 3 (25.0) | 1 (12.5) |
| Employment Status | | | |
| Employed outside the home | 5 (24.0) | 9 (75.0) | 3 (37.5) |
| Stay at home mother | 16 (76.0) | 3 (25.0) | 5 (62.5) |
| Generational Status | | | |
| 1st generation | NA | 10 (83.0) | 6 (75.0) |
| 2nd generation | NA | 1 (8.5) | 2 (25.0) |
| 3rd generation | NA | 1 (8.5) | 0 (0.0) |
| No. of years in the U.S. (*M*±*SD*) | NA | 23.6 ± 6.6 Range: 17 - 35 | 20.2 ± 4.7 Range: 15 - 28 |

Note: All participants' country of origin is Mexico. Generational status: 1st – moved to the U.S., 2nd – born in the U.S., 3rd – grandparents moved to the U.S. Income for each site is described in the section titled participants.

**Participant Recruitment**

Study procedures were approved by the University of Illinois and California State University, Fresno Institutional Review Boards and incorporated recommendations for research with immigrants and vulnerable families (e.g., Rodriguez, Rodriguez, & Davis, 2006; Knight, Roosa, Calderón-Tena, & Gonzales, 2009). Furthermore, the Autonomous University of San Luis Potosi submitted a letter of approval in collaboration with the University of Illinois IRB to conduct research.

Self-identified Hispanic project staff recruited 12 mothers in Central Illinois (two focus groups), eight mothers in Fresno, California (three focus groups), and 21 mothers in San Luis Potosí, Mexico (four focus groups) by direct solicitations at Hispanic related events, including community events and festivals. Flyers in Spanish were posted in public locations frequented by Hispanics and we also used snowball sampling (Patton, 1990). Mothers in Mexico were recruited through ongoing research projects with the Autonomous University of San Luis Potosi. Mothers who identified as Mexican with at least one school-age child at home were invited to participate. We specifically targeted mothers because they often assume the major caregiving responsibilities, including planning and cooking meals and feeding children, despite employment status.

**Data Collection**

Focus groups were chosen as our source of data collection for several reasons. First, this technique is sensitive to cultural variables and is often used in cross-cultural research and work with ethnic minorities (Umaña-Taylor, & Bámaca, 2004). Second, due to our limited understanding of factors that impact changes in dietary and health behaviors among Hispanic families from multiple locations, focus groups were a way to explore new ideas in a group setting (Patton, 2001). Focus groups also help researchers tap into the many different forms of communication that mothers use when discussing their dietary and health behaviors. By being able to tap into interpersonal communication among our participants, we were able to highlight cultural values and group norms. We focused on the mother's perspectives because they have typically taken the lead role in planning, shopping, and cooking meals for their household (McArthur et al., 2001), although we do recognize that fathers can be both a positive and negative influential factor in maintaining these practices healthy (Lora, Cheney, & Branscum, 2017). Therefore, our focus groups were purposely homogenous to encourage participants to talk with one another, ask questions, exchange and explore new experiences, and comment on each other's points of view. The ability for participants to process what others are saying helps participants explore and clarify their own views in ways that would be less accessible in an individual interview (Kitzinger, 1995). Nine focus groups were digitally recorded using a phantom-power, dynamic microphone. Six experienced Hispanic female research assistants (2 assistants per location) conducted all nine focus groups in Spanish. Each focus group ranged from 50 to 100 minutes long.

A semi-structured interview protocol was used with open-ended questions to elicit participants' experiences (Patton, 1990). The interview protocol included questions about mothers' mealtime routines such as cooking and eating practices, and was inspired by prior research with Hispanic samples (see Appendix A; e.g., Evans et al., 2011; Nepper & Chai, 2016). Strengths of using a semi-structured, open-ended focus group protocol include the open-ended nature of the questions that emphasize participants' perspectives. We focused on three content areas concerning food-related and mealtime practices: (a) family cooking and eating practices in their home as adults and children (e.g., similarities, changes, challenges); (b) roles families take in food preparation; and (c) cultural attitudes and beliefs about perceived barriers to healthy eating. The facilitators were familiar with the protocol and presented the prompts in a conversational tone that elicited active participation, with special attention to encouraging reticent participants. Self-administered forms asking demographic information were distributed prior to participation in the focus groups. All mothers in the U.S. received $20 USD and mothers in Mexico received $10 USD in cash as a token of appreciation. A light snack and free child-care were also provided.

**Analysis**

Three bilingual self-identified Hispanic researchers followed the six-step process by Braun and Clarke when conducting thematic analysis (2006). In the first step, researchers familiarized themselves with the data. Each digitally recorded focus group was transcribed verbatim in Spanish, translated to English, and then checked for accuracy by different trained research assistants. Then one immersed themselves with the data through repeated reading, searching for meanings and patterns. Secondly, after reading through and familiarizing one's self to the data, initial codes were formed. Initial codes were given to particular sections of the focus groups where they specifically discuss the three content areas mentioned previously. Furthermore, data displays were used to directly compare responses to the same questions across the three locations. Organized in the form of tables and matrices, data displays helped summarize data, identify patterns, and develop interpretations (Miles & Huberman, 1994). In the third step, researchers re-focused the analysis at the broader level of themes by sorting codes and their extracts into potential themes. Fourth, once there were concrete ideas of the major themes- this step was used to review them by rereading the data and extracts under each category ensuring fit and enough data to support the themes. Then we took a step back and considered the themes according to the entire data allowing for the further establishment of the themes within the larger context and to evaluate if any excerpts are missing. In the fifth step, themes were identified and defined by determining what aspects of the data capture each theme. Lastly, the results section define, describe, and give a variety of examples to demonstrate each theme (Braun & Clarke, 2006).

Multiple strategies were used to enhance data quality and integrity. The research team during data collection was led by a European American faculty member who has conducted research with ethnically diverse families in the U.S. and Mexico. Field staff (e.g., recruiters and interviewers), were Hispanic bilingual/bicultural graduate and undergraduate students who underwent extensive training. Next, the semi-structured interview protocol ensured that participants in each focus group were asked the same questions, while the open-ended questions allowed participants to respond to questions in ways that reflected their unique family experience. Six culturally competent Hispanic interviewers who matched on ethnicity and sex with participants conducted all of the focus groups. To further ensure the quality of the analysis process, several steps were undertaken. One Spanish-fluent member of the research team transcribed each focus group in Spanish, and a second Spanish-fluent research assistant checked each focus group transcript for accuracy. Then a third team member translated each focus group from Spanish to English. A fourth dual-language speaker checked the final English transcripts and worked with the team to resolve grammatical and semantic inconsistencies. Each interviewer also provided written field notes for each group, providing additional insights about social and paralinguistic dynamics. The main research analyst is a graduate student who has taken several qualitative methodology courses and has published papers using focus group data. The additional two assistants have been trained by the graduate student and have helped translate the focus groups from Spanish to English; therefore, these two assistants were well immersed in the data and aware of the project goals. Furthermore, two PI's (BHF and MTG) oversaw the efforts of this project. Data quality was enhanced through peer debriefing, an activity aimed to provide an external check on the inquiry process by involving peers to explore potential bias and test working hypotheses (Lincoln & Guba, 1985).

To ensure methodological integrity, each step of the process was documented using memos. Memos are written elaborations of our ideas about the data; each of the research members created a memo after coding to help move the analysis to a deeper understanding, expand descriptive explanations to grasp at meaning, and allowed for an audit trail (Strauss & Corbin, 1990). Upon completing each stage of coding, members met to discuss the adequacy of their coding to ensure they were capturing forms of diversity in the data, understanding each other's perspectives and discussed how the findings are grounded in the evidence (Levitt et al., 2018). When discrepant codes arose, each team member described their reasoning behind the code and then as a team all members came to a conclusion on the accurate code and proper meaning of the placement. Furthermore, as a team, each member checked the initial codes of another to ensure reliability among *apriori* categories. Lastly, data display examples and a process visualization was created to ensure transparency in the analysis process.

**Findings**

The thematic coding analysis allowed us to find three major themes within the focus groups. After each step of the Braun and Clark Thematic Analysis plan, three trained team members discussed their codes, findings, and emerging themes (2006). Weekly memos were created to summarize the task, findings, and connections made through discussion of each step. Individual team members came up with their own set of themes with direct quotes and definitions to explain those themes. During team meetings, members collaborated and distilled smaller themes into larger concepts. Team members made concept maps to help understand how smaller themes and ideas fit within a larger story. Finally, the three major themes were chosen by comparing and contrasting ideas that stemmed from the data. The three major themes include: 1) Mom shops and cooks the food, but kids and fathers command the food, 2) Family Meals are different than before, and globalization is a contributing factor, and 3) Family time has shifted to weekend endeavors eating out at restaurants and fast food chains. In the first theme, mothers act as the main leader in shopping and cooking for their family, however children and fathers are their number one influencers when it comes to the decision-making behind the scenes. However, children and fathers are often absent when it comes to helping shop and prepare the food. In the second theme, there is a cultural shift due to the effects of globalization and a modernized world as mothers compared their own childhood experiences to their role as mothers. There are differences in food availability and access, new technology development has changed mealtime communication and eating, and working moms have struggled to maintain traditional and healthy eating behaviors. In the third theme, mothers take advantage of the weekend to rest and be together with family, so although there is a focus on the family they often choose to eat outside the home at restaurants or fast food restaurants. Additionally, there were minimal differences due to location and how migration has influenced several aspects of family life, which are specified throughout the themes.

**Mom Shops and Cooks the Food, but Children and Fathers Command the Food**

All of the mothers who participated discussed how they are the main person in the family to cook and shop. Saying things like, "Me! I'm in charge of all that (*CA*)," or "I am the one that cooks (*CA*)," and "I'm the one that cooks and I'm the one that goes to the market (*CA*)." Even across the two other sites, mothers state they are the ones who cook and shop, "Well, I live alone with my son, so I have to do it [shop and cook] (*IL*)," "In my case, I cook and I do the shopping (*IL*)."

Mothers in Mexico are in agreement, "during the week no one helps me [shop or cook], during the week normally I decide and I know what I'm going to make because they are not there, so there is no way for them to give me a hand (*MX*)." Another mother states, "To buy vegetables and the fruit I just go, I don't include them [my family] and for cooking I do it. My husband works all day and he arrives very late and when he gets home the food is there (*MX*)." Evidently, mothers are contributing a major amount

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of their time and efforts to provide food and meals for their family, however, most mothers recognize that they are not the only ones contributing to the planning and decision making around mealtimes.

When asked what determines that which is served for meals, several mothers said they were in charge, often deciding and making the ultimate choice of what to buy and what to make. For example, a mother in California states, "when I cook sometimes, I forget that one [of my children] does not like fish or things like that so I will adjust what I make but I'm the one that decides." However most mothers explained that her children often have input in what they make for dinner but she also decides what she likes, "sometimes me [I decide] or also sometimes my son says, 'Mami, we want to eat this' and sometimes I make what I want to make to eat and sometimes I make what they tell me to make (*CA*)." In Illinois, mothers decide by what they are craving and by what they have in the home, "I go shopping in larger trips… it's better to plan for two or three days, but sometimes you crave something else or you're missing a vegetable. Then you cancel what you planned and figure out how to make something from what you have (*IL*)." While other mothers acknowledge they are influenced by their family's preferences. For example several moms talk about how they decide what to cook, "my kids tell me what they want to eat (MX)," "they ask me to cook what they like (*MX*)," and " they tell me 'mamita cook this or that' and if there aren't any [ingredients] one needs to improvise with what you have (*MX*)." Another mother talked about the complications that could occur if she does not cook what her kids prefer,

> "I mean I choose the food according to the preferences of my kids because if I make for example a soup of purslane, well they are not going to want it. So I try to always make soup of pasta, that which my kids like and which my husband likes, so practically I decide what we are going to eat according to the needs of them (*MX*)."

Mothers further discuss how much their family influences their eating style across the three sites. Sometimes mothers become frustrated with their children because of the increased pickiness of their dietary preferences and others complain about the negative influence their husbands have on choosing healthy lifestyles.

**Children rule the kitchen but do nothing to help.** As described, children are a major influencer in what is being purchased and made for meals at home. Apart from mothers in Mexico, those in the U.S. mention similar behaviors, "Well I try to make what the kids eat most. What they like the most and what they will also eat (*CA*)." Another mother states, "Well I always think about what they [kids] will eat because they are a bit squeamish and picky. I think about what they will eat and from there I decide what I will cook tomorrow, and I try to make what they will eat (*CA*)." Mothers in Illinois responded in a similar fashion,

> "The times when we cook it's something that my daughter asks for. If she asks for something, we go and buy what we need, but we never have it at home because no one cooks, so it's something specific that we are going to buy. If it's on sale or not, we buy it anyway (*IL*)."

Mothers talked about how shopping with kids can become burdensome because they ask for foods and it can become difficult to deny their requests. Therefore, mothers try to strategize and negotiate with their families to provide healthy options and limit junk foods by strategically planning their shopping trip.  For example, "it's different when you go [shopping] with the kids, you buy different things." In response to that comment a mother stated, "Yes, me too, I prefer to go alone." Then another mother contributed saying, "because it's that they always want to get the cookies and bread (*IL*)" Then with laugher two other mothers agreed: "yes chocolate cookies," "and those Cheetos (*IL*)." Consequently, mothers have stopped bringing their kids to the grocery store to prevent them from buying unhealthy foods, for example, "my daughter used to accompany me sometimes [to the store] when my son doesn't. My daughter is four and my son is eight. He is desperate and grabs things, for that no more do I bring them (*IL*)." Another mother agreed, "well in my case, it's the same…they sometimes put everything they like or like candies and cookies [in the cart]. I don't want to bring them because they are putting everything in the cart. It's worse when you go sometimes hungry and they want everything (*IL*)."

Children are typically asking for unhealthy food options coming from their spheres of influence. For instance, mothers typically blame the school. A mother in Mexico states,

> "well I say it's the candy that they sell at school because for example, they don't sell a cup of cucumber with lime, they sell the fried things and everything bad… they should prohibit it in the schools, it's why in Mexico there is such a problem with childhood diabetes."

Another mother recognized that the television often influences what children want, for example in reference to TV ads one mother says, "they see the pizza [on TV] and they want pizza, they see the fries and then they want the fries (*MX*)," or "the hamburgers on television later makes them ask for McDonald's or Burger King (*MX*)." It is similar for families in the U.S. One mom in Illinois discussed how her son's preferences changed over time due to what was given to him at school:

> "When he was in daycare… they gave him a lot of pizza, mac n cheese, everything. After when he went to school, it was difficult to make him food because he would eat that food! When he wanted to eat he would tell me that he's craving a pizza, a hamburger, a hotdog. I tell him you have to eat vegetables, a piece of cheese, a glass of milk, or beans, and now that he is in school his appetite has changed (*IL*)."

While there are these challenges only a select group discussed the strategies they used in the home to promote healthier eating, for example, "we used to drink a lot of soda, but now we put a jar of water on the table and we put it in the fridge that way it's always there as a reminder (*MX*)." Another family stated a similar strategy:

> "My husband wanted to lose weight and what helped is that we always have things on the table, the water or fruit. If it's in the refrigerator things go bad and are not consumed because the cookies are closer. And that helps you because you pass it and there they are, the healthy things, washed and cut up (*IL*)."

Another mother confirmed her strategy suggesting, "It's true because the children see the fruit on the table and crave it. I have seen my children with an orange and I even had a craving for one. Especially when I cut them they will eat it (*IL*)." Although these strategies help some mothers negotiate and limit unhealthy foods, kids still have a lot of influence on what is purchased and cooked for mealtimes. Since children are huge influencers on food preferences and shopping, kitchen chores and their involvement in cooking should match. However, there is often a disconnect with the types of chores they are assigned.

*Children are assigned household chores but not kitchen chores.* When asked do your kids help you with cooking or mealtime planning? Mothers say, "no, rarely, from time to time (*CA*)," or "very rarely (CA)." Mothers brought up the other several types of chores that children help with around the house but often not do not mention cooking or mealtime planning. For instance, "in my house my son cleans his room and vacuums, my daughter picks up her clothes and cleans her room (*IL*)." In Mexico it is the same, "in the morning I say I already washed the dishes now you [to kids] mop the dining room and kitchen and I'll clean the main room and the aisle and he makes his bed." Another mom suggests similar chore distribution, "for my kids, one has to wash the dishes, other makes the beds and sweeps, and the other one has to mop and clean the living room. We divide the chores and it varies by day because they fight on who does what chore… so they rotate (*MX*)."

Some children may help with kitchen chores but it is often simple tasks, for example, "my kids wash the fruit and when I arrive from work they already have the dishes washed, mopped the floor, and are dressed for bed…when I arrive nothing more than brush them (*MX*)." Other moms recognize the limitations of their children in the kitchen, "my two children of 6 and 4 help me to cook until I tell them 'move aside so that I can finish cooking' (*IL*)." Another example suggests moms can be a bit fearful to let their children in the kitchen, "when I want to make fried eggs, my son wants to make them in the pan, but what scares me is that he can burn himself (*IL*)." Additionally, moms think it can be dangerous for children to help, "the kids do not help much with the food because the knives or something hot, to be honest, is dangerous (*IL*)." Children are helping around the house but not in the kitchen, mothers seem to assign other types of chores due to fear and safety. Children continue to be a driving force in mealtime patterns and cooking, fathers as well have a lot of input to what is being served and dictating how their wives or partners manage these routines.

**Are fathers the bad guys?** When asked what determines what you make and what you choose to buy, children came up as the number one influencers, as described above. However, when asked what challenges prevent you from making healthy changes for your family in food choices and mealtimes, most mothers blamed the father. For example, one mom feels obligated to make what her husband wants to eat,

> "I almost always ask my husband what he wants to eat for the next day, and depending, I already know the tastes of my daughters and more than anything also of my husband because he is the one working, I have to attend to him and to make him something that he likes (*CA*)."

Another mother says it is her whole family impeding their health,

> "I have a girl that is 8 and one that is 15, also my husband. Like I am trying to eat healthy and make them do it with me, but it's difficult for me because one likes one thing to eat and the other wants another thing and I give my husband another thing and I eat another thing, and so it's like 3 or 4 meals (*CA*)."

In Illinois, mothers were quick to mention their husbands as impeding factors in making healthier changes. For instance, "honestly he [husband] is not used to eating salads. That is, he, only eats vegetables or tomatoes in stews." She further explains, "I wanted to make a drastic change because of health issues such as high blood pressure and migraines and all that. So he says we will eat healthier… but it cost me a lot of work with him because we were used to a mountain of rice and a mountain of meat and eating until you are done." Another mother states that her husband often buys treats, "well my husband does a lot [to impede our health], he buys bread refined sweet bread that reminds me of bread I like from his village in Mexico." Another mom recognizes this hardship too, "we try to eat a little better but what impedes me a lot is that my husband buys a lot, a lot of food like bread that is fattening." One mother recognizes that her husband is not healthy but she still tries to be,

> "Well in my house, I eat healthy but not many vegetables but not as many sweets or candy. Pizza yes, but I am not one to eat like that although my husband is, he loves to. When I bring home candy, I say these candies are only for our daughter and in a week they're gone…He likes bread with cream and peanuts and he buys it for our daughter but he eats it instead."

These realizations are similar for mothers in Mexico. One mom states that her husband does not like vegetables and another agreed, "my husband doesn't like vegetables either but I tell him, I am not giving you poison so you have to eat it all." One mother's husband does not want vegetables because he is the thinner one in the family, "my husband is thin, my son and I are the only chubby ones that's why he doesn't want to eat veggies." This push back from fathers and the dietary patterns they are accustomed to often impede and challenge what mothers are trying to implement at home. Therefore, it can be critical to gain the support of their husbands in making healthier lifestyle changes.

**Family Meals are Different than before, and Globalization is a Contributing Factor**

A main facilitator of unhealthy habits that contribute to obesity trends is globalization. The mothers in this study have grown up in an era with a rapidly changing food landscape that they are unable to navigate due to a lack of education on how to do so. When they were little, their mothers would cook with natural products and the family would take time to sit together at family meals. Now, frozen food and preservatives have usurped the more natural products of the past. These changes are noted especially in comparison to their lives as children when they were growing up. For example, several mothers discussed how their mothers took the time to make healthier, natural, and home-cooked meals whereas today their experiences as mothers are different. A mother from Illinois said, "It's different because, in Mexico, the moms don't work, they stay home, clean the house, and here everyone has a job and we don't

have time to cook what we want, we need something quick." The responses were similar in Mexico, "all the meals with my parents were with vegetables, chicken, soup, and water but now… the truth is the easiest is soda and that which is fried and sometimes I try not to make things like that but they don't want vegetables." Additional examples and how they fit into larger globalization concepts are explained.

**There is less fresh food due to changing environments and resources.** When asked how family meals are different then when you were a child, mothers discussed how cooking patterns are different and what is available has changed. For example, a mother in Illinois talks about the changes compared to life in Mexico,

> "In my case, well, I believe that the way you live changes. You come to your country here, maybe you come making the same food, but here the food is different. Although there are some of the same products here, it changes. You make it the same as you did in your native country but the flavor is different. I also feel that it is different in nutrition. Like the produce in my home country are fresher, the meats are newly fresh. But not here, ice cream or vegetables have a lot of chemicals."

Another mother shares a similar perspective, "I said to my friend, well we eat the same food but it doesn't [taste] the same because there in my village [in Mexico] everything was from the harvest. The vegetables, the potatoes, beans, corn, oats. You eat the same here but here it is frozen (*IL*)." Mothers mention how frozen foods are more common here, "you grab all your fresh vegetables, same with chicken they're almost alive when you go to shop there [in Mexico]. Here [in the U.S.] everything is frozen, fish too was fresh when you went to the market (*IL*)." Beyond the freshness of food, some moms recognize that the type of food has changed from less traditional dishes to quick meals more common in the U.S. Such that one mom said, "I, for example, remember the foods in my house [growing up] they were rice, soup, beans, but now we want pizza or fast food. It's changed like that (*IL*)."

Moms often described how the environment has made them choose different foods especially if their children are asking for new foods, for example, "my daughter doesn't like anything that's prepared at home. American food is what she eats (*IL*)." Comparably mothers in Mexico describe similar experiences despite their lack of migration. For example, "now we have a lot of junk food and it's what we find in the supermarkets. Before everything was more natural (*MX*)." Another mother shares a similar experience with more specific examples, "we eat like instant soups, canned food, packaged juices, and before everything was more natural (*MX*)."

Mothers recognize that food options are different but also decide to opt-in for easier and quicker options. For instance, one mom stated, "Before they didn't sell such things like now. They sell junk food, like sabritas, fried potatoes, gorditas. It's not the same (*MX*)." Therefore many said, "it's healthier to eat a homemade soup than an instant soup, I know that but sometimes we go for the easiest option, we go for instant soup and that's not okay (*MX*)." Another example, "yes, we go for ready to eat food and one that's easier to eat like hot dogs or hamburgers (*MX*)." The common thread found is that families recognized,

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during their childhood they had access to fresh food from their local farm or ranch but that is less common now. "Now we are going for the food that is preserved or everything in the style of fast food. Before the food was healthier… it came from the ranch like cactus, tunas. Everything was more natural and now everything is more preserved (*MX*)."

**Technology and electronics become distractions.** Technology was often a common practice paired with family mealtimes. Although mothers discussed that technology such as television, phones, or tablets would impede family time during a shared mealtime it was commonly allowed. For example, this mother described what family mealtimes look like, "at times, we sit together, and other times one sits at the bar in the kitchen and the other at the table. Yes we do have conversations and joke and we discuss things, but the television is turned on (*CA*)." Another mother described that they do eat together but also with the TV on, "each day our family sits at the table and sometimes we have the TV put on, so we listen to that too (*CA*)." A mom in Mexico described a similar scenario, "Yes [we eat] with the TV on. I don't want to lose the telenovela. Well, and the little ones don't want to miss the cartoons (*MX*)." Although it is common among some families, often mothers recognize their frustration with technology, for instance, "it is different here, they have their tablet or their cell phone or video games and are eating. I cannot figure out how they are playing and eating. I tell them to sit and eat but no they play (*IL*)." Some moms use technology as a reward and have strict rules around this issue, "I turn off the TV as we are eating. If the TV is on they are only paying attention to it and I like to talk to them, ask them what they did (*IL*)." Another mom said, "Well I punish my son if he uses his phone at the table (*IL*)." Additionally, one mom explicitly mentioned how she noticed technology distancing her family,

> "In my house, I have a rule from long ago with my kids that when one eats you don't turn on the television or use your phone, because we have the internet and each one grabs [their phone] and leaves and it's very bad. Even if the telephone sounds with a message or whatever, we just hurry up and eat so we can get up from the table. Because there was a time in everyone was on their phones while we ate and it's very bad, it loses the family unity (*MX*)."

Lastly, one mom recognized that technology was a new change in their family and discussed how it was different when she was a child, "I told my mom, it is a big difference now before there was not so much technology and we respected our parents [during mealtimes] (*IL*)."

**Work barriers and the changing workforce.** The circumstances of today are much different than before. Due to the influence of changing gender roles over the past few decades, many mothers now find themselves extremely busy out in the workforce. Today's nuclear family is on a tight schedule of work, school and extracurricular activities for the children which does not leave much time to develop healthy eating habits. Most participants even describe that their mothers never worked and were stay at home caregivers, often having more time to cook, clean, and take care of the kids. For example, "Until 19 years ago, I never worked and always made food. My family would arrive and the food was ready. But

here [in the U.S.] it has changed because I work and now I don't have time. So we eat more outside of the house now (*IL*)." Another mother described how the change occurred after she moved, "it's different here because, in Mexico, the moms don't work, they stay home to clean the house and here [in the U.S.] everyone has a job and we don't have time to cook what we want, we want something quick (*IL*)." Additionally, when mothers work they find it harder to cook at home so they opt in for quick meals, "when I go to work, I want to pick up a pizza instead (*IL*)." Another example, "the barriers are time and money. It's not like before if you both work you come home to cook what is fastest, you want what is healthy but you can't always do it (*IL*)."

Much of the pressure to work is for an increase in income, "the biggest barrier is lack of money, if I didn't work it would be another thing, we would have more time to dedicate to my kids to cook for them more healthily…to eat healthily it costs, for me that is the major problem, the economy (*MX*)." Conflicting work schedules have even limited the frequency of shared mealtimes. For instance, one mother describes, "Well we eat together on the weekends because on weekdays some of us work. I work different shifts compared to my husband but on the weekends we try to eat together (*MX*)." Another in California stated a similar experience, "we don't eat together anymore, now that one goes to work." Or often fathers have longer shifts and therefore shared mealtimes have to be split up, "If my husband has to work late, then my kids and I try to eat together daily (*CA*)." Similarly, in Illinois, one mother explained, "it's very rare that I eat with my husband, he comes home around nine or ten pm. So, I eat only with my children."

**Family Time has Shifted to Weekend Endeavors Eating Out at Restaurants and Fast Food Chains**

Several families talk about continuing shared mealtimes but often on the weekend when everyone can get together and there are fewer obligations that get in the way. For example, one mother explains there "very few times when we eat all together, on the weekends yes, sometimes, but often no more than my little girl and their father (*CA*)." Mothers talk about trying to get more family together on the weekends, "usually the weekends are when the family reunions can be done and sometimes someone cooks and sometimes someone brings fast food (*CA*)." Another mother added to the conversation and agreed saying, "yes or bring Chinese food or something like that to family gatherings." One mother has shifted away from making traditional meals and often goes out to eat instead, "almost always we eat out and if we make something at home its almost never something traditional Mexican (*CA*)." Families in Illinois have similar habits, "I don't cook Friday, Saturday, and Sunday. I'm too lazy for it so we usually pick up something like fast food (*IL*)." Another five mothers in Illinois agreed and said the weekend is the best time to get together as a family. One family also enjoys eating out but they try to grill out when the weather is nice, "sometimes one or two days we eat out, but it depends if it is nice weather, then we go outside to make grilled steak, grilled cactus, corn, things like that (*IL*)." Mothers in Mexico have similar

experiences in that they are not able to eat with their husbands as they work late during the week, therefore they make an effort to eat together over the weekend often with extended family as well,

"well during the week its different because my husband is not there during the meal hour, neither is he there in the morning so I eat breakfast alone. Though at mealtime my husband isn't there, but my kids are there. Only on the weekends, on Sunday we are all there for the three meals (*MX*)."

Other examples include, "Sunday is the only day that we are together, we get to eat breakfast together, and we are together all day (*MX*)," "It's nothing more than Fridays when we get together with my family, but it's only Friday almost (*MX*)," and "In my case it's Saturdays, we get together with more people. We go with my parents-in-law and eat together because my parents live further (*MX*)." The stark difference in these practices is that families in Mexico appear to go out to eat less often. Although there are families that pick-up specialty items for weekend meals such as burgers, tacos, and grilled chicken, "on Saturdays or Sundays we don't want to make anything so we go for tortas or hamburgers (*MX*)," or "we also eat tacos and grilled chicken out [at restaurants]." It is often less common due to costs and larger household size, "since we are six, well if I buy them tacos…well, it's just more feasible to make them at home because we are a lot in the family so I buy them but very rarely (*MX*)."

## Discussion

The purpose of this study was to understand family barriers and facilitators in maintaining healthy lifestyles patterns particularly around mealtime routines and dietary behaviors. More specifically, we noticed how families negotiate mealtime patterns of planning, food purchasing, cooking, preferences, and structuring quality family time. We first recognize that mothers do the majority of the shopping and cooking, but the remaining family members do a lot of the asking. Asking and commanding for their own food preferences, putting up a fight to eat certain food groups such as vegetables, yet doing little to help complete these mealtime routines. The distinguishing factor between children and fathers was that children provide their input in food preferences and mothers are constantly considering what their children would eat and what they want to eat. Fathers, on the other hand, were described as a barrier in making healthy changes. Especially since fathers have the ability to purchase extra snacks and often unhealthy treats, navigate their own food preferences, and mothers want to fulfill their partner's wishes. Secondly, family meals were different than their childhood experiences across all sites. Often mothers in the U.S. attributed changes to their behaviors and experiences because of migration and their new life in the U.S. compared to growing up in Mexico. Several changes were attributed to new barriers mothers faced, that have been tied to the concept, globalization. These changes include food access and resources, increase technology use around mealtimes and time barriers due to an increase of working mothers. Lastly, maintaining daily shared family mealtimes has become difficult for some families due to conflicts discussed above, therefore families have shifted their shared mealtimes to the weekend when everyone

can be present. However, these times are often eating out at restaurants and fast food chains. Although there are some differences by site, these few patterns are often over masked with the idiosyncratic nature of unique family patterns and experiences.

As described previously, globalization is the concept that modern life is changing in the Majority World through changes in interconnection via technology, adoption of open and unfettered trading markets, movements of people to various countries for work and trade, and the increase of movement in goods and services around the world (Giray & Ferguson, 2018; Pais, 2006). The added effects of modernization, resources and food availability, employment of women outside the home, and the changing of spaces for some families (i.e., immigration), these sociocultural influences whether remote or local may be contributing to the way families are negotiating shared mealtimes. Migration to another country may mean leaving extended family behind. These changing environments and the effects of globalization allow for different food options from around the world. Past literature seeking to unpack the concept of remote acculturation stemming from globalization practices suggest that changes can occur due to engaging in the second culture's food, tourism, and transnational communication (Ferguson & Bornstein, 2015). Furthermore, remote acculturation can have implications on life satisfaction and psychological distress, in which integrated strategies have higher life satisfaction and lower distress than other acculturation strategies (Ferguson & Adams, 2016). Therefore, to understand how geographical changes and remote cultural influences impact family mealtime behaviors, we first wanted to gather information on the patterns that take place in the home and if changes stem from how mothers grew up to what their practices are now. Since mothers often play a fundamental role in household shopping and cooking, which is noted even beyond our sample (McArthur et al., 2001), they can become natural household leaders regarding dietary health and mealtime routines. Both children and fathers make requests and challenge the mother's power in purchasing and cooking, which can be a common barrier especially between children and mothers (Stott, 2015). These annoyances from children in asking for unhealthy food choices, putting snacks or foods in the shopping cart without permission, or refusing to eat certain foods can lead mothers to utilize different strategies. The most notable strategy from this study was that mothers chose not to involve their children in these processes. They no longer brought their children to the grocery store or prevented them from helping in the kitchen due to fear and safety concerns. Although these strategies may eliminate the added stress and conflict between children and parents regarding mealtime planning behaviors, they can also prevent teaching opportunities. Several studies have found that when children help with the cooking, they are more likely to try the foods they helped prepare especially vegetables (Hersch, Perdue, Ambroz, & Boucher, 2014; van der Horst, Ferrage, & Rytz, 2014). Children also learn by example, when children partake in grocery store trips, they often influence what is purchased, if parents negotiate and teach shopping tactics, children have the potential to

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increase healthy food purchasing (Haselhoff, Faupel, & Holzmüller, 2014; Wingert, Zachary, Fox, Gittelsohn, & Surkan, 2014).

Historically mothers have served as primary caregivers, as seen in this study, however, in recent decades family-based gender roles and household responsibilities have changed (Bianchi, 2000; Khandpur, Blaine, Fisher, & Davison, 2014). These changes have occurred due to increasing employment outside the home of both mothers and fathers (Bianchi, 2000; Khandpur et al., 2014). Such that children's time with fathers has not only increased but fathers have also begun to take more responsibility in organizing their children's meal or feeding their young children on a regular weekly basis (Mallan, et al., 2013). However, these changing gender roles may look different for Hispanic families. There are a number of studies considering Hispanic father's role in household meals that suggest, fathers often disagree with mothers and can act as a barrier in promoting healthy food preferences and preparation routines (Dave et al., 2017; Lora et al., 2017). In one particular study, fathers were described as unsupportive and disagreeable when mothers plan healthier food/meal options (Lora et al., 2017). Fathers would contribute to the availability of high-calorie foods in the home especially when they worked at fast food restaurants or during trips to the grocery store (Lora et al., 2017). Thus, support and reinforcement from fathers can be a crucial step in promoting healthy living. In the current study, most mothers put some blame on their husbands or partners for preventing them from having optimal healthy mealtime routines. Spousal support may be necessary to work together and plan ahead in mealtime routines. As one study showed that healthy weight families would often take extra steps to work together and plan ahead compared to families classified as overweight or obese (Nepper & Chai, 2016).

When exploring how these behaviors and tactics have changed over time, cultural factors through acculturation processes was an overarching feature that impacted mealtime routines. Globalization encompasses an "exchange of people, products and processes throughout the world, and about the consequences of that trade" (Prilleltensky, 2012, p. 613). Meaning that through this process of exchanging information via technology, products, and migration, beliefs, ideas, and behaviors are spread across the world. Changing environments can especially allow for the changing of behaviors and norms due to differences in location, beliefs, behaviors, and values, seen through an acculturation process with immigrant families. However, nonmigrant families may also adopt new ideas and customs in a remote sense. Through a process called remote acculturation, in which nonmigrant families experience a type of acculturation due to "indirect or intermittent intercultural contact with a geographically and historically separate culture" (Ferguson & Bornstein, 2012; Ferguson et al., 2017, p. 158). In the current study, we recognize that families in the U.S. may be experiencing the effects of globalization and direct acculturation which impact their behaviors around mealtime routines, whereas families in Mexico may be

experiencing the effects of remote acculturation since they describe a change of behaviors due to larger globalization influences and access to U.S. culture.

The biggest barriers of maintaining healthy mealtime routines and dietary patterns including the availability of resources, technology as distractions, and time conflicts often due to work schedules. These barriers were similar for families in the U.S. and in Mexico. Mothers described a change in food options, from fresh and local foods to more frozen and instant food options. Often families who have moved to the U.S. talk about moving away from farms or having less access to locally grown foods because they are expensive, however, families in Mexico discuss similar issues in that now there is more access to easy, quick, unhealthier foods. Preparing instant meals such as frozen pizzas or soup can be less stressful especially with the increase in working mothers and limited time to prepare meals from scratch.

Mothers in Illinois and California are working more than mothers in San Luis Potosi, but we do notice that all sites talk about how time barriers due to work have made it harder to maintain daily mealtimes, cooking from scratch, and keeping it all under the budget. The increase in work conflicts is consistent with previous literature (Greaney et al., 2012; McArthur et al., 2001), however, now more is understood about families in Mexico. In Mexico, fathers are often the ones working longer hours and therefore cannot often partake in daily family mealtimes. When families do get together to eat though, it is often alongside the television.

A critical component to globalization and changing values is technology. Technology can often be used as a form of connecting with family members that live away or to learn about different cultures across the world, but it is often used as a form of entertainment and distraction (Andaya et al., 2011). Especially during mealtimes, having the television on or using phones to play games or connect with others outside of the table can be a form of distraction and detrimental to one's health (Tumin & Anderson, 2017). In the current study, mothers realized that technology was a common practice paired with family mealtimes. Some enjoyed it and partook in watching their programs with their families while others were frustrated with not being able to manage their children's behaviors around technology. Frustrated mothers talked about how it impedes quality family time during meals, often distracting conversation, eating, and was seen as disrespectful. Technology was not something that many of the mothers dealt with as children and therefore understanding their perspectives is helpful for directing families on how to navigate these concerns. Modernization in forms of technology, increase of working mothers, and a variety of goods and services in food options has influenced how mothers navigate mealtime routines.

As described, the increase in working mothers and conflicting schedules due to work has shifted when families can gather for shared mealtimes. Several families discussed the importance of continuing mealtimes for quality shared family time, however, most families have moved this time to the weekends

when all family members can get together. Nevertheless, weekends are also a time when families want to eat out. Mothers seem to want a break from cooking and other household duties especially if they were gathering with additional family members or friends, so they would choose to eat out. Although these can be times when the families feel unified and connected, eating out has been associated with higher total energy intake, eating fewer micronutrients, and consuming more fat (Lachat et al., 2012). Comparing families from Mexico, we notice they also prioritize family time and shared mealtimes especially on the weekends when all members can be present but several recognize that eating out can be costly and burdensome on finances especially with larger families. Therefore, they either do not go out or several of them pick cheaper specialty food items.

Mothers have the intention to provide healthy meals and food that is satisfying for their families, although mothers do struggle with their families' opinion and external factors such as time, technology, and resources. Therefore, these perspectives on how cultural factors and influential global ideas impact these families provide more information to best support Hispanic family health. Despite the few differences by site, we recognize that Hispanic families in both the United States and Mexico deal with similar negotiation issues and concerns. By recognizing these similarities between sites it could be beneficial to adapt successful health promotion interventions evaluated in the U.S. for Mexican audiences. For example, the program *Abriendo Caminos* has been successful in improving family dietary behaviors and family health promotion routines (Hammons, Wiley, Fiese, & Teran-Garcia, 2013; Villegas, Hannon, Wiley, Luna & Teran-Garcia, 2017), therefore, these types of programs can be altered to directly target Mexican families in Mexico but since they have shown promising results similar expectations could be seen. Additionally, finding ways to empower mothers as leaders, gain the support of fathers, and strategize against unhealthy global factors can be the next step in combatting health disparities among Hispanic families. Recruiting fathers first could allow for an increased involvement of the entire family in a community intervention (Panter-Brick et al., 2014). Although we recognize that fathers are not the household leaders when it comes to shopping and cooking they have a big role in commanding the food, therefore by empowering mothers and fathers to work together as a team to promote healthy behaviors, changes can begin to occur. Researchers and practitioners should consider these implications when wanting to support Hispanic families create lasting health behaviors changes.

**Limitations**

A few limitations should be considered. First, although we found slight differences across the sites, we recognize they are not the completely homogenized sites, to begin with. In the U.S. samples, we targeted smaller towns due to the goals of the larger study, *Abriendo Caminos*. For the sample collected in Mexico already established collaborations allowed us to collect data in an urban setting. Despite these differences, the demographic information presented across all sites show clear similarities among the

groups. Secondly, although we have demographic information on generational status and number of years in the U.S., we are unable to identify the individual speakers in each focus group to match their demographic information; consequently, we cannot compare differences due to time or status. Although, we were able to classify differences by site location and can compare demographic information due to site.

**Innovation**

Despite the number of limitations suggested this study brings unique elements that bridge a number of gaps in the literature. First, this study compares Mexicans living in Mexico and Hispanics living in the U.S., with the majority (80%) being born in Mexico and migrating to the U.S. and the other 20% having ancestors from Mexico. This allowed for a comparison of perspectives from mothers that provided some cultural insight to behaviors and customs in Mexico while being able to understand differences post-migration and otherwise. These data gave insight into how modernization plays a role in family dynamics and mealtime behaviors. Secondly, acculturation whether remote or local is an important topic concerning Hispanic populations and has numerous links to health outcomes. Therefore, exploring behavior changes in mealtime and dietary practices due to migration and cultural elements, these mother's perspectives provided an understanding of barriers and facilitators of healthy living for a population with the highest obesity rates.

**Chapter Four: Study 2:**
**Examining the Mechanism in Which Mothers' Bidimensional Acculturation and Mealtime Routines Influence their Child's Health Outcomes Among Hispanic Families**

## Introduction

Acculturation, the process by which two or more different cultural groups come into contact allowing for changes and negotiations in one another's identity, values, and behaviors (Sam & Berry, 2010); has shown to affect numerous health outcomes (Abraído-Lanza, Echeverría, & Flórez, 2016; Sam et al., 2016). Acculturation is a complex theory because the process of changing spaces and encountering new cultures creates opportunities to change and adapt daily patterns and routines. It is often these geographic changes that truly affect health outcomes such as dietary quality and weight status. Specifically, mealtime routines are a family pattern that directly relates to what one eats and how families interact around food (Fiese et al., 2012). Furthermore, the quality and frequency of mealtime routines have been found to protect against childhood obesity (Fiese et al., 2012). For Hispanic families, mealtime routines are of high importance because of the value, *familism*, a term relaying the significance of close family relationships (Ayón, Marsiglia, & Bermudez-Parsai, 2010). Therefore, this study will seek to expand on explorative findings of study 1 by testing indirect, direct, and main effects of acculturation on child's health outcomes (dietary quality and weight status), by examining self-reported measures of acculturation and protective routines with Hispanic mothers in the United States (U.S.).

## Literature Review

**Acculturation and health outcomes.** Over time it is common for immigrant families to adopt American behavioral norms for health status and risk (Gorden-Larsen, Mullan, Ward, & Popkin, 2003). However, reinforcement and maintenance of native cultural traditions and norms can slow the assimilation process, meaning when individuals have a higher orientation to the second or new culture while not maintaining their origin culture (Gorden-Larsen et al., 2003). More specifically, multiple studies using the Hispanic Health and Nutrition Examination Survey and the National Health and Nutrition Examination Survey (NHANES) data have shown that higher assimilation, is associated with lower fruit and vegetable intakes and higher consumption of sugar, sugar-sweetened beverages (SSBs), and added fats. Additionally, migrants who were assimilated reported a higher frequency of eating out at fast-food restaurants and consuming salty snacks (Ayala, Baquero, & Klinger, 2008; Mainous III et al., 2006; Pérez-Escamilla, 2011). Moreover, a study from the Hispanic Community Health Study and the Study of Latinos with over 16,415 Hispanic adults indicated that time living in the U.S. was a greater predictor of obesity than language and dietary acculturation. Although the results did show that Hispanics who reported eating equal amounts of American foods and Hispanic foods were more likely to be classified as obese compared to those who ate mostly Hispanic foods (Isasi et al., 2015). Although the measure of acculturation was not a direct predictor of obesity, several markers often used as definitions of

acculturation such as time in the U.S. and ethnic-specific food intake (e.g., eating more American foods) were predictors of obesity (Isasi et al., 2015).

Overall there are mixed findings but the majority of this evidence suggests that higher European American orientation (*assimilation*) in a unidimensional framework may increase health disparities because it has been associated with poor quality dietary intake patterns (see Table 1 page 11 for a summary). Research findings using the bidimensional framework of acculturation is still unclear and understudied. The few reviews that discuss this topic propose that future studies should consider a bidimensional framework in that it allows for biculturalism where there can be a negotiation between two cultures and individuals can balance both their origin culture and new culture (Arandia, Naltay, Sharkey & Dean, 2012; Lara et al., 2005; Wallace, Pomery, Latimer, Martinez, & Salovey, 2010). Most studies that measure acculturation use factors such as language use, generation, and years in the U.S. which are at best proxy variables and are "not fully capturing the construct of acculturation" (Wallace et al., 2010, p. 385). Therefore, it is necessary to include a bidimensional model of acculturation to best capture a range of variables that fall under the definition of acculturation.

**Acculturation influences on children's health.** Hispanic children may adapt to the new culture faster than their parents because of greater exposure to social influences in their peer groups, social media, and exposure to new foods or norms at school. For children, it can be especially typical to adopt 'Americanized' foods, since children are in constant communication with perhaps a more diverse group of cultures at school and with their peers compared to their parents (Dondero & Van Hook, 2016). Living in an immigrant community may slow down the exposure to 'Americanized' foods, as defined as foods consumed by individuals most common to U.S.-born peers of the same age, for children these may typically include pizza, burgers, hotdogs, and soda (Van Hook, Quiros, & Frisco, 2015; Van Hook, Quiros, Frisco, & Fikru, 2016). Considering the first study, we recognize that children often command the food and have influence over what is purchased and cooked at home (see page 26 - 30). Results from the first study also suggest that cultural changes and globalization impacts behaviors centered on the mealtime routine. Therefore, when children's social and cultural environment changes this can increase the desire to fit in or change behaviors by eating 'Americanized' foods. Furthermore, children are enrolled in school and other social programs (i.e., childcare, after-school programs, clubs) allowing them to have a unique opportunity to learn from peers and the environment of the school. Studies have shown that peer influence and foods available in the school cafeteria are related to children's fruit and vegetable consumption (Elder et al., 2010). For example, a child may want to fit in with their peers at school. One way that can occur is eating similar foods as their friends and if they are not from the new culture, they may be more prone to eat foods like pizza and burgers, even though it may not be what they eat at home

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(Van et al., 2015). Therefore, by examining how acculturation and social environments impact children's health outcomes will provide insight to household health disparities.

To my knowledge, there are no studies that examine self-reported acculturation in middle-childhood aged children through a validated scale and its' association with dietary or BMI health outcomes. Self-reported acculturation of this age group may be problematic because children may not be developmentally able to accurately report their values, behaviors, and identity. Therefore, the few studies that examine this question with children explain acculturation with proxy acculturation measures such as language preference, generational status, and birthplace (McLeod, Buscemi, & Bohnert, 2016). Of the six studies in a systematic review reporting proxy measures of acculturation for children, two found a negative association between U.S. acculturation and weight, suggesting that children who preferred Spanish language, were of earlier generational status, and were foreign-born were more likely to be overweight or obese. Such that children having fewer ties to U.S. culture was associated with higher BMI percentile. This counter-intuitive finding of the acculturation hypothesis could imply that acculturation may affect children differently depending on age given that this same review reported positive associations with preschool aged children and adolescents (McLeod et al., 2016). Furthermore, in one of the two studies, they found this negative association was only true for Central American families and not Mexican origin especially for those that lived in areas that were separated from mainstream American culture (Wojcicki, Schwartz, Jiménez-Cruz, Barcardi-Gascon, & Heyman, 2012). The other four studies did not find a significant association (McLeod et al., 2016). Due to the limitations of the literature, I will discuss how parental acculturation influences children's dietary behaviors and BMI.

*Parental acculturation influences on a child's health.* As seen in the previous discussion of the literature, childhood dietary patterns, overweight and obesity is influenced by individual, family, and cultural factors. In the Elder and colleagues (2010) study looking at parent-child dynamics with children between the ages of 5 and 8 years in the U.S., parents reported on measures of acculturation, family socio-demographics, and child's dietary patterns, additionally, BMI was collected. Results demonstrated that parents who were highly oriented to their origin culture were significantly more likely to have children who were overweight. It was also the case that one of the strongest correlates of children's BMI was parents' BMI and dietary habits, suggesting that the child may imitate parent behaviors and the household food environment is important because it allows for the availability of certain foods (Elder et al., 2010). Another study suggests that parent to child (ages 5-12) influences of acculturation and diet show that children from less-acculturated parents (more traditional) had significantly higher total fruit and vegetable intake per day compared to those with parents who were more assimilated (Dave, Evans, Saunders, Watkins, & Pfeiffer, 2009). The findings suggest that traditional households tend to eat more Hispanic traditional foods, which may serve as culture-based protection, or buffer, against poor dietary patterns.

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However, these contradictory findings continue to make it difficult to understand how acculturation plays a role in health outcomes for children. Often these inconsistencies are due to the differences in how acculturation is measured. Some studies include only proxy measures (i.e., generational status, birth country, years in the U.S.), while others use acculturation measures that can target a variety of topics such as language use, social relationships, beliefs, and values. These measures can lead to different outcomes and mean different things depending on who is answering the question (Taverno, Rollins, & Francis, 2010). Additionally, as mentioned previously there are differences in obesity outcomes due to age (McLeod et al., 2016), for older children three out of six studies showed positive associations between acculturation and weight status, with the other three studies showing no association (McLeod et al., 2016). Because of these inconsistencies and equivocal findings, this study will use both a scale (ARSMA-II) and proxy (years in the U.S.) measure of acculturation and add age as a continuous variable to understand these gaps.

**Acculturation influences on adolescent's health.** Adolescence is a time period where youth begin to have more agency in their own choices and peers typically become a much larger influence than parents and family (Larson & Richards, 1991). Therefore, it is necessary to review literature specifically on Hispanic adolescents. In the Hispanic Community Health Study/Study of Latino Youth, results demonstrate that adolescent's generational status and language use is associated with Healthy Eating Index (HEI) scores, showing that earlier generations and Spanish speaking youth have healthier scores than later generations and English-speaking youth (Arandia et al., 2018). Additionally, Arandia and colleagues (2018) measured 1,298 youth reports of bidimensional acculturation, and although there were no differences among mean HEI scores, integrated youth (youth who are oriented to both the new culture and their origin culture) had higher whole grain intake, lower sodium, and empty calorie scores compared to assimilated youth. Another study using the National Survey of Children's Health, had 4,704 adolescents report on their health behaviors, BMI was measured, and acculturation through proxy measures was taken (generation status and language use). The results showed a higher prevalence of obesity in homes where English was the second language, though socioeconomic status was a major contributing factor (Liu, Probst, Harun, Bennett, & Torres, 2009). A third study with Hispanic adolescents measured self-reported acculturation with the U.S. orientation subscale of the Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA; Unger et al., 2004). In this study, they found that higher orientation to U.S. culture predicted a higher frequency of fast-food consumption one year later. Though proxy acculturation measures such as English language use was not related (Unger et al., 2004). For adolescents it seems clearer- most studies find that higher orientation to the new culture predict and are associated with negative health outcomes of poorer quality diets and higher BMI, although there are still some differences among the measure of acculturation. These differences may be due to

adolescent self-report and accuracy of the measurement or there may indeed be differences among acculturation measures and proxy measures. Several of these studies have adolescents report on their own acculturation processes but for the purposes of this study, mothers reported on their own acculturation and will be used as a predictor for children of all ages to maintain consistency.

In summary, the impact acculturation has on dietary quality, and BMI is complex and equivocal. Some studies find no relationship; others find positive relationships with certain food groups such as fruits versus fat intake, while others found negative relationships between the chosen measure of acculturation and diet or weight status. However, culture continues to play an important role in the behaviors, routines, and beliefs that play into diet quality and weight status. Therefore, due to the differences in measurement between children and parents, measurement type, and age this study will address gaps by having the mother report on their own bidimensional acculturation. This will be measured as a predictor for child's health outcomes considering child's age and mother's dietary and weight status.

Furthermore, mealtime routines have played a role in health outcomes and the behaviors that promote routines regarding diet and weight status (Kong et al., 2013). Mealtime routines are a family pattern that directly relates to what one eats and how families interact around food (Fiese et al., 2012). Therefore, despite the level of acculturation or cultural shifts within the context of the family, mealtime routines themselves influence health outcomes and may explain the link or explain under what conditions acculturation influences diet and weight status. In this next section, mealtime routine elements will be examined in understanding health outcomes for mothers, children, and specifically research conducted with Hispanic families.

**How mealtimes affect maternal health.** There is a limited amount of research examining the role of mealtimes in maternal health outcomes. Since mothers play a fundamental role in executing the mealtime routines in activities such as planning, modeling, healthful teaching, communication (McArthur et al., 2001), it is important to understand the impact of mother's organizational skills in mealtimes on their own health outcomes and their child's health outcomes. Particularly, a mother's emotional and mental health can play a role in their ability to promote healthful behaviors that affect their child's diet and weight status (Berge, Meyer, MacLehose, Eisenberg, & Neumark-Sztainer, 2014).

In a study reporting parents view of mealtimes, frequent family meals were associated with closeness, connectedness, and improved emotional well-being (Fruh et al., 2011; Hammons & Fiese, 2011). Mealtime brings the family together to relax, laugh, and eat well (i.e., Fulkerson et al., 2006), but planning mealtimes can come with a number of challenges (Malhotra et al., 2013). Family mealtimes involve logistical scheduling with family members, cooking, cleaning, conflict and stress management, chaos control, and food preferences (Koulouglioti, Cole, & Moskow, 2011; Malhotra et al., 2013; Quick,

Fiese, Anderson, Koester, & Marlin, 2011). These components can be stressful for parents, creating negative experiences for the family.

Added chaos, loud noises, and mealtime distractions can be harmful to family cohesion, communication, and quality dietary patterns (Berge et al., 2012; Fiese et al., 2015). Specifically, a study with Hispanic immigrant adults measured the risk of weight gain in a seven-year follow-up to understand their mealtime behaviors (Dosamantes-Carrasco et al., 2017). Mexican adults (N= 837) were asked to report on mealtime distractions such as watching television or talking on the phone. Results showed that participants who reported meals without distractions had a significantly lower likelihood of gaining body weight or becoming obese seven years later compared to those with more distracted mealtimes (Dosamantes-Carrasco et al., 2017). Furthermore, in a racially diverse parent report study on mealtime frequency and dietary patterns (fruit and vegetable intake, fast food consumption), results showed that mothers who ate fewer shared meals ate fewer servings of fruit and vegetables compared to those participating in seven or more meals a week. However, the results did not find an association between the frequency of meals and BMI for mothers (Berge et al., 2012). These studies suggest that the quality of mealtimes, parent's ability to plan, maintain harmony, and meal frequency may have implications for their health and their children's health.

**How mealtimes affect child health.** Mealtime frequency and family cohesion have positive health implications for child dietary patterns and weight status. In a meta-analysis, 17 studies were pooled with 182,836 child participants to measure how shared mealtime frequency predicted the likelihood of childhood obesity and dietary patterns (Hammons & Fiese, 2011). The results indicate that children who share family meals three or more times per week were 12% less likely to be overweight, 20% less likely to eat unhealthy foods, but this effect was larger for high school-aged children than for middle childhood/school age children. Children were also 24% more likely to eat healthy foods and maintain healthier diets compared to families who shared fewer than three meals a week (Hammons & Fiese, 2011). Another review showed similar results. Indicating that families who shared meals on most days in a week had higher intakes of protein, calcium, iron, vitamins, vegetables, fruit and lower intakes of sugar-sweetened beverages, fried food, and fast food diets (Martin-Biggers et al., 2014). This review also showed significant differences in weight status. For example, in children six to ten years old, mealtime frequency was associated with lower BMI, though this association was not true for African American and Hispanic children (Fulkerson et al., 2008; Martin-Biggers et al., 2014). These findings are even true for adolescents, frequency and quality of family meals has a positive link to adolescent health in eating patterns and weight status (Fulkerson et al., 2006; Taveras et al., 2005). Overall, these studies show that increased frequency of family mealtimes has positive health outcomes particularly for dietary patterns and weight status.

The lack of quality and cohesion of a shared mealtime can have negative implications. An experimental study looking at noise distractions found that mealtimes with more noise and distractions were associated with children engaging with distractions and parents exhibiting more controlling and critical communication during the mealtime (Fiese et al., 2015). With constant distractions, families are less likely to engage in positive and encouraging communication, model healthy eating, and limiting unhealthy food advertisements which have been associated with children's weight status and diet (Fiese & Bost, 2016; Fiese et al., 2012; Harrison et al., 2012). Providing quality mealtimes with positive communication, healthy food options, and opportunities for bonding creates an environment that promotes health behaviors and outcomes.

**Mealtimes and Hispanic families.** Culturally, Hispanic families value *familism*, a term relaying the importance of close family relationships (Ayón, Marsiglia, & Bermudez-Parsai, 2010) often shown through the high importance of frequent family mealtimes. *Familism* has demonstrated to have positive health outcomes for Hispanic families. A study showed higher levels of *familism*, family closeness, and social support predicted better psychological health comprised of stress, depression, and general mental health (Campos et al., 2014). However, scant research has been conducted to understand the effects of mealtimes in the context of Hispanic health outcomes particularly with weight status and dietary patterns. Few studies have looked at racial and ethnic differences in mealtime and health outcomes. A study by Fulkerson and colleagues (2010) suggest that Hispanic children report significantly more family dinners but lower levels of parent-child communication than African American and Caucasian children. Over time those reporting greater communication was associated with more family dinners. This finding is noteworthy because Hispanic families at the beginning of the study have a higher frequency of shared family dinners, but lower levels of communication, which can lead to fewer shared mealtimes over time (Fulkerson et al., 2010). On the contrary, a study comparing 30 family mealtimes across ethnic groups resulted in Hispanic families displaying more behavioral control and the least amount of critical communication during mealtimes compared to African-American and Non-Hispanic White families (Kong et al., 2013). Behavioral control actions often reflect more rigid or controlling mealtime parenting styles (Fiese et al., 2012) which has been linked to poor dietary quality in children (Patton et al., 2009). Positive communication has often been associated with healthy weight while conflict-driven or critical communication is linked to the quality of life, behavior problems, and disease severity (Fiese et al., 2012). These behaviors during a mealtime can either create tension or bring the family closer together, once again influencing the frequency, quality, and continuation of the routine.

Dietary patterns are also influenced by the frequency and quality of mealtimes. In a study with Hispanic children nine to 18 years of age, children were asked dietary intake questions, family influences such as household size, shared mealtime frequency, television advertisement exposure, and healthful

eating support (Ayala et al., 2007). Mothers were also interviewed on demographic questions and acculturation scores. The results show that those eating more shared meals were more likely to consume more fiber, but increased frequency of shared meals was also associated with increased snacking and soda consumption. An opposing study with Hispanic children aged five to 10 years old, showed that families who ate together for breakfast more than any other meal were related to consuming more fruit and vegetables. Additionally, families who rarely or never watched television during meals consumed significantly less soda and chips than those who watched television often or always during meals (Andaya et al., 2011). It appears that some aspects of the family routine (e.g., what meal is shared, the frequency of distractions, and frequency of meals) can be more beneficial than others particularly for Hispanic families in the U.S.

There are a large number of gaps that should be considered for understanding the theoretical implications of acculturation, mealtime routines, and health outcomes (dietary patterns and weight status) with Hispanic families. Parents, as one of the most influential figures in their children's lives, can impact the behaviors and routines of their children. Therefore, if mealtimes elicit negative outcomes for parents, they may, in turn, cease efforts to continue shared mealtimes which will have negative implications for child health (Martin-Briggers et al., 2014). Additionally, mealtimes patterns may act as a protective factor. Studies have shown that more frequent mealtimes and organized mealtime routines have been positively associated with healthier weight status and dietary behaviors (Dosamantes-Carrasco et al., 2017; Hammons & Fiese, 2011). Therefore, if acculturation processes have negative effects on health outcomes the interaction of positive mealtime patterns may alleviate that association. However, since there are a limited number of research studies seeking to understand Hispanic health outcomes in the context of shared mealtimes it is necessary to understand these associations. In particular, how mealtime routines for Hispanic families may serve as a protective or risk factor throughout the acculturation process.

## Proposed Study

The purpose of this study is to understand how family mealtime patterns influence the association between acculturation and child health outcomes. Therefore, the main objectives of this study sought to 1) investigate if mother's bidimensional acculturation influences mealtime routines (mealtime planning and frequency of shared meals) and child's health outcomes (dietary quality and weight status), 2) test indirect and direct effects of mealtime planning on child's health outcomes considering acculturation and maternal health, 3) test whether the link between acculturation and health outcomes depends on family mealtime patterns, and 4) examine the likelihood that acculturation and mealtime behaviors are associated with children's weight categories.

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According to the evidence, it is hypothesized that the link between acculturation and child health outcomes depends on the quality and frequency of family mealtime patterns. Meaning the link between acculturation and health outcomes could be explained by the quality of mealtime routines or shows that the quality of mealtime routines may explain the conditions in which acculturation and health outcomes are associated (see Figure 3, page 60). Additionally, better mealtime patterns are hypothesized to serve as protective factors if acculturation is negatively associated with healthier weight status and dietary behaviors. Furthermore, certain acculturation strategies may influence dietary quality and weight status more than others. In a bidimensional model, limited evidence suggests those who are *bicultural* or maintain certain *traditional* elements of cultural behaviors would have better health outcomes compared to *assimilated* and *marginalized* groups. However, the families' acculturation strategy would not directly impact health outcomes if they maintained optimal mealtime routines, since they could serve as a protective factor.

**Methods**

This study used data from a larger intervention study, Abriendo Caminos, a multi-state, randomized-controlled, childhood obesity prevention program that is culturally-tailored for Mexican and Puerto Rican families. Through this program, underserved Mexican and Puerto Rican origin families received six weeks of interactive educational sessions focused on healthy eating, family routines (i.e., mealtimes and bedtimes), and physical activity for the whole family. This particular study uses a subset of the sample at the pre-intervention time point from the Illinois and California sites only, totaling 189 mothers, 68 from Illinois and 121 from California (Table 3). This study does not include the subsample study from Mexico. Eligible participants were of Mexican or Puerto Rican heritage with at least one child between the ages of 5 and 17. For this study, we examine child age as a continuous variable. Additionally, of the 189 mothers, 60 did not report on the number of years they have been in the U.S., therefore, a subset of 129 will be used to understand how a proxy measure of acculturation (time in the U.S.) answers each objective.

Table 3.

*Demographic Characteristics of Participants (n = 189)*

| Characteristic | n (%) |
|---|---|
| Mother's U.S. Education level | |
|   Less than high school | 152 (80.4) |
|   More than high school | 37 (19.6) |
| Mother's Country of Origin[1] Education level | |
|   Less than high school | 135 (71.4) |
|   More than high school | 54 (28.6) |
| Anthropometric Measurements | |
|   Mother's BMI (k/m$^2$; M±SD) | 32.8 ± 8.4 |
|   Mothers classified as normal weight | 22 (11.6) |
|   Mothers classified as overweight | 63 (33.3) |
|   Mothers classified as obese | 104 (55.0) |
|   Child's BMI Percentile (M±SD) | 75.2 ± 25.6 |
|   Children classified as normal weight | 98 (51.9) |
|   Children classified as overweight | 33 (17.5) |
|   Children classified as obese | 58 (30.7) |
| Marital Status | |
|   Married | 103 (54.5) |
|   Single | 17 (9.0) |
|   Living with partner but not married | 46 (24.3) |
|   Divorced/Widowed | 23 (12.2) |
| Child Age (M±SD) | 9.6 ± 3.2 |
|   Ages 5 to 11 | 137 (73.2) |
|   Ages 12 to 17 | 52 (26.8) |
| Income | |
|   Less than $20,000 annually | 82 (43.4) |
|   Between $20,001 - $30,000 annually | 75 (39.6) |
|   Greater than $30,001 annually | 32 (16.9) |
| Country of Origin | |
|   Mexico | 182 (96.8) |
|   Puerto Rico | 6 (3.2) |

Note: [1]Country of origin refers to the educational attainment in their birth location either Mexico or Puerto Rico.

**Study Procedures.** Mother and child dyads set up a scheduled time to come into the lab to complete a comprehensive survey questionnaire with their choice of validated English or Spanish measures that have been used in previous studies with Spanish-speaking immigrants, and anthropometric measurements were taken. Anthropometrics were measured with the same brand of Seca Portable Stadiometer and Seca Flat Scale at both research locations. Trained researchers at each site, with the same protocol, practiced taking measurements until each team member matched measurements with the lead researcher. Trained researchers then took two measurements of both height and weight for each participant. Body Mass Index (BMI) was then calculated by $kg/m^2$, and overweight and obesity will be calculated by the Centers for Disease Control and Prevention (CDC) BMI charts for adults, and BMI percentile and Z-scores in children were calculated using age-and-sex specific CDC growth charts to determine overweight and obesity. Child's BMI percentile was then also converted into BMI weight categories of underweight/normal = <85th percentile, overweight = 85th to 94th percentile, and obese = > 95th percentile. Surveys were then administered as paper-pencil at the data collection site (see Appendix B for survey questions). A trained student read the survey with each participant that requested assistance. An additional research assistant then reviewed the survey before payment to ensure completion and any missed answers. Families were compensated for their time and effort with a cash gift of $30.

**Measures**

**Acculturation.** Acculturation was measured with one of the most widely used measures of acculturation for Hispanics, which is the Acculturation Rating Scale for Mexican Americans–II (ARSMA-II). This 12-item measure designed as a bidimensional measure (Cuéllar, Arnold & Maldonado 1995) and is used to self-report acculturation processes based on identifying culture in one's self and language involved with everyday activities, such as watching television and reading. The ARSMA-II contains two orientation subscales: the Hispanic Orientation Scale (HOS) and Anglo Orientation Scale (AOS). Sample items from these subscales include questions such as: "I associate with Hispanics and/or Hispanic Americans" and "I enjoy English language movies." Responses for question items range from 1 being "not at all" to 5 being "extremely often or almost always."

Although the original manuscript provides directions to calculate unidimensional scores of acculturation, bidimensional scores can be derived and have been reported by using the interaction method with the average HOS and AOS subscale scores (Jones & Mortimer, 2014). Bidimensional strategies were also categorized into the four strategies to understand the sample's breakdown (Table 4). However these categorizations do not necessarily represent the how the interaction method categorizes each strategy for example low HOS represents one standard deviation below the mean, but when categorized into a strategy low HOS can represent a Traditional strategy.

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Table 4.

*Percentage Distribution of Bidimensional Acculturation Strategies derived from ARSMA-II*

| Acculturation Strategies | Without the variable years in the U.S. (n = 60) | With the variable years in the U.S. (n = 129) | Total Sample (n = 189) |
|---|---|---|---|
| Traditional | 43 (71.6%) | 99 (76.7%) | 142 (75.1%) |
| Marginalized | 11 (18.3%) | 10 (7.8%) | 21 (11.1%) |
| Integrated | 4 (6.7%) | 12 (9.3%) | 16 (8.5%) |
| Assimilated | 0 (0%) | 3 (2.3%) | 3 (1.6%) |
| Unclassified | 2 (3.3%) | 5 (3.9%) | 7 (3.7%) |

*Note*: There are no significant differences between samples ($\chi^2 = .197$).

In a unidimensional framework, scores would be calculated by subtracting the HOS average from the AOS average. Using the bidimensional framework is preferable to using a unidimensional framework because it better reflects how individuals are capable of having multiple cultural identities, behaviors, or values (Ryder et al., 2000). Therefore, using a unidimensional model would be incomplete because it is unable to distinguish bicultural individuals who strongly identify with both cultural groups or individuals who do not identify with any cultural group. These subscales had high internal reliability being between α = .79 - .87. Additionally, the number of years in the U.S. will be used as a proxy variable of acculturation.

**Mealtime patterns.** Mothers completed the mealtime planning portion of the Family Routines Questionnaire (Fiese & Kline, 1993). The mealtime planning scale includes 7 self-report items asking questions about the regularity, roles, flexibility, attendance expectations, importance, special meaning, and planning involved in mealtimes. Responses to the mealtime planning scale range include: "1" Often True, "2" Sometimes True, and "3" Never True. For this measure, scores were summed and higher scores indicate that more household planning around mealtimes. Several research studies have used the Family Routines Questionnaire reporting associations with health outcomes (Evans & English, 2002; Fiese, Gundersen, Koester, & Jones, 2016; Fiese et al., 2012) and in the current study, the internal reliability was acceptable (α = .65). Since the frequency of family meals has been an important factor of health outcomes, mothers were asked to report on the number of shared dinnertimes from 0 to 7 times in the past week.

**Dietary patterns.** Mother's dietary behavior was measured with The Latino Dietary Behavior Questionnaire. This questionnaire measured the frequency of eating behaviors in several domains such as fact consumption and sweeteners in drinks. (Fernandez, Olendzki, & Rosal 2011). Question items were summed, and higher scores reflect healthier eating behaviors. The original study confirms concurrent and convergent validity via correlation with several measures of dietary behaviors (24-hour recall), with our internal reliability being acceptable at α = .68 (Fernandez et al., 2011).

*Child's dietary behavior*. Mothers reported children's dietary quality with the Children's Nutrition Behavior Questionnaire (Macro & Frazao, 2005). This is a seven-item measure asked parents to estimate the frequency of how much their child eats a certain food category per week. A sample question is "How many times did your child eat French fries or other fried potatoes? Include tater tots, hash browns, etc., in your response." All seven items are then recoded to reflect how many times per day children eat a particular item. The variable ranged from 0 to 16, suggesting the number of times total for the seven poor dietary items were eaten in one day. Our internal reliability being good at α = .77.

**Anthropometric outcomes.** Mother and child's height and weight were directly measured by trained research assistants, using standardized procedures as described in Harrison, Liechty, & STRONG

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Kids Team, 2012 manuscript. Height and weight were measured using a Seca stadiometer and a digital scale. Two measurements were taken at each time point by different research assistants to establish reliability. Mother's body mass index (BMI) was calculated using the National Center for Disease Control and Prevention guidelines and child's BMI percentile and Z-scores using national guidelines based on age and sex (Kuczmarski & Flegal, 2000). BMI percentile and Z-scores was used as a continuous outcome variable. Further analysis was run to understand the association between mother's acculturation and child's weight classifications by categorizing between normal weight = 0 and overweight and obese = 1.

**Covariates.** Control variables have been selected based on both theoretical and empirical evidence. Covariates include parents' education, child's age, and sex.

**Power.** Using GPower (Faul, Erdfelder, Lang & Buchner, 2007), power analyses were conducted to determine the minimum study sample size. For the current study, a two-tailed significance level of 0.05 and an expected effect size of .20 with the statistical power level of 80% indicates that an estimated sample of 189 respondents would be sufficient for a multiple regression study.

<div align="center">

**Plan of Analysis**

</div>

Data were screened for distributions, outliers, patterns of missingness and multicollinearity. When necessary, severely non-normal data and outliers were reduced via transformations. Secondly, because data were collected within families, I tested for potential clustering effects by calculating the variation of child's health outcomes across and within families using a hierarchical linear model (Snijders & Bosker, 2012). Analyses of the two outcome variables revealed nonsignificant intraclass correlations (ICC) within the family level (the measures of child BMI Z-score and child's diet quality [ICCs = .0002 and .0007, respectively]). These ICCs indicated minimal variance at the family level, and accordingly, data were analyzed using standard regression analytic techniques with the Statistical Package for Social Sciences (SPSS) since dyadic data analysis was not needed.

Multiple imputation procedure was used for analyzing missing data. This procedure replaces each missing value with a set of plausible values that represent the uncertainty about the right value to impute. I performed ten multiple imputations for incomplete multivariate data and analyzed results from these imputed datasets. Multiple imputation was done for variables of interest except for the number of years in the U.S. This variable had 31.7% missingness, therefore, I did not impute this variable and instead tested for differences among samples (the full subsample $n = 189$ and the subsample that answered this question $n = 129$). There were no statistical differences by demographic variables, predictor variables or outcome variables apart from marital status (see Table 5), therefore further analysis was run to investigate if there were differences by bidimensional acculturation strategies, income categories, and education level by categories or scale alphas to understand if there were comprehension differences. Chi-

square tests showed no significant differences by acculturation strategies, income categories, or educational levels. Furthermore, there were no differences in Cronbach's alphas for each scale when comparing the two samples, therefore, each objective was analyzed with both samples. Additionally, some preliminary analysis to test for differences among the demographic variables and weight status was conducted with the whole sample ($n = 189$). The only significant difference by birth location was education level (see Table 6). Among-site location, we see significant differences for child's diet behavior with worse quality diet for children in California (see Table 7). Lastly, I checked for differences by child sex and there are no differences among the variables studied and child's sex (Table 8). Bivariate correlations show that having a high school education is associated with Anglo-oriented acculturation (AOS) and the interaction of the acculturation subscales. Among the study variables, increased levels of mealtime planning were positively associated with frequency of weekly shared mealtimes. Mother's BMI and diet was associated with child's BMI. Anglo orientation scale was negatively associated with the Hispanic orientation acculturation scale (HOS; Tables 9 & 10).

Table 5.

*Mean Differences on Demographic and Outcome Variables by Sample.*

| Variable | Sample differences | | $t(187)$ | $p$ value |
| --- | --- | --- | --- | --- |
| | Without Years in the U.S. Reported ($n = 60$) | With years in the U.S. Reported ($n = 129$) | | |
| U.S. Education level | .27 (.44) | .16 (.37) | 1.679 | .120 |
| Country of Origin Education level | .30 (.46) | .28 (.45) | .295 | .768 |
| Income | 3.97 (1.75) | 3.53 (1.75) | 1.637 | .103 |
| Marital Status | .67 (.48) | .49 (.50) | 2.311 | .020* |
| Child Age | 9.88 (3.73) | 9.45 (3.09) | .824 | .411 |
| Hispanic Oriented | 4.29 (.69) | 4.25 (.72) | .351 | .726 |
| Anglo Oriented | 2.25 (.84) | 2.33 (.95) | -.573 | .567 |
| AOSxHOS | 9.54 (3.64) | 9.66 (3.69) | -.206 | .837 |
| Mealtime Routines | 27.17 (3.59) | 27.80 (3.33) | -1.176 | .241 |
| Mealtime Frequency | 5.07 (1.86) | 5.44 (1.83) | -1.285 | .200 |
| Mother's BMI (kg/m$^2$) | 33.18 (7.56) | 33.70 (8.72) | .363 | .717 |
| Mother's Dietary Behaviors | 28.80 (5.21) | 29.17 (6.05) | -.409 | .683 |
| Child BMI percentile | 75.04 (25.56) | 75.29 (25.69) | -.063 | .950 |
| Child BMI Z-score | 1.03 (1.04) | .98 (1.09) | .278 | .781 |
| Child Dietary Behaviors | 7.49 (3.96) | 7.19 (4.02) | .487 | .627 |

*Note*. Figures are *M* (*SD*). Education level was binary with those higher than high school education = 1. Income was a categorical variable ranging from 1 to 9, 5 = $25,000 - $30,000. Marital status was transformed into a binary with those who were married = 1. Child diet behaviors reflects poorer dietary behaviors.

Table 6.

*Mean Differences on Demographic and Outcome Variables by Birth Location (n = 189).*

| Variable | Birth Location | | t(186) | p value |
|---|---|---|---|---|
| | Mexico (n = 182) | Puerto Rico (n = 6) | | |
| Hispanic Oriented | 4.27 (0.71) | 4.18 (0.56) | .30 | .499 |
| Anglo Oriented | 2.28 (0.91) | 3.01 (0.77) | -1.95 | .593 |
| U.S. Education level | 0.20 (.40) | 0.00 (.00) | 1.21 | .000 |
| Country of Origin Education level | 0.26 (.44) | 1.00 (.00) | -4.07 | .000 |
| Income | 3.67 (1.72) | 3.50 (2.26) | 0.23 | .535 |
| Mother's BMI (kg/m$^2$) | 32.83 (8.47) | 33.11 (6.44) | -0.08 | .625 |
| Child BMI percentile | 75.08 (25.77) | 78.31 (23.70) | -0.30 | .672 |
| Child BMI Z-score | 0.99 (1.07) | 0.85 (1.28) | 0.34 | .896 |
| Child Diet Behaviors | 7.40 (3.89) | 5.11 (5.84) | 1.39 | .261 |

*Note*. Figures are *M* (*SD*). Education level was binary with those higher than high school education = 1. Income was a categorical variable ranging from 1 to 9, 5 = $25,000 - $30,000. Child diet behaviors reflect poorer dietary behaviors.

Table 7.

*Mean Differences on Demographic and Outcome Variables by Site Location (n = 189).*

| Variable | Illinois (n = 68) | California (n = 121) | t(187) | p value |
|---|---|---|---|---|
| | **Site** | | | |
| Hispanic Oriented | 4.32 (.55) | 4.24 (.78) | .786 | .388 |
| Anglo Oriented | 2.36 (.82) | 2.28 (.97) | .558 | .577 |
| U.S. Education level | .15 (.36) | .22 (.42) | -1.321 | .208 |
| Country of Origin Education level | .37 (.48) | .24 (.43) | 1.812 | .072 |
| Income | 3.47 (1.65) | 3.78 (1.76) | -1.172 | .243 |
| Mother's BMI (kg/m$^2$) | 31.31 (6.43) | 33.72 (9.17) | -1.918 | .057 |
| Child BMI percentile | 78.35 (23.63) | 73.45 (26.55) | 1.265 | .207 |
| Child BMI Z-score | 1.09 (1.05) | .94 (1.08) | .909 | .365 |
| Child Diet Behaviors | 6.38 (4.28) | 7.80 (3.74) | -2.280 | .019 |

*Note*. Figures are *M* (*SD*). Education level was binary with those higher than high school education = 1. Income was a categorical variable ranging from 1 to 9, 5 = $25,000 - $30,000. Child diet behaviors reflects poorer dietary behaviors.

Table 8.

*Mean Differences on Demographic and Outcome Variables by Child Sex (n = 189).*

| Variable | Child's Sex | | $t(187)$ | $p$ value |
| | Male (*n* = 75) | Female (*n* = 114) | | |
| --- | --- | --- | --- | --- |
| Hispanic Oriented | 4.25 (.66) | 4.28 (.74) | -.225 | .819 |
| Anglo Oriented | 2.39 (.89) | 2.24 (.93) | 1.067 | .287 |
| U.S. Education level | .27 (.44) | .15 (.36) | 1.916 | .058 |
| Country of Origin Education level | .25 (.44) | .31 (.46) | -.796 | .427 |
| Income | 3.54 (1.89) | 3.74 (1.61) | -.774 | .440 |
| Mother's BMI | 32.19 (8.40) | 33.29 (8.33) | -.887 | .376 |
| Child BMI percentile | 76.48 (23.93) | 74.37 (26.68) | .553 | .581 |
| Child BMI Z-score | 1.00 (1.01) | .98 (1.11) | .156 | .876 |
| Child Dietary Behaviors | 7.56 (4.21) | 7.11 (3.84) | .762 | .447 |

*Note*. Figures are *M* (*SD*). Education level was binary with those higher than high school education = 1. Income was a categorical variable ranging from 1 to 9, 5 = $25,000 - $30,000. Child diet behaviors reflects poorer dietary behaviors.

Table 9.

*Intercorrelations Between Study Variables and Demographic Covariates (n = 189).*

| Variable | U.S. Edu | Origin Country Edu | Income | Child Age | Male Child |
|---|---|---|---|---|---|
| Hispanic Oriented | -.129 | .039 | -.031 | -.018 | .016 |
| Anglo Oriented | .477** | .004 | .127 | .029 | -.078 |
| Mealtime patterns | -.044 | .039 | -.059 | -.112 | -.054 |
| No. shared mealtimes | .129 | .020 | -.037 | -.104 | -.019 |
| Mother BMI | .097 | -.003 | -.033 | .001 | .065 |
| Mother Dietary Behaviors | .019 | .019 | .127 | .059 | -.126 |
| Child BMI percentile | -.087 | -.053 | -.085 | .076 | -.040 |
| Child BMI Z-score | -.058 | -.067 | -.038 | -.082 | -.011 |
| Child Dietary Behaviors | -.066 | -.119 | -.078 | -.019 | -.056 |

Note: HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Child diet behaviors reflects poorer dietary behaviors.

$* p < 0.05. ** p < .01$

Table 10.

*Intercorrelations, Descriptive Statistics and Reliabilities, for Study Variable (n = 189).*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Hispanic Oriented | - | | | | | | | | |
| 2. Anglo Oriented | -.339** | - | | | | | | | |
| 3. Mealtime Routines | -.100 | .096 | - | | | | | | |
| 4. No. shared mealtimes | -.006 | .129 | .430** | - | | | | | |
| 5. Mother BMI | -.042 | .008 | -.142 | .055 | - | | | | |
| 6. Mother Dietary Behaviors | -.077 | .061 | .119 | .104 | -.170* | - | | | |
| 7. Child BMI percentile | -.031 | -.064 | -.106 | -.071 | .182* | .005 | - | | |
| 8. Child BMI Z-score | -.035 | -.040 | -.086 | -.066 | .236** | -.018 | .951** | - | |
| 9. Child Dietary Behaviors | .017 | -.105 | -.104 | -.005 | .002 | -.108 | -.064 | -.054 | - |
| Mean | 4.26 | 2.31 | 27.60 | 5.32 | 32.85 | 29.05 | 75.21 | .99 | 7.29 |
| Standard Deviation | .71 | .92 | 3.41 | 1.84 | 8.35 | 5.78 | 25.58 | 1.07 | 3.99 |
| Cronbach's α | .79 | .87 | .65 | - | - | .68 | - | - | .77 |

Note:  HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Child diet behaviors reflects poorer dietary behaviors.

* $p < 0.05$. ** $p < .01$

Step-wise regression tests were evaluated in order to address the research aims. To test the first objective, I ran multiple regression analysis to understand the degree to which acculturation predicts mealtime planning, and child's health outcomes (weight status, and dietary behavior; Aiken, West, & Reno, 1991). The first through fourth tests measured acculturation regressed on child's BMI percentile and Z-score, child's dietary quality and mealtime planning separately; the first step included the control variables that were significantly correlated. Then in the second step, acculturation (each cultural dimension was entered along) were entered. In the third step, the interaction of HOS and AOS was entered, and years in the U.S. was added for the subsample ($n = 129$).

To address the second objective, multiple regression tests were evaluated to test indirect and direct effects. To test these effects, a first test measured acculturation and maternal health on mealtime planning. Then acculturation was run on child's health outcomes (BMI percentile, Z-score, and diet quality) by adding path 'c' in the first step and adding path 'b' in the second step (see Figure 3). A follow up bootstrapping test was be done if path "c′" was significant to analyze if the mediation effect was statistically significant, testing the indirect effect (different from zero; Preacher & Hayes, 2004). Bootstrapping is a conservative test to determine population-based estimates of coefficients by resampling the data. To test the third objective, stepwise multiple regression was run to test main effects and interactions. Stepwise regression reduces possible issues of multicollinearity and entering interactions into different steps allows to understand independent effects (Farrar & Glauber, 1967). The first step included the significant control variable (U.S. education). Then in the second step, centered acculturation variables (each cultural dimension was entered) were entered, and in the third step, the interaction of Hispanic and Anglo orientation scales were added. The fourth step included centered mealtime planning (frequency and planning quality) variables. In step five, the interaction of each acculturation dimension with mealtime planning was added. In step six, the 3-way interaction of the two cultural dimensions and mealtime planning was entered. In step seven, the interaction of each acculturation dimension with mealtime frequency was added. The eighth step included the 3-way interaction of the two cultural dimensions and mealtime frequency. Finally, for the subsample, an additional ninth step included years in the U.S. and the tenth step included the interaction of years in the U.S. and mealtime planning and frequency separately (see Figure 3). If interactions were significant, simple slopes test were explored to understand the main effects in the model (Aiken et al., 1991; Sibley, 2008).

**Figure 3**. *Visual Model to Understand Acculturation and Mealtime Routines on Health Outcomes*
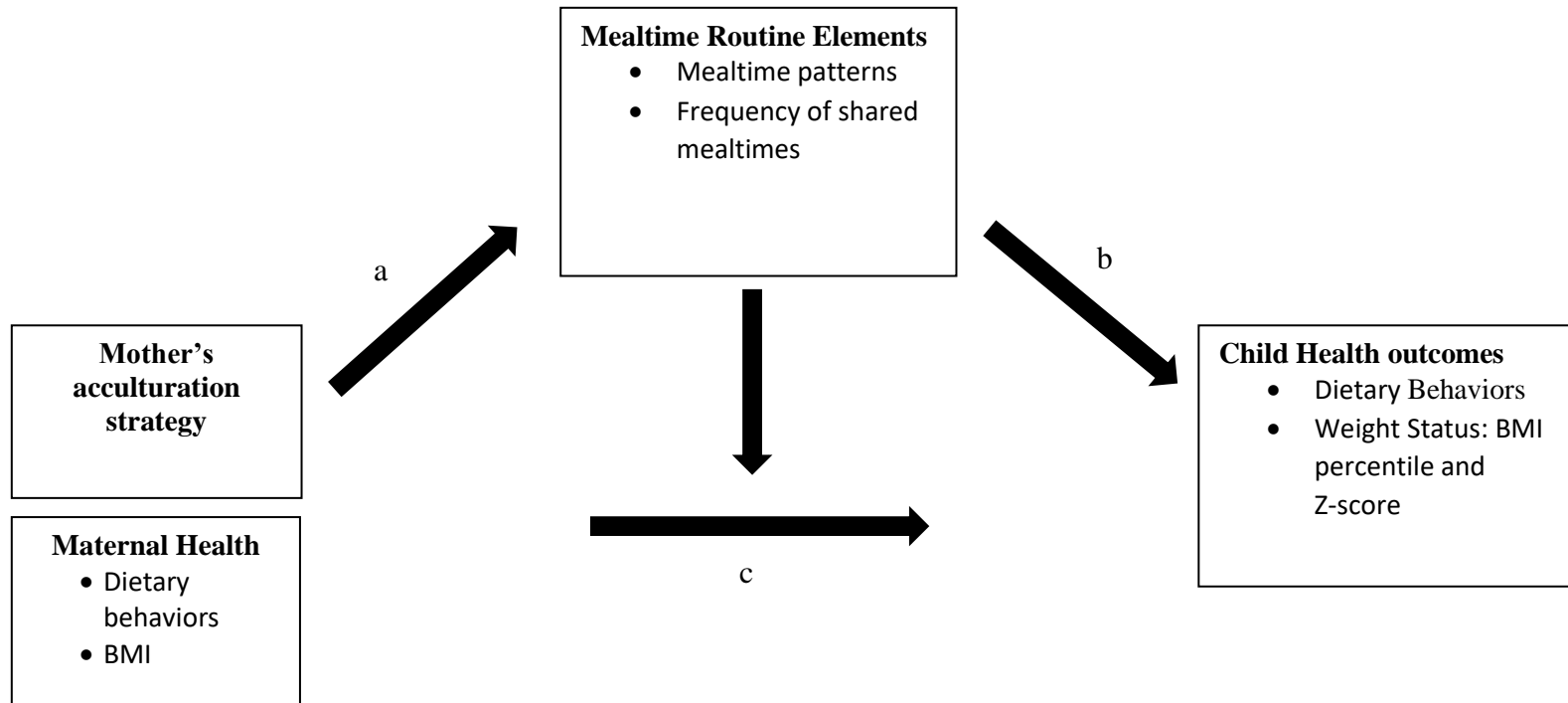


*Note.* The above model was designed to demonstrate a visual representation of objective number 2 and 3. A first test will measure acculturation and maternal health on mealtime patterns (path a). Then acculturation will be run on child's health outcomes (BMI Z-score and diet quality) by measuring path 'c' in the first step and adding path 'b' in the second step. For objective 3, interaction effects will be tested to understand how mealtime routine elements moderate the association between acculturation and child health outcomes.

In the fourth objective, logistic regression was used to test child BMI as a dichotomous variable. Child BMI was recoded (0 = normal weight, 1 = overweight or obese; the 2nd test included 0 = normal or overweight, 1 = obese only) to understand if bidimensional acculturation, years in the U.S., and mealtime routines predicted the likelihood of being classified as overweight or obese. These two dichotomous variables will tell us if there are increased odds of being classified as overweight or obese or the increased odds of being classified as obese.

## Results

Of 189 mothers, 96.8% of mother's country of origin was Mexico with the remaining 3.9% of the sample ($n = 8$) being born in Puerto Rico. 80.4% percent of our sample had less than a high school education from the U.S., approximately 70% had less than a high school education from their country of origin, and the majority were married (54.5%). Additionally, 83% of the sample had an income of $30,000 annually or less. Children ranged from 5-17 years (M = 9.6 SD = 3.2) and most were female (60%). Mothers and target child's height and weight were measured then body mass index was calculated. 88.3% of the mothers were overweight or obese, and 48.2% of the children were overweight or obese. Additional information about the sample is included in Table 3. The subsample ($n = 129$) of mothers who reported on the number of years they had lived in the U.S. only significant difference was marital status, with fewer married mothers (Table 5, page 53).

**Objective 1.** The initial tests were conducted to understand the degree to which acculturation predicts mealtime planning and child's health outcomes. The complete sample ($n = 189$) showed no significant associations between the covariates or acculturation and child BMI Z-score, child BMI percentile, child dietary behaviors, or mealtime patterns (Table 11).

Table 11.

*Regression Analysis: Acculturation as a Predictor of Child BMI, Dietary Behaviors and Mealtime Patterns (n = 189)*

| | Child BMI Percentile | | | | Child BMI Z-score | | | | Child Diet Behaviors | | | | Mealtime Patterns | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | $\Delta R^2$ | B | $SE_b$ | p-value | $\Delta R^2$ | β | $SE_b$ | p-value | $\Delta R^2$ | β | $SE_b$ | p-value | $\Delta R^2$ | β | $SE_b$ | p-value |
| Step 1 | .01 | | | .24 | .00 | | | .42 | .00 | | | .37 | .00 | | | .55 |
| U.S. Edu | | -5.58 | 4.68 | .24 | | -.16 | .20 | .42 | | -.67 | .73 | .37 | | -.38 | .63 | .55 |
| Step 2 | .00 | | | .72 | .00 | | | .78 | .01 | | | .51 | .02 | | | .12 |
| HOS | | -2.06 | 2.82 | .47 | | -.08 | .12 | .50 | | -.12 | .44 | .79 | | -.35 | .37 | .35 |
| AOS | | -1.39 | 2.44 | .57 | | -.04 | .10 | .69 | | -.44 | .38 | .25 | | .46 | .32 | .15 |
| Step 3 | .02 | | | .10 | .02 | | | .06 | .00 | | | .79 | .00 | | | .83 |
| HOS | | 8.52 | 6.92 | .22 | | .42 | .29 | .15 | | .15 | 1.09 | .89 | | -.16 | .92 | .86 |
| AOS | | 15.64 | 10.47 | .14 | | .76 | .44 | .08 | | -.03 | 1.65 | .99 | | .77 | 1.39 | .59 |
| AOS X HOS | | -4.15 | 2.48 | .10 | | -.20 | .10 | .06 | | -.10 | .39 | .79 | | -.07 | .33 | .83 |
| Total $R^2$ | .03 | | | | .02 | | | | .01 | | | | .02 | | | |

*Note.* HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. If repeated variables in each step were not included it is because results did not indicate significance.
*p<0.05. **p<0.01.

In the subsample ($n = 129$) there were significant associations between acculturation (the interaction of cultural orientations and years in the U.S.) and child BMI Z-score, and mealtime patterns (Table 12). For child BMI percentile, there were no significant covariates in step one or the subsequent steps. In steps two through four, no main effects or interactions were statistically significant. For the outcome child BMI percentile, the interaction of HOA and AOS in step three was significant. No other variables in the model were significant. Simple slopes were run to understand the main effect between the interaction of acculturation dimensions and BMI percentile. The simple slopes test showed that when HOS was low, child BMI Z-score increased significantly when AOS was also high but not when HOS was high (low HOS: simple slope = -.882, $p = .04$; high HOS: simple slope = .452, $p = .09$; Figure 4). Lastly, the only predictor of better quality mealtime planning was years in the U.S. in step four, with less time in the U.S. predicting more mealtime patterns ($\beta = -.07$, $p = .03$).

Table 12.

*Regression Analysis: Acculturation as a Predictor of Child BMI, Dietary Behaviors and Mealtime Patterns (n = 129)*

| Variable | Child BMI Percentile | | | | Child BMI Z-score | | | | Child Diet Behaviors | | | | Mealtime Planning | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta R^2$ | B | $SE_b$ | p-value | $\Delta R^2$ | β | $SE_b$ | p-value | $\Delta R^2$ | β | $SE_b$ | p-value | $\Delta R^2$ | β | $SE_b$ | p-value |
| Step 1 | .04 | | | .02* | | | | | .02 | | | .41 | .01 | | | .25 |
| U.S. Edu | | -14.07 | 6.03 | .02* | | -.08 | .10 | .39 | | -1.11 | .98 | .26 | | .92 | .79 | .25 |
| Step 2 | | | | | | | | | .01 | | | .77 | .01 | | | .59 |
| HOS | | -.09 | .09 | .38 | | -.03 | .09 | .77 | | .69 | 1.31 | .60 | | -.29 | .45 | .50 |
| AOS | | -.07 | .10 | .51 | | .19 | .16 | .26 | | .23 | 1.83 | .90 | | .19 | .38 | .63 |
| Step 3 | | | | | | | | | .01 | | | .82 | .00 | | | .61 |
| HOSxAOS | | -.17 | .09 | .07 | | -.06 | .026 | .03* | | -.10 | .44 | .82 | | -.18 | .36 | .61 |
| Step 4 | | | | | | | | | .03 | | | .08 | .04 | | | .03 |
| Yrs in the U.S. | | .05 | .09 | .53 | | .12 | .09 | .16 | | .07 | .04 | .08 | | -.07 | .03 | .03* |
| Total $R^2$ | .04 | | | | .04 | | | | .06 | | | | .06 | | | |

*Note.* HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Repeated variables in each step were not included because results did not indicate significance.
*p<0.05. **p<0.01.

**Figure 4**. *2-way Interaction between Anglo Orientation and Hispanic Orientation on Child BMI Z-score (189 sample)*

*b* = .452, *p* = .09

*b* = .882, *p* = .04*

Low HOS

High HOS

Child BMI Z-score

Anglo Orientation
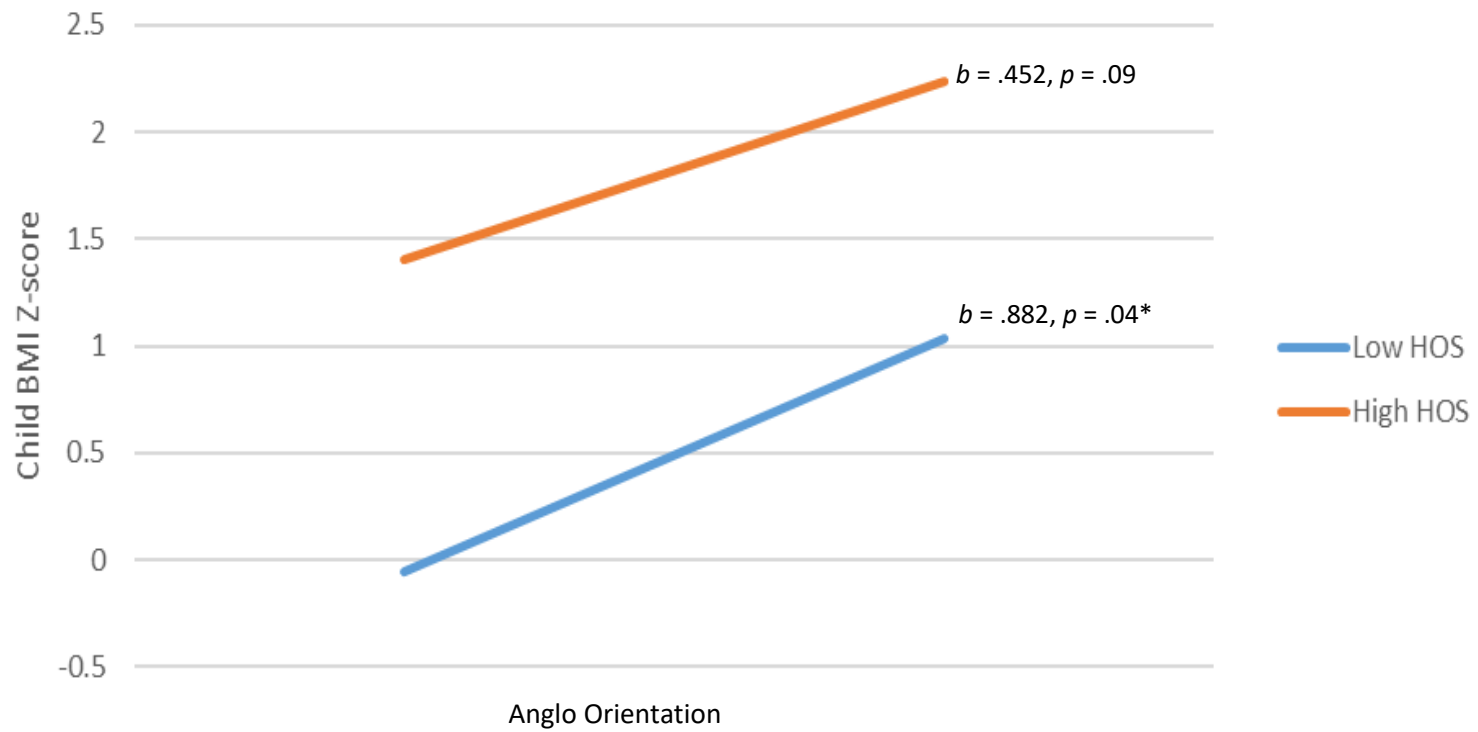
**Objective 2.** When testing indirect and direct effects the "a" path as portrayed in figure three must be significant. If the "a" path is not significant then the link between acculturation and health is not explained by mealtime patterns and therefore are not indirectly or directly associated with the outcome variables of child health (BMI percentile, BMI Z-score, or dietary behaviors). For both samples the "a" path was not significant, therefore in the next objective, we tested main effects and the interaction of acculturation and mealtime patterns.

**Objective 3.** For the third objective, moderation models were tested to understand the impact family mealtime patterns had on the link between acculturation and child health outcomes. With the complete sample ($n = 189$) the results showed significant interactions between acculturation and mealtime patterns on child BMI Z-score, child BMI percentile, and child dietary behaviors (Table 13).

For the outcome BMI percentile, there were two significant predictors. The interaction between Anglo orientation and mealtime planning was negatively associated with child BMI percentile. While the interaction between Anglo orientation and mealtime frequency was positively associated with child BMI percentile. Simple slopes were run to understand the interactions of acculturation and mealtime patterns on BMI percentile in steps five and seven. For the interaction between Anglo orientation and mealtime planning, both slopes were significant suggesting that mothers with high Anglo orientation whether they have low or high mealtime planning are associated with higher child's BMI percentile (low meal planning: simple slope = 21.54, $p = .05$; high meal planning: simple slope = 27.89, $p = .01$; Figure 5). For the interaction between Anglo orientation and mealtime frequency, the simple slopes test showed that when mealtime frequency was high and Anglo orientation was also high this interaction was associated with higher child BMI Percentile compared to when Anglo orientation was low (low meal frequency: simple slope = 21.98, $p = .06$; high meal frequency: simple slope = 24.60, $p = .05$; Figure 6).

For child BMI Z-score, the results were similar to BMI percentile in that significant interactions with mealtime patterns and Anglo orientation were associated with the outcome. In step five, the interaction between Anglo orientation and mealtime planning was negatively associated with BMI percentile, whereas in step seven the interaction of Anglo orientation and mealtime frequency was negatively associated with BMI percentile. No other variables were significant. Simple slopes were run to understand the interaction of acculturation and BMI Z-score in steps five and seven. For the interaction in step five, both slopes were significant showing that with high Anglo orientation and either low or high mealtime planning, BMI Z-score increased (low mealtime planning: simple slope = 1.34, $p = .002$; high mealtime planning: simple slope = 0.95, $p = .03$; Figure 7). For the interaction in step seven, the slope was significant when Anglo orientation and mealtime frequency were both high signifying a higher BMI Z-score (low mealtime frequency: simple slope = 1.34, $p = .01$; high mealtime frequency: simple slope = 0.85, $p = .08$; Figure 8).

Table 13.

*The Interacting influence of Acculturation and Mealtime patterns on Child Health Outcomes (n = 189)*

| Variable | Child BMI Percentile | | | | Child BMI Z-score | | | | Child Dietary Behaviors | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value |
| Step 1 | | | | | | | | | | | | |
| U.S. Edu | | -.11 | .07 | .15 | | -.15 | .20 | .47 | | -.77 | .75 | .31 |
| Step 2 | | | | | | | | | | | | |
| HOS | | -.02 | .07 | .75 | | -.07 | .12 | .53 | | -.05 | .44 | .91 |
| AOS | | -.06 | .07 | .39 | | -.04 | .11 | .71 | | -.30 | .39 | .44 |
| Step 3 | | | | | | | | | | | | |
| HOSxAOS | | -.11 | .07 | .15 | | -.20 | .11 | .06 | | -.14 | .39 | .72 |
| Step 4 | | | | | | | | | | | | |
| Meal Plan | | .00 | .04 | .97 | | -.01 | .03 | .85 | | -.06 | .10 | .56 |
| Meal Frequency | | -.09 | .07 | .198 | | -.04 | .05 | .45 | | .07 | .19 | .73 |
| Step 5 | | | | | | | | | | | | |
| HOSxMeal Plan | | .07 | .08 | .36 | | .02 | .08 | .77 | | .23 | .15 | .12 |
| AOSxMeal Plan | | -1.30 | .61 | .04* | | -.05 | .03 | .05* | | .05 | .11 | .65 |
| Step 6 | | | | | | | | | | | | |
| AOSxHOSxMealPlan | | .06 | .17 | .74 | | -.04 | .17 | .79 | | -.14 | .15 | .36 |

Notes: HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Repeated variables in steps 1-8 were not included because for ease of presentation and if variables were not significant.
*p<0.05. **p<0.01.

*The Interacting influence of Acculturation and Mealtime patterns on Child Health Outcomes (n = 189)*

| Variable | Child BMI Percentile | | | | Child BMI Z-score | | | | Child Dietary Behaviors | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value |
| Step 7 | | | | | | | | | | | | |
| HOSxMeal Freq. | | -.05 | .07 | .51 | | .02 | .08 | .80 | | -.54 | .30 | .07 |
| AOSxMeal Freq. | | 3.19 | 1.21 | .01** | | .132 | .05 | .01** | | -.47 | .21 | .03* |
| Step 8 | | | | | | | | | | | | |
| AOSxHOSxMeal | | | | | | | | | | .46 | .31 | .13 |
| Freq. | | -.10 | .15 | .50 | | -.158 | .14 | .27 | | | | |
| Total R² | .10 | | | | .12 | | | | .10 | | | |

Notes:  HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Repeated variables in steps 1-8 were not included because for ease of presentation and if variables were not significant.
*p<0.05. **p<0.01.

**Figure 5**. *2-way Interaction between Anglo Orientation and Mealtime Planning on Child BMI Percentile (189 sample)*

*b* = 27.89, *p* = .01**

*b* = 21.54, *p* = .05*

Child BMI Percentile

Anglo Orientation

— Low Mealtime Planning

— High Mealtime Planning
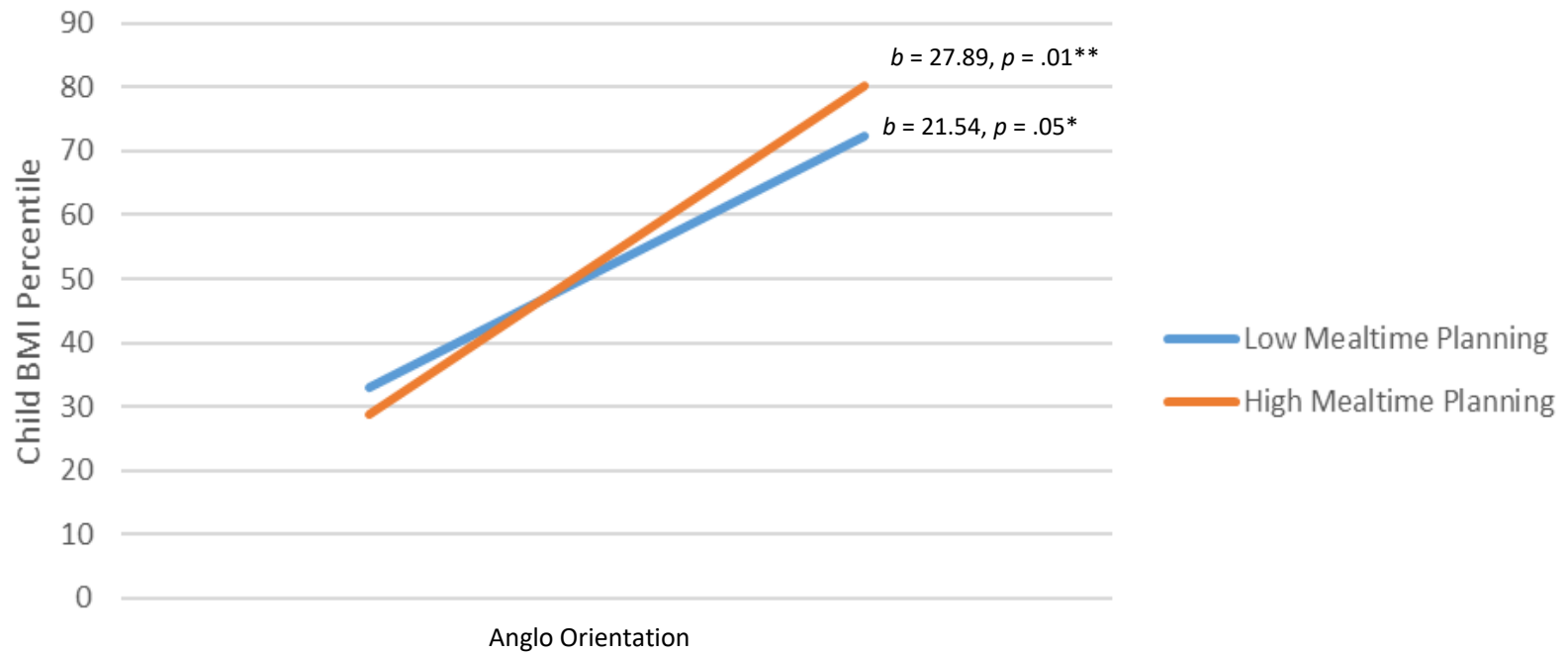
**Figure 6**. *2-way Interaction between Anglo Orientation and Mealtime Frequency on Child BMI Percentile (189 sample)*

$b = 21.98, p = .06$

$b = 24.60, p = .05*$

Child BMI Percentile

Anglo Orientation

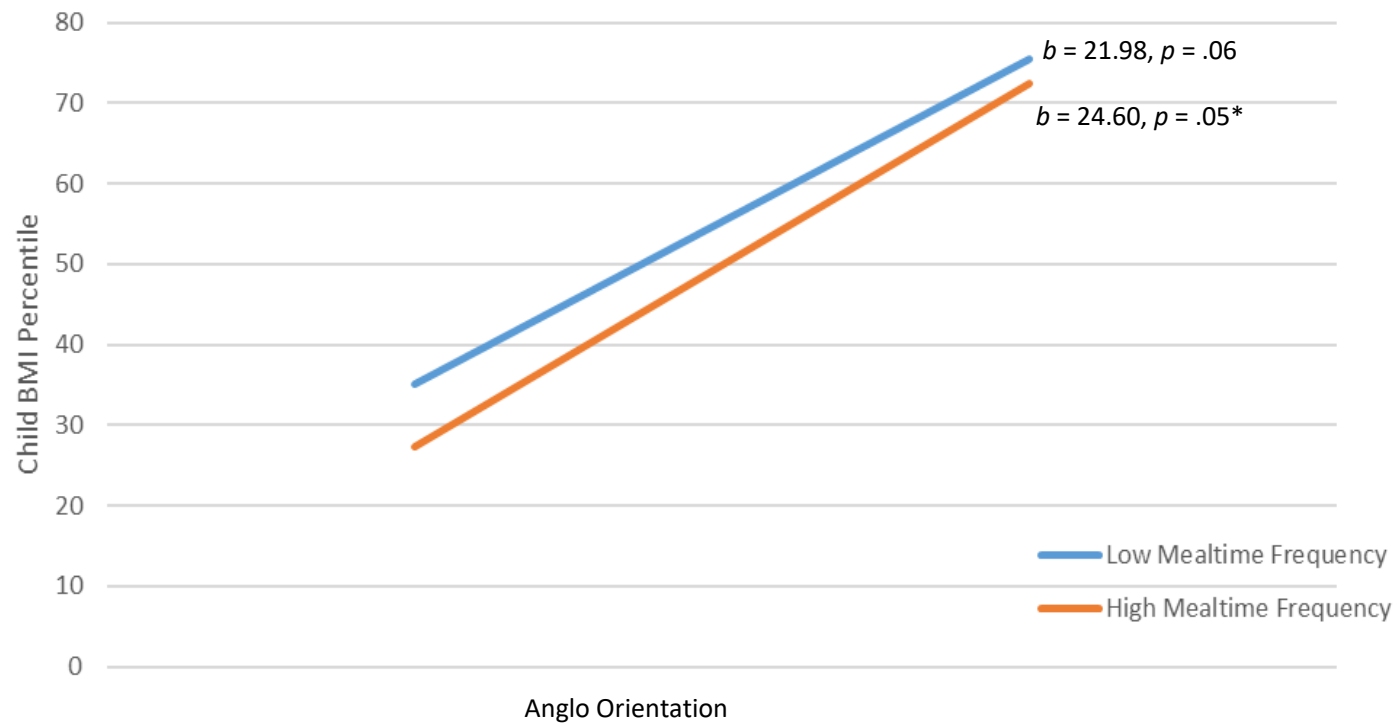Low Mealtime Frequency

High Mealtime Frequency

**Figure 7**. *2-way Interaction between Anglo Orientation and Mealtime Planning on Child BMI Z-score (189 sample)*
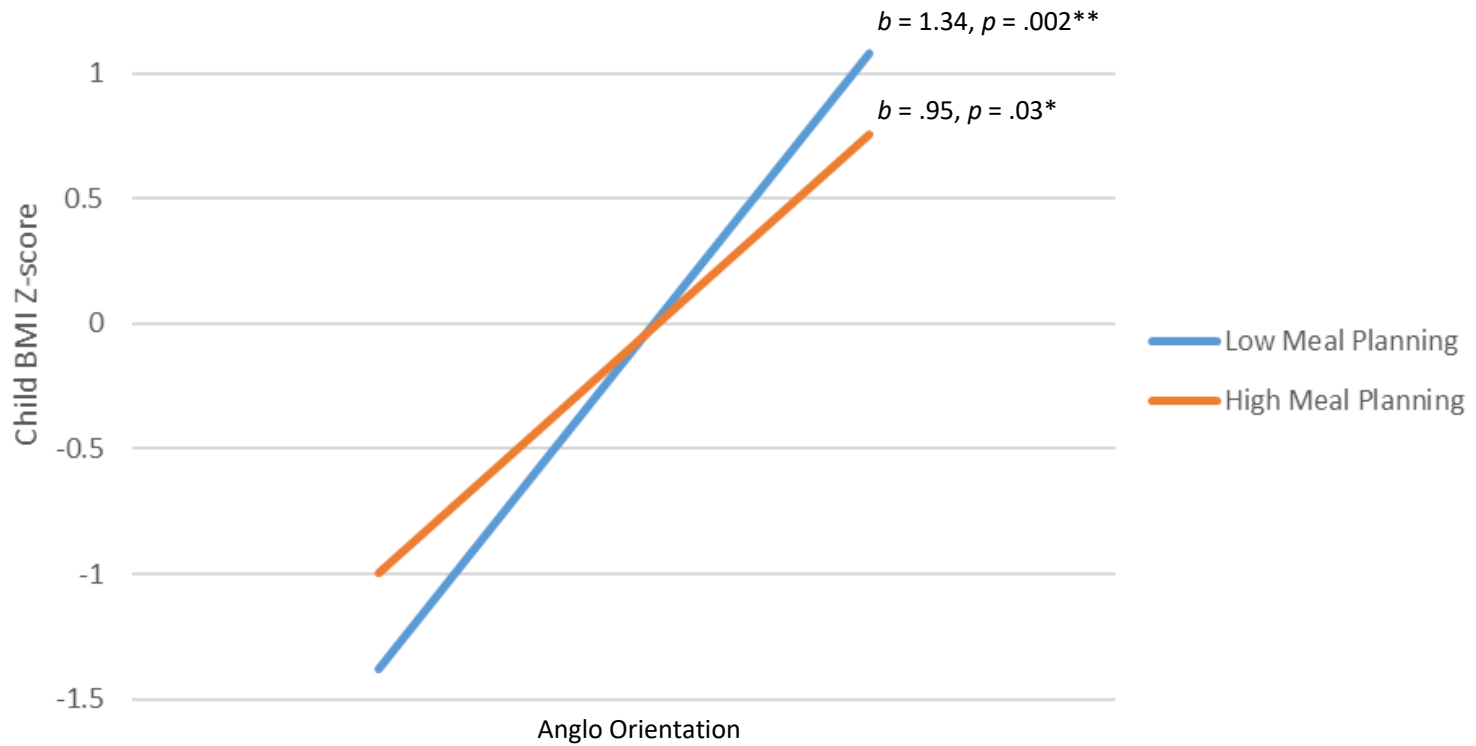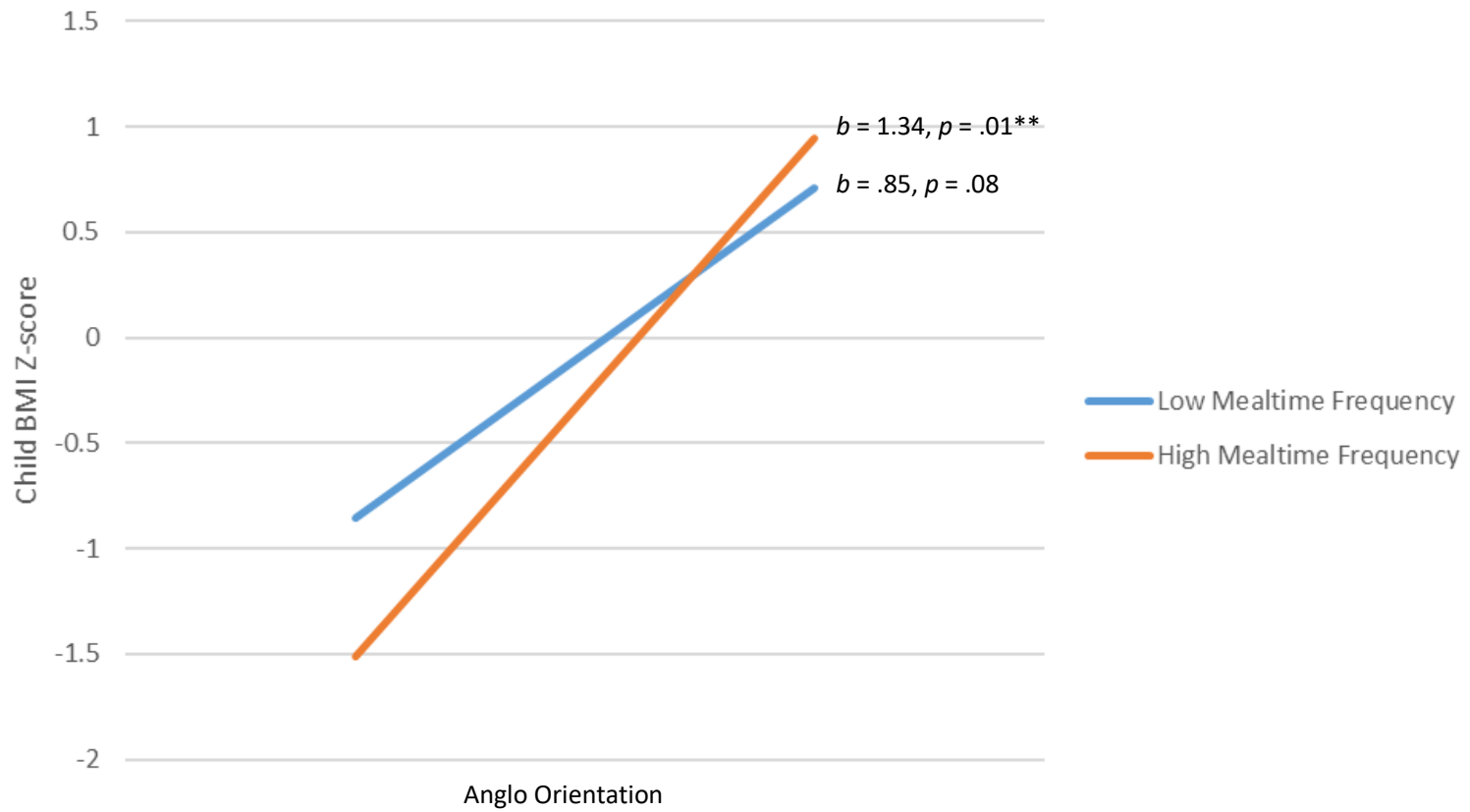
**Figure 8**. *2-way Interaction between Anglo Orientation and Mealtime Frequency on Child BMI Z-score (189 sample)*

For child dietary behaviors outcome, the only significant predictors were in step seven. The interaction of Anglo orientation and mealtime frequency was negatively associated with poorer child dietary behaviors. Simple slopes were run to understand this interaction. For the interaction of Anglo orientation and mealtime frequency both slopes were not significant at a 0.05 p-value suggesting there is no significant interaction between acculturation and mealtime planning (less meal frequency: simple slope = -.343, $p = .86$; more meal frequency: simple slope = -2.07, $p = .31$; Figure 9).

In the subsample ($n = 129$) there were significant associations between acculturation (the interaction of both HOS and AOS) and child BMI Z-score, with a three-way interaction between HOS, AOS, and mealtime planning were associated with child BMI percentile (Table 14). For the outcome of child BMI percentile, there was a significant 3-way interaction between acculturation orientations and mealtime planning in step six. Therefore, simple slopes were run to understand the main effect between the interaction of acculturation dimensions and mealtime planning on BMI percentile. The simple slopes test was not significant (Figure 10).

For the outcome of Child BMI Z-score, the interaction of acculturation was a significant predictor of BMI Z-score. Hispanic and Anglo orientations were negatively associated in step three. There were no significant variables in the remaining steps. The simple slopes test show significant slopes representing that when Anglo orientation is low and Hispanic orientation is high these mothers have children with significantly higher BMI Z-scores than when Hispanic and Anglo orientations are both low (low AOS: simple slope = .99, $p = .03$; high AOS: simple slope = .42, $p = .01$; Figure 11). No variables were significantly associated with the outcome variable of child dietary behaviors.

**Objective 4.** Logistic regression was used to understand the likelihood of being classified as overweight or obesity. With the overall sample ($n = 189$), after adjusting for sociodemographic variables higher BMI of the mother was associated with children's weight status, being 1.07 times more likely to be overweight or obese (Table 15). Mother's BMI was also associated with children being 1.08 times more likely to be classified as obese (Table 16). For the subsample ($n = 129$), the interaction of acculturation showed a 0.56 decrease in odds that the child would be classified as overweight or obese (Table 17). Additionally, as mother's BMI increased, children had an increased odds of being classified as having overweight or obesity (odds ratio, 1.063; 95% CI, 1.008 – 1.121) and increased odds of having childhood obesity (odds ratio, 1.076; 95% CI, 1.018 – 1.136; Table 18).

**Figure 9**. *2-way Interaction between Anglo Orientation and Mealtime Frequency on Child Dietary Behaviors (189 sample)*

*b* = -.343, *p* = .86

*b* = -2.07, *p* = .31

Low Mealtime Frequency

High Mealtime Frequency

Poor Child Dietary Behaviors

Anglo Orientation

Table 14.

*The Interacting influence of Acculturation and Mealtime patterns on Child Health Outcomes (n = 129)*

| | Child BMI Percentile | | | | Child BMI Z-score | | | | Child Dietary Behaviors | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value |
| Step 1 | | | | | | | | | | | | |
| U.S. Edu | | -14.35 | 6.19 | .02* | | -.08 | .10 | .45 | | -1.15 | .98 | .24 |
| Step 2 | | | | | | | | | | | | |
| HOS | | -.08 | .09 | .37 | | -.02 | .09 | .79 | | .39 | .54 | .47 |
| AOS | | -.05 | .10 | .60 | | .19 | .16 | .25 | | -.04 | .47 | .93 |
| Step 3 | | | | | | | | | | | | |
| HOSxAOS | | -.17 | .10 | .09 | | -.05 | .03 | .04* | | -.09 | .44 | .84 |
| Step 4 | | | | | | | | | | | | |
| Meal Plan | | .09 | .09 | .31 | | -.01 | .08 | .94 | | -.11 | .13 | .40 |
| Meal Frequency | | -.02 | .09 | .84 | | -.00 | .07 | .98 | | .07 | .23 | .76 |
| Step 5 | | | | | | | | | | | | |
| HOSxMeal Plan | | -.03 | .09 | .72 | | -.09 | .09 | .32 | | .08 | .21 | .71 |
| AOSxMeal Plan | | -.13 | .09 | .13 | | -.10 | .09 | .27 | | -.03 | .14 | .81 |

Notes: HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Repeated variables in steps 1-8 were not included because for ease of presentation and when variables were not significant.
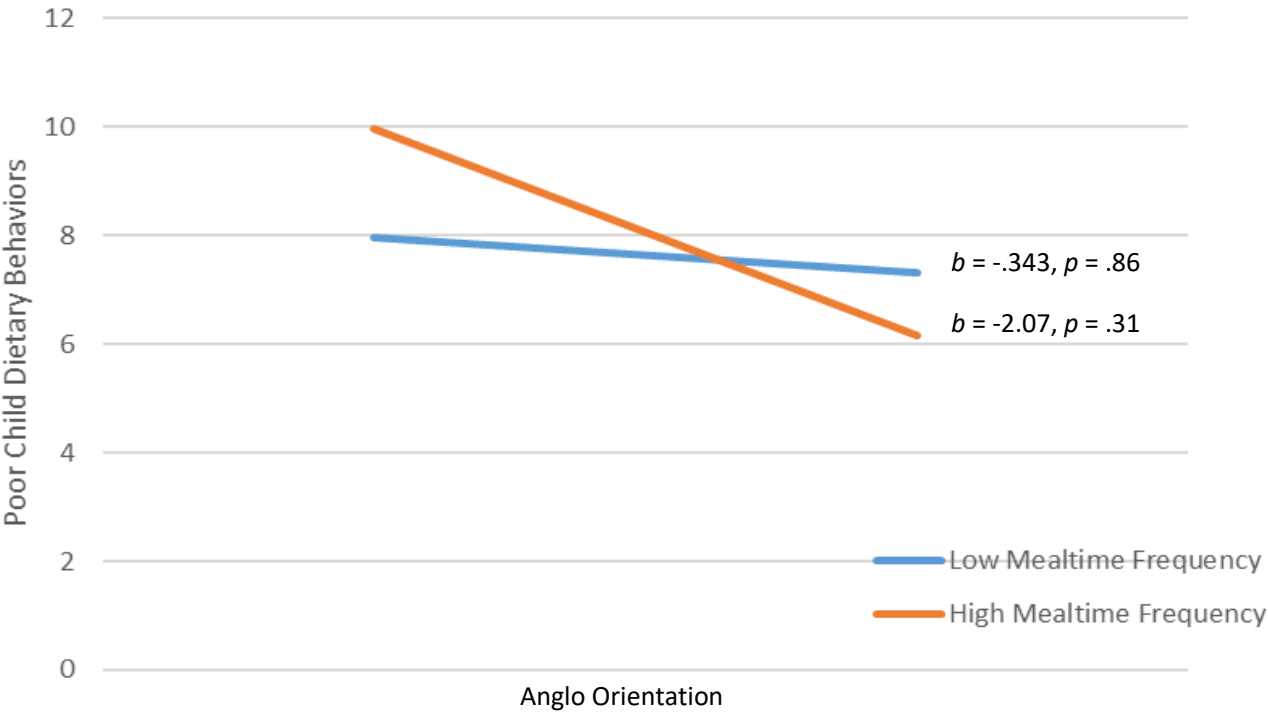*p<0.05. **p<0.01.

Table 14 (cont.)

*The Interacting influence of Acculturation and Mealtime patterns on Child Health Outcomes (n = 129)*

| Variable | Child BMI Percentile | | | | Child BMI Z-score | | | | Child Dietary Behaviors | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value | $\Delta R^2$ | β | SE B | p-value |
| Step 6 | | | | | | | | | | | | |
| AOSxHOSxMealPlan | | -.39 | .20 | .05* | | -.16 | .09 | .07 | | -.27 | .18 | .15 |
| Step 7 | | | | | | | | | | | | |
| HOSxMeal Freq. | | -.10 | .09 | .23 | | -.16 | .09 | .07 | | -.68 | .42 | .11 |
| AOSxMeal Freq. | | .17 | .09 | .06 | | .07 | .09 | .46 | | -.33 | .26 | .22 |
| Step 8 | | | | | | | | | | | | |
| AOSxHOSxMeal Freq. | | .12 | .10 | .230 | | -.02 | .09 | .84 | | .57 | .38 | .14 |
| Step 9 | | | | | | | | | | | | |
| Years in the U.S | | .02 | .09 | .86 | | .14 | .09 | .13 | | .08 | .04 | .08 |
| Step 10 | | | | | | | | | | | | |
| Years in USxMeal Plan | | .04 | .09 | .69 | | -.04 | .09 | .67 | | .01 | .01 | .34 |
| Years in USxMeal Freq. | | -.00 | .08 | .96 | | .04 | .09 | .62 | | .04 | .03 | .24 |
| Total R² | .11 | | | | .03 | | | | .14 | | | |

Notes:  HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale. Repeated variables in steps 1-8 were not included because for ease of presentation and when variables were not significant.
*p<0.05. **p<0.01.

**Figure 10**. *3-way Interaction between Anglo, Hispanic Orientations and Mealtime Planning on Child BMI Percentile (129 sample)*
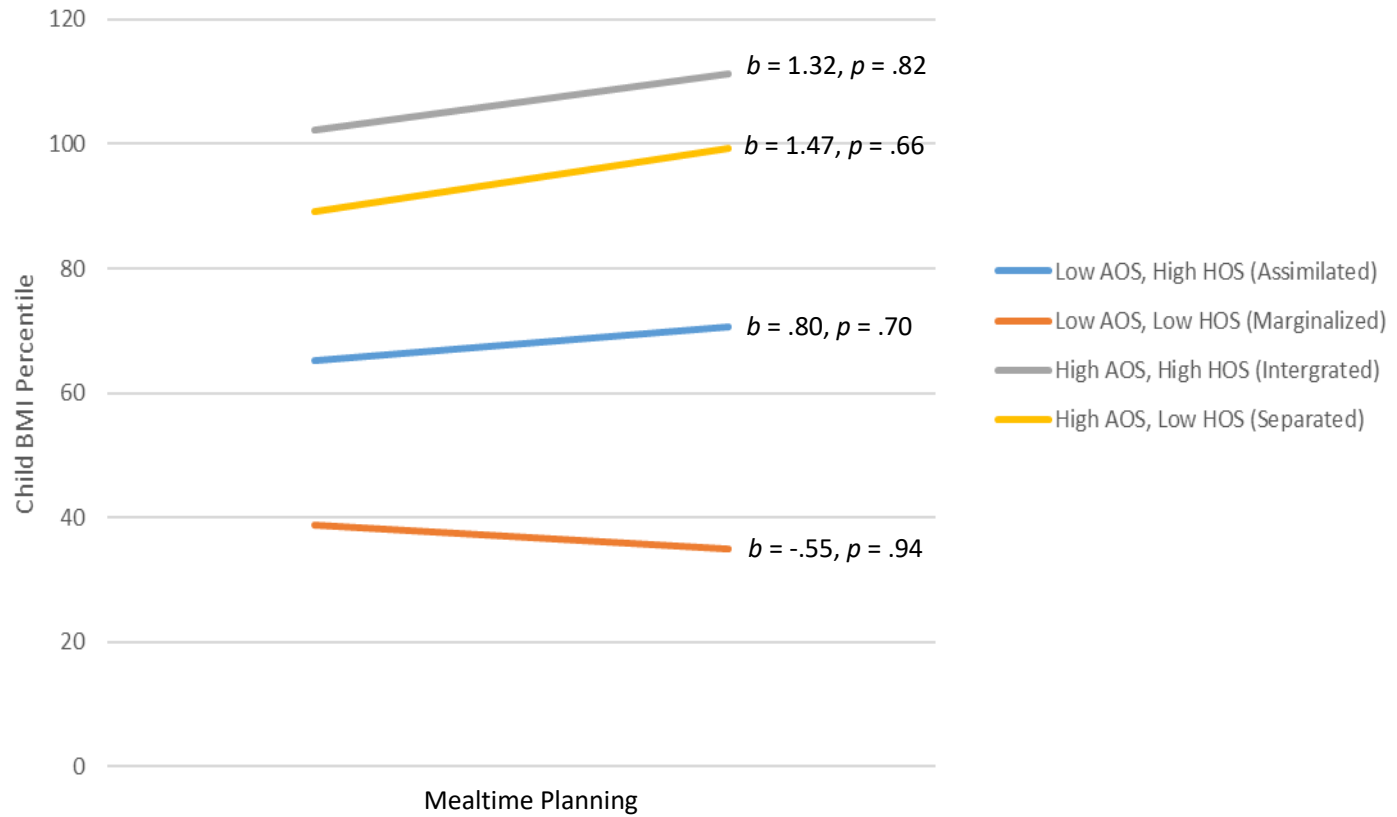
**Figure 11**. *2-way Interaction between Anglo and Hispanic Orientations on Child BMI Z-score (129 sample)*

*b* = .42, *p* = .10

*b* = .99, *p* = .03*

Child BMI Z-score

Hispanic Orientation

Low AOS

High AOS

Table 15.

*Logistic Regression Predicting Child's Weight Status: Overweight or Obese (n = 189)*

| Predictor | B | SE | OR | 95% CI | Wald Statistic | p |
|---|---|---|---|---|---|---|
| Child Sex | -.214 | .321 | .807 | [.430, 1.515] | .444 | .505 |
| U.S. Education level | -.252 | .471 | .777 | [.309, 1.956] | .286 | .593 |
| Origin Country Education level | .025 | .348 | 2.420 | [.739, 7.928] | .005 | .942 |
| HOS | .884 | .605 | 2.420 | [.739, 7.928] | 2.130 | .144 |
| AOS | 1.522 | .952 | 4.580 | [.709, 29.571] | 2.558 | .110 |
| AOS X HOS | -.356 | .224 | .700 | [.451, 1.087] | 2.521 | .112 |
| Mealtime patterns | .017 | .052 | 1.017 | [.918, 1.127] | .107 | .743 |
| Mealtime Frequency | -.094 | .095 | .911 | [.756, 1.098] | .963 | .326 |
| Mother BMI | .063 | .002 | 1.065 | [1.019, 1.113] | 7.906 | .005** |
| Mother Dietary Behaviors | -.009 | .027 | .991 | [.939, 1.046] | .104 | .748 |

*Note.* HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale.

Table 16.

*Logistic Regression Predicting Child's Weight Status: Obese (n = 189)*

| Predictor | B | SE | OR | 95% CI | Wald Statistic | p |
|---|---|---|---|---|---|---|
| Child Sex | .276 | .361 | 1.318 | [.649, 2.676] | .583 | .445 |
| U.S. Education level | -.211 | .527 | .810 | [.288, 2.277] | .160 | .689 |
| Origin Country Education level | -.292 | .395 | .747 | [.344, 1.619] | .547 | .459 |
| HOS | 1.054 | .644 | 2.869 | [.812, 10.137] | 2.679 | .102 |
| AOS | 1.337 | .954 | 3.807 | [.587, 24.694] | 1.964 | .161 |
| AOS X HOS | -.330 | .225 | .719 | [.463, 1.117] | 2.152 | .142 |
| Mealtime patterns | .052 | .058 | 1.053 | [.940, 1.180] | .804 | .370 |
| Mealtime Frequency | -.073 | .105 | .929 | [.756, 1.142] | .484 | .486 |
| Mother BMI | .076 | .023 | 1.079 | [1.033, 1.128] | 11.496 | .001** |
| Mother Dietary Behaviors | .021 | .030 | 1.021 | [1.003, 1.128] | .469 | .493 |

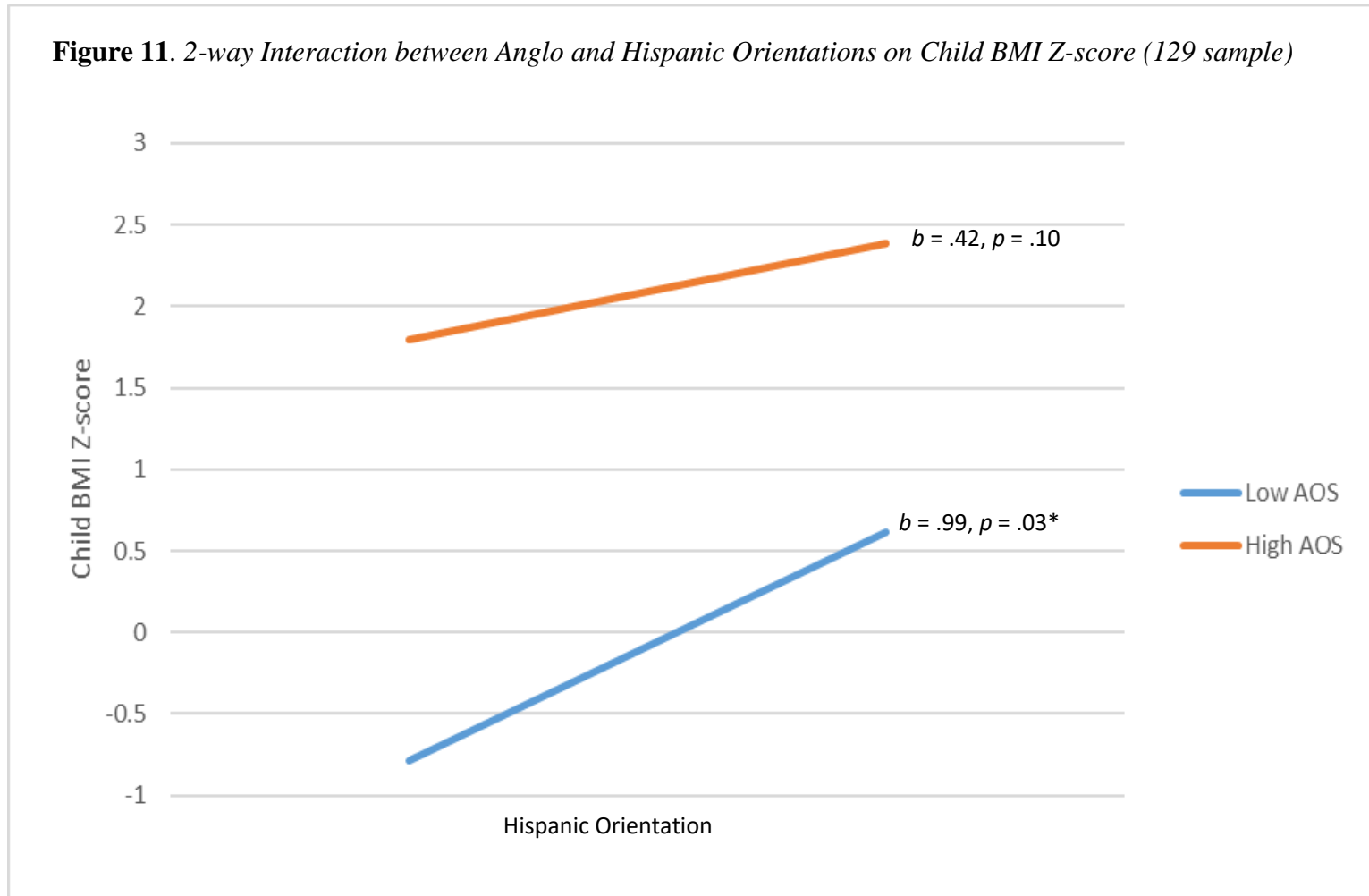*Note.* HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale.

Table 17.

*Logistic Regression Predicting Child's Weight Status: Overweight or Obese (n = 129)*

| Predictor | B | SE | OR | 95% CI | Wald Statistic | p |
|---|---|---|---|---|---|---|
| Child Sex | -.044 | .398 | .957 | [.438, 2.090] | .012 | .913 |
| U.S. Education level | -.330 | .640 | .719 | [.205, 2.520] | .266 | .606 |
| Origin Country Education level | -.021 | .437 | .979 | [.416, 2.307] | .002 | .961 |
| HOS | 1.523 | .793 | 4.584 | [.968, 21.700] | 3.684 | .055 |
| AOS | 2.319 | 1.198 | 10.165 | [.971, 106.39] | 3.747 | .053 |
| AOS X HOS | -.582 | .287 | .559 | [.318, .980] | 4.115 | .042* |
| Years in the U.S. | .017 | .023 | 1.017 | [.972, 1.065] | .533 | .465 |
| Mealtime patterns | .038 | .071 | 1.039 | [.905, 1.193] | .288 | .591 |
| Mealtime Frequency | -.098 | .122 | .907 | [.714, 1.152] | .641 | .423 |
| Mother BMI | .061 | .027 | 1.063 | [1.008, 1.121] | 5.114 | .024* |
| Mother Dietary Behaviors | -.009 | .033 | .991 | [.929, 1.057] | .082 | .774 |

*Note.* HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale.

Table 18.

*Logistic Regression Predicting Child's Weight Status: Obese (n = 129)*

| Predictor | B | SE | OR | 95% CI | Wald Statistic | p |
|---|---|---|---|---|---|---|
| Child Sex | .398 | .462 | 1.489 | [.603, 3.680] | .745 | .388 |
| U.S. Education level | -.684 | .771 | .520 | [.115, 2.358] | .719 | .396 |
| Origin Country Education level | -.625 | .527 | .535 | [.190, 1.504] | 1.405 | .236 |
| HOS | 1.127 | .808 | 3.087 | [.633, 15.055] | 1.944 | .163 |
| AOS | 1.433 | 1.155 | 4.193 | [.436, 40.318] | 1.541 | .215 |
| AOS X HOS | -.402 | .179 | .669 | [.387, 1.154] | 2.086 | .149 |
| Years in the U.S. | .046 | .027 | 1.047 | [.994, 1.104] | 3.025 | .082 |
| Mealtime patterns | .024 | .080 | 1.024 | [.875, 1.199] | .090 | .764 |
| Mealtime Frequency | .011 | .142 | 1.011 | [.765, 1.335] | .006 | .940 |
| Mother BMI | .073 | .028 | 1.076 | [1.018, 1.136] | 6.735 | .009** |
| Mother Dietary Behaviors | .013 | .037 | 1.013 | [.942, 1.088] | .118 | .731 |

*Note.* HOS- Hispanic Oriented Scale, AOS- Anglo Oriented Scale.

**Discussion**

This study examined how family mealtime patterns influence the association between acculturation and child health outcomes. We investigated if mother's bidimensional acculturation influenced mealtime routines and child health outcomes. Furthermore, we tested how mealtime patterns moderated or mediated the path between acculturation and health outcomes. The results showed that bidimensional acculturation was associated with weight status but not child dietary behaviors. Assimilated strategies, those high in Anglo orientation, was associated with child BMI Z-score and percentile regardless of high or low mealtime planning and frequency. Additionally, the proxy variable of acculturation, years in the U.S., was a predictor of mealtime planning.

Considering our hypothesis, objective one findings were consistent. The main goal of objective one was to understand the degree to which acculturation was associated with mealtime planning and child's health outcomes. The interactions for objective one showed that when Hispanic orientation was low and Anglo orientation was high (represented as assimilated) child BMI Z-score increased. This finding was in line with our hypothesis and previous research that has studied acculturation in a unidimensional framework (see Dave et al., 2009; Elder et al., 2010; Lara et al., 2005). Higher assimilation has been associated with unhealthy dietary behaviors such as lower fruit and vegetable intake, higher consumption of sugar, SSBs, and added fats with a higher frequency of eating out at fast-food restaurants (Ayala et al., 2008; Mainous III et al., 2006; Pérez-Escamilla, 2011). Although one study, in particular, examined weight status which reported that parents with traditional acculturation strategies, the unidimensional opposite of an assimilated strategy, were more likely to have children who were overweight (Elder et al., 2010). Our study found that parents who were assimilated were associated with children of higher BMI Z-score. Although these findings are contradictory to Elder et al's study, our study expanded the construct of acculturation and by using a bidimensional framework we can resolve this contradiction.

We recognize that mealtime patterns were not a mediating link between acculturation and child health outcomes since objective two outcomes, which tested for indirect and direct effects, were not significant. One explanation for this finding is that the data were cross-sectional. Therefore, we did not find causal links over time explaining that mealtime patterns were the mechanism between acculturation and health outcomes. Therefore, our study objective number three was to understand how if mealtimes patterns moderated the link between acculturation and health outcomes.

Some of the most salient findings are with the interactions of Anglo orientation and mealtime patterns. The interaction of mealtime planning and cultural orientation identified associations with child BMI percentile and Z-score, particularly when there was a high orientation toward Anglo culture and either low or high mealtime planning levels an increase in child weight status emerged. Additionally, the

interaction of high Anglo orientation and high frequency of shared mealtimes were also associated with higher child BMI percentile and Z-score. In summary, assimilated strategies, a high cultural tie to Anglo culture regardless of mealtime planning was associated with higher weight status. This finding was unique in that our hypothesis suggests that mealtime planning can influence the association between acculturation and weight status. Particularly because added chaos and less organization around mealtimes has been associated with lower quality diet and prevented weight gain among Hispanic adults (Berge et al., 2014; Dosamntes-Carrasco et al., 2017). Moreover, mealtime planning can heighten the risk that low cultural ties have toward weight status. For example, data from NHANES and several other studies have shown assimilation (low ties toward Hispanic culture) to be associated with consumption of added fats, lower fruit and vegetable intakes, and increased frequency of fast-food visits (Ayala et al., 2008; Mainous III et al., 2006; Pérez-Escamilla, 2011). Although when there are limitations on mealtime distractions, planned logistical scheduling, behavior management and an emphasis on positive mealtimes, these behaviors can buffer the effect assimilation has on quality mealtimes (Andaya et al., 2011) as seen in our results. However, we also recognize that this association is also true for families with high levels of mealtime planning and mealtime frequency. Additionally, mealtime frequency was significantly associated with child weight status however it was not in the direction of previous research outcomes in that more shared mealtimes with assimilated strategies was associated with higher weight status (i.e., Hammons & Fiese, 2011; Martin-Biggers et al., 2014; Fulkerson et al., 2008). In the studies by Martin-Briggers and colleagues (2014) and Fulkerson et al (2008), they highlight that mealtime frequency was not associated with lower BMI for Hispanic children but only for White children. Mealtimes could be a time shared with most family members but not necessarily all members. Fathers often have to work longer hours and may not be there for mealtimes (Coltrane, Parke, & Adams, 2004). This can disrupt family routines which lead to negative mealtime experiences having ties to negative health outcomes (Spagnola & Fiese, 2007). However, more should be explored as to why more shared mealtimes were not seen as a protective factor especially for assimilated mothers.

A major determinant of acculturation is time in the U.S. In past literature it has been considered a proxy variable of acculturation, representing elements of the acculturation process lower levels of mealtime planning and positively associated with poor dietary behaviors suggesting that the longer mothers have been in the U.S., the less mealtime planning was reported and poorer child dietary behaviors. Thus, more assimilated strategies (measured by acculturation and the proxy- years in the U.S.) were associated with negative health outcomes and behaviors. Assimilated mothers adopt the new culture without maintaining their original cultural dimension (Berry & Sam, 1997) particularly around consumer choices (Luedicke, 2011). The result of higher weight status may stem from the change in adopting European American consumer styles which can look like purchasing low-cost and high-visibility items

(e.g. fast food and highly advertised products; Peñaloza, 1994). As described before, an important Hispanic family value is "familism," marked by devotion and importance to family unity over the individual members (Ayón et al., 2010). If a value such as this changes through the acculturation process then mealtimes and their importance may fade, which in turn influence weight status as seen in the findings.

Lastly, the purpose of objective four was to examine the likelihood that acculturation and mealtime behaviors were associated with children's weight categories. The main predictor of increased odds for having a child with overweight or obesity was mother's BMI, which is common among other studies that measure Hispanic families' BMI (i.e., Elder et al., 2010; Morello, Madanat, Crespo, Lemus, & Elder, 2012; Larson, Wall, Story, & Neumark-Sztainer, 2013). There was a seven to eight percent increase in odds with every unit increase of mother's BMI. Implying that mother's weight status is a major influencer of children's health outcomes. Parents are often the main influencer in their children's lives, determining and managing the household food environment, meal preparation, financial resources, and cooking skills (Larsen et al., 2015; Patrick & Nicklas, 2005; Salvy et al., 2010). This may be especially true for Hispanic children having close ties to family unity and closely following the behaviors and customs of their parents (Santiago-Torres et al., 2014). Additionally, the interaction of acculturation showed a decrease in odds that their child will be classified as overweight or obese, meaning that with higher orientations to both Hispanic and Anglo cultures (integrated) there is a 44% decrease in odds that a child will be classified as overweight or obese. Integrated strategies may elicit positive outcomes especially for families that may have acculturation gaps (Soto et al., 2017), since second-generation children may have access to the new culture in more immediate settings such as school or media outlets (Dondero & Van Hook, 2016). Mothers with ties to both cultures may be able to connect and manage changing cultural dynamics within the household better than those who are separated or have more traditional cultural ties. Especially when there are differences in preferences due to acculturation strategies, it can be frustrating and difficult for mothers to maintain healthy habits (Lora et al., 2017). All in all, these findings demonstrate that maintaining quality mealtime planning routines may mitigate the effects acculturation has on child health outcomes.

**Limitations**

A few limitations should be considered; although the larger study, Abriendo Caminos is a longitudinal study, it is a randomized control intervention. Therefore I could not test these effects longitudinally due to the potential intervention effects on health outcomes. Secondly, the only data we collected from children was their anthropometric measurements and the target children themselves did not report on their behaviors. Future studies should consider understanding the acculturation process for children and their health behaviors to then, therefore, examine the interaction between parent-child

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acculturation on health behaviors and outcomes. Additionally, the measure of acculturation, although a popular and common measurement among Hispanic populations, is limited. The ARSMA-II questionnaire asks questions on behaviors such as practices in speaking, reading, and watching TV and movies in English compared to Spanish and having either more contact with English speakers and non-Hispanic Whites or with Spanish speakers and other Hispanics. These practices appear to capture behavioral aspects of culture but do not capture deep-rooted beliefs or values that may be specific to each cultural dimension. Future studies should consider how different cultural domains relate to health outcomes. Lastly, due to the high level of incomplete data for the variable: number of years in the U.S., we used a subsample to understand these effects. Therefore, it would be helpful to go back and follow up with the participants about this particular measure as well as to understand how other proxy variables of acculturation play a role in health outcomes.

## Implications

As the rate of obesity continues to rise, the integration of acculturation and mealtime routines presented in this paper gives insight into future research, practice, and policy focused on combating health disparities for Hispanic immigrant families. The outcomes seen by testing the integration model between acculturation and mealtime routines on dietary patterns and weight status will allow researchers to expand on health prevention promotion programs. Additionally, previous work on acculturation factors influencing health outcomes for Hispanic immigrant families in the U.S. has largely focused on measurement through unidimensional models of acculturation. This study is innovative because it tested the framework of bidimensional acculturation on health outcomes. These findings suggest that mealtime planning is an important factor contributing to acculturation and health outcomes among Hispanic families. Furthermore, assimilated strategies may be at greater risk as we saw that higher levels of mealtime planning and frequency were associated with higher weight status.

Family-focused obesity interventions have shown some impact on decreasing weight and increasing positive health outcomes (Davis, Ventura, Cook, Gyllenhammer, & Gatto, 2011; Kobel et al., 2016). A few Hispanic-tailored inventions seem to integrate culture and family routines that specifically seek to alter behavior and learned habits due to an acculturation process (Guarnaccia, Viviar, Bellows, & Alcaraz, 2012). These findings suggest that mealtime routines are an important topic that should be discussed and interwoven when targetting Hispanic populations. Additionally, understanding individuals and families' acculturation strategies can be a useful tactic in intervention programs to individually help those who are assimilated.

Public and social policy would benefit from understanding how cultural differences and changes post-migration influence health behaviors affecting BMI and dietary quality. Policy could then be directed towards impacting culturally relevant health behaviors that change dietary quality leading to better health

and obesity prevention strategies (Ben-Sefer, Ben-Natan, & Ehrenfeld, 2009). Changes can be made in schools, allowing for a greater variety of cultural food options in school cafeterias and emphasizing the importance of maintaining quality household routines (Ojeda & Piña-Watson, 2013). Health practitioners and intervention specialists should seek to integrate family wellness lessons on household routines and planning for mealtimes along with nutrition education especially among families with broken cultural ties. This study sought to understand how mealtime patterns influence the link between bidimensional acculturation and child health outcomes among Hispanic families. Parents continue to be a major influence on their children's health outcomes particularly the patterns around mealtime routines. Culture was associated with weight status but it is necessary to understand how mealtime planning influenced that association. Examining bidimensional acculturation allowed for a new understanding of how acculturation processes impact the Hispanic community and its' health disparities.

**Chapter Five: Integrated Discussion**

Although there have been numerous studies examining Hispanic health with a cultural lens, no studies to date have compared families from Mexico and the U.S. in understanding their behaviors around mealtime routines. Additionally, few studies have examined bidimensional acculturation influences on dietary behaviors and weight status among Hispanic families. Therefore, these studies were a necessary contribution considering the rising rates of childhood and adult obesity among Hispanic populations in the U.S. and in Mexico (OCED, 2014; Ogden et al., 2016; Wang & Beydoun, 2007). With the increasing Hispanic immigrant and U.S.-born population, understanding cultural factors that influence health behaviors is vital in combatting these health disparities. Considering these implications, the purpose of these studies was to understand these gaps by exploring mother's perspectives and experiences around mealtime routines from across two countries and examine bidimensional acculturation effects on children's health outcomes.

We first realize that culture is an important aspect interwoven in behaviors, identity, and beliefs (Berry & Sam, 2016). Particularly for Hispanic families cultural values such as familism, referring to strong in-group feelings and an emphasis on family goals and support, pushes families to consider their time spent together, the relevance of family networks, and emotional support given to one another (Bardis, 1959; Calzada, Tamis-LeMonda, & Yoshikawa, 2012). These behaviors can then act as a protective factor regarding child development and health outcomes when considering numerous obstacles affecting Hispanic families such as poverty, acculturation, and discrimination (Delgado, Updegraff, Roosa, & Umaña-Taylor, 2011). In terms of acculturation, we recognize the multifaceted nature of different layers influencing identities, behaviors, and beliefs. Such that understanding acculturation in a bidimensional framework dictates that individuals are capable of having multiple cultural identities, behaviors, and values (Ryder et al., 2000). For example, mothers who have migrated with increased work commitments may have pressure to maintain traditional gender roles in caregiving, mealtime planning, and cooking and these commitments influence healthy eating patterns (Greaney et al., 2012).

These types of cultural intersections were seen in both of the study outcomes. For instance, findings from study one highlight changes in cultural practices due to globalization influences. Modernization in terms of the availability of resources, increased employment of women, and the movement of people (Giray & Ferguson, 2018; Pais, 2006) explained a variety of these hardships faced among families. Around mealtimes, food preparation has changed, there are now more food options available and a push for quick and easy meals. Mothers talked about the difference from their own childhood experiences in that they used to visit local markets and farms to receive fresh produce and meat, however this practice seemed to be less common now that easier and cheaper options are available in frozen food sections of the grocery store, in cans, or opting to buy something that is already made from

a restaurant or fast food chain. Secondly, alongside the availability of quick meals that are often frozen, mothers are working for the first time or working longer hours. Therefore, they are wanting quick options because of time conflicts. However, these foods may not be the healthiest option and mothers have to negotiate what is best for their family to what is most feasible and consider what their family will eat.

Technology is a major component of globalization (Prilleltensky, 2012). Information, media sources, and entertainment can all come from the increased use of technology. Mothers realized that technology via television, phones, and videogames was a unique barrier to implementing quality mealtimes focused on positive family unity and communication. This was unique in the sense that they did not have this experience in their childhoods. Highlighting that the circumstances of today are much different from before. The influence of globalization and modernized values in high productivity and fast-paced lifestyles have influenced health promotion decisions around mealtimes. Acculturation influencing health is also seen in study two. Such that when Anglo orientation was high (represented as an assimilated acculturation strategy) child BMI Z-score and percentile was higher than those with low orientations to Anglo culture. Cultural values may protect or hinder behaviors leading to children's health outcomes. Therefore, by further unpacking the meaning behind these findings could be the first step to combat health disparities.

Study two intends to address inconsistencies in the literature regarding acculturation. Taking a bidimensional approach, it was found that high cultural ties Anglo orientation when there is low mealtime planning had significantly higher weight status than those with low cultural ties to Anglo orientation. This finding overlaps with study one in a descriptive manner. Mothers discuss how changes in their behaviors from their childhoods in food purchases, influences from their children wanting more "Americanized" or unhealthy food snacks, and differences in technology have become barriers in maintaining healthy mealtime routines. Furthermore, mothers talk about being influenced by their family members and as a result, may be swayed in what is purchased, cooked, or picked up from a restaurant that day or week. Consequently, inconsistent planning routines may occur because of the unclear roles around who makes the decisions behind mealtimes.

Moreover, the finding in which assimilated strategies was associated with higher weight status regardless of mealtime planning, may describe how several mothers talk about their uncertainty and struggles in maintaining traditional Hispanic meals. Because meals are different from before, there may be an added pressure to follow the traditions they grew up with but not being able to maintain those and not being able to fully immerse themselves in the new culture's dietary patterns. This push against tradition and adopting novel behaviors has led mothers to opt-in for quick meals such as instant soups, pizza, or pre-made food. These examples can help tailor health messages for families struggling to maintain healthy routines especially when cultural practices have changed and it has become harder to

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serve and prepare traditional meals. Lastly, study two found that mothers' weight status was a predictor of child's weight status. Considering that mothers are the main leaders for all steps leading to mealtimes, as seen in study one, they can continue to advocate for their family and bring each family member on board in supporting healthy routines. The context and real-life experiences found in study one help support the findings from study two.

Considering how these two studies come together and contribute to one another's findings there are important implications for future directions. Although our findings suggest assimilated strategies may be more important than the level of mealtime patterns, mealtime planning and frequency have important implications for weight status for particular acculturation strategies. Furthermore, in study two results showed that with more shared mealtimes and assimilated strategies were associated with higher weight status. This suggests the type of mealtime patterns (mealtime planning vs. mealtime frequency) may play a more significant role in health outcomes among Hispanic families.

A large contributor to healthy routines were family members beyond mothers. Study one demonstrated that children and fathers often influenced what was being purchased, cooked, and the process of mealtime routines. Mothers would often blame their husbands or partners in facilitating negative dietary behaviors. Consistent with previous research, husbands and fathers should be considered as part of health behavior research (Nepper & Chai, 2016). Although fathers and father-figures may have fewer opportunities to plan the shopping and cooking routines at home, they were seen to have the ability to negotiate and navigate those types of practices by making their own purchases, influencing their children's preferences, and commanding their own preferences.

Lastly, children also significantly impact their mother's choices and behaviors which in turn impacts their health outcomes as seen in both studies. Study one discusses the implications of what children ask for in meals, their own efforts in shopping and cooking or the lack thereof, and their own preferences or pickiness to certain food groups. All of these factors contribute to how mothers make decisions on how to shop for food, whether alone or with family members, how to prepare and cook meals, with or without the help and support of their children, and rules around the mealtime, considering technology and communication. Then in study two, results show that mother's acculturation does influence children's weight status. By then understanding the role of the child in their own acculturation strategies, their perspectives, and the impact they have on the family would allow for a better understanding of how the entirety of Hispanic families contribute to their health outcomes as a unit. Furthermore, examining differences in acculturation often understood through acculturation gaps between family members could allow for an understanding of family conflict and differences when it comes to beliefs, behaviors, and identities around mealtimes (Soto et al., 2017).

Overall, understanding perspectives and examining acculturation through various methods helps contribute to the larger picture of Hispanic health. Despite these significant contributions added by these two studies, future research as described is needed to continue combatting such a complex multi-level health disparity. Interventions should focus on family dynamics and negotiating the quality of mealtime routines by empowering each family member and focusing on both parents. One step to target the entire family and involving others besides the mother can be to recruit fathers. This could allow for an increase in attendance and involvement from the entire family. Additionally, study two highlights the need to understand how acculturation may act as a risk factor but could a factor in which interventionists could specifically target the most at-risk families in order to tailor their program to best support their needs. For instance, assimilated strategies were the cultural dimensions negatively associated with weight status and therefore their needs could be sought and then targeted especially since both high and low levels of mealtimes planning added to these risk factors. Furthermore, in study one there were few differences among site suggesting that intervention programs could be used across nations. These studies continue to provide insight on how to best support Hispanic families therefore, by making these efforts and continuing to invest in underserved families will allow for progress in combatting health disparities.

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Appendix A

## Focus Group Protocol for Illinois and California

ABRIENDO CAMINOS (AC2)
FOCUS GROUP PROTOCOL

Thank you for being part of this group discussion. We want to understand ways to help families live as healthy as they can. To do this, we have to talk to people with many different kinds of experiences, so we can be helpful to as many families as possible.

Today, we are going to ask you to talk about how each of _your_ families manages meals and activities. It is helpful to talk as a group so that people can remind each other of things and learn from each other's experiences. There are no right or wrong answers- we all do things differently. Sometimes we may see similar patterns, other times not.

Everyone's opinion is important. I will try to make sure that everyone gets a chance to add to the talk- you can help me by trying to take turns. It helps if only one person at a time talks, too. I do have a set of topics to learn about, and so I will keep us moving.

**Food in your family**

All families differ in what kinds of foods they eat, how they prepare them, etc.

1.  What types of foods does your family prefer?  (give examples)
    *   Traditional Mexican/Puerto Rican foods?
    *   Fast foods?
    *    "American foods?"
2.  Does your family like to eat beans?
    *   If not, why not? If so, how often, what type and how prepared?
3.  Does your family like to eat tortillas?
    *   If not, why not? If so, how often and what type?
4.  What cooking oil/fat does your family prefer? (e.g. corn oil, canola, lard, olive, spray)

**Carrying out mealtimes**

Mealtimes happen in many different ways for families.

5.  Who does cooking and grocery shopping in your home?
    *   How often?
    *   Do your children ever help with either?
    *   Are your family meals different than when you were a child?

Some families are casual or spontaneous about cooking and shopping. They see what is available and go from here. Others make a plan and use it to shop and cook. And some are in between.

6.  What is your family like?
    *   What determines what you serve for meals?….
    *   Do you choose things on sale; use leftovers; have a weekly menu planned ahead?

7. What does a "family meal" look like in your house?
   - Who is typically there? Describe what all happens during family meals (music, tv, conversation, homework, etc)
   - How often do you have a "family meal?"
   - Are your family meals "traditional"?  If so, how or if not, why not?

Appendix B

## Focus Group Protocol for San Luis Potosí, Mexico

ABRIENDO CAMINOS (AC2) FOCUS GROUP PROTOCOL *FOR MEXICO*

Thank you for being part of this group discussion. We want to understand ways to help families live as healthy as they can. To do this, we have to talk to people with many different kinds of experiences, so we can be helpful to as many families as possible.

Today, we are going to ask you to talk about how each of your families manages meals and activities. It is helpful to talk as a group so that people can remind each other of things and learn from each other's experiences. There are no right or wrong answers- we all do things differently. Sometimes we may see similar patterns, other times not.

Everyone's opinion is important. I will try to make sure that everyone gets a chance to add to the talk- you can help me by trying to take turns. It helps if only one person at a time talks, too. I do have a set of topics to learn about, and so I will keep us moving.

**Topic 1: Food in your family**
  a. How, if so, has what you eat and who you eat with changed since you were a child to what you do with your family now?
      - Are the foods you eat similar to what you ate as a child?
      - Some families eat out at restaurants or bring take-out food home. How often does your family eat out?
      - What are the reasons your family eats out?
  b. What are the biggest influences on your family's eating style?
      - How healthy is your family eating style?
      - Do your children ask for certain foods?
      - How much control do you have over what your children eat?
  c. Who does the cooking and grocery shopping in your home?
      - Do children every help?
  d. What does a family meal look like in your home? (describe in as much detail- what happens and who is there?)
      - How often do you have a family meal?

Appendix C

## Survey Questions

## ARSMA; Mother's Acculturation

For each statement mark one answer that most describes your habits.

| | Not at all 1 | Very little or not very often 2 | Moderately 3 | Very Often 4 | Extremely Often or almost always 5 |
|---|---|---|---|---|---|
| 1. I enjoy Spanish language TV | | | | | |
| 2. I enjoy speaking Spanish | | | | | |
| 3. I enjoy Spanish language movies | | | | | |
| 4. I speak Spanish | | | | | |
| 5. I think in Spanish | | | | | |
| 6. I enjoy reading in Spanish | | | | | |
| 7. I speak English | | | | | |
| 8. I write letters in English | | | | | |
| 9. I enjoy English Language Movies | | | | | |
| 10. I associate with Anglos | | | | | |
| 11. I think in English | | | | | |
| 12. My friends are Anglos | | | | | |

## Mealtime Planning and Frequency

Think about DINNER (or **MAIN MEALTIME**) in your home with YOUR family.
Use the following scale to indicate how true each statement is for your family.

| | Not at all true 1 | Sort of true 2 | Very true 3 |
|---|---|---|---|
| 1. In our family, dinner (or main meal time) is planned in advance. | | | |
| 2. Our family regularly eats dinner (or main meal) together. | | | |
| 3. In our family, we feel that it is not important that we eat together. | | | |
| 4. In our family, everyone is expected to be home for dinner (or main meal). | | | |
| 5. In our family at dinner (or main meal time), everyone has a specific role or job to do (setting the table, cooking, etc.). | | | |
| 6. In our family, the main meal time is flexible; people eat whenever they want. | | | |
| 7. In our family, dinner (or main meal time) is just for eating, nothing else happens. | | | |
| 8. In our family, dinner (or main meal) is pretty much the same time over the years. | | | |
| 9. In our family, the television is usually on when we eat dinner (or main meal). | | | |
| 10. In our family, someone is using their phone (tablet, video game or other screen) when we eat. | | | |
| 11. In our family, fixing and preparing meals is a chore and a burden. | | | |
| 12. Our family would like to eat together more often. | | | |

13. On an average week, how many times do you eat breakfast?

     0     1     2     3     4     5     6     7

14. In an average week, how many times does your child eat breakfast at home?

     0     1     2     3     4     5     6     7

15. In an average week, how many times does your child eat breakfast at school?

     0     1     2     3     4     5     6     7

16. In an average week, how many times do all (or most) of the people in your family who live with you eat a meal together?

     0     1     2     3     4     5     6     7

17. When someone is going to be late for a shared mealtime, what usually happens in your family?
    a. The late comer just eats whenever they can by themselves
    b. At least some of us come back to the table to keep the late comer company while he/she easts
    c. The rest of the family waits for the latecomer

**The Latino Dietary Behavior Questionnaire, Mother's Dietary Quality**
We have a few more questions about eating- now we are back to **how YOU eat** (not your child)

1. How often do **you** eat fried foods per week?
    - **5**. ❐ never
    - **4**. ❐ less than once a week
    - **3**. ❐ about once a week
    - **2**. ❐ 2–5 times per week
    - **1**. ❐ about once a day
    - **0**. ❐ 2 or more times per day

2. How often do **you** drink regular soft drinks or soda pop? (includes regular soda and regular juices)
    - **5**. ❐ never
    - **4**. ❐ less than once a week
    - **3**. ❐ about once a week
    - **2**. ❐ 2–5 times per week
    - **1**. ❐ about once a day
    - **0**. ❐ 2 or more times per day

3. How often do **you** drink diet soft drinks or soda pop (including diet soda and juices)
    - **5**. ❐ never
    - **4**. ❐ less than once a week
    - **3**. ❐ about once a week
    - **2**. ❐ 2–5 times per week
    - **1**. ❐ about once a day
    - **0**. ❐ 2 or more times per day

4. How often do **you** eat regular white rice or white bread? (not whole grain)
    - **5**. ❐ never
    - **4**. ❐ less than once a week
    - **3**. ❐ about once a week
    - **2**. ❐ 2–5 times per week
    - **1**. ❐ about once a day
    - **0**. ❐ 2 or more times per day

5. How often do **you** drink 1% or skim milk?
    - **0**. ❐ Rarely or never
    - **1**. ❐Sometimes
    - **2**. ❐ Many times
    - **3**. ❐ All of the time

6. How often do **you** eat sweets with artificial sweeteners? (like Splenda, Equal, or Sweet& Low) (including desserts, candies, pastry and ice cream)
    - **0**. ❐ Rarely or never

      **1**. ❏Sometimes

      **2**. ❏ Many times

      **3**. ❏ All of the time

7. How often do **you** drink coffee or tea without sugar OR with artificial sweeteners (like Splenda, Equal, or Sweet & Low)?

      **0**. ❏ Rarely or never

      **1**. ❏ Sometimes

      **2**. ❏ Many times

      **3**. ❏ All of the time

8. * How often do **you** eat chicken with the skin?

      **0**. ❏ Rarely or never

      **1**. ❏ Sometimes

      **2**. ❏ Many times

      **3**. ❏ All of the time

9. How often do **you** control the amount of food that you eat? Or try to eat smaller portions?

      **0**. ❏ Rarely or never

      **1.** ❏ Sometimes

      **2**. ❏ Many times

      **3**. ❏ All of the time

10. How often do **you** change your foods to make them healthier?

      **0**. ❏ Rarely or never

      **1**. ❏ Sometimes

      **2**. ❏ Many times

      **3**. ❏ All of the time

11. How often do **you** eat a complete breakfast, and not just coffee and crackers?

      **0**. ❏ Rarely or never

      **1**. ❏ Sometimes

      **2**. ❏ Many times

      **3**. ❏ All of the time

12. How **many complete** meals do **you** eat during the day almost every day? (do not include snacks or what you pick at during the day?

    a. ❏ Only one complete meal (Complete breakfast, or lunch, or dinner)

    b. ❏ Two complete meals only (Lunch/dinner, or breakfast/dinner, or breakfast/lunch)

    c. ❏ Three complete meals (Breakfast, lunch and dinner)

13. How many times in a week or month do **you** eat breakfast, lunch or dinner prepared at restaurants or fast food places? (such as McDonald's, Burger King, Wendy's, Arby's, Pizza Hut or Kentucky Fried Chicken; DO NOT include meals-on wheels)

      **0**. 3 or more times per month

**1**. 2–3 times per month

**2**. 1 time per month

**3**. Almost never or less than 1 time

### Children's Nutrition Behavior Questionnaire; Child's Dietary Quality

**These questions focus on your CHILD eats**

1. What kind of **COW** milk did your child usually (most often) drink?
   - ☐ Whole milk
   - ☐ 2% Milk
   - ☐ Skim milk
   - ☐ Low Fat or 1% Milk
   - ☐ Flavored cow milk
   - ☐ Some other milk (Please specify :_____)
   - ☐ Don't know
   - ☐ Doesn't consume cow's milk

2. How many times did your child drink Non-Diet SODA POP (for example, Coke, Pepsi, or Mountain Dew), SPORTS DRINKS (for example, Gatorade), or FRUIT DRINKS that are not 100% Fruit Juice (for example, Kool-Aid, Sunny Delight, Hi-C)?
   - ☐ Once a day
   - ☐ Twice a day
   - ☐ Three times a day
   - ☐ Four or more times a day
   - ☐ One to three times during the past 7 days
   - ☐ Four to six times during the past 7 days
   - ☐ My child did not drink any during the past 7 days
   - ☐ Don't know

3. How many times did your child drink 100% FRUIT JUICES such as orange juice, apple juice, or grape juice? Do not count punch, Sunny Delight, Kool-Aid, sports drinks, or other fruit-flavored drinks.
   - ☐ Once a day
   - ☐ Twice a day
   - ☐ Three times a day
   - ☐ Four or more times a day
   - ☐ One to three times during the past 7 days
   - ☐ Four to six times during the past 7 days
   - ☐ My child did not drink any during the past 7 days
   - ☐ Don't know

4. How many times did your child eat FRESH FRUIT, such as apples, bananas, oranges, berries or other fruit such as applesauce, canned peaches, canned fruit cocktail, frozen berries, or dried fruit? Do not count fruit juice.
   - ☐ Once a day
   - ☐ Twice a day
   - ☐ Three times a day
   - ☐ Four or more times a day
   - ☐ One to three times during the past 7 days
   - ☐ Four to six times during the past 7 days
   - ☐ My child did not eat any fruit during the past 7 days
   - ☐ Don't know

5. How many times did your child eat FRENCH FRIES or other fried potatoes? Include tater tots, hash browns, etc., in your response.
- ☐ Once a day
- ☐ Twice a day
- ☐ Three times a day
- ☐ Four or more times a day
- ☐ One to three times during the past 7 days
- ☐ Four to six times during the past 7 days
- ☐ My child did not eat fried potatoes during the past 7 days
- ☐ Don't know

6. How many times did your child eat VEGETABLES (other than fried potatoes)? Include vegetables like those served as a stir fry, or stew, or side dishes, in your response.
- ☐ Once a day
- ☐ Twice a day
- ☐ Three times a day
- ☐ Four or more times a day
- ☐ One to three times during the past 7 days
- ☐ Four to six times during the past 7 days
- ☐ My child did not eat any vegetables during the past 7 days
- ☐ Don't know

7. How many times did your child eat a meal or snack from a FAST FOOD restaurant with no wait service, such as McDonald's, Pizza Hut, Burger King, Kentucky Fried Chicken, Taco Bell, Wendy's and so on? Consider both eating out, carry out, and delivery of meals in your response.
- ☐ Once a day
- ☐ Twice a day
- ☐ Three times a day
- ☐ Four or more times a day
- ☐ One to three times during the past 7 days
- ☐ Four to six times during the past 7 days
- ☐ My child did not eat any fast food during the past 7 days
- ☐ Don't know

8. How many times did your child eat candy (including Fruit Roll-Ups and similar items), ice cream, cookies, cakes, brownies, or other SWEETS?
- ☐ Once a day
- ☐ Twice a day
- ☐ Three times a day
- ☐ Four or more times a day
- ☐ One to three times during the past 7 days
- ☐ Four to six times during the past 7 days
- ☐ My child did not eat any sweets during the past 7 days
- ☐ Don't know

9. How many times did your child eat potato chips, corn chips such as Fritos or Doritos, Cheetos, pretzels, popcorn, crackers or other SALTY SNACK foods?
- ☐ Once a day
- ☐ Twice a day
- ☐ Three times a day
- ☐ Four or more times a day
- ☐ One to three times during the past 7 days
- ☐ Four to six times during the past 7 days
- ☐ My child did not eat any salty snacks during the past 7 days