THE EFFECTS OF PARENTAL RESILIENCY ON CHILDREN'S HEALTH ADJUSTMENT

BY

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THESIS

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Abstract

The purpose of this study is to explore maternal resiliency patterns regarding family health behaviors and outcomes in vulnerable populations. With increasing rates of Hispanic childhood obesity and disproportionate health disparities, this is an issue that must be better understood. Altogether, 100 Mexican and Puerto Rican immigrant mothers from Illinois and California completed questionnaires reporting their stressors, protective mechanics, and family health behaviors. Multiple regression analyses revealed that higher perceived stress levels for mothers predicted mealtime distractions, non-nutritive snacking reasons, and child's diet quality. The interaction between stress and social support was a significant predictor of non-nutritive snacking reasons, and the results indicate that high levels of social support more so than average and low levels of support predict a higher frequency of non-nutritive snacking. Stress and chaos also predicted non-nutritive snacking, particularly when chaos levels were high and average compared to low levels of chaos. There were no significant findings for food insecurity as a predictor of these health behavior adjustment outcomes. Taken together, maternal stressors play a role in family health behaviors, and further studies should take these factors into account when trying to understand protective mechanisms for families.

Keywords: Hispanic Health, Family Resiliency Model, Stress, Food Insecurity

Acknowledgements

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Chapter 1

Introduction

Hispanic immigrant populations start off in a vulnerable place; for example poverty is a reality many face. Immigrant status can create high levels of stress from the transition to new cultures, changes, and ways of life (Flores et al., 2008). Vulnerabilities like these often lead to lower quality of life, health risk behaviors, and outcomes (Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010). These risk factors and increased vulnerability also have implications for weight status. Obesity is a pressing problem for American children, especially Hispanic populations. According to the Centers for Disease Control (CDC), more than one in five Hispanic children in the U.S. are obese; the highest of any racial and ethnic group (Ogden, Carroll, Kit, & Flegal, 2014; Ogden et al., 2016). The efforts to impact these trends have not been very effective. Obesity and overweight in Hispanic immigrant populations have continued to rise despite intervention and clinical efforts (Skinner, Perrin, & Skelton, 2016). This is important given that individuals with obesity are at increased risk of experiencing a host of biological and psychological problems including high blood pressure, high cholesterol, breathing and sleep difficulties, psychological stress and lower self-esteem problems, and impaired emotional function.

Health behaviors play a major role in predicting obesity levels. Parent behaviors regarding health are one of the most impactful components for household health outcomes. Lack of mealtime routines and mealtime distractions have been found to be negatively associated with positive health outcomes (Berge, Jin, Hannan, & Neumark-Sztainer, 2013). Family diet also plays a key factor in determining high energy-dense food intake versus vegetable consumption or non-nutritive snacking behaviors (Santiago-Torres, Adams, Carrel, LaRowe & Schoeller, 2014). Even parents' intent to promote healthy eating and physical activity interacts with their emotional health. Thus parental mental health variables often impacts children's health behaviors (Zeller & Modi, 2006). For example, parents who are anxious and depressed are less likely to initiate and coordinate physical activities for their children (Lampard, Jurowski, Lawson, & Davison, 2013), and lack of physical activity is linked to significant levels of childhood obesity.

In this study, we examined the role of maternal resiliency processes, measured through social support, coping skills, dietary efficacy, and chaos levels may play in influencing a mother's ability to promote dietary health habits for her household and specifically her children. We collected data from Hispanic families living in five sites across the United States. We particularly examined non-migrant rural populations because most studies of Hispanic health have relied on samples from urban or migrant populations. Further, underserved Hispanics immigrant families moving into rural areas often do not have as many resources to live healthy lives as urban life families.
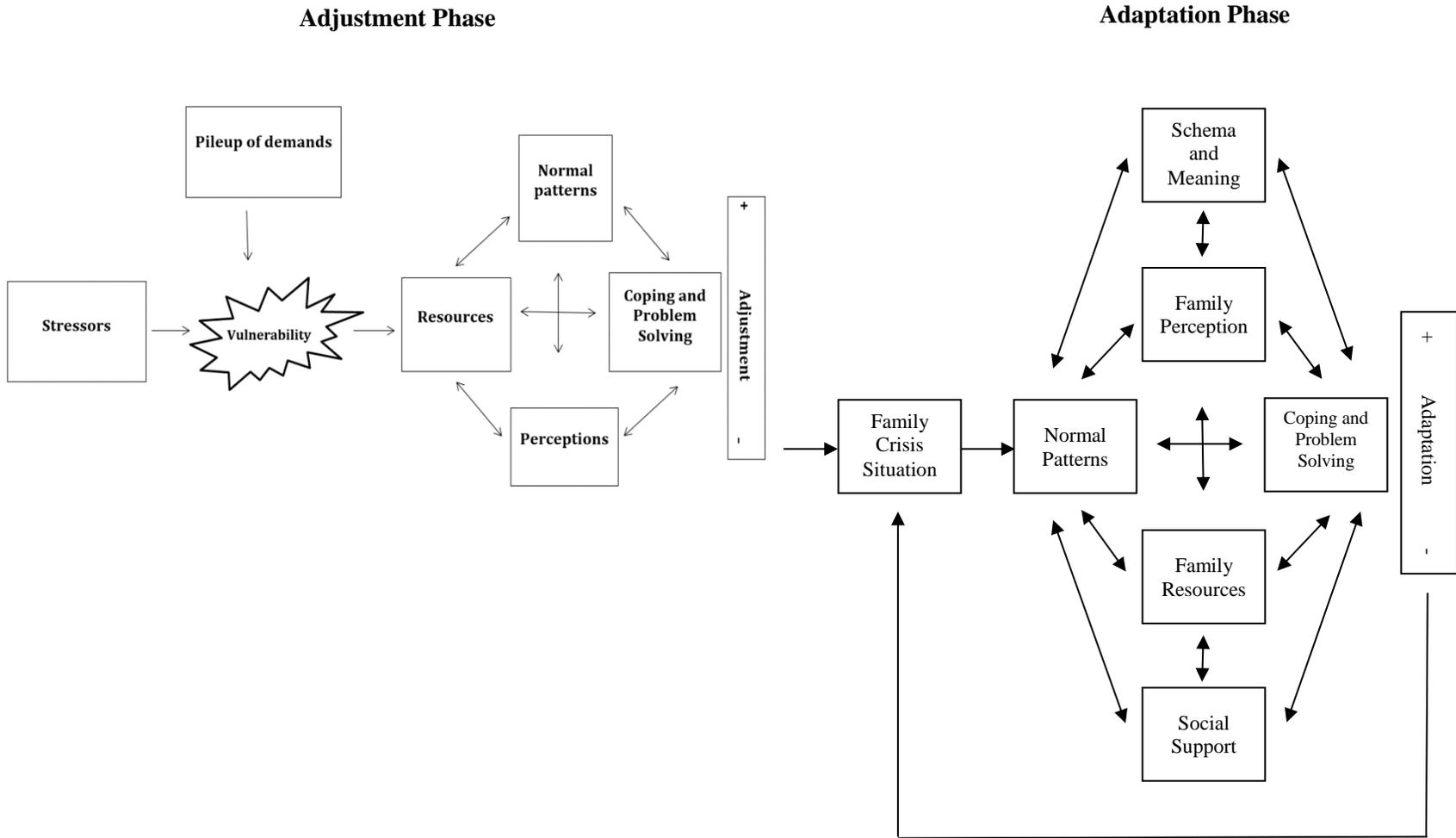
Chapter 2

Theoretical Background

Hispanic families can be particularly resilient shown by a heightened ability to combat high levels of risk and vulnerability (Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009). Therefore, the family resiliency model of family stress, adjustment and adaptation will help conceptualize behaviors that occur before a fully blown crisis. "Resiliency focuses on what family types, patterns, processes, coping, supports, problem-solving abilities, and transactions with the community play a role in family recovery" (McCubbin & McCubbin, 1996, p 3). Resilience can be defined as a "dynamic process encompassing positive adaptation within the context of significant adversity" (Luther, Cicchetti, & Becker, 2000, p 24). When families are resilient they seek to find balance and stability in times of high stress and risk (McCubbin & McCubbin, 1993).

According to this model, families will face hardships, and families should foster growth, protect the family, and draw on their network of relationships to restore order and balance. The adjustment phase of the resiliency model describes a series of interacting components that shape family outcomes on a continuum from positive adjustment to maladjustment. The interacting components may range from positive to negative behaviors indicating that not all factors contribute to positive adjustment. Some components serve as protective factors, typically buffering the effects of negative vulnerability under certain risk factors, while other attributes serve as promotive factors (Luther, Cicchetti & Becker, 2000; Luther & Zelazo, 2003). Promotive factors show a direct positive association towards an outcome without depending on the level of risk, whereas protective, "benefits will accrue in the presence of risk conditions but not in their absence" (Luther & Zelazo, 2003, p 522). The adaptation phase of the model describes the family's resiliency and struggle to manage the crisis created by the initial stressors; essentially the goal is the restoration of balance in relationships, structure, and function. A successful adaptation results in newly formed patterns, resources, shared values, coherence, and problem-solving. If the family is unsuccessful, it leads families toward maladaptive outcomes potentially restarting the cycle of adaptation (McCubbin & McCubbin, 1993). Figure 1 illustrates the adjustment and adaptation phases, which will first be explained in general terms and later discussed how it will be used in the current study.

Figure 1. *Family Resiliency Model of Stress, Adjustment, and Adaptation*

Adjustment Phase

Adaptation Phase

Pileup of demands

Stressors

Vulnerability

Normal patterns

Resources

Coping and Problem Solving

Perceptions

Adjustment

+

−

Schema and Meaning

Family Perception

Family Crisis Situation

Normal Patterns

Coping and Problem Solving

Family Resources

Social Support

Adaptation

+

−

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More specifically the adjustment phase has several components predicting outcomes. For example, the pileup of demands join with ongoing stressors to increase a family's vulnerability. Vulnerability is defined as the "interpersonal and organizational condition of the family system" composed of an accumulation of demands and trials associated with family life (McCubbin & McCubbin, 1996, p. 17). Vulnerability factors interact with the factors in Figure 1 to amplify or buffer the intensity of bonadjustment or maladjustment.

Contributing factors are "normal patterns" of family interaction and daily life. These patterns are part of how the family system operates, what their daily routines are and how their relationships function. These types of daily patterns can range from positive to negative characteristics. Positive patterns such as bonding and flexibility protect family strength, coherence, and predictability. Negative patterns such as chaos or disorganized mealtimes can harm a family's strength and coherence particularly with high-risk levels of stress or in low-income populations.

The next elements included are described as the capabilities and strengths a family has through resources to address and manage the stressor in order to either maintain balance or imbalance that may lead to dysfunction (McCubbin & McCubbin, 1996). Some critical resources are social support, cohesiveness, flexibility, and traditions that help resist crisis (Berkman, 2000). These components can interact with the stressor in order to maintain balance, for example, social support can offer a sense of belonging and cohesion that allow for an increased benefit of information, services, networks (Black & Lobo, 2008).

Family perception is the way families appraise their vulnerability and their resources. In other words, perception helps determine the severity or the meaning of the stressor event (McCubbin, Joy, Cauble, Comeau, Patterson & Needle, 1980). For example, a positive perception could be optimism in that "negative behaviors are not ignored, but rather various viewpoints and opinions are examined to identify underlying problems, always augmenting positive aspects" (Black & Lobo, 2008 p. 38). Adjustment will be influenced by how the family defines the seriousness of their hardships and the adequacy of their resources. Typically, the more positive their perception, the more constructive the problem-solving efforts become.

The last component that contributes to adjustment is problem-solving and coping. Problem-solving and coping contribute to the family's ability to manage stressors and hardships by using abilities, skills, and initiating steps to resolve issues and communicate among those in the family system (McCubbin & McCubbin, 1996). Positive coping strategies such as effective communication, strong spiritual ties, and planning allows for families to maintain stability despite the hardships created by the stressor.

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The outcome of these factors and their interactions is adjustment which varies along a continuum from bonadjustment to maladjustment (McCubbin & Patterson, 1983). With continual maladjustment, the family enters a crisis, "a state of imbalance, disharmony, and disorganization in the family system," (McCubbin & McCubbin, 1996, p 10). Change is then necessary to restore some functional stability or to improve life quality in the family system. This process is known as the adaptation phase (McCubbin & McCubbin, 1996; McCubbin & Patterson, 1983). Outcomes of this adaptation process are determined by modifications and newly formed patterns in roles, rules, goals and systems of interaction. These new patterns interact with resources and are further supported by family and friends. The changes should allow for a restoration of family harmony and balance creating a sense of resiliency against the crisis. If newly formed patterns are rejected, there is a lack of social support, and there are increased disruptions of family resources instead, these components may bring more chaos and disharmony leading to maladaptation (McCubbin & McCubbin, 1996). This process may continue until balance or positive adaptation is found, the family disintegrates or experiences lasting poor outcomes.

This study, explored the adjustment phase of the resiliency model of family adjustment and adaptation, especially patterns of family life in the context of child health behaviors and healthy diet promotion by parents. For the Hispanic immigrant families in the current study, background stressors include ethnic minority and low social-economic status. The pileup of demands is measured by perceived stress and food insecurity. This study measures resources (social support), patterns (chaos), perceptions (dietary self-efficacy) and coping (coping strategies). In this study, we assessed adjustment patterns by measuring family outcome in behavior such as mealtime distractions, snacking reasons, and diet quality.

Chapter 3

Literature Review

Being healthy requires a commitment to physical activity and healthy eating. Research has shown that many adults and children fail to meet recommended levels of physical activity or consume the recommended daily servings of fruit and vegetables (Lampard et al., 2013). However, less is understood about how parental emotional health and coping abilities influence child health behaviors. The proposed project will fill in these gaps by exploring how maternal mental health, coping ability, normal family patterns and resources contribute to Hispanic adjustment in health behaviors and outcomes such as weight status, mealtime behaviors, and diet quality.

Stressors

Minority status, socioeconomic level, and other underlying stressors contribute to family health status. Current obesity markers show that those of ethnic minority status, African American or Hispanic, are more overweight and obese than their white or other ethnic counterparts and have more health issues such as diabetes (Bécares et al., 2012; Ogden et al., 2014). Studies also suggest that ethnic minority status may influence other health conditions such as lung cancer, breast cancer, and dietary patterns such as lower consumption of greens (Eschbach, Mahnken, & Goodwin, 2005; Reyes-Ortiz, Eschbach, Kuo, & Goodwin, 2009). Socioeconomic status also accounts for differences in health. A variety of these studies show that low SES can account up to 90% of health differences, demonstrating that SES is a stressor and underlying component influencing health adjustment (Bond Huie, Krueger, Rogers, & Hummer, 2003; Chetty et al., 2016; Hass, Krueger, & Rohlfsen, 2012; Kahn & Fazio, 2005). These studies suggest that ethnic minority status and low SES contribute to health outcomes making a population such as this vulnerable to non-nutritive health behaviors. Yet since these are the background characteristics of our current sample they are not directly measured.

Pileup of Demands

Continued vulnerability influences how families manage stressors and other factors in their daily lives. Vulnerability becomes greater as the pileup of demands continues to increase for the family. These pile-ups of demands can include perceived stress and food insecurity.

Studies have demonstrated a link between discrimination, stress, and health outcomes for Mexican-origin adults (Castañeda et al., 2015; Flores et al., 2008). One study included 215 adults who participated in The Health Maintenance Organization in Northern California (Flores et al., 2008). Participants needed to be of Mexican-origin and were contacted by letters and phone calls. Data were collected based on a one-hour bilingual telephone interview. Questions covered topics on discrimination, stress, depression, health and symptoms of health, and acculturation. The results showed that higher stress was significantly related to more negative health symptoms such as reports of illness and even more so

with perceived discrimination (Flores et al., 2008). Other research indicates that these parental stressors can then affect children's health. Studies have shown an association between psychological stresses experienced by parents and obesity in their children (Shankardass et al., 2013). One study followed 4,078 ten-year-old children and their parents over four years to examine the relationship between parental stress and child's weight over time (Shankardass et al., 2013). The study measured BMI of the children and parental stress at baseline and again four years later. This study found small effects of parental stress on BMI at age ten and weight gain later for those children (Shankadass et al., 2013). Taken together, these results indicate that parental stress contributes to an imbalance of energy, preparation of unhealthy meals, and mismanagement of lifestyles which has shown to contribute to overweight and obesity in the household (Parks et al., 2012). Understanding stress in the context of health adjustment could have implications for understanding what contributes to overweight and obesity issues and how.

Household food insecurity is a status that affects both child and adult health. Household food insecurity refers to the inability of a family unit to afford nutritionally sufficient food (Seligman, Laraia, & Kushel, 2010). Food insecure households tend to have less dietary variety. They tend to eat fewer fruits, vegetables, micronutrients, and eat more energy-dense foods such as refined grains, added sugar, added fats and high-calorie inexpensive foods. This type of diet leads to decreased levels of health and increased weight status (Seligman et al, 2010). A nutrition education study by Mello and colleagues (2010) also showed that food insecurity is associated with significantly higher fat intake and juice intake compared to those who are food secure. A sample of 193 mothers shows that household insecurity is associated with obesity and child hunger (Olson, 1999). It is also related to chronic diseases such as hypertension, hyperlipidemia, and glucose disturbances that tend to stem from poor diets in food insecure homes (Seligman et al., 2010; Weigel, Armijos, Hall, Ramirez, & Orozco, 2007). This study also finds that Mexican immigrant farmworkers and households are particularly likely to experience food insecurity (50-60%), with levels significantly higher than U.S. national levels (8%) (Kaiser, Townsend, Melgar-Quiñonez, & Fujii, 2004; Weigel et al., 2007). Food insecurity also impacts mental health such as perceived stress, anxiety, and depression that are a strong risk factor for other comorbid mental health issues and diabetes (Seligman et al., 2010; Weigel et al., 2007). These studies show that food insecure households often have negative health outcomes and understanding this pileup demand will shed more light on particular mealtime and diet outcomes in children.

Resources

There are also a number of other contributing factors such as social support that influence well-adjusted health outcomes. Higher levels of support within a family and through friends help elicit better health outcomes (Gallo et al. 2014; Uchino, 2009; Uchino, 2013; Umberson, Crosnoe, & Reczek, 2010). Specifically, for Hispanic populations, high levels of social support are even associated with lower

diabetes prevalence (Gallo et al., 2014). Beyond physical health, social support has played an important role in buffering the effects of poor mental health. 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, Ullman, Aguilera, & Dunkel Schetter, 2014). Another study conducted questionnaires with university students measured the multidimensional social support scale along with health-promoting lifestyle, health practices and the value on health measures. These assess the value placed on or the importance of different aspects of health such as maintaining an appropriate weight or maintaining good physical fitness. Results showed that valuing health and health self-efficacy were significant contributors to engaging in health-promoting lifestyles. Social support, valuing health behaviors, and self-efficacy also accounted for 51% of the variance in the level of engagement in health promoting lifestyles (Jackson, Tucker, & Herman, 2007). Overall, these studies suggest more social support helps foster healthier lifestyles. With a higher number of increased stressors, social support has been shown to act as a buffer and result in health promoting behaviors. We seek to further explore these relationships in Hispanic families.

Normal Patterns

A family's normal daily patterns can be a resource or vulnerability influencing how families adjust to health outcomes (McCubbin & McCubbin, 1996). Chaotic family interactions are one example of how daily patterns can contribute to stressors and magnify maladjustment. Chaos in the home is characterized by disorder and constant disruption in family life (Dumas, Nissley, Nordstrom, Smith, Prinz, & Levine, 2005). A chaotic home environment has been linked to long-term behavioral problems with children such as hyperactivity, psychological distress, poor self-regulation, and risky behaviors such as substance abuse and violence (Chatterjee, Gillman, & Wong, 2015). Beyond the child, parents often have a difficult time parenting in chaotic home environments. Parents in more chaotic homes engage in inconsistent discipline, report less competence with their child, and greater difficulty completing a sorting task with their child (Dumas et al., 2005). The Dumas and colleagues study (2005) measured mother-child dyads and asked mothers to report using the CHAOS (confusion, hubbub, and order scale), as well as on parenting discipline styles, stress, and child behavior. They also completed tasks in the lab with their child.

Household chaos can become disruptive at the household level, contributing to added risk. A study done by Fiese et al., shows that increased chaos and lack of planning has dietary and financial implications (2016). Chaos predicted food insecurity, and families who did more mealtime planning were less likely to be food insecure (Fiese, Gundersen, Koester, & Jones 2016). Chaos in turn disrupts attention to planning and therefore limits the effective use of resources. Participants in the Midlands Family study, answered survey questions on household chaos, mealtime atmosphere, and child dietary quality and

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intake (Rosemond, 2016). The results indicate that household chaos was associated with diet quality, with chaos participants had a 15% increased odds of reporting worse child dietary quality measured by the Healthy Eating Index score (Rosemond, 2016). These studies show evidence that chaos is a contributing factor to negative child health outcomes such as competency, behavior, diet quality, and family planning. Therefore, studying how chaos can add to household vulnerability is a necessary component of understanding health outcomes.

Coping and Problem Solving

Prior research has suggested that coping mechanisms play a role in dietary behaviors which in turn affect weight status and obesity. However, less is understood about how mental health impacts physical health among immigrant families (Chuang, 2011). Farley and colleagues (2005) compared coping between non-Hispanic whites and Mexican-Americans living in the U.S. While their findings showed little difference in coping strategies, for Mexican-Americans, the stress of acculturation as well as coping strategies did play a role in physical activity levels. For example, active coping styles, measured by positive reframing skills (looking at issues through a positive lens), acceptance, and utilization of social supports, were associated with better health outcomes (Farley et al., 2005). In patients with type 2 diabetes, emotional expressive coping was found to be significantly correlated with positive behaviors of diet, exercise, and increased blood sugar testing (Smalls, Walker, Hernandez-Tejada, Campbell, Davis, & Egede, 2012). Emotional coping, is comprised of emotional expression and emotional processing defined as trying to communicate experiences (Stanton, 2011). Emotional coping led to better self-care particularly among those with diabetes, suggesting it could help with other health issues such as obesity since diet and health behaviors are correlated with coping. Other types of coping mechanisms may buffer negative outcomes but there has been a lack of literature examining how the combined coping strategies comprised of active coping, religious coping, humor, and planning (Carver, Scheier, & Weintraub, 1989) have specifically affected a mothers' ability to promote and execute health behaviors such as increased shared mealtimes and healthy diet for their families. Such relationships will be examined in this study.

Perceptions

Parents shape the way children eat (Mitchell, Farrow, Haycraft, & Meyer, 2013). When parents feel that they have the ability to impact their children's health, they often do so. Self-efficacy is the power parents believe they have to promote healthy diets and lifestyles. A study looking at parental opinions and their ability to influence their child's choices showed that parents of overweight children were less likely to perceive themselves as having the capacity to influence their child's physical activity behaviors (Eckstein et al., 2006). A pre-post quasi-experimental study looked at parental empowerment by asking parents to rate their self-efficacy to promote healthy diets for their families (Jurkowski, Lawson, Mills, Wilner III, & Davison, 2014). The results show that higher levels of empowerment predicted

improvement in diet-related parenting practices such as higher frequency of offering fruit and vegetables and lower frequency of eating fast food (Jurkoswki et al., 2014). Parents with higher levels of self-efficacy in dietary behaviors will promote healthier diets for their children. Having a strong sense of empowerment could help buffer the negative effects of stress and food insecurity on unhealthy behaviors.

Adjustment

Health adjustment could be measured in a number of ways. For this study, it will be operationalized as the presence of mealtime distractions, reasons for giving snacks to children, and child diet quality. Mealtime distractions have implications for eating patterns and obesity status in adults and children (Fiese, Jones, & Jarick, 2015; Martin-Briggers, et al., 2014). An experimental study looking at noise distractions found that mealtimes with more noise and distractions were associated with eating more cookies, children engaging with distractions, and parents exhibiting more controlling and critical communication (Fiese et al., 2015). With constant distractions, families are less likely to engage in positive and encouraging communication, modeling healthy eating, and limiting unhealthy food advertisements which have been associated with children's weight status and diet (Fiese & Bost, 2016; Fiese, Hammons, Grigsby-Toussaint, 2012; Harrison, Liechty & the STRONG Kids Program, 2012). A study with Hispanic immigrants measured the risk of weight gain in a seven-year follow-up by understanding their mealtime behaviors (Dosamantes-Carrasco et al., 2016). Mexican adults (N= 837) were asked to report on mealtime distractions such as watching TV or talking on the phone and other mealtime behaviors. This study showed that participants who reported meals without distractions also had a significantly lower likelihood of gaining body weight or becoming obese seven years later compared to those with lower quality mealtimes (Dosamantes-Carrasco et al., 2016). Families, particularly mothers who often direct and plan the mealtime hour have some agency in choosing what happens and what distractions may occur. Although mealtime distractions can be viewed as a household pattern, these distractions are a result of parental choice and in the case of this study, are predicted to be influenced by stress levels and to interact with of protective factors to predict adjustment.

Frequent snacking has been associated with higher intake of total energy and total added sugars. Snacking frequency has resulted in mixed findings, a snacking patterns review of the literature showed that some studies found no relationship between snacking and obesity while others found negative associations (Larson & Story, 2013). Few studies look at the reasons behind snacking, not just the frequency of it. A study by Blaine and colleagues used the Reasons Parents Offer Snacks to Children measure to understand how frequently low-income parents offer snacks for nutritive versus non-nutritive reasons and if these reasons are associated with children's poor diet (2015). The results showed that parents who were less educated were more likely to offer snacks for non-nutritive reasons, and children who received snacks for non-nutritive reasons were also less likely to adhere to dietary recommendations

(Blaine et al., 2015). This has implications for health as some Hispanic parents and caregivers believe entire meals such as a fast food children's meal can be given as a snack (Younginer et al., 2016). Another study looking at daily self-reports of stress and snacking show that increased daily hassles or stressors are correlated with more snacking (Conner, Fitter, & Fletcher, 1999). These studies indicate that parents with higher stress levels could themselves be snacking more and for non-nutritive reasons which could impact why they are giving snacks to their children and therefore influence the overall health of the family.

Particular foods have been shown to be associated with childhood overweight status. Foods that are higher in sugar, sodium, and fat have been associated with overweight status in childhood (Boumtje, Huang, Lee, & Lin, 2005). A national survey showed that children who ate fast food consumed more total energy, more fat, more added sugar and sugar-sweetened beverages (Bowman, Gortmaker, Ebbeling, Pereira, Ludwig, 2004). Overall children with poorer diets had an increased risk for obesity (Bowman et al., 2004). Poor diet quality in children has a large impact on obesity status and continued poor dietary behaviors could lead to negative health outcomes in adulthood. Foods with increased sugar, fat, and energy density are measured within this study. Reasons for providing children with snacks will be examined in this study and nutritive reasons are conceived as a more positive adjustment outcome.

Summary

Adjustment outcomes are determined by how family behavior, strategies, resources, and perceptions interact with stressors. With consistent ongoing maladjustment a crises could lead to childhood obesity pressuring families to adapt and make changes. These adjustment outcomes of mealtime distractions, non-nutritive snacking reasons, and poor dietary quality have been associated with childhood obesity and therefore indicators of protective behaviors in regards to family health.

The literature shows that stressors and pileup of demands contribute to added vulnerability for Hispanic immigrants. This vulnerability challenges family health adjustment. Family resources, normal patterns, and coping and perceptions can interact as protective factors to buffer their vulnerability and improve or further threaten their adjustment. This study will explore how all these components fit together within the resiliency framework and the relationships of maternal behaviors and family health adjustment. Understanding each of these elements will allow the development of prevention and intervention tools for parents and communities to promote healthy lifestyle changes in child nutritional intake and family health behaviors.

Given the problem as stated and the literature reviewed the following aims and hypotheses are advanced: The first aim of this study is to test associations between perceived stress and food insecurity on health outcome variables of mealtime distractions, snacking reasons, and child's diet quality. The second aim of this study is to see if social support, coping skills, dietary self-efficacy, and household chaos moderate these relationships.

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(1) Higher levels of perceived stress is hypothesized to be associated with the health outcome variables of increased mealtime distractions, offering snacks for non-nutritive reasons, and poor child's diet quality.

(2) Higher levels of social support, positive coping skills, and dietary self-efficacy are predicted to lessen the effects that high stress levels have on dietary and mealtime adjustment, while higher levels of chaos would be negatively associated with the health outcomes.

(3) Higher levels of food insecurity are predicted to be associated with the health outcome variables of increased mealtime distractions, offering snacks for non-nutritive reasons, and poor child diet quality.

(4) Higher levels of social support, positive coping skills, and dietary self-efficacy are predicted to lessen the effects food insecurity has on dietary and mealtime adjustment, while higher levels of chaos will magnify how vulnerability negatively impacts dietary and mealtime adjustment.

<center>**Chapter 4**</center>
<center>**Methodology**</center>

Data

This study used data from a larger intervention study called Abriendo Caminos. Abriendo Caminos is a community-based project to promote healthy lifestyles for Hispanic heritage families across the United States. Through this program, underserved Spanish-speaking families received six weeks of interactive sessions teaching about healthy eating, healthy family routines (such as mealtimes and bedtimes), and physical activity for the whole family. One of the main goals of the larger evaluation project is to determine whether the participants who are assigned to the healthy habits intervention program improve their health and health behaviors compared to participants in the control group.

In the larger project, we expect to have one hundred families each from Illinois, Texas, California, Iowa, and Puerto Rico. Families have been randomly assigned to control or treatment groups. The treatment group takes part in a series of workshops as part of the intervention. At each site, the control group will include 50 families from the same community as the treatment group. The participants in the control group will not participate in the health workshops, but they will receive non-health related workshops and health-promotion material distributed by Extension offices at the end of the study, and/or an opportunity to receive the workshops post-data collection.

Participants in the treatment and control groups have completed a comprehensive survey questionnaire. The questionnaire has validated Spanish measures that have been used in previous studies across the U.S. with Spanish-speaking immigrants. In the few cases where we were unable to find a validated measure, particular questions were generated from focus groups and based on past research. These were translated and back-translated then checked by the bilingual committee for semantic equivalence. Surveys were administered as paper-pencil or online. In addition, all participants provided biomedical data before the intervention period, at post-intervention, and at a six-month follow-up visit. To avoid attrition and maintain as many participants as possible, families were compensated for their time and effort at each of the three periods of data collection with a cash gift totaling $105.00.

For this particular study, we took a subset of the sample at the pre-intervention time point of the study from Illinois and California sites, totaling 100 mothers, 50 from each site. Examining health variables before the intervention can help determine needs of the population before addressing any particular patterns, problem-solving, perceptions and/or resources through the intervention program.

Sampling

The focus population of this study is Hispanic immigrant families from Mexico (n = 93) with five percent or less of participants from each of the following states: Aguascalientes, Baja California, Chipas, Zacatecas, and Guanajuato. Ten percent came from Jalisco, seven to eight percent from Morelos, Oaxaca

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and Puebla. The highest percentage (13%) came from Michoacan. Participants from Puerto Rico (n= 7) came from Bayamon, San Juan, and Utuado. Participants were recruited with flyers, postings in the community and cultural centers of the targeted communities, and via snowball sampling. We encouraged families that participated to invite families they knew.

Demographics and procedures. Participants were eligible for this study if they were of Mexican or Puerto Rican heritage. These families also needed to have at least one child between the age of 6 and 18. Each family was randomly assigned to the intervention group or the control group. All members of the family were invited to participate in the study, regardless of their group assignment. Whole families were the target of the intervention, in part because changes are more likely to occur if the entire family is involved. The project coordinator orally confirmed that potential participants met the inclusionary criteria of having Spanish as a first language, being of Mexican or Puerto Rican descent, and having a child 5 to 18 years old. See Table 1 for this study's demographic information.

Table 1.

Demographic Information (N= 100)

Variable	*M*	SD	Range
Mother's Age	38.55	7.59	24-59
Child's Age	8.84	2.94	5-18
	Male	Female	
Child's Sex	40%	60%	
	Mexico	Puerto Rico	U.S.
Mother's Birth Country	83%	6%	12%

Measures

Surveys were administered to mothers in the study and questions concerned demographic, psychosocial and health behaviors. The survey asked about 100 questions and took approximately one and a half hours to complete. Participants chose to take the survey either online through Qualtrics, a paper-pencil survey or had a trained student administer the survey orally, question by question. Biomedical and anthropometric data were collected at the same session as the surveys. Trained students measured BMI and waist circumference. For this study, we selected a particular subset of questions to answer the questions of interest.

Pileup of demands. Stress was measured by the Perceived Stress Scale (PSS; Cohen, Kamarck, Mermelstein, 1983). A 14-item questionnaire asking participants to rank their feelings and thoughts during the last month on a scale of how often they felt a certain way (from 0 = "Never" to 4 = "Very

Often"). To identify feelings of stress sample items include "In the last month, how often have you felt that things were going your way?" and "In the last month, how often have you felt that you were on top of things?" The total score of the PSS is obtained by reverse coding items positively worded items and adding the 14-items as a total. The higher the score would indicate a higher level of perceived stress. Previous studies have shown high levels of reliability with an internal consistency of .81 and a test-retest reliability of .73 ($p = .000$) (Remor, 2006), with our internal reliability being $\alpha = .74$.

Food Insecurity was measured by the US Household Food Security Survey Module (Bickel, Nord, Price, Hamilton, & Cook, 2000). The 6-item short form asks families about their food security in the last 12 months. For example, one question item is worded "we couldn't afford to eat balanced meals. The response scale is "was that often, sometimes, or never true for you or your household in the last 12 months?" and "In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?" Scores were then recoded into a total number of positive affirmatives meaning questions they answered "sometimes" or "often" were given a point and responses of "never" were coded as zero. Then total raw scores are given a status of high food security (0-1 raw score), food insecure (2-4 raw score) or extreme food insecurity (5-6 raw score). The continuous score was then used for measurement and had an internal reliability of $\alpha = .77$.

Resources. Social Support was assessed with the Multidimensional Scale of Perceived Social Support (MSPSS) a 12-item self-report measure with a 7-point Likert-type scale ranging from (1 = "very strongly disagree" to 7 = "very strongly agree") (Zimet, Dahlem, Zimet, & Farley, 1988). The 12 items were structured in such a way to measure support from family, friends, and a significant other. Sample items include "There is a special person with whom I can share my joys and sorrows" and "My friends really try to help me." Items are then averaged and grouped into a range of low (1-2.9), average (3-5), or high support (5.1-7). The original study confirms good internal reliability with Cronbach's Alpha value of .85 and test-retest value of .72 (Zimet et al., 1988), with our internal reliability being $\alpha = .94$.

Normal patterns. The (CHAOS) Confusion, Hubbub, and Order Scale is a 15-item measure assessing how participants view their home life, as chaotic or calm and relaxing (Matheny, Washs, Ludwig, & Philips, 1995). The 15-statements are rated on a 4-point scale (1 = "very much like your own home" to 4 = "not at all like your own home"). For example, participants rank questions such as "we are usually able to stay on top of things," or "the telephone takes up a lot of our time at home." Negative items were reverse-coded, and all items were added for a total score of chaos perceived in the home. A higher total score indicated more chaos. Previous studies have shown high levels of reliability with an internal consistency of .79 and a test-retest reliability of .74 (Matheny, Washs, Ludwig, & Philips, 1995), with our internal reliability being $\alpha = .77$.

Coping and problem solving. Coping skills were measured by the Brief COPE scale (Carver, 1997), an adapted 10-item self-report measure of how a person coped with a difficult situation in the past year. Items were rated on a scale from (1 = "I didn't do this at all" to 4 = "I did this a lot") with questions pertaining to how they coped (e.g., "I have been criticizing myself" and "I have been making jokes about it"). Items taken from the Brief Cope Scale demonstrate whether parents actively coped, used religion, humor, self-blame, and/or planning skills to help them deal with hard times. The negative coping items of self-blame and humor were reverse coded. Items were then summed for a total of positive coping strategies used. The original study confirms good internal reliability with Cronbach's Alpha value of .51 to .73 across subscales and test-retest value of .60 to .75 (Carver, 1997), with our internal reliability being α =.88.

Perceptions. Health efficacy was measured by the Health Opinions scale. This scale comes from a larger survey called Perceptions of Child's Weight and Health. The subscale of health opinions asks parents to rank their beliefs on certain statements. We used two questions that focused on parental belief about food, in particular. Such items asked the perception of parent's influence, for example, "I can influence my child's food choice" and "Eating habits of parents influence the eating habits of their children" (Eckstein et al., 2006). These two items were then summed to get an overall dietary efficacy score, having a higher score indicated more self-efficacy towards dietary behaviors.

Outcome variables. Adjustment was measured by mealtime distractions, snacking reasons, and child's dietary patterns.

Mealtime distractions were measured with the Family Routines Questionnaire (FRQ). Two questions from the FRQ were used to ask the frequency and type of distractions families engaged in during mealtimes. Mothers reported on the accuracy of the following statements: "the television is usually on when we eat dinner and someone is using their phone or other electronics when we eat," on a scale from (1 = "not at all true" to 3 = "very true") (Fiese, Hooker, Kotary, & Schwagler 1993). Items were added to get a range of distraction (2 to 6). The higher the number, the more often they would watch television or use their phone while eating dinner.

Snacking reasons were measured by the survey called Reasons Parents Offer Children Snacks (Blaine et al., 2015). Parents were prompted by six reasons why a parent might give snacks to their children, including "to help child grow"; "to celebrate"; and "to keep child quiet." Questions were coded based on frequency of snacks offered by reason, (1 = "never" to 7= "five or more times a week"). Nutritious reasons to give children snacks represent positive adjustment. Non-nutritive reasons to offer snacks represent poorer adjustment. Nutritious reasons were reverse coded and then all items were averaged to get the frequency of non-nutritive reasons to offer snacks in a given week.

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Mother reported children's nutrition with the Children's Nutrition Behavior Questionnaire (Marco & 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. For example, a question will ask "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 they are eating a particular item. Items are then summed, the higher the number the poorer quality of diet for the child in a given day. The variable ranged from 0 to 16, suggesting the number of times total for the seven poor quality diet items were eaten in one day.

Ethical Concerns and Risks

There are always concerns and risks when conducting a study with human participants. In this study, we carefully considered possible risks and ensured participant privacy and confidentiality. All materials including consent forms, questionnaires, and storage of private information were approved by the University of Illinois Institutional Review Board (Appendix A). Families might have experienced some discomfort when answering questions relating to their own or their child's psychosocial behaviors, the level of physical activity and their eating habits in particular if they believed they were not reaching the level they should be or reaching the socially desired behavior. This discomfort or distress was minimized through the intervention program or general health information was given to the families. These families were also given the option to drop out from the study at any point and were informed that they could choose to disclose certain information, meaning they did not have to answer any question they do not wish to answer. Another issue of concern with this particular population is citizenship status. We did not ask information pertaining documentation or residence status at any point during the study. This information was told to participants in advance so they could feel reassured of their safety and privacy.

Chapter 5

Results

Plan of Analysis

   There were only three cases of missing data with the variables of interest. The Little MCAR test was not significant, indicating that the data were missing completely at random, therefore the three missing cases were listwise deleted (Allison, 2002; Little & Rubin, 1987). A total of 100 participants were used for this analysis.

   The normality of distribution was calculated with skewness and kurtosis tests for each variable. All data were normally distributed except for the Children's Nutrition Behavior Questionnaire (Child Diet Quality) data. Therefore, those data were transformed to normalize skewness. Correlation coefficients were calculated for demographic items (site location, country of origin, income, acculturation, education level, and family size) to observe any significant relationships with the adjustment outcomes.

   To address the main research aims, multiple regression analysis interaction method was run to understand how vulnerability predicts adjustment patterns and may be buffered by a number of protective factors (Aiken & West, 1991), in which each vulnerability predictor was centered and entered to test for main effects along with the product to analyze the interaction terms. Six multiple regression tests were run in order to address the research aims. The first test was a measure of mealtime distractions that was regressed on stress, then in the second model social support, chaos, coping strategies, dietary efficacy were added, and the third model was the interaction of stress and each of the previous. The second test was a measure of mealtime distractions that was regressed on food insecurity, then in the second model social support, chaos, coping strategies, dietary efficacy were added, and the third model was the interaction of food insecurity and each of the previous. The third test was a measure of snacking reasons that was regressed on stress, then in the second model social support, chaos, coping strategies, dietary efficacy were added, and the third model was the interaction of stress and each of the previous. The fourth test was a measure of snacking reasons that was regressed on food insecurity, then in the second model social support, chaos, coping strategies, dietary efficacy were added, and the third model was the interaction of food insecurity and each of the previous. The fifth test was a measure of child's diet quality that was regressed on stress, then in the second model social support, chaos, coping strategies, dietary efficacy were added, and the third model was the interaction of stress and each of the previous. The sixth test was a measure of child's diet quality that was regressed on food security, then in the second model social support, chaos, coping strategies, dietary efficacy were added, and the third model was the interaction of food security and each of the previous. When interactions were significant, simple slopes tests were run to understand the main effects in the model (Aiken, West, & Reno, 1991).

Results

        All means, standard deviations, and correlations for study variables and demographic variables are shown in Table 2. This preliminary analysis showed that some demographic variables were significantly correlated with some study variables and could impact some of the study findings but due to sample size, these controls were not taken into account. Mother's age was negatively correlated with perceived stress, a predictor variable. Income was negatively correlated with food insecurity, a predictor variable, and chaos, a potential moderator. Education level was negatively correlated with non-nutritive snacking reasons, an outcome variable. Acculturation was negatively correlated with mealtime distractions, an outcome variable. Between site (Illinois and California) there were no significant differences in variables of interest, education level, family size, and income, indicating that site location was not a contributing factor to the health outcome variables. Education level did differ by country of origin, with Puerto Ricans having attainted a higher education level compared to immigrants from Mexico. Yet no other differences were found between country of origin.

        All means, standard deviations, and correlations for study variables are shown in Table 3. This preliminary analysis shows that the predictor variables of stress and food insecurity were significantly correlated with chaos in the home ($r's = .22$, $p < .05$), a potential moderator. Additionally, stress was negatively correlated with the potential moderator social support ($r = -.30$, $p < .01$), and with child's diet quality, an outcome variable. Of the six correlations between predictors and outcomes, only one (stress and child diet quality) was significant.

Table 2.

Correlations and descriptive statistics among the primary conceptual variables and demographic variables

Variable	Age	Site Location	Country of Origin	Acculturation	Income	Education level	Family Size
1.Stress	-.21*	.02	.09	.03	-.02	-.07	.12
2.Food Insecurity	.04	.14	.02	-.02	-.27**	.01	.09
3.Social Support	.03	-.01	.01	.004	.18	.16	.07
4.CHAOS	-.02	.003	.29**	.09	-.21*	-.09	-.21*
5.COPE	-.06	.05	.01	-.03	-.07	-.08	.12
6. Diet Efficacy	-.04	-.02	.07	.21*	-.06	.08	.04
7.Child Diet	.06	.19	.02	-.18	-.13	-.12	.08
8.Snacking Reasons	.04	.04	.03	-.18	-.12	-.30**	.12
9.Meal Distractions	.01	.13	.11	-.23*	.10	-.07	.03
Mean	38.54	1.58	1.29	-1.73	3.89	2.58	4.31
Standard Deviation	7.59	.50	.67	1.46	1.97	1.64	2.41

Notes: Stress-Perceived Stress Scale; Social Support- Multidimensional Scale of Perceived Social Support; CHAOS- confusion hubbub and order scale; COPE- Brief coping scale; Child Diet- Child's diet quality; Snacking Reasons- Reasons parents offer children snacks.

*p<0.05. **p<.01

Table 3.

Correlations and descriptive statistics among the primary conceptual variables

Variable	1	2	3	4	5	6	7	8	9	M	SD
1.Stress	-									26.9	7.15
2.Food Insecurity	.16	-								1.29	1.49
3.Social Support	-.30**	-.02	-							5.70	1.26
4.CHAOS	.22*	.22*	-.26**	-						31.26	6.48
5.COPE	-.16	.03	.07	-.17	-					29.29	5.72
6. Diet Efficacy	-.03	.04	.31**	-.17	.08	-				3.91	0.68
7.Child Diet	.29**	.07	-.14	.13	-.09	.07	-			0.64	0.27
8.Snacking Reasons	.19	.003	-.09	.21*	-.05	-.18	.10	-		3.07	0.80
9.Meal Distractions	.19	.04	-.02	.25*	.15	.02	.19	.02	-	3.95	1.03

Notes: Stress-Perceived Stress Scale; Social Support- Multidimensional Scale of Perceived Social Support; CHAOS- confusion hubbub and order scale; COPE-Brief coping scale; Child Diet- Child's diet quality; Snacking Reasons- Reasons parents offer children snacks.

*p<0.05. **p<.01

Mealtime distractions. The results show that mothers who are more stressed reported using significantly more distractions during mealtimes than those who are less stressed ($R^2 = .04$, $F(1,97) = .19$, $p < .05$). In addition, higher chaos in the home ($\beta = .27$, $p < .05$) and better coping strategies ($\beta = .21$, $p < .05$) were significantly associated with more mealtime distractions, regardless of maternal stress level (Table 4). There were no significant interactions between maternal stress and the proposed moderators social support, chaos, coping strategies or dietary efficacy. Food Insecurity did not predict mealtime distractions nor did any interactions of food insecurity and the moderators, which was tested in its own model.

Snacking reasons. The results for the maladjustment outcome of giving snacks to children for non-nutritive reasons show that on average, there were marginal significant associations between maternal stress levels and snacking reasons ($\beta = .05$, $p < .058$). Two interaction variables were statistically significant. The interaction between maternal stress level and social support was statistically significant and the interaction between stress and chaos was statistically significant with both interactions predicting non-nutritive snacking reasons, see Table 5. Simple slopes for the association between stress and social support were tested for low (-1 SD below the mean), moderate (mean), and high (+1SD above the mean) levels of social support. The simple slopes test revealed a significant association between perceived stress level and the frequency of non-nutritive snacking even more so when there were high levels of social support ($\beta = .055$, $p < .01$) (Figure 2), suggesting that with increased levels of stress, social support acts as a protective factor. When stress is lower, having higher social support is associated with less non-nutritive snack-feeding, yet when stress is high, higher social support is associated to more non-nutritive snack-feeding. Simple slopes were also tested between stress and chaos. The test revealed that stress significantly predicted the frequency of non-nutritive snacking reasons when levels of chaos were average and high but not when chaos in the home was low (Figure 3). Food insecurity did not predict non-nutritive snacking reasons nor did any interactions of food insecurity and the moderators.

Child dietary quality. The next set of regression tests were conducted to understand the predictors association with the outcome variable: child's dietary quality. The results indicate that there is a significant association between stress level and child's diet quality, showing that higher stress levels predict giving children significantly poorer quality foods on a daily basis ($R^2 = .092$, $F(1,98)=.26$, $p < .05$). None of the moderators significantly added to the prediction of child's diet quality. Food insecurity did not predict child's diet quality nor did any interactions of food insecurity and the interaction terms.

Table 4.

Multiple Regression Analysis for Variables Predicting Mealtime Distractions

Variable	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
Stress	.030	.015	.199*	.028	.015	.190†	.025	.016	.166
MSPSS				.067	.089	.080	.040	.091	.048
CHAOS				.044	.017	.271**	.015	.017	.288**
COPE				.038	.018	.207*	.045	.018	.248*
Efficacy				.053	.156	.035	-.029	.162	-.019
Stress*MSPSS							.002	.011	.018
Stress*CHAOS							-.003	.002	-.128
Stress*COPE							-.002	.003	-.058
Stress*Efficacy							.033	.024	.150
R^2		.040			.136			.181	
F for change in R^2		4.016*			2.582*			1.235	

Notes: Stress-Perceived Stress Scale FS- Food Insecurity; MSPSS- Multidimensional Scale of Perceived Social Support; CHAOS- confusion hubbub and order scale; COPE- Brief coping scale Efficacy- dietary efficacy.

*$p<0.05$. **$p<0.01$. † $p<.10$.

Table 5.

Multiple Regression Analysis for Variables Predicting Reasons Parents Offer Children Snacks

Variable	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
Stress	.022	.011	.191†	.019	.012	.170†	.030	.012	.258*
MSPSS				.032	.070	.050	.033	.070	.052
CHAOS				.019	.013	.154	.020	.013	.157
COPE				.002	.014	.011	.000	.014	.000
Efficacy				-.202	.123	-.173	-.171	.125	-.146
Stress*MSPSS							.020	.009	.257*
Stress*CHAOS							.004	.002	.261*
Stress*COPE							.003	.002	.148
Stress*Efficacy							-.003	.018	-.016
R^2		.036			.092			.171	
F for change in R^2		3.674			1.414			2.116	

Notes: Stress-Perceived Stress Scale FS- Food insecurity; MSPSS- Multidimensional Scale of Perceived Social Support; CHAOS- confusion hubbub and order scale; COPE- Brief coping scale Efficacy- dietary efficacy.

*$p<0.05$. †$p<.10$

Figure 2. *Interaction between Maternal Stress and Social Support (moderator) on Non-Nutritive Reasons for Snacking*
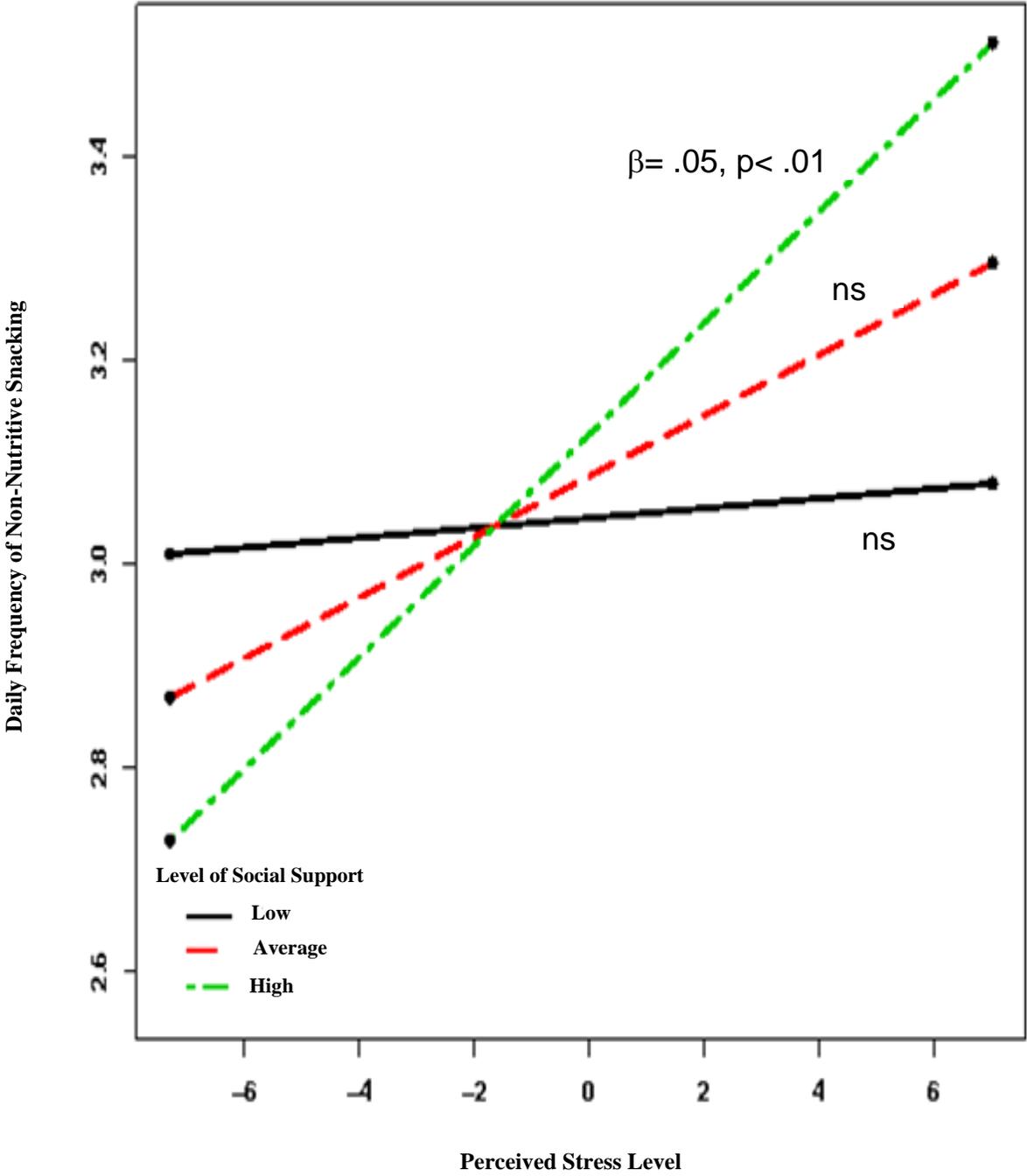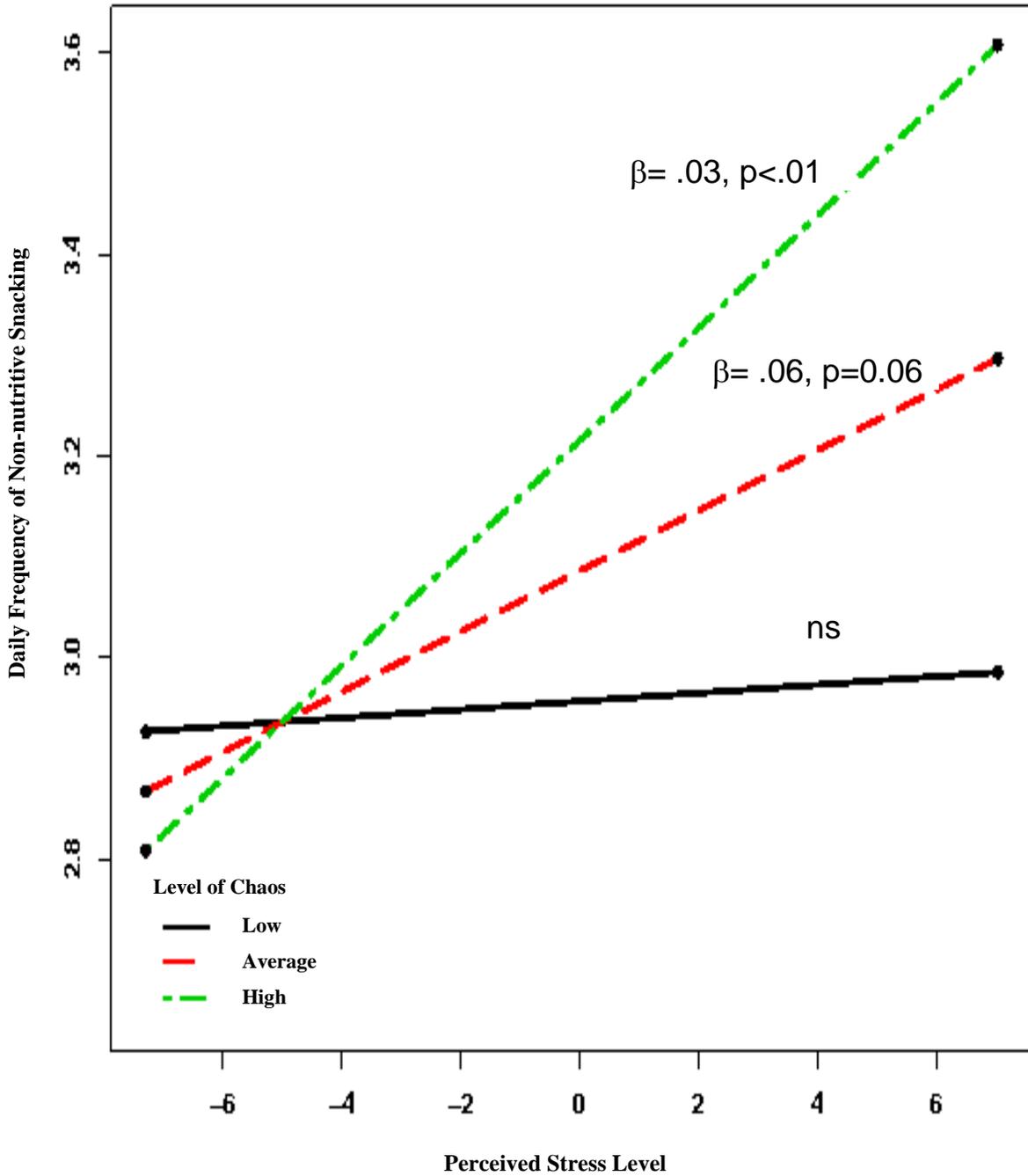
Figure 3. *Interaction between Maternal Stress and Chaos in the Home (moderator) on Non-Nutritive Reasons for Snacking*

Chapter 6
Discussion

The goal of our study was to examine how family vulnerability is associated with maternal protective factors predicting family health-related outcomes. The family resiliency framework provides an explanation for how factors interact and relate to adjustment outcomes. Our analyses indicated associations between independent variables, interaction variables, and family health outcomes. This is an important study that emphasizes the significance of maternal stress levels and how these levels impact household outcomes of health and obesity prevention. Overall, we find that stress is associated with all outcome variables and these associations can be heightened with household chaos. Household environment, as well as mental health, is a necessary component to consider when thinking about health promotion and obesity prevention programs in that, these variables are major contributing factors.

Our first hypothesis stated that higher levels of perceived stress would be associated with the health outcome variables and this statement was partially supported. The main effects of higher reported stress levels significantly predicted more mealtime distractions in regression models 1 and 2, and child diet quality. In accordance with previous literature, mothers tend to be overwhelmed or burdened by their stress levels, as indicated by the findings, that heightened stress predicted increased mealtime distractions, poor quality in their children's diet, and offering their children snacks for non-nutritive reasons. Mothers may want to escape during stressful occasions such as mealtimes. Therefore, television or cell phone use may be utilized as a distraction during mealtimes as a means of dealing with stress and in order to control the behavior of their children (Kubey, 1986). Although food insecurity did not significantly contribute to child's diet quality, maternal stress was related to poor quality feeding practices. Mothers are a primary influence on their child's diet quality and continue to have some control over what their children are eating even as they age (Savage, Fisher, & Birch, 2007). Stress played a role in predicting lower quality diets for their children. Children of more stressed mothers were eating more sugar-sweetened beverages, fast-food, sweet and salty snacks. Frequent consumption of these foods can lead to weight gain, obesity status, and health problems (Bowman et al., 2004; Malik, Pan, Willett, & Hu, 2013; Poti, Duffey, Popkin, 2014) potentially causing a crisis for the family. Stress has been shown to be associated with negative health outcomes, but this study contributes to understanding how specific household behaviors in the Hispanic community may be related to stress more than to financial strain through food insecurity. These findings strongly suggest that stress management components, which are rarely incorporated, would benefit in health promotion or obesity prevention programs tailored to Hispanics.

The three modifiers of social support, coping strategies, and diet-efficacy were hypothesized to lessen the effects that high stress levels would have on non-nutritive snacking reasons, child's diet quality, and mealtime distractions (hypotheses 2); while high chaos levels would be negatively associated

with the health outcomes. Results from these analyses partially supported these predictions. The interaction between stress and chaos was a significant predictor of offering snacks for non-nutritive reasons, meaning that mother's offer more non-nutritive snacks when stress is high or average but not when chaos is low. It is consistent with the literature that higher stress contributes to feeding snacks to children to quiet them or to encourage good behavior (Shankardass et al., 2013). This can be a tactic to control the home and attempt to ease stress and perceived chaos. These findings contribute to the literature in that, especially when a mother is stressed, chaos can add to the burden leaving mothers unsure how to control and manage the household. Giving snacks can help manage the chaos within the home providing short-term relief for parents, though this is shown to be an unhealthy behavior that contributes to obesogenic outcomes (Blaine et al., 2015; Dumas et al., 2005). These findings suggest that helping mothers cope with chaos in a different manner bedsides offering non-nutritive snacks can help lessen the load in stressful situations.

The interaction of stress and social support significantly predicted higher frequency of offering snacks for non-nutritive reasons. Several previous studies have shown that higher levels of social support reduce stress and promote healthier lifestyles for individuals and in families (Gallo et al., 2014; Jackson et al., 2007; Umberson et al., 2010). We expected that higher levels of support would predict healthier behaviors, in this sample, however results from this study did not support our expectation. There are some possible culturally-grounded reasons for this.

Hispanic families rely heavily on family and friend support even compared to other ethnic and racial groups (Campos et al., 2014). Some research has shown that particularly with Hispanic families, poor quality eating and snacking are highly prevalent in social contexts (Ayala, Maty, Cravey, & Webb, 2005; Gerchow et al., 2014). A study with Hispanic families showed that children who tend to eat meals away from home (at least once a week at a relative's, neighbor's, or friend's house) was associated with children's risk of obesity and poor dietary quality (Ayala et al., 2008). These results indicate that foods eaten away from home are less nutritious, including larger portion sizes, higher levels of fat, calories, and greater consumption of snacks and sugar sweeten beverages (Ayala et al., 2008; Bezzerra, Curinoi, & Sichieri, 2012). In this manner, if social support involves commensality with "comfort foods" for Hispanic families then social support in times of high stress may be an impediment to certain health outcomes.

When highly stressed, mothers may seek out social support. This may be a great strategy in general, as seen in our bivariate findings (stress and social support were negatively correlated). However, if their support system gives inaccurate information about eating patterns or does not engage in health-promoting behaviors then their friendships may be leading them towards unhealthy behaviors (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). For example, a mother may ask a friend about

parenting methods and her friend, although, typically a good emotional support, in reality the friend is not advising accurate information on how to reward her child for good behavior.

Chaos and coping strategies were also significant predictors of mealtime distractions as main effects, a result that was not originally hypothesized. This would suggest that the more chaos felt in the home, the more likely there were to be mealtime distractions. This finding could mean that families may feel more chaos because of the increased noise or distraction levels throughout their day and during mealtimes (Fiese et al., 2015). Also in part, mealtime distractions may contribute to a more chaotic environment. Inconsistent with the literature better coping strategies predicted mealtime distractions. In this population, mother's may use TV and phone use as a coping strategy to deal with chaos or stress. If this is upheld in future studies, interventions with Hispanics should directly address other coping strategies for managing chaos, especially at the family table.

Other results did not confirm our hypotheses. Hypothesis 3 and 4 stated that having higher levels of food insecurity would be associated with negative health outcomes and that the variables of social support, efficacy, and coping would lessen these effects but chaos would add to the financial strain. Food insecurity was not a significant predictor for any of the adjustment outcomes. Unlike the findings of previous literature (Rosas et al., 2009), food insecurity for our population did not account for unhealthy dietary behaviors even though 36% of our sample was food insecure. A potential explanation could be that Hispanic mothers may not see food insecurity as a large stressor and have already learned to manage or have found other ways to compensate for the lack of financial strain. Since food insecurity did not predict positive or negative health behavior outcomes, we should consider other stressors that may directly predict food insecurity and health behavior outcomes. Further analysis should be considered to understand how other financial strains such as income or job demands may impact the relationship between food insecurity and health outcomes. Dietary efficacy was also not a predictor of any outcome variables positively or negatively. This suggests that parents' beliefs about impacting their child's diet quality do not make any significant difference in this study. These findings may be a result of survey bias, meaning that mothers may want to present themselves as having agency and knowledge about what might affect diet but may not do so in practice.

In sum, this study showed that maternal stress was the main predictor of negative health behaviors for families and particularly the children. Maternal behavior and household factors such as chaos have implications for mealtime distractions and non-nutritive snacking. Although food insecurity was not a significant predictor nor were any interactions with food insecurity, further analysis should be done to understand why this aspect may not be consistent with the literature.

Limitations and Future Directions

        This study contributes to our understanding of how maternal resiliency influences children's health adjustment; however, some limitations should be addressed. First, the cross-sectional design of this study did not allow for causal interpretations among the variables that are suggested by the multiple regression tests. Longitudinal designs are best to analyze causal interpretations because the direction of variables is emphasized and explained by time rather than conceptually. Second, the low number of participants did not enable us to control for a number of factors that could be contributing to maternal stress levels such as income, prior knowledge of positive health behaviors, and other pre-existing stressors such as mental health issues like depression. Future research can replicate and expand this current study with other samples and with a broader national represented population of Mexican and Puerto Rican immigrants.

        This analysis was done as part of a larger ongoing study; with completed data, we will analyze how resiliency factors predict adjustment over time. The Abriendo Caminos intervention teaches families nutritional standards, skills to promote well-being within the family, and health behaviors such as limiting mealtime distractions. This program can also be analyzed to understand the impact of educational resources when it comes to protective factors against family crises such as obesity or poor health. In addition, this study informs us of the importance of promoting stress-management skills and routines in order to maintain an ordered, organized, and peaceful home in the Abriendo Caminos intervention or other similar programs targeting Hispanic immigrants.

Conclusion

        In trying to understand and combat disproportionate Hispanic health disparities, this study explored what factors could be contributing to childhood and family health behavior adjustment within the context of the Family Resiliency Framework. Several factors contribute to Hispanic families' adjustment outcomes. Stress was a significant factor predicting maladjustment outcomes to childhood and family health behaviors, and more so when taking into account the levels of household chaos. Since these factors can negatively add to maladjustment, further analysis could help deepen this understanding and clarify conflicting results with some of the previous literature. Efforts to improve Hispanic health behaviors should be complemented with strategies to also address family routines and organization patterns in order to reduce stress and chaos.

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Appendix A: IRB Approval Letter

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign. IL 61820

April 4, 2016

Margarita Teran-Garcia
Food Science & Human Nutrition
437 Bevier Hall
905 South Goodwin Avenue
Urbana, IL 61801

RE: *Abriendos Caminos 2: Clearing the Path to Hispanic Health*
        IRB Protocol Number: 15503

Dear Dr. Teran-Garcia:

This letter authorizes the use of human subjects in your continuing project entitled *Abriendos Caminos 2: Clearing the Path to Hispanic Health*. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) approved the protocol as described in your IRB application, by expedited continuing review. The expiration date for this protocol, IRB number 15503, is 04/01/2017. The risk designation applied to your project is *no more than minimal risk.*

Copies of the attached date-stamped consent form(s) must be used in obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Under applicable regulations, no changes to procedures involving human subjects may be made without prior IRB review and approval. The regulations also require that you promptly notify the IRB of any problems involving human subjects, including unanticipated side effects, adverse reactions, and any injuries or complications that arise during the project.

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at the OPRS office, or visit our Web site at http://oprs.research.illinois.edu.

Sincerely,

LeaAnn Carson

LeaAnn Carson, MS
OPRS Specialist

Attachment(s)

c: Angela Wiley
     Michelle Cruz-Santiago

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