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EXPLORING THE RELATIONSHIPS BETWEEN CULTURAL VALUES AND DIET PATTERNS AMONG MEXICAN AND CUBAN IMMIGRANTS IN KENTUCKY

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in Nutrition and Food Systems in the
College of Agriculture, Food and Environment
at the University of Kentucky

By

Nasreen Omran
Lexington, Kentucky

Director: Dr. Julie Plasencia, Professor of Dietetics and Human Nutrition

Lexington, Kentucky

2021

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ABSTRACT OF THESIS

EXPLORING THE RELATIONSHIPS BETWEEN CULTURAL VALUES AND DIET PATTERNS AMONG MEXICAN AND CUBAN IMMIGRANTS IN KENTUCKY

The number of Latinx in the U.S. is expected to grow to about 28 percent of the population by the year 2060. As the number of Latinx increases in the U.S. it is important to understand how cultural beliefs influence dietary behaviors as Latinx are disproportionately affected by diet related disease such as diabetes mellitus, cancer, and cardiovascular disease. The aim of this secondary data analysis is to examine the relationship between family values, gender roles, and religious values on diet patterns in adult Mexican and Cuban immigrants in Kentucky utilizing the Mexican American Cultural Values Scale. The study findings show there are no direct relationships between cultural values, and diet patterns. Implications for future research include utilizing measures of health beliefs related to diet which may provide clarity to the role cultural values play in influencing diet.

KEYWORDS: cultural values, immigrants, Mexican American Cultural Values Scale, familism support, religious values, traditional gender roles

Nasreen Omran

June 4, 2021

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TABLE OF CONTENTS

LIST OF TABLES v

LIST OF FIGURES vi

CHAPTER ONE: INTRODUCTION 1

1.1 Research Aim 3
1.2 Research Questions 3
1.3 Research Hypotheses 4

CHAPTER TWO: REVIEW OF LITERATURE 5

2.1 Demographics of Latinx in the US 5
2.2 The Hispanic Health Paradox 5
2.3 Cultural Values and Health 6
2.4 Latinx Diets 10
2.5 Cultural Values of Mexicans and Cubans 13
2.6 Measures of Cultural Values 17
2.7 Diet Quality 23
2.8 Conceptual Framework 25

CHAPTER THREE: METHODS 28

3.1 Research Design 28
3.2 Setting 28
3.3 Participants and Recruitment 28
3.4 Procedures 29
3.5 Measurements 29
3.6 Statistical Analysis 37

CHAPTER 4: RESULTS 39

4.1 Sociodemographic Characteristics of Mexican and Cuban Participants 39
4.2 Reliability Testing of Mexican American Cultural Value Scale subscales 40
4.3 Cultural Values 41
4.4 Diet Composition 42
4.5 Diet Patterns and Cultural Values 45

CHAPTER 5: DISCUSSION 49

5.1 Sociodemographic Descriptions 49
5.2 Reliability Analysis of Cultural Value Score 51
5.3 Cultural Values of the Mexican American Cultural Values Scale 51
5.4 Diet Composition 54
5.5 Familism Support and Seafood and Plant proteins in Mexicans 56
5.6 Strengths and Limitations 57

CHAPTER 6: CONCLUSION AND IMPLICATIONS 60

APPENDICES 62

APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER 63
APPENDIX B: MEXICAN AMERICAN CULTURAL VALUES SCALE QUESTIONNAIRE 64
APPENDIX C: 24-HOUR RECALL 72
APPENDIX D: PROTOCOL FOR IDENTIFYING VALID 24-HOUR RECALLS 75
APPENDIX E: LINEAR REGRESSION 77
APPENDIX F: TERMINOLOGY 78

BIBLIOGRAPHY 80

VITA 91

LIST OF TABLES

Table 1: 3.1: The HEI-2015 Components and Scoring Standards[136] 36
Table 2: 4.1 Sociodemographic Characteristics of Mexican and Cuban participants (n = 103) 40
Table 3: 4.2: Results of reliability testing of the Mexican American Cultural Values Scale and Subscales using Cronbach's alpha for Mexican and Cuban participants (n = 103)... 41
Table 4: 4.3: The Mexican American Cultural Value Scores of Mexican and Cuban Participants..... 42
Table 5: 4.4.2: Total Healthy Eating Index-2015 Score and Healthy Eating Index Components 44
Table 6: 4.5: Linear Regression comparing the Components of the Healthy Eating Index-2015 to Cultural Values, Traditional Gender Roles, and Religion Subscales for the Mexican American Cultural Values Scale in Participants of Mexican and Cuban origin 46
Table 7: 4.5.2: Linear Regression comparing the Components of the Healthy Eating Index-2015 to the Cultural Values Familism Support in participants of Mexican Origin (n=64)..... 48

LIST OF FIGURES

Figure 2.1: Representation of the framework for surface and deep level structures from the Resnicow et. al cultural sensitivity framework in public health[132] 27

CHAPTER ONE: INTRODUCTION

In 2018, the U.S. Census Bureau estimated the Latinx population to account for about 19% of the total U.S. population.[1] In addition, the U.S. Census Bureau estimates the number of Hispanics in the U.S. will grow to about 28% of the population by the year 2060.[1] As the numbers of Latinx increase in the U.S., it is important to understand how cultural beliefs may influence health behaviors, specifically diet. Latinx are at an increased risk for health disparities associated with diet such as diabetes mellitus, heart disease, and cancer.[2-4] An adequate understanding of how cultural beliefs influence health behaviors may improve understanding of how to reduce health disparities among Latinx in the U.S.

Culture is defined as the values that shape behaviors and give substance to the development of individual identity.[5] In this study, the term culture refers to ethnic identity. Some aspects of culture can shift in order to accommodate a group's effort to adapt to the mainstream environment. This definition describes the process of acculturation in which individuals adapt to a new living environment where they may adopt the beliefs, norms, and main stream practices of their new society in addition to retaining their cultural identity and practices.[6] Health is influenced by culture-linked behaviors, such as food and food preparation.[7] Culturally informed behaviors vary among ethnic groups and in order for health behavior interventions to be effective they must be responsive to the cultural practices, beliefs, and values for the group in which they are intended.[8] Culturally sensitive health behavior interventions contribute to an increase in positive health changes and a decrease in the diet related diseases.[9-12]

Traditionally, the family is a vital source of support that is made-up of close-knit, cohesive, and interdependent relationships. The composition of a Latinx family may include multiple generations in one household.[5] In Latinx culture, these strong emotional bonds are sometimes measured by the psychometric construct *familismo*.[13] Latinx who are more tied to their families have positive mental and physical health outcomes because they are more likely to seek support from their family for mental illness or to better manage their diabetes for example.[14, 15] It is unclear how well familial ties may be indicative of higher diet quality. It is plausible that the relationships between *familismo* and diet is positive based on evidence that supports other health outcomes.

Similar to family values, the role of gender may also influence diet. Traditional gender roles among Latinx consist of women acting in the role of homemaker, rearing the children, and providing meals among other household duties.[16] Traditional patriarchal duties entail going to work in order to provide financially for their families.[16] It is unclear if traditional gender roles influence diet quality of Latinx through consistent meals prepared at home by women who traditionally make the dietary choices.

Religious orientation and its linkages to health, especially mental health has been widely studied.[17] However, few studies have examined this relationship in a cultural context, and even fewer studies have examined the relationship between religion and diet quality.[17, 18] There are many studies between religious orientation and physical health outcomes.[19-24] However, these studies mostly address cardiovascular disease and reduced blood pressure among African Americans.[25, 26] Latinx continue to be understudied in terms of religious orientation and health.[17] One study examining religion among Latinx looks at the relationship to mental health, specifically depression in Mexican origin adults

from California, found a modest relationship between religious values and decreased depression.[27] A longitudinal study examined the relationship between religion and mortality among Mexican Americans who attended church, it was noted those who attended church were likely to have decreased mortality.[28] We hypothesize a positive relationship between religious values and diet quality based on the positive associations between religious values with decreased mortality and reduced symptoms of depression.

It remains unclear how family values, traditional gender roles, religious values and diet patterns are related. Mental health outcomes such as reduced depression, and physical health outcomes such as reduced blood pressure, and properly managed diabetes mellitus show that these cultural values may be indicative of positive outcomes, however, current evidence is limited. Therefore, the aim of this study is to examine the relationship between family values, gender roles, and religious values on diet patterns in Mexican and Cuban adults by using the Mexican American Cultural Value Scale (MACVS) as a measure of cultural values and the Healthy Eating Index-2015 as a measure of diet quality.

1.1 Research Aim

1. To determine how cultural values, family values, gender roles, religious values, influence diet patterns among participants of Mexican and Cuban ethnicity.

1.2 Research Questions

1. How do family values influence diet patterns in participants of Mexican and Cuban ethnicity?
2. How do gender roles influence diet patterns in participants of Mexican and Cuban ethnicity?

3. How do religious values influence diet patterns in participants of Mexican and Cuban ethnicity?
4. How do cultural values and diet patterns differ between participants of Mexican and Cuban ethnicity?

1.3 Research Hypotheses

1. It is hypothesized there is a positive relationship between family values and diet patterns. Studies show that the more cohesion, family support an individual has, the better their social, mental, and physical health outcomes.[29, 30]
2. It is hypothesized there is a positive relationship between gender roles and diet patterns. When more Traditional Gender Roles are followed, women are more likely to assume the role of homemaker, providing home cooked meals which may be a healthier alternative compared to other meal options.[31]
3. It is hypothesized there is a positive relationship between religious values and diet patterns. Those who attended religious services had improved physical health outcomes such as decreased blood pressure and heart disease, mental health outcomes include decreased depression symptoms.[25, 32]
4. It is hypothesized there is a difference between how cultural values influence diet patterns in Mexican and Cuban participants.

Findings of this study may provide insight into cultural values of Mexican Americans and Cuban Americans that influence diet. By understanding the relationship between diet, we may better inform behavior change strategies in culturally adapted interventions to prevent diet related disease.

CHAPTER TWO: REVIEW OF LITERATURE

This study aims to increase the knowledge of cultural factors, specifically family support, perceived gender roles, and religion and how they influence diet quality in Mexican Americans and Cuban Americans. A better understanding of these factors among Latinx communities may inform future dietary interventions to reduce diet-related health disparities. The current study focuses on participants of Mexican and Cuban ethnic origin, and an overview of some general dietary differences of Hispanic ethnic groups is discussed in this review.

2.1 Demographics of Latinx in the US

In 2018, there were an estimated 58.9 million Latinx in the U.S. comprising of about 18.1% of the U.S. population.[33] The 2015 U.S. Census Bureau projects that in 2060, Latinx persons will make-up around 28.6% of the U.S. population.[34] With an increasing Latinx population, it is vital to understand the difference in culture values and beliefs among different Latinx ethnicities in order to better accommodate the healthcare needs of this population.

2.2 The Hispanic Health Paradox

The Hispanic Health Paradox is an epidemiological paradox that suggests despite higher poverty rates, less education, and worse health care, health outcomes of many Latinx living in the U.S. are equal to, or better than, those of their non-Hispanic white counterparts.[35] The Hispanic Health Paradox may be attributed to the fact that immigrants have healthier diets than non-immigrants. Acculturation is the process in which individuals adapt to a new living environment where they may adopt norms, values, and practices of their new society while retaining traditional practices and ethnic identity.[6] One study examining the length of residency effect on Latin American immigrants in

Spain found that the longer the residency, both healthy and unhealthy changes occurred; specifically a decrease in sugary beverage intake and the increase of consumption in saturated fat, fiber, olive oil, vegetables, and fish increased.[36] Another study found that the longer the residency in the US, immigrants slowly begin to adopt U.S. dietary behaviors of high in fat foods and less fruits and vegetables, opting for more convenience and processed foods.[37] One study grouping Asian, Black, White, and Latinx immigrants together found immigrants had a lower consumption of meat and more fruits and vegetables, however, after five years of residency in the US, consumption became similar to an unhealthy American diet.[38]

2.3 Cultural Values and Health

Increased retention of traditional cultural values are correlated with better health outcomes emphasizing the importance of cultural values to Latinx and how it may influence health.[14] One example is mental health where Mexican Americans who were tied to their traditional cultural values were more likely to seek mental health services than those individuals who were not as tied to their culture.[14] In a study examining the prevalence of suicidal ideation and attempts amongst Mexicans, Cubans, and Puerto Ricans used family values, as well as church attendance as measures.[39] High scores for family support was the only significant protective factor of suicidal ideation and attempt—reducing the odds of both by 60%.[39]

Family Values

Strong familial values may also have an effect on diet quality and are important to Latinx families.[40] *Familismo,* for example, is the concept that the family's needs are more important than those of the individuals'.[40] For young boys and girls, *familismo* was

associated with higher family cohesion. Traditional Gender Roles are also linked with higher family cohesion.[41]

One study examined the relationship between familial eating habits and diet quality among urban Hispanic children.[29] Diet quality was heavily influenced by parents and food availability.[29] Children who engaged in family dinners away from the television had a higher Healthy Eating Index (HEI) score than their counterparts who did not engage in family dinner or ate dinner in front of the television.[29] In this study, parental intake was also examined. Parental diet associations with children's HEI total score included their reported intake of nutrient rich and nutrient poor, energy dense foods, and beverages.[29] Parents who reported intake of fruits and vegetables were found to be positively associated with children's total HEI score.[29] However, the parental reported intake of milk and 100% juice was not positively associated with total HEI score for children.[29] The study concluded, that parent's dietary habits have both a positive and a negative influence on their children's diets.[29]

Similarly, a secondary data analysis of Project Eating Among Teens focused on adolescents of all ethnicities noted diet quality increased with family meals. This secondary data analysis, examined the association between regular family meals and dietary intake.[30] Regular family meals were positively associated with an increase in mean daily vegetable intake, calcium rich food, dietary fiber, and several nutrients including calcium, magnesium, potassium, iron, zinc, pyridoxine, and folate for both male and female adolescents.[30] There was also a positive association for reduced sodium intake among females although not in males.[30] The same was discovered for Mexican Americans with Type 2 Diabetes. Those who had the support of their families were more

likely to follow diet recommendations and engage in physical activity to manage their condition.[42] Familial support can be defined as seeking encouragement, advice, and direction from a large number of family members.[40] Familial support is one way that the cultural value of *familismo* presents in behavioral change efforts. In turn, the patients with familial support had lower glycohemoglobin A1c levels compared to their counterparts who did not have familial support.[42] There is a need for more research on familial values and diet quality on other Latinx ethnic groups. It is difficult to provide suggestions for improving health when there is a lack of understanding of the different Latinx cultures.[43] Therefore, this study focuses on Mexican and Cuban immigrants.

Gender Roles

Traditional Hispanic gender roles describes males as the patriarchal authority while women are more likely to act as a homemaker.[16] These roles can be further categorized as *marianismo* and *machismo*. The construct of *marianismo* is used to describe the role of the woman as family and home centered; encouraging passivity, self-sacrifice, and chastity.[44, 45] Historically, *marianismo* is rooted in Christian values which defined the woman as a nurturing and spiritual pillar of the family-like the Virgin Mary.[45] In this value, the woman holds responsibility to act as a pillar and hold the family together.

The construct of *machismo* describes the male in the family as strong and is considered the protector of the family.[46] It is often used to describe masculinity of Latinx men.[46] *Machismo* can be described in various forms, including someone who is trying to prove their manhood through aggression, engaging in risky behaviors including seeking multiple sexual partners.[47] One study among Hispanic males examined attitudes and

found that those who strongly associated with *machismo* were more favorable towards having more sexual partners and less condom use, thus increasing the risk for HIV.[48]

On the contrary, *machismo* also has positive associations on health. In Mexican American men, pain and disability are motivating factors to seek health care. However, some men only seek help when the pain keeps them from working and providing for their families.[49] Machismo enhances men's awareness of their health because they have to be in adequate health to fulfill their duties as fathers, husbands, sons, and provider.[49]

Gender roles may play a large part in determining diet quality. One study shows that women in traditional household consumed less fast food, less saturated fats, more fiber, and less dietary fats compared to women who lived in a home where shared decision making occurred[31]. The majority of the literature related to *machismo* among Hispanic men focuses on mental health issues, such as depression in Hispanic. A secondary data analysis of the HCHS/SOL examined the relationship between *machismo*, *marianismo,* and cognitive emotional factors like depression, anxiety, cynical hostility, and anger.[50] The study included many groups, including Mexicans, Cubans, Dominicans, Puerto Ricans, and those from Central and South America. Gender role beliefs were assessed using the Machismo Beliefs Scale and the Marianismo Beliefs Scale.[50] Bivariate analysis regressions demonstrated traditional *machismo* was associated with greater cynical hostility while higher scores on the marianismo subscales of "family pillar" and "silencing self to maintain harmony" were correlated to greater anxiety and cynical hostility.[50] While there is much information on the role of gender and mental health, there is a need for research on the role of gender and diet quality. Currently, there is a need for

more studies on family values and perceived gender roles on diet quality to better gain insights into the relationships between gender roles and physical health.

Religious Values

In the past, religion and spirituality were thought to have a negative influence on physical and mental health.[22] Studies on the influence of religion suggest that religion usually plays a positive role if the religious experience has positive outcomes.[22, 32, 51]The religious variables examined in these studies included: prayer, social support (fellowship, companionship), relationship with God, participation in religious ceremonies, and meaning.[22] A study examining religious attendance and mortality among older Mexican Americans, 65 years and older, noted those who attended church were more likely to live longer than their counterparts who did not attend religious services.[32] This has been met with criticism, those who attend religious services may be more physically able to attend religious services; especially among the elderly who may have health and transportation issues.[52, 53] A study of religiosity on the psychological well-being among African American males noted a significant positive relationship between religiosity and mental health variables.[25] African American males who considered themselves to be more religious were less likely to be depressed and more likely to better cope with their mental health concerns.[25] Given these positive findings, a deeper look into the importance of religiosity, wellbeing, and diet quality among Hispanics may provide clarity on how religious values may influence health.

2.4 Latinx Diets

To date, the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) study is the largest study of Latinx and Hispanics in the US. The HCHS/SOL recruited

16,000 men and women self-identifying as Latinx between the ages of 18-74 years from communities in the Bronx, Chicago, Miami, and San Diego.[54] The sites were selected to ensure a consistency of at least 2,000 people from the following countries: Mexico, Puerto Rico, Dominican Republic, Cuba, and Central and South America.[54] The HCHS/SOL includes research aimed at prevalence and risk factors for heart, lung, kidney and liver function, and diabetes among other diseases to better characterize health status and disease burden among Latinx in the US.[54] The study also describes the positive and negative consequences of immigration and acculturation of Latinx to mainstream U.S. lifestyles, environment, and health care opportunities, and to identify likely causal factors of disease in this population.[54]

In a secondary data analysis, food group and nutrient density intakes were examined among different groups of Latinx from the HCHS/SOL.[55] The distribution of both food group and nutrient density was examined in Cubans, Dominicans, Mexicans, Puerto Ricans, Central and South Americans. The purpose of the study was to note variations in diet among the different groups of Latinx individuals which may account for diet-related differences in health outcomes.[55] The study concluded that Cubans had higher intakes of total energy (calories) including all types of fats and alcohol compared to other groups.[55] Mexicans had a higher intake of Vitamin C, calcium, and fiber compared to other groups.[55] Dominicans consumed less calories, folate, iron, and calcium compared to other groups.[55] Puerto Ricans had low intake of Vitamin C and fiber compared to other groups.[55]

Cubans consumed more refined grains, vegetables, red meats, and fats compared to other groups, while Dominicans consumed the most fruit and poultry of all the

groups.[55] Puerto Ricans were noted to have the lowest intake of fruits and vegetables compared to the other groups at 1.4 servings a day with 1/3 of intake from citrus fruits.[55] In comparison to other groups, Central and South Americans were second for highest fruit and poultry, as well as the highest in fish consumption.[55] Mexicans had the highest consumption of whole grains compared to the other groups.[55]

Cultural Food Practices of Cubans

Cubans consume three meals a day. An example of a traditional Cuban breakfast consists of a *tostada* or Cuban bread made with lard. The *tostada* is often spread with butter and then pressed like a panini.[56] Breakfast may also consist of egg omelets and *cafe con leche* or coffee with milk.[56] A traditional Cuban lunch typically consists of *empanadas*, or a chicken and meat turnover wrapped in flour dough or a Cuban sandwich.[56] Another common lunch food are Cuban sandwiches. These often contain ham, pork or cheese and is then grilled like a panini.[56] These sandwich items are often paired with thinly sliced potato sticks, or fried plantains.[56] A traditional dinner often consists of a meat, chicken, or fish, and is accompanied by white rice, black beans, and sweet fried plantains (*maduros*).[56] Based on the example, a traditional Cuban diet is high in refined grains, red fatty meats like pork, fried foods, saturated fats, and starchy vegetables. Espresso-style coffee *café Cubano* is served after dinner.[56]

Cultural Food Practices of Mexicans

In modern times, Mexicans consume three meals a day. Traditional Mexican cuisine consists of many mixed dishes like *enchiladas, tamales,* and *sopa de arroz*.[56] Traditionally, rice or beans are consumed first. Corn and beans are two starchy vegetables most often consumed.[56] Tortillas made from corn or wheat flour are also very

common in the diet. The traditional Mexican diet consist of many non-starchy vegetables like chilies, *nopales*, tomatoes, and tomatillos. The traditional Mexican diet consists of mostly red meats like beef and pork. These meats are sometimes fried. *Manteca* or lard is commonly used in Mexican cooking.[56]

Comparison Between Cuban and Mexican Foods

The Cuban diet consists more of refined grains, like tostadas, empanadas, made of flour, whereas the Mexican diet consists of corn and flour tortillas. The Cuban diet also consists of more dairy, and saturated fats compared to Mexicans. Compared to the Cuban diet, the traditional Mexican diet consists of more vegetables, both starchy and non-starchy like beans, corn, which is used for tortillas, *tomales*, *atole*, and *sopas*.[56] *Crema* is commonly used as garnish in Mexican dishes, where in the Caribbean, Cubans consume more milk and milk products like cheddar cheese, gouda cheese, milk, white cheese, and whole milk.[56]

In the U.S., the traditional foods and eating patterns vary. The types of foods that are less consumed in the U.S. by individuals of Cuban and Mexican descent vary by availability, access, cost, and other factors such as preferences and health beliefs surrounding food. In general, dietary acculturation that occurs often results in immigrants to the U.S. consuming less fresh fruits and vegetables and more foods high in fat and fast foods.[57]

2.5 Cultural Values of Mexicans and Cubans

Family Values of Cubans

Like the other of Hispanics, Cubans place a strong importance on family, familism is a strong cultural value.[58] In traditional Cuban families there is a greater

expectation of involvement of family members.[59] There are specific hierarchal family structures but also strong family ties, unity, loyalty, and family traditions.[60]

Cubans often reported a strong familial dependency due to living conditions, tight living quarters, often with members of the extended family.[60] During crises families often come together to support one another, with certain individual like the mother, who are expected to support all members of the family.[60]

Family Values of Mexicans

As a collectivist society, Mexico places a high importance on the family.[61] Collectivist societies emphasize values such as family, security, responsibility, and conformity to societal norms.[62] Aspects of a collectivist society include the pressure of individuals to conform to the goals of the collective in groups, examples of the in group include family and religious organizations.[62] These collectivists may also participate in in-group activities together, are more concerned about in-group interests, and are more likely to feel compelled to share the same opinions.[62] Collectivist societies are tightly knit and individuals within these groups conform to an established set of norms, roles, and values.[63]

In Mexico, there is a strong emphasis on family unity and cohesiveness, the cultural value *familismo* is held to high regard.[64] The emphasis on the family is based on the traditional set of norms and values that is passed on from parents to children.[64] These norms and values are referred to as familial norms. Part of these norms is the emphasis placed on parental authority, respect, obedience, affective interdependence, and discipline of the children.[64, 65] Mexicans were found to display unity within the family and reject

individual priorities to better conform to the interests of the group.[64] It is suggested that influence of the family on an individual's behavior is strong due to collectivist thinking.[66]

Differences between Cuban and Mexican Family Values

While both Mexican and Cubans place high emphasis on family, Cubans place more emphasis on the mother keeping the family together. Mexicans place emphasis on the family unit as whole, with norms and values being passed from parents to children. These family roles largely influence gender roles in these two cultures.

Gender Roles among Cubans

Unlike traditional gender roles, social participation of woman began in 1959 during the revolutionary process.[67]In Cuba, women had the highest level of participation in the labor force compared to their Latin American counterparts as well as the lowest level of illiteracy—even lower than that of Cuban men.[67] Between the years of 1965-1985 women in the workforce in Cuba nearly doubled and child rearing decreased by half.[67] It has been noted that this greater equality has led to shared roles among men and women including housekeeping, grocery shopping, and child care among husbands.[67, 68] However, the traditional female gender roles are still common amongst the working class.[67, 68]

Gender Roles among Mexicans

Research has shown the traditional Mexican family as an authoritarian, patriarchal system with the father/husband as control of the family.[50] The two different roles are defined as *machismo* for the male and *marianismo* for the female.[50] The man is also supposed to be a protector of his mother and sisters, however, many heterosexual relations are also encouraged.[69, 70] Machismo also teaches men to be emotionally

detached, especially with the children, men should be strong, consume alcohol, and be able to fight to defend his honor and of women.[70-72]

Marianismo is characterized by femininity, passivity, and self-abnegation.[50] Women are often socialized to show respect to male authority and internalize and normalize patriarchal views.[50] Women are expected to be submissive, nurturing mothers who are self-sacrificing for others.[50]

Differences between Cuban and Mexican Gender Roles

The major difference between these two groups is in responsibilities. In Cuba, the responsibilities are shared between both women and men. In Mexico, the men are expected to take care of the household and the women are expected to stay home, rear the children and take care of the home. These differences are largely related to the socio-political climate in these countries.

Religious Values of Cubans

Catholicism is a large cultural presence in Cuba. In 1960, only 72.5% of Cubans identified as Catholic, 20% claimed to have no religion at all.[73] In spite of the Cuban revolution, many left Cuba—migrating to Spain and the US.[73] Cuba did not become a secular state until 1992, when one year previously the communist party removed atheism as a requirement.[74] However, although number of individuals attending church services was low during the 20th century, religious beliefs and religious norms coexisted with Marxism.[75] In 2009, approximately 85% of Cubans state they believe in a higher being.[75] So while formal practice remains low the influence of religion in society was strong.[75]

Religious Values of Mexicans

Nearly all Mexicans report a religious preference with nearly 89% identifying as Catholic.[76-78] Religion is very important in the life of the Mexican people.[78] 84% of Mexicans reported that religion is very important or important and only 3% claimed religion had no meaning to them.[79] Other aspects of religion in Mexico include the belief in God, respect for priests, trust in religious institutions, and religious education in the home.[79]

Differences Between Cuban and Mexican Religious Values

While Catholicism is the main religion of both Mexicans and Cubans. Due to the political differences in the countries, formal practice of Catholicism among Cubans remains low.[74] In Mexico, the majority of people reported religion is very important or important, while less than 5% claimed religion had no meaning to them.[77]

2.6 Measures of Cultural Values

Measuring cultural values among different ethnic groups is challenging and several scales designed and validated in the fields of psychology and sociology were reviewed.[50, 58, 80, 81] For the current study, scales that measure family values, gender roles, and religious values were reviewed.

Family Values

Familism refers to the collective orientation in which family roles and obligations are highly valued, and the well-being of the family groups takes precedence over the interests of each of its own members.[80, 82] Similar to the MACVS, the Attitudinal Familism scale measures beliefs and attitudes towards the family on a Likert scale and

contains a similar subscale, familial support, addressing items related to the extended family.[83]

The Attitudinal Familism scale was created to address problems with reliability and validity with other scales measuring familism.[80] Familism is a sociological term that denotes a commitment to family.[84] The term has been referred to in the literature meaning family solidarity, family integration, or intergenerational solidarity.[85, 86] Attitudinal familism is a cultural value that involves an individual's strong identification with and attachment to his or her nuclear and extended families and strong feelings of loyalty, reciprocity, and solidarity among members of the same family.[86, 87] The Attitudinal Familism scale contains 18-items and included themes and values the authors identified were to be applicable to Latinx.[80] The themes were scored on a 10 point Likert scale ranging from 1(strongly disagree) to 10 (strongly agree).[80] The scale is available in English and Spanish.[80] The Attitudinal Familism Scale is used in three studies examining its association with mental health such as suicide risk, depression, and academic engagement among high school seniors.[83, 88-90] Two studies examined the Attitudinal Familism scale and its association to weight and physical activity.[91, 92]

A study examining the association of familism, also referred to as Familialism, on infant birth weight with Latina mothers, specifically from Mexican, El-Salvador, and Guatemala[81] used a 10-item Familialism Scale consistent with a previous study of familism in Latinx.[93] This scale was used to measure orientation towards the welfare of one's immediate and extended family.[81] Similar to the MACVS, the Familialism Scale is includes items such as, 'When it comes to social responsibility, blood really is thicker than water' and 'I cherish the time I spend with my relatives.[81] They found that the

Familialism scale was positively associated with increased birth weight among infants, and decreased stress among foreign born Latinas.[81]

A study examining the protective factor of familism among Mexican origin adolescents exposed to deviant peers, used the familism subscale of the MACVS to measure beliefs related to the family.[94] The study found that adolescents who had stronger familism values were less likely to engage in deviant behavior, had better grades, and behavior in school. Another study examining prosocial behavior tendencies of Mexican American Adolescents and their mothers utilized the familism subscale of the MACVS to measure family values.[94] The study used the three subscales of the MACVS (family emotional support, family obligations, and family as referent).[95] The Cronbach's alpha for mothers and adolescents respectively were 0.66 and 0.68 for emotional support, 0.61 and 0.60 for family obligations, and 0.70 and 0.64 for family as referent.[95] The study showed that there was a positive relationship between familism values and prosocial behaviors; mother and adolescents who had stronger familism values were more likely to be more helpful or beneficial to other people.[95]

Gender Roles

The HCHS/SOL secondary study examining the relationship between machismo, marianismo, and negative cognitive emotional factors, the Machismo Beliefs Scale and the Marianismo Gender Role Beliefs Scale were used to measure the endorsement of machismo beliefs and traditional female gender role beliefs respectively, among different groups of Hispanics. The Machismo Gender Roles Beliefs Scale consists of eight items measured on a 4-point Likert Scale from 1 (strongly disagree) to 4 (strongly agree).[50] The items from this scale stemmed from the Multiphasic Assessment of Cultural

Constructs-Machismo Scale as well as the Male Honor and Machismo Subscales.[96-98] These scales demonstrated internal consistency.[50] The scale contains two subscales: *traditional machismo* and *caballerismo.*[50] The subscale of traditional machismo includes 5 items: hypermasculinity, dominance, sexism, and emotional restrictiveness while the subscale of *caballerismo* is characterized by bravery, honor, and chivalry.[50] *Caballerismo* originates from the Spanish word hose and horseman an refers to masculine chivalry.[99] Sample items of statements include, "Wives should respect a man's position", and "It is important for a man to stick to his beliefs".[50] Many of the studies using the Machismo Beliefs Scale examine the influence of Machismo on mental health[50, 100] and marital satisfaction.[101] Only one study examined the influence of machismo on health behaviors.[102] The study, which included 144 participants consisted mostly of Mexicans (98%) with a small number of participants from other Central and South American countries—Guatemala, Peru, Argentina, Brazil, Venezuela, Chile, Ecuador, and the Dominican Republic. This study found no significant relationship between machismo and health promoting behaviors such as seeking preventative care and medical compliance.[102]

Similarly, there is the Traditional *Machismo* and *Caballerismo* scale which is the only measure that aims to capture both the negative and positive dimensions of machismo.[99] The scale contains 20 items and two subscales Machismo and Caballerismo.[99] The *Machismo* subscale contains questions regarding expected roles of males and females (e.g a man should be in control of his wife, the bills should be under the man's name, women should be beautiful).[99] The Caballerismo subscale contains questions regarding men's responsibilities to their families and societies in general (e.g men should be willing to fight to defend their families, men should be affectionate to

their children, men must display good manners in public).[99] The scale has been tested for reliability and validity among Mexican American males in English and has been translated into Spanish.[99] The Traditional *Machismo* and *Caballerismo* has not been used in any studies measuring physical health outcomes or diet, but is used to examine cultural values on mental health.[100, 103]

The Marianismo Beliefs Scale is a validated scale used to measure the traditional female gender role beliefs among Hispanics.[58] The scale contains 24 items, asking respondents to rate the extent to which they agree with statements regarding female gender role values and practices regarding the construct *marianismo*.[58] The scale consists of five subscales : family pillar, virtuous and chaste, subordinate to others, silencing self to maintain harmony, and spiritual pillar.[58] Each subscale is on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Higher scores on each subscale is a greater endorsement for the *marianismo* beliefs.[58] Much like the Machismo Beliefs Scale, the Marianismo Beliefs Scale has been used in studies related to mental health,[50, 104] but one study did examine the influence of marianismo on physical activity in immigrant Latinas.[105] The study found that those who favored marianismo were more likely to prioritize their family over their health needs, thus resulting in less physical activity.[105]

Religious Values

In Hispanic cultures, religion is considered to be a central value, guiding attitudes, behavior, and even social interactions.[106, 107] In a study examining the relationship between religiosity, acculturative stress and alcohol use in Latinx immigrants, religiosity was measured using a validated Spanish version of the Brief RCOPE Scale (S-BRCS), a

14 item measure scored on a 4-point Likert scale.[108] The scale is separated by positive and negative religious coping subscales.[109] Examples from the positive religious coping subscale include, “Looked for a stronger connection with God”, and “Sought help from God in letting go of my anger” [109] Religious coping is defined as the “use of cognitive and behavioral techniques, in the face of stressful life events, that arise out of one’s religion or spirituality”.[110] Positive religious coping is characterized by an adaptive coping strategy that includes: religious forgiveness, seeking spiritual support, reframing of a stressful event to view it as a potentially beneficial opportunity for growth and learning, and finding meaning in a negative situation through spiritual connectedness with a higher power.[108, 111] Positive religious coping was associated with improved physical and mental health outcomes.[111, 112]

Similarly, a longitudinal study examining sociocultural determinants of substance misuse among Latinas of Caribbean descent used the Santa Clara Strength of Religious Faith Questionnaire to measure religious involvement.[113] The 10-item questionnaire uses a 4-point Likert scale. Examples of statements include, “I pray daily” and “I consider myself active in my faith”.[114] Using a sample of 415 Latinx immigrants, positive religious coping was associated with lower levels of alcohol misuse while negative religious coping was associated with an increase in alcohol misuse.[114, 115]

The Allport-Ross Religious Orientation Scale (ROS) is a widely used instrument to measure motivation for religion. The ROS consists of 20 questions and two subscales: intrinsic and extrinsic on a 5-point Likert scale.[116] The intrinsic subscale assesses the degree to which individuals are committed to their faith and the extrinsic scale endorses self-serving ways.[116] The intrinsic subscale includes items like, “I try hard to carry my

religion over into other dealings of life", and "If not prevented by unavoidable circumstance, I attend church." Extrinsic items include, "the purpose of prayer is to secure a happy and peaceful life" and "I pray chiefly because I have been taught to pray".[116] The ROS has been used to measure health related outcomes but not related to diet, rather the sample self-rated their health, life satisfaction, and exercise.[116]Individuals who rated themselves as more religious also had higher life satisfaction, health, and exercise scores.[116]

The Mexican American Cultural Value Scale (MACVS) is a 50-item scale with nine subscales. The MACVS is a general scale that has been used in studies examining cultural values in relation to mental health topics such as depression, trauma, and stress because it examines nine cultural values of Mexican-Americans including familism support, familism obligation, familism referent, religion, traditional gender roles, respect, material success, independence, competition and personal achievement.[94, 117-120]

2.7 Diet Quality

Diet quality has significant impacts on health. Several measures exist to assess diet quality including the Diet Quality Index (DQI) and the Healthy Eating Index (HEI). The Diet Quality Index (DQI) tool measures diet quality and is versatile to be used among many different ethnic groups.[121-123] Furthermore, the Diet Quality Index International (DQI-I) was created to compare diet quality between countries using variety, adequacy, moderation, and overall balance of diet. The tool allows for users to see variable intakes of food and nutrients and patterns of diet quality.[121] In comparison, some studies reviewed used the DQI and examined diet quality against a health marker. For example, one study assessed diet quality and associations with cardiometabolic risk factor among

Latinx Americans. A healthier diet quality lowered the odds of metabolic syndrome overall. However, the association between diet quality and the different Latinx ethnic groups varies.[124] While there is much research on Latinx communities, many of the studies do not focus on a particular group. In this aspect, there is more research to be conducted on diet quality between different Latinx ethnic groups.

The Healthy Eating Index is a measure of diet quality and is updated about every five years. Previous studies have shown that as the HEI continues to be modified, the more accurate they become in predicting diet quality.[125] Most recently, the HEI-2015 was released, corresponding to the new Dietary Guidelines for Americans (DGA). There are 13 dietary components of the HEI-2015, including total fruits, whole fruits, total vegetables, greens and beans, whole grains, dairy, total protein foods, seafood and plant proteins, fatty acids, refined grains, sodium, added sugars, and saturated fats. When used correctly, the HEI-2015 can provide a pattern of diet quality and summed to represent overall diet quality.[126]

The HEI-2015 has been used in multiple studies including Latinx individuals among other groups.[127-129] The HEI 2015 scoring details are described in chapter three, section 3.5. The studies reviewed found that among Latinx individuals, the average HEI ranged from 55 to 74, and these differences are due to the study samples varying by geography, urbanicity, gender, age, and health status.[127-129] For this study, the HEI-2015 will be used as it provides the most up to date Dietary Guidelines for Americans giving a more recent interpretation of diet quality.

2.8 Conceptual Framework

Resnicow's Model for Cultural Sensitivity

Cultural sensitivity can be defined as the extent to which ethnic/cultural characteristics, values, behavioral patterns, and beliefs of a target population, are incorporated in the design, delivery, and evaluation of targeted health promotion materials and programs.[8] Cultural sensitivity can be conceptualized by two dimensions: surface structure and deep structure. The surface structure dimension involves "matching intervention materials to observable, superficial characteristics of a target population" as well as identifying appropriate channels and settings for delivery of messages and programs.[8] This may include incorporating language, people, places, and foods recognizable to the target audience in materials. It also embraces incorporating people of the same ethnicity to deliver and evaluate the program.[8]

The second dimension, deep structure, reflects the social, psychological, historical, and environmental factors that influence health behaviors.[8, 130] The deep structure dimension, a more subjective approach, requires an understanding of how religion, family, society, economic, and government shape target behaviors in a population.[130] A review, examining the theoretical principles and components of culturally sensitive interventions in randomized controlled trials aimed to modify the nutrition and physical activity behaviors in Latinx, noted many surface level interventions through the use of bilingual materials. However, the majority of the studies lacked deep level intervention as they were minimally guided by cultural models and framework.[131] The cultural sensitivity framework in public health is demonstrated in **Figure 2.1,** incorporating both surface level and deep level intervention components.

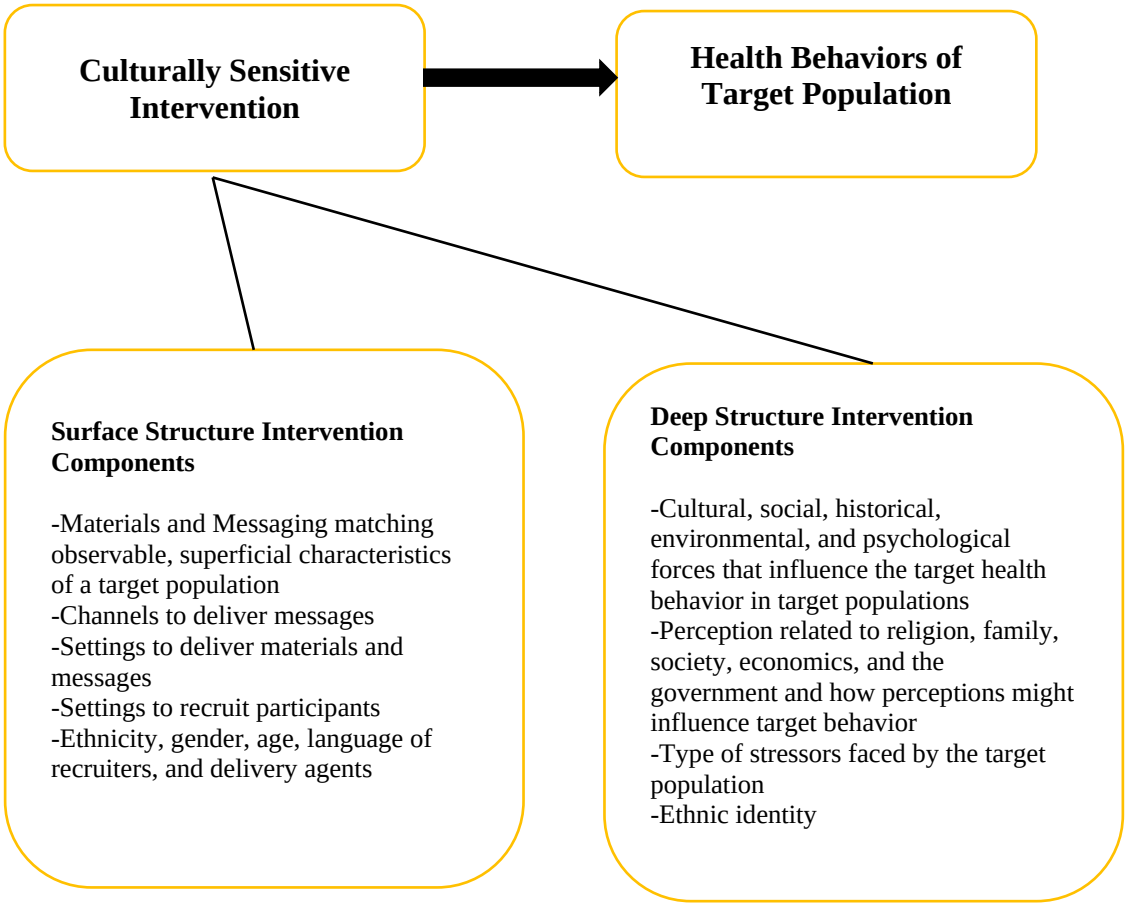

Figure 2.1: Representation of the framework for surface and deep level structures from the Resnicow et. al cultural sensitivity framework in public health[131]

Conceptual Model for Thesis

Resnicow's model for cultural sensitivity provides a deeper understanding of structures used to adapt interventions to benefit the health of the Mexican and Cuban populations, specifically, the deep level structure. The framework includes understanding of perceptions related to religion, family, and society as ways to enhance cultural sensitivity.[8] For the purposes of this thesis, we will explore the relationships between the cultural values familism support, religion, and traditional gender roles and their influence on diet patterns using the HEI-2015.

CHAPTER THREE: METHODS

3.1 Research Design

The University of Kentucky Institutional Review Board approved the study design and data collection instruments prior to the start of this study (Appendix A). This study, a secondary data analysis, will examine the effects of family, perceived gender roles, and religious cultural values on diet quality among Mexican Americans and Cuban Americans in Louisville, Kentucky. The MACVS, as well as a 24-hr dietary recall were used to assess cultural values on diet quality.

3.2 Setting

Data collection occurred at three different Family Health Centers, Inc (FHC). between May 2019 through August 2019. FHC Inc. is a non-profit community health clinic with eight locations in Louisville, KY. The clinics provides different services including primary care, women's care, pediatric care, pharmacy, behavioral health, services, substance use services, and dental care. Many of the patients at these clinics are low-income and are eligible to pay sliding scale fees based on income. The three clinics utilized for this study were selected due to their proximity to the Latinx communities and because Latinx individuals in these communities were the predominant patients served.

3.3 Participants and Recruitment

Participants were a convenience sample of 350 Latinx individuals. While 350 were recruited, only 214 completed the study. Inclusion criteria included those 18 years old or greater, identifying as Latinx, and a patient of the FHC. Those excluded included those less than 18 years of age, pregnant women, persons not identifying as Latinx, or persons who were not a patient of FHC. Participants were recruited using study posters

that were posted strategically in and around the clinic prior to data collection (Appendix B).

For this secondary data analysis, participants include Mexicans and Cubans for a total of 103 participants: 64 Mexicans and 39 Cubans.

3.4 Procedures

On data collection days, once checked in, patients who were identified as Latinx by clinic staff were referred to speak with bilingual research staff wearing identifiable name tags, and the researchers invited them to learn about the study. If the participant was interested, the researchers read the consent form to them and obtained their signature once all their questions were answered and the community members understood that they were participating voluntarily in a research study. The survey was verbally administered by trained research assistants in an interview format. After completion of the survey (Appendix B), anthropometric measurements of height, weight, and waist circumference and 24-hour recall (Appendix C), the participants were given a gift card incentive valued at 35 dollars.

3.5 Measurements

Demographics

Data on demographics was collected after the participant had been interviewed on the MACVS. The second part of the survey included questions about cultural food beliefs and demographic information. The participants were asked questions related to marital status, employment status, highest level of education completed, and perceived income on a 5-point Likert scale, where the participant noted they made “enough money”, “less money”, “or very less money (very poor).[132] To determine country of ethnic origin,

participants where asked, “What is your country of ethnic origin?” For the purposes of this paper, participants will be defined by their country of origin, either Mexican or Cuban.

Cultural Values

Data on cultural values was collected using subscales from the MACVS. The 50-item survey, contains nine subscales measuring different Mexican/Mexican American cultural expectations. The nine subscales measure both mainstream and traditional values. The traditional Mexican/Mexican American values include familism, respect, religion, and traditional gender roles. The main-stream values include independence, self-reliance, competition, and personal achievement. The participants respond using a 5-point Likert scale 1 (strongly disagree) to 5 (strongly agree), the higher the score the higher presence of cultural values.[117] For the purposes of this study, the subscales used include: familism support, gender roles, and religion

Familism Subscale

The Familism Subscale falls under the category of the traditional Mexican American Values. Of the nine subscales, three of the subscales focus on family values. These subscales include Familism Support, Family Obligations, and Familism Referents.[117] For the purposes of this study, the Familism-Support Subscale will be used. There are six questions on the MACVS reflecting familism support. These questions focus on family and having a close relationship, primarily with family providing emotional support.[117] Examples of questions from the Familism Support Subscale include, “Parents should teach their children that the family always comes first” and

"family provides a sense of security because they will always be there for you".[117] Each question was rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Scores were calculated using the average of item responses. The higher the average, the stronger the cultural value.[117]

Gender Roles Subscale

Like the Familism-Support Subscale and Religion Subscale, the Traditional Gender Roles Subscale falls under Mexican American Values rather than Mainstream. The MACVS contains five questions that reflect values related to Traditional Gender Roles questions focused on the differing expectations between male and females. For example, the idea that males are the bread winners, head of house, while females stay home and raise the children.[117] Examples of questions from the Traditional Gender Roles subscale includes, "men should earn most of the money for the family so women can stay home and take care of the children and the home" and "families need to watch over and protect teenage girls more than teenage boys".[117] Each question was rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Scores were calculated using the average of item responses. The higher the average, the stronger the belief in traditional gender roles.[117]

Religion Subscale

The Religion Subscale falls under Mexican American Values. The MACVS contains seven questions that reflect religious values among Mexican Americans, spiritual beliefs and having faith in a higher power.[117] The Religion Subscale of the MACVS consists of seven questions. Each question was rated on a 5-point Likert scale

from 1 (strongly disagree) to 5 (strongly agree). Examples of questions from the Religion Subscale include: “God is first, family is second”, “Parents should teach their children to pray”, “If everything is taken away, one still has their faith in God” and “Religion should be an important part of one’s life”.[117] Scores were calculated using the average of item responses. The higher the average, the stronger the religious value.[117]

Diet

To collect dietary data, the 24-hour dietary recall was completed using the U.S. Department of Agriculture, five step multiple pass method.[133] Prior to the study, research assistants were provided training of this method by a registered dietitian nutritionist to ensure consistency and adequacy throughout the data collection process. The 24-hour dietary recalls were completed by interview, using food models to determine portion sizes. Two research assistants and one registered dietitian nutritionist conducted the interviews. Aside from the 24-hour recall, participants were asked about where they had their meals, whether meals were consumed with family, whether they were lactose intolerant, and if they considered their recall to be a normal eating day.[134]

To determine diet quality, first the 24-hour dietary recalls were entered into the 2017 Nutrition Data System for Research (NDSR) by two trained research assistants, including one registered dietitian nutritionist. NDSR provided output of an analysis of nutrients including total energy, macronutrients, micronutrients, and analysis of nine different food groups.

The diet quality was measured using the HEI-2015. There are thirteen components of the HEI-2015: Total Fruits, Whole Fruits, Total Vegetables, Greens and Beans, Whole Grains, Dairy, Total Protein foods, Seafood and Plant Proteins, Fatty Acids, Refined Grains, Sodium, Added Sugars, and Saturated Fats.

The HEI-2015 is calculated from the nutrient analysis of the 24-hour recalls. The mean ratio method was used to calculate HEI. The steps of conducting the mean ratio method include deriving the sums. For each dietary component, the constituents were summed together, ratios were then constructed of the constituents to 1000 calories of energy. The means of the ratios per each individual were calculated and each ratio was scored according to scoring standards, the scores were then summed giving a total HEI score.[135] Each of the 13 components is assigned a standard for achieving a maximum score. Each of the components can be summed to get the total, a maximum score of 100.[126] The total HEI-2015 score is based on a score from 0 - 100, the higher the number, the greater the diet reflects meeting the Dietary Guidelines for Americans 2015-2020.

The HEI-2015 is divided into two components, the adequacy components and the moderation components. The adequacy components are representative of food groups, subgroups, and dietary elements that are encouraged. Higher scores for these components are desirable as they reflect, higher intakes. The moderation components are representative of foods that should be limited. Higher scores for moderation components, indicate lower intakes, as lower intakes are desirable.[126]

Among the adequacy components, Total Fruits, Whole Fruits, Total Vegetables, Greens and Beans, Total Protein Foods, and Seafood and Plant Proteins are scored on a range from 0 – 5. For a component of the HEI to score a 0, the participant had to have not consumed any of the component. For the participant to earn the maximum score of 5, the participant must have consumed greater than or equal to 0.8 cup equivalent per 1,000 calories for Total Fruits, greater than or equal to 0.4 cup equivalent per 1,000 calories for

Whole Fruits, greater than or equal to 1.1 cup equivalent per 1,000 calories for Total Vegetables, greater than or equal to 0.2 cup equivalent per 1,000 calories for Greens and Beans, greater than or equal to 2.5 cup equivalent per 1,000 calories for Total Protein, and greater than or equal to 0.8 cup equivalent per 1,000 calories for Seafood and Plant Proteins.

The remaining adequacy components, Whole Grains, Dairy, and Fatty Acids, as well as moderation components Refined Grains, Added Sugars, and Saturated Fats are scored from 0-10. To score a 0 for Whole Grains and Dairy, the participant had to not have consumed any of the component. To receive a score of 0 for Fatty Acids, the polyunsaturated fats summed with the monounsaturated fats divided by the saturated fatty acids had to be less than or equal to 1.2. To score the maximum of 10, the participant had to consume greater than or equal to 1.5 cup equivalent per 1,000 calories for Whole Grains, greater than or equal to 1.3 cup equivalent per 1,000 calories for Dairy, and polyunsaturated fats summed with monounsaturated fats divided by saturated fatty acids which was greater than or equal to 2.5.

The moderation components are Refined Grains, Sodium, Added Sugars, and Saturated Fats. For the participant to have an unfavorable score for the moderation components, a score of 0, the participant had to consume greater than or equal to 4.3-ounce equivalent per 1,000 calories of Refined Grains, for sodium the participant had to consume greater than or equal to 2.0 grams per 1,000 kcal. For Added Sugar and Saturated Fats, a score of 0 was awarded if the participant consumed greater than or equal to 26% and 16% of their energy intake, respectively. To score the maximum, a favorable score, the participant had to consume less than or equal to 1.8-ounce equivalent per 1,000

calories of Refined Grains, less than or equal to 1.1 grams of Sodium per 1,000 calories, and less than or equal to 6.5% of energy for Added Sugars, and less than or equal to 8% of energy of Saturated Fats. **Table 3.1**

Table 1: 3.1: The HEI-2015 Components and Scoring Standards[136]

Component	Range of Score	Standard for minimum score of zero	Standard for maximum score
Adequacy			
Total Fruits[2]	0 - 5	No Fruit	≥ 0.8 cup equivalent per 1,000 kcal
Whole Fruits[3]	0 - 5	No Whole Fruit	≥ 0.4 cup equivalent per 1,000 kcal
Total Vegetables [4]	0 - 5	No Vegetables	≥1.1 cup equivalent per 1,000 kcal
Greens and Beans[4]	0 - 5	No Dark- Green Vegetables or Legumes	≥0.2 cup equivalent per 1,000 kcal
Whole Grains	0 - 10	No Whole Grains	≥1.5 cup equivalent per 1,000 kcal
Dairy[5]	0 - 10	No Dairy	≥1.3 cup equivalent per 1,000 kcal
Total Protein Foods[4]	0 - 5	No Protein Foods	≥2.5 cup equivalent per 1,000 kcal
Seafood and Plant Proteins[4,6]	0 - 5	No Seafood or Plant Proteins	≥0.8 cup equivalent per 1,000 kcal
Fatty Acids[7]	0 - 10	(PUFAS + MUFAS)/SFAs ≤ 1.2	(PUFAS + MUFAS)/SFAs ≥ 2.5
Moderation			
Refined Grains	0 - 10	≥ 4.3-ounce equivalent per 1,000 kcal	≤ 1.8-ounce equivalent per 1,000 kcal
Sodium	0 - 10	≥ 2.0 grams per 1,000 kcal	≤ 1.1 grams per 1,000 kcal
Added Sugars	0 - 10	≥26% of energy	≤6.5% of energy
Saturated Fats	0 - 10	≥16% of energy	≤8% of energy

[1] Intakes between the minimum and maximum standards are scored proportionately
[2] Includes 100% fruit juice
[3] Includes all forms except juice
[4] Includes legumes (beans and peas)
[5] Includes all milk products, such as fluid milk, yogurt, and cheese, and fortified soy beverages
[6] Includes seafood, nuts, seeds, soy products (other than beverages), and legumes (beans and peas).
[7] Ratio of poly- and mono-unsaturated fatty acids (PUFAS and MUFAs) to saturated fatty acids (SFAs)

3.6 Statistical Analysis

Statistical analyses were completed using SPSS (version 27), Inc, Tokyo, Japan, 2010. To examine data for sociodemographic characteristics, anthropometrics, energy intake, and cultural value scores, descriptive statistics were analyzed to describe the study sample, presented as means ± SD. Chi-square and Fisher Exact tests were used to analyze statistical differences between categorical variables. The Fisher Exact test was used to analyze statistical difference between categorical variables with small cell size. Reliability testing was completed for each of the subscales, for both Mexicans and Cubans participants using Cronbach's alpha.

Differences were noted in completeness and accuracy of 24-hour recalls between researchers. Therefore, content analysis was conducted to identify key missing information in 24-hour recalls that limited the analysis and interpretation of the dietary intake of participants. A protocol was created for identifying the valid 24-hour recalls (Appendix F). Exclusion criteria was initially created by primary coder one, a registered dietitian nutritionist, who reviewed the 24-hour recalls of all participants of Mexican and Cuban origin (n=136), categorizing the recalls into three groups, labeled for the researcher who conducted the interview. A total of 58 of the 136 recalls were collected by the researcher with the least experience. The primary coder, went through each of the 24-hour recalls using nutrition knowledge, expertise, and experience to make decisions for exclusion. Once the exclusion criteria were set, the primary coder trained the second coder, also a registered dietitian nutritionist. The coders met twice, the first time to review coding protocol and make changes to the exclusion criteria and the second time after independently coded to reach a consensus about the exclusion criteria.

To calculate HEI-2015 and generate the scores for the 13 components, SAS210x and NDSR output files were used. The mean ratio method was used to calculate HEI. The steps of conducting the mean ratio method include deriving the sums. For each dietary component, the constituents were summed together, ratios were then constructed of the constituents to 1000 calories of energy. The means of the ratios per each individual were calculated and each ratio was scored according to scoring standards, the scores were then summed giving a total HEI score.[135]

Multivariate regressions were run using SPSS (version 27) to investigate the relationships between cultural values and the total HEI-2015 score and each of the 13 components of the HEI-2015 by country of origin. To examine the relationship between diet patterns and cultural values, we used linear regressions between the three cultural values Familism Support, Religion, and Traditional Gender Roles, and 13 components of the HEI-2015 including total HEI-2015 score. We developed two models, Model 1 includes the cultural values, HEI scores, and country of ethnic origin. Model 2 was adjusted from covariates including gender, age, education, marital status, employment status, income, and years in the U.S.

CHAPTER 4: RESULTS

4.1 Sociodemographic Characteristics of Mexican and Cuban Participants

The study included a total of 103 participants total with 64 participants of Mexican origin and 39 participants of Cuban origin, **Table 4.1.** The mean age of the participants was 41 and had lived in the U.S. for an average of 14 years. There was a statistical difference between years lived in the U.S. between the two groups. Overall, most participants were female (69%), were married or living with a domestic partner (63%) and employed full or part time (57%), and the self-reported income was low with 45% reporting they made enough money, while 55% of the sample reported making less or very less money. There was a statistical difference noted between gender and education status between the two groups. One difference between the participants was education with 62% of Cuban participants reporting completing more than high school while 44% of the participants of Mexican origin did not complete high school. There were also statistically significant differences noted between employment status. Mexican participants were more likely to list homemaker as their employment than Cubans. No Cuban participants listed homemaker as their employment.

Table 2: 4.1 Sociodemographic Characteristics of Mexican and Cuban participants (n = 103)

Variable and Category	All (n = 103)	Mexican (n= 64)	Cuban (n=39)	p-value
Female n (%)	71 (69)	49 (77)	22 (56)	0.03
Education Status n(%)				<0.01
Less than high school	45 (44)	39 (61)	6 (15)	
High school	27 (26)	18 (28)	9 (23)	
Greater than high school	31 (30)	7 (11)	24 (62)	
Marital Status n(%)				0.68
Single	24 (23)	11 (17)	13 (33)	
Married/Living with Partner	66 (63)	42 (65)	24 (62)	
Separated/Divorced/Widowed	14 (14)	12 (18)	2 (5)	
Employment n(%)				<0.01
Employed full time or part time	59 (57)	35 (55)	24 (62)	
Homemaker	19 (29)	19 (18)	0	
Disabled/Unable to Work/Retired/Student/Unemployed	25 (24)	11 (17)	15 (38)	
Income[a] n(%)				0.29
Enough Money	46 (45)	30 (47)	16 (41)	
Less Money	29 (28)	20 (31)	9 (23)	
Very Less Money (Very Poor)	28 (27)	14 (22)	14 (36)	
Age (Years) mean ± SD	40.5 ± 13.2	39.2 ± 11.2	42.6 ± 15.9	0.19
Years in the U.S. mean ± SD	13.9 ± 8.2	17.1 ± 7.7	8.9 ± 6.4	<0.01

[a] No participants reported two categories, "More than enough money" or "Lots of money (very rich)"

4.2 Reliability Testing of Mexican American Cultural Value Scale subscales

Testing was conducted for internal consistency of the subscales using Cronbach's alpha, **Table 4.2.** The internal consistency coefficients for a composite of the items from the overall Mexican American values subscales are 0.92 for participants of Mexican origin and 0.85 for participants of Cuban origin. The Cronbach's alpha coefficient for the Familism Support Subscale among Mexicans was appropriate at 0.65 indicating an acceptable level of reliability.[137] However, the Cronbach's alpha coefficient for the Familism Support Subscale among Cubans was low at 0.29 indicating poor reliability.

The Cronbach's alpha for the Traditional Gender Roles subscale is about 0.60 for Cubans and 0.75 for Mexicans indicating an acceptable level of reliability. The Religion Subscale has the highest Cronbach's alpha coefficient for both groups with 0.85 among Mexicans and 0.94 and Cubans, respectively.

Table 3: 4.2: Results of reliability testing of the Mexican American Cultural Values Scale and Subscales using Cronbach's alpha for Mexican and Cuban participants (n = 103)

Subscale	**Number of Items in Subscale**	**Mexican Ethnicity**	**Cuban Ethnicity**
MACVS	50	0.92	0.85
Familism Support	6	0.65	0.29
Religion	7	0.85	0.94
Traditional Gender Roles	5	0.75	0.60

4.3 Cultural Values

The mean score for the overall scale MACVS was 3.78, Mexicans scored higher with a mean score of 3.80, compared to Cubans with a score of 3.75. The mean score of the Religion Subscale for the sample was 4.23, the mean score of the Familism Support Subscale was 4.61, and the mean score of the Traditional Gender Roles subscale was the lowest at 2.70, **Table 4.3**. The mean score of the Religion and the Traditional Gender Roles subscales were higher for Mexicans, 4.46 and 2.83, the for the Cuban participants at 3.87 and 2.46. However, the mean score for the Familism Support Subscale was 4.78, higher for Cuban participants compared to the score for Mexicans at 4.51. There was a statistically significant difference between the means of the Religion and Familism Support subscales between Mexican and Cuban participants.

Table 4: 4.3: The Mexican American Cultural Value Scores of Mexican and Cuban Participants

	All n= 103	**Mexican n= 64**	**Cuban n= 39**	**p-value**
MACVS Overall Score	3.78 ± 0.45	3.80 ± 0.48	3.75 ± 0.38	0.59
Religion	4.23 ± 0.96	4.46 ± 0.71	3.87 ± 1.18	<0.01
Familism Support	4.61 ± 0.44	4.51 ± 0.49	4.78 ± 0.27	<0.01
Traditional Gender Roles	2.70 ± 0.94	2.83 ± 0.93	2.47 ± 0.92	0.06

4.4 Diet Composition

The dietary intake data from the 24-hour recalls show that participants consumed an average of 1726 calories per day, **Table 4.4.** The participants of Mexican origin consumed an average of 1630 calories per day, while the participants of Cuban origin consumed more calories with an average of 1884 calories per day. In terms of macronutrient consumption, overall, the participants consumed 32% percent of calories from fat, 19% of calories from protein, and 48% calories from carbohydrates. Participants of Mexican origin consumed a greater percentage of calories from fat and carbohydrates, 33% and 48% respectively compared to Cubans who consumed on average 31% and 47% calories from fat and carbohydrates, respectively. Both participants of Mexican and Cuban origin consumed about the same percentage of calories from protein 19% and 20%, respectively. There were no significant differences between the calories and percent macronutrients between Mexican and Cuban participants.

Table 4.4: Calories and percent macronutrients from 24-hour dietary recalls (n = 103)

Calorie and Percentages of Macronutrients	**All (n = 103) Mean (SD)**	**Mexican (n = 64) Mean (SD)**	**Cuban (n = 39) Mean (SD)**	**p-value**
Energy kcals (mean ± SD)	1726 ± 652.6	1630 ± 630.0	1884 ± 666.3	0.05
% calories from Fat	32 ± 8.6	33 ± 9.5	31 ± 7.0	0.44
% calories from Protein	19 ± 5.9	19 ± 5.4	20 ± 6.5	0.51
% calories from Carbohydrates	48 ± 11.8	48 ± 12.4	47 ± 11.1	0.57

The average HEI-2015 score for all participants was 59. The average total HEI-2015 score for participants of Mexican origin was higher than for Cubans, 61 and 56, respectively, **Table 4.4.2.**

Table 5: 4.4.2: Total Healthy Eating Index-2015 Score and Healthy Eating Index Components

HEI Component	Range of Score	All (n = 103) Mean (SD)	Mexican (n = 64) Mean (SD)	Cuban (n = 39) Mean (SD)	p-value
Adequacy Components[a]					
Total Fruit	**0 - 5**	2.5 ± 2.16	2.6 ± 2.18	2.4 ± 2.14	0.59
Whole Fruit	**0 - 5**	2.4 ± 2.32	2.5 ± 2.37	2.2 ± 2.26	0.48
Total Vegetables	**0 - 5**	3.2 ± 1.62	3.4 ± 1.45	2.8 ± 1.83	0.06
Greens and Beans	**0 - 5**	2.5 ± 2.32	2.6 ± 2.35	2.4 ± 2.31	0.70
Whole Grains	**0 - 10**	4.8 ± 4.70	6.6 ± 4.41	1.8 ± 3.47	0.00
Dairy	**0 - 10**	4.9 ± 3.71	4.9 ± 3.83	5.2 ± 3.54	0.63
Total Proteins	**0 - 5**	4.8 ± 0.80	4.8 ± 0.82	4.8 ± 0.77	0.82
Seafood and Plant Proteins	**0 - 5**	2.7 ± 2.41	2.8 ± 2.45	2.5 ± 2.37	0.64
Fatty Acids	**0 - 10**	4.3 ± 3.40	4.4 ± 3.36	4.2 ± 3.52	0.71
Moderation Components[b]					
Refined Grains	**0 - 10**	7.6 ± 3.42	7.6 ± 3.59	7.6 ± 3.16	0.94
Sodium	**0 - 10**	5.5 ± 3.89	5.2 ± 3.93	5.9 ± 3.82	0.37
Added Sugars	**0 - 10**	7.5 ± 3.08	7.4 ± 3.22	7.7 ± 2.86	0.68
Saturated Fats	**0 - 10**	6.3 ± 3.36	6.0 ± 3.37	6.6 ± 3.36	0.40
Total HEI	**0 – 100**	59 ± 14.21	61 ± 14.47	56 ± 13.41	0.09

[a]Higher scores reflect higher concentrations in diet
[b]Higher scores reflect lower concentrations in diet

Adequacy components of the Healthy Eating Index-2015

On average, the participants scored 2.5 for Total Fruit, 2.4 for Whole Fruit and 3.2 for Total Vegetables. When looking at differences among participants of Mexican origin versus Cuban origin, those of Mexican origin scored higher in Total Fruit, 2.6, Whole Fruit, 2.5, Total Vegetables, 3.4, Greens and Beans, 2.6, Whole Grains 6.6, Seafood and Plant Proteins, 2.8, and Fatty Acids, 4.4. Participants of Cuban origin scored higher on Dairy with a score of 5.2 compared to participants of Mexican origin with a score of 4.9. Participant scores were similar for Total Proteins with participants of

Mexican and Cuban origin scoring an average of 4.8. The difference between the mean of Whole Grains between Mexican and Cubans was considered statistically significant.

Moderation components of the Healthy Eating Index-2015

For the moderation components, Cubans scored higher on Sodium, 5.9, Added Sugars, 7.7, and Saturated Fats, 6.6 compared to those of Mexican origin, 5.2, 7.4, and 6.0, respectively. Participants of both Mexican and Cuban origin scored the same on Refined Grains, 7.6. There were no significant differences in Moderation components between Mexican and Cuban participants.

4.5 Diet Patterns and Cultural Values

Our bivariate regression analysis showed no significant relationships between the cultural values and HEI-2015, nor its components, meaning that the cultural values examined do not directly predict dietary behaviors. We completed the remaining analyses findings for exploratory purposes that will serve in analyses and development of future studies. Our regression analyses show only the HEI component of Whole Grains was significantly predicted by two cultural values by country of ethnic origin, in the unadjusted models, **Table 4.5**. There were no other significant relationships found, indicating that the three cultural values we examined are not directly predicting dietary behaviors of participants in our study. In our unadjusted model (Model 1) that examined Traditional Gender Roles, we found that the HEI component of Whole Grains was 1.07 points higher for participants of Mexican origin compared to participants of Cuban origin when the Traditional Gender Roles subscale increased by one point. Similarly for the cultural value of Religion, we found that the HEI component of Whole Grains was 1.14 points higher for participants of Mexican origin compared to Cuban origin when the

Religion Subscale increased by one point. However, our adjusted models show that after adjusting for covariates the relationships were no longer significant meaning that the significant relationship can be explained by the variables for which we controlled. One-way ANOVA showed that the only significant difference was in the difference in consumption of Whole Grains where Cuban participants scored very low, 1.8 out of 10 compared to the Mexican participants which scored on average 6.6 out of 10.

Table 6: 4.5: Linear Regression comparing the Components of the Healthy Eating Index-2015 to Cultural Values, Traditional Gender Roles, and Religion Subscales for the Mexican American Cultural Values Scale in Participants of Mexican and Cuban origin

	Traditional Gender Roles		**Religion**	
	Model 1 β	**Model 2** β	**Model 1** β	**Model 2** β
Total HEI-Score	1.32	-1.55[f]	2.53	0.54[a]
Total Fruit	0.33	0.09[ad]	0.05	-0.27[acd]
Whole Fruit	0.19	-0.17[ac]	0.11	-0.26[ad]
Total Vegetables	-0.18	-0.21[b]	-0.04	-0.03[b]
Greens and Beans	-0.36	-0.61[a]	0.03	-0.12[a]
Whole Grains	1.07*	0.48	1.14**	0.75
Dairy	0.01	0.41[c]	0.46	0.68[c]
Total Proteins	-0.15	-0.12	-0.11	-0.08
Seafood and Plant Proteins	-0.18	-0.61[e]	0.27	0.09[e]
Fatty Acids	0.19	-0.12	-0.06	-0.12
Refined Grains	0.05	-0.30[a]	0.28	-0.08[a]
Sodium	0.30	0.09[b]	0.51	0.22[b]
Added Sugars	-0.31	-0.48[bd]	-0.35	-0.27[bd]
Saturated Fats	0.36	-0.01	0.23	0.03

Model 1: unadjusted linear regression (*Outcome variable: HEI score; Main independent variable Cultural value by country of origin, table displays results for participants of Mexican origin*)
Model 2: gender, age, education, marital status, employment status, income, years in the U.S.
*p< 0.05
** p < 0.01
[a] age in years p < 0.05
[b] years in U.S. p < 0.05
[c] education p < 0.05
[d] income p <0.05
[e] employment p < 0.05
[f] age in years p <0.01

A linear regression compared the components of the HEI to the Familism Support Subscale by gender of the participants of Mexican Origin, **Table 4.5.2**. We excluded the participants of Cuban origin in this analysis due to the low reliability of the familism support subscale with this ethnic subgroup. We found that for the HEI component of Seafood and Plant protein, the score of 1.39 was lower in females of Mexican origin than males for every point increase in the Familism Support Subscale. After adjusting for covariates, the relationship was still significant. However, because the bivariate correlations between Familism Support Subscale and the Seafood and Plant protein component did not show a relationship, we cannot report that this subscale directly predicts dietary behaviors. Results on the Dairy component indicate that the Familism Support cultural value does not directly predict the intake of diary, but in model 2, employment was significantly correlated with intake of diary of males versus females. This finding shows that men consumed more dairy than females and that employment status is a significant indicating that employment, not gender is likely predicting the consumption of diary.

Table 7: 4.5.2: Linear Regression comparing the Components of the Healthy Eating Index-2015 to the Cultural Values Familism Support in participants of Mexican Origin (n=64)

	Familism Support	
	Model 1 β	**Model 2** β
Total HEI-Score	-0.01	-0.84
Total Fruit	-0.14	0.08[a]
Whole Fruit	-0.16	0.04[a]
Total Vegetables	0.26	0.53[ac]
Greens and Beans	-0.68	-0.62
Whole Grains	-0.35	-1.58[bc]
Dairy	1.80	2.30*
Total Proteins	-0.21	-0.27
Seafood and Plant Proteins	-1.39*	-1.75*[d]
Fatty Acids	-0.72	-1.13
Refined Grains	0.53	0.68[c]
Sodium	-0.06	0.15
Added Sugars	0.21	-0.17[e]
Saturated Fats	0.89	0.92

Model 1: unadjusted linear regression *(Outcome variable: HEI components; Main independent variable: Cultural value by gender, table displays results for females)*

Model 2: adjusted for age, education, marital status, employment status, income, years in the US

*p < 0.05

[a] age in years p <0.05

[b] marital status p <0.05

[c] education p <0.05

[d] employment p< 0.05

[e] income p < 0.05

CHAPTER 5: DISCUSSION

Findings from this study provide guidance for further exploration regarding cultural values and their influence on diet of Latinx immigrants. This study examined the relationship between the cultural values of familism support, traditional gender roles, and religion and the influence on diet patterns among Mexican and Cuban immigrants. Although we found no direct correlations between cultural values and diet, the data provided insight into understanding cultural values and diet of Mexican and Cuban immigrants in Kentucky.

5.1 Sociodemographic Descriptions

There are many similarities in sociodemographic descriptions in the present study compared to other studies involving Latinx conducted around the U.S.[2, 124, 138] Similar to other studies, Cuban participants were more likely to have a high school education compared to other Latinx.[55, 124] Overall, Mexican women were more likely to participate in research studies on diet compared to participants of Cuban origin.[55, 139] In our study, there were more Cuban men than women and more Mexican women than men, this may have influenced socioeconomic status, which may explain the significant difference between employment status, Mexicans noted homemaker as a type of employment and no Cuban participants indicated they identified as a homemaker. Overall, our study reported a low socioeconomic status, similar to others.[140] Sociodemographic factors like education and income have been associated with higher diet quality. [141, 142] In a study based on a nationally representative sample of the U.S. examining income and education on diet quality, found low-income young children and middle-aged adults, generally had lower diet-quality compared to their higher- income counterparts.[141] Greater than a high school level education was associated with higher diet quality, and that higher education might

be associated with increased nutrition knowledge lending itself to higher diet quality.[141, 142] However, in our study, although the Cuban participants demonstrated higher education, they also had lower diet quality. This study, among others, also noted women had higher diet quality than men.[143, 144] It is possible that this gender difference may explain why Mexican participants had a higher total HEI score than our Cuban participants. If more women had been included in our study, we may have seen higher total HEI scores.

Some key differences in our study were regarding immigration status and years in the U.S. Our participants are immigrants, with an average of 14 years in the U.S. Overall, our participants were in the U.S. for a shorter period of time compared to the Multi-Ethnic Study of Atherosclerosis (MESA) studies and the Hispanic Community Health Study/Study of Latinos (HCHS/SOL).[55, 140] The Multi-Ethnic Study of Atherosclerosis (MESA) examined the association between acculturation and prevalence of diabetes in Latinx and Chinese individuals, reported 53% of the participants of Mexican origin were U.S. born, 33% had been in the U.S. longer than 20 years, while only 14% had been in the U.S., between 0-20 years.[140] In the HCHS/SOL study, 81% of the target population was born outside the U.S, however, 33% of the total Mexican participants had lived in the U.S., longer than 20 years, compared to Cuban participants where only 13% had lived in the U.S., longer than 20 years. Of the total sample, 28% of study participants had lived in the U.S. for 20 years or more.[55]

In the current study, while the Mexican participants had on average lived in the U.S. longer than the Cuban participants, the total HEI-score for Mexicans was higher than in Cubans. These findings are like a 2017 study, in which diet quality was higher

among older Mexican Americans.[145] The authors noted that diet quality increased as age increased, however, acculturation scores in this sample were also higher in older participants, with seniors having the highest level of acculturation.[145] These findings contradict the idea that higher acculturation equates to lower diet quality, however this may be related to socioeconomic status, there were significant differences between the age groups, with older adults having higher income then their counterparts.[145]

5.2 Reliability Analysis of Cultural Value Score

Reliability Analysis of the Mexican American Cultural Value Scale and each of the subscales was calculated using Cronbach's alpha to ensure internal reliability and consistency for use with Cubans as the scale is valid for use among Mexican Americans.[117] The Cronbach's alpha for the overall Mexican American Values were acceptable for both groups with an internal reliability coefficient of 0.90 and 0.84 for Mexicans and Cubans, respectively. The internal reliability coefficient for the Mexican participants was acceptable for the Familism Support subscale with a Cronbach's alpha score of 0.65 but it was too low for the Cuban sample at 0.29. It is unclear if socio-political differences in the countries influence family-related cultural values. However, in our sample, the difference was sufficient that we were unable to draw comparisons in Familism Support between the groups.[74, 146]

5.3 Cultural Values of the Mexican American Cultural Values Scale

Religion

Our study found significant differences between the means of the Religion Subscale in Mexicans and Cubans. The participants of Mexican origin scored higher on the Religion subscale than Cubans. Our findings are consistent with the literature. A

study examining the relationship between religion and generational status, found 74% of Mexican immigrants identified as belonging to a particular religion, 52% reported attending a religious organization while only 62% of U.S. born Mexican Americans identified to belonging to a religion and 31% reported attending a religious organization. In addition, 69% of Mexican immigrants reported religion is important in their lives while only 49% of U.S. born Mexican Americans.[147, 148] In Cuba, Catholicism is considered the main religion but formal practice of religion was low with 89% of proclaimed Catholics reporting they did not attend church,[74] largely due to the weak presence of religious institutions during the Fidel Castro presidency.[75]

Gender Roles

The average scores of the traditional gender roles subscales were generally low among both Mexicans and Cubans. However, many of our participants identified as female of Mexican origin, most of our participants (57%) were employed in some fashion. Interestingly, only 29% of our total participants identified as a homemaker and all of them were of Mexican origin. In the *Puentes* study, the study in which the MACVS was originally created and used for, 77% of the adolescents who participated in the interviews were born in the U.S., of the mothers and fathers who were interviewed, only 33% and 31% were born in the U.S., respectively.[117] While the traditional gender roles subscale scores for our study were low for our population of immigrants, the scores of the MACVS were compared for each subscale of the MACVS for immigrants and non-immigrants in the *Puentes* study.[117] There were significant differences in the traditional gender roles scale for adolescents, mothers, and fathers of those born in the U.S. and those born in Mexico.[117] The traditional gender roles subscale scores were higher of those

born in Mexico.[117] This is also similar to the *La Familia* study, traditional gender roles subscale scores were higher in those born in Mexico, and there were significant differences between those born in the U.S. and those born in Mexico.[117] In our study, these subscale scores were lower in general which may be an indicator of greater acculturation among our participants, this may be because our participants have been in the U.S. on average of 14 years.

Familism Support

While the reliability coefficient for the familism support subscale was low among Cubans, we are unable to make any conclusions between the differences of familism support between Mexican and Cuban participants. However, the lack of reliability among this scale for Cubans, draws attention for the need of further study. Many interventions in the Latinx communities are becoming more family-based rather than individual based.[149-151] This further supports findings from other studies that Latinx in the U.S. are not homogenous, therefore cultural tailoring of interventions should be considered for the community and the ethnic subgroup that is being served.[152]

In our comparison of Familism among the Mexican participants, we suggest an examination of gender for differences in dietary intake. However, our finding suggest that employment was more important in the intake of seafood. Studies on employment types of Latinx communities show that the following are the top areas of employment. Given that the service industry, specifically restaurants, food service, and hospitality are key employers, it is important to determine the extent to which Mexican immigrants consume foods outside of the home and the reasons for why they may be high.

5.4 Diet Composition

The first aim of this study is to determine how family values, gender roles, religious values, influence diet patterns among participants of Mexican and Cuban ethnicity. Although our bivariate analyses showed that there are no direct relationships between cultural values and diet, exploratory analyses provided some insights. We examined the components of the HEI-2015, to better understand the diet patterns of the Mexican and Cuban participants.

Diet Patterns of Mexican Participants

In our study, the average total HEI score for Mexicans was 61, this is higher than the total HEI score for Cubans in our study and higher than the most recent data for Americans, who have an average total HEI score of 59.[153] Siega Riz (2019) examined the alignment of the 2010 DGAs and diet choices of individuals in the HCHS/SOL between 2008 and 2011. In the HCHS study, the overall 2015-HEI score for Mexicans was 71, much higher than our current findings.[139] The average number of calories consumed by our participants was 1726, with Mexicans consuming 1630 calories on average. In the MESA study, the average number of calories for Mexicans was 1903 kcals.[140] In the study examining food group intakes among Latinx, the average number of calories was 2003 for Mexicans.[55] It is possible that the calorie intake among the Mexican participants in our study is lower compared to these other two studies due to low income status and recency of relocation to the U.S. Compared to these two larger studies that used three 24-hour recalls, our study only used one 24-hour dietary recall. A study performed fourteen 24-hour dietary recalls on 79 middle-aged White women while also tracking energy expenditure via doubly labeled water method to determine the accuracy

of the 24-hour recalls. It was concluded that 24-hour recalls were typically underreported for the first 24-hour recall and three 24-hour recalls is the optimal amount necessary to estimate the energy intake.[154]

Diet Patterns of Cuban Participants

The average Total HEI-2015 score for Cuban participants in our study was 56; a lower score than the average HEI-2015 score for Americans of 59.[153] The overall HEI-2015 score for Cubans was 59, in the 2019 Siega Riz study, a higher score than our current findings.[139] The average number of calories consumed by the Cuban participants in our study was 1884 calories on average, higher than the average of our total participants, 1726 calories. In the MESA study, the average calories for Non-Mexican Latinx were 1,635.[140]

In the HCHS/SOL study examining food group intakes among Latinx the average number of calories was 2029 for Cubans.[55]

Differences in Diet Patterns of Mexican and Cuban Participants

While calories of our study were lower compared to the HCHS/SOL and MESA studies, the macronutrient breakdown was similar. The percentage of carbohydrate, protein and fat for our study was 48%, 19%, and 32%, respectively. The MESA study averages of macronutrients were 48% carbohydrates, 14% protein, and 38% of fat for Mexicans, 52%, 14%, and 34% for Non-Mexican Latinx immigrants.[140] The Mexican participants in our study consumed a higher percentage of fat and carbohydrates and the Cuban participants in our study consumed a higher percentage of protein. When looking at trends in the American diet it consists of, 50% carbohydrates, 16% protein, and 33% fat.[155] The participants in our study consumed more protein, and less carbohydrates

compared to the trends in the American diet trends. The only significant difference between Mexican and Cuban participants in HEI components was Whole Grains. Mexican participants scored 6.6 compared to 1.8 of Cubans. Traditional grains of Mexicans typically includes corn and wheat tortillas, while the Cuban diet consists of a diet heavy in *tostadas*, *empanadas*, *pan con bistec*, and *media noche* (a Cuban sandwich made with ham, pork, cheese, panini grilled bread with pickles).[56] Both groups scored 7.6/10 for refined grains likely due to adapting their diet to what is accessible and affordable.

5.5 Familism Support and Seafood and Plant proteins in Mexicans

While the familism support subscale was unreliable for participants of Cuban origin, we ran regressions comparing the Components of the Healthy Eating Index-2015 to the Cultural Values familism support in participants of Mexican Origin. The analyses compared males to females in the Mexican subgroup. We found that for the HEI component of Seafood and Plant protein, the score of 1.39 was lower in females of Mexican origin than males for every point increase in the familism support subscale. After adjusting for covariates, the relationship was still significant, after running a bivariate correlation between familism support and seafood and plant proteins, the relationship was insignificant.

Results on the dairy component indicate that the familism support cultural value does not directly predict the intake of dairy, but in model 2, employment was significantly correlated with intake of dairy of males versus females. Although this finding shows that men consumed more dairy than females the analysis showed that that employment status is a better predictor of dairy intake than Familism support. This may

be related to the type of employment of Mexican men. In 2015, the Bureau of Labor Statistics reported Latinx individuals made up 18% of the total labor force, 61% identified as of Mexican origin, with 25% working in food preparation and serving.[156] Many of our participants indicated they were employed, and many of the Mexican participants with less than a high school education, maybe more likely to consume these foods at work, if they are employed in the restaurant or other food industry.

Although the current study did not show that diet quality is directly predicted by cultural values, other variables related to health beliefs should be used to examine if there is a moderating relationship between health-related beliefs and associated dietary behaviors. In a study of 387 patients in Portugal with type 2 diabetes, family-related variables were found to moderate self-care behaviors, including diet.[157] Further studies are needed to better understand the relationship between cultural values on diet quality.

5.6 Strengths and Limitations

Strengths

Our study used a validated cultural values scale, the MACVS. The study also examined both surface- (language, places, food) and deep-level (cultural values – religion, family, and gender roles) dimensions that are important for developing public health interventions. Bilingual and bicultural researchers collected all the data which improved the 24-hour dietary recalls because the researchers knew to ask for specific ingredients of cultural foods when time was not a constraint. The survey was collected as an interview to increase participation if participants had low literacy level.

Limitations

Our study used convenience sampling in a clinical setting that primarily serves immigrants resulting in homogeneity of income and immigrations tatus among the Cuban

and Mexican participants in the study. Due to financial constraints recruiting a representative sample of Latinx participants representative of the Latinx population in Kentucky was not feasible.[55] Our total sample was of lower income and may not be representative of the total Mexican and Cuban populations in Kentucky or the U.S.

Due to the nature of the data collection site as a health clinic, some of our participants were fasting, making the 24-hour recalls inaccurate, thus being excluded from the sample. Additionally, time and financial constraints allowed for only one 24-hour recall. Ideally at least three should be collected.[158] In data entry, given the diverse population of Latinx immigrants, many of the food items listed in the 24-hour recall were not available in NDSR. Therefore, an equivalent item was to be determined by the dietitian research assistant. In some instances, recipes were used that were estimates based on the 24-hour recall ingredients provided. A weakness with all dietary assessments, including 24-hour recalls, is the self-reported nature that often results in underreporting because it relies on memory.[159]A study examining the number of 24-hour recalls to best describe an individual's intake concluded energy intake was underreported on the first 24-hour recall, three recalls appear to be optimal for estimating energy intake.[154, 158]

Other studies use acculturation to explore health-related outcomes including diet quality.[31 160, 161] However, we did not use acculturation as a variable but rather years in the U.S. In data not shown, we did generate a proxy variable[140] for acculturation and ran the analyses reported with acculturation in place of years in U.S. Our findings were not different, (Appendix E)**.** We selected years in the U.S. as recent studies suggest acculturation does not adequately capture changes in Latinx immigrants' diets[159, 162] due

in part to the role of globalization and the nutrition transition processes of modernizing the diet in Latin American countries.[159] Additionally, acculturation scales were developed using language-based preferences and other culturally specific behaviors such as preferences in music, and media, proficiency in use of, and preference for the Spanish or English language, and cultural identity.[163]

Although we used a validated cultural values scale, the scale was developed for Mexican American youth, and has not been validated for use among other Latinx ethnic groups. For this reason, we did not use the Familism Support Subscale with a lot of reliability in our regression analyses. Through a review of the literature (Chapter 2), we established that these three cultural values were common for both Cuban and Mexican individuals. However, it is possible that nuance in the way the items of the Familism Support Subscale were written resulted in a poor reliability.

CHAPTER 6: CONCLUSION AND IMPLICATIONS

While the relationship between cultural values and diet pattern was not significant, the main findings of this study provide insights on the diversity of Latinx diets. Although the HEI-2015 is based on American foods, it provides some insight into the differences in the diets of Mexican and Cuban immigrants, particularly in the amount of grains consumed. The use of the MACVS also reinforced the differences between these two cultures and the need for culturally tailored interventions, not just for Latinx communities overall but for ethnic groups within those communities.

With the number of Latinx individuals in the U.S. increasing, and the high prevalence of diet related disease among these individuals, it is important for research to keep up with knowledge on cultural differences among Latinx communities. The goal of the research on this topic is to create culturally tailored interventions that may best address the needs of the different Latinx communities.

The purpose of this study was to examine the relationship between family values, gender roles, and religious values and diet patterns among Mexican and Cuban adults by using the Mexican American Cultural Value Scale (MACVS) as a measure of cultural values and the Healthy Eating Index-2015 in determining diet quality and patterns. Latinx are disproportionately affected by diet related disease, as the population is projected to continue to grow in the U.S., it is important to understand cultural values and their relationship with diet. The Familism Support Subscale was not reliable with the Cuban participants, warranting further study because more recent nutrition interventions developed for the Latinx community are family-based versus individually based. More research, including formative work, should examine if a family-based approach is as effective with the Cuban participants because the findings in our study suggest that

Familism does not capture the right construct around family with this ethnic subgroup. Our findings relative to diet are consisted with other studies showing that the diet of Latinx in the U.S. are not the same, emphasizing the need for cultural tailoring based on community and ethnic subgroups, rather than creating an intervention that is broad for the Latinx community. Finally, there is a need for further studies on cultural values, health beliefs, and diet quality to improve our understanding of how diet patterns are influenced by culture and ethnicity. By having a better understanding, we can provide more tailored and effective nutrition counseling to ethnic subgroups to improve health outcomes of diet-related diseases.

APPENDICES

APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

University of Kentucky | Office of Research Integrity
IRB, RDRC

Modification Review

Approval Ends:	IRB Number:
5/2/2025	47209

TO:	Julie Plasencia, PhD, RDN Dietetics and Human Nutrition PI phone #: 8592574146 PI email: julieplasencia@uky.edu
FROM:	Chairperson/Vice Chairperson Nonmedical Institutional Review Board (IRB)
SUBJECT:	Approval of Modification Request
DATE:	2/19/2021

On 2/19/2021, the Nonmedical Institutional Review Board approved your request for modifications in your protocol entitled:

Cultural Influences on Diet among the Hispanic Community

In addition to IRB approval, you must also meet the requirements of the VPR Resumption of Research Phased Plan (i.e., waiver for Phase 1, training & individualized plan submission for Phases 2-4) before resuming/beginning your human subjects research. If your modification request necessitated a change in your approved informed consent/assent form(s), the new IRB approved consent/assent form(s) to be used when enrolling subjects can be found on the approved application's landing page in E-IRB. [Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.]

Note that at Continuation Review, you will be asked to submit a brief summary of any modifications approved by the IRB since initial review or the last continuation review, which may impact subject safety or welfare. Please take this approved modification into consideration when preparing your summary.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research" available in the online Office of Research Integrity's IRB Survival Handbook. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site. If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at 859-257-9428.

seeblue.
405 Kinkead Hall | Lexington, KY 40506-0057 | P: 859-257-9428 | F: 859-257-8995 | www.research.uky.edu/ori/
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APPENDIX B: MEXICAN AMERICAN CULTURAL VALUES SCALE

QUESTIONNAIRE

Participant ID _____
Recorder Initials _____ **Date** _____

English Version	**Spanish Version**
The next statements are about what people may think or believe. Remember, there are no right or wrong answers. Tell me how much you believe that . . .	Las siguientes frases son acerca de lo que la gente puede pensar o creer. Recuerda, no hay respuestas correctas o incorrectas. Dime que tanto crees que. . .
Responses	Respuestas
1 = *Not at all*	1 = Nada
2 = *A little*	2 = Poquito
3 = *Somewhat*	3 = Algo
4 = *Very much*	4 = Bastante
5 = *Completely*	5 = Completamente
Please write your numerical answer in the box to the Right of the question.	Por favor escriba su respuesta numérica en el cuadro al lado izquierdo de la pregunta.

1. One's belief in God gives inner strength and meaning to life.		1. La creencia en Dios da fuerza interna y significado a la vida.
2. Parents should teach their children that the family always comes first.		2. Los padres deberían enseñarle a sus hijos que la familia siempre es primero.
3. Children should be taught that it is their duty to care for their parents when their parents get old.		3. Se les debería enseñar a los niños que es su obligación cuidar a sus padres cuando ellos envejezcan.
4. Children should always do things to make their parents happy.		4. Los niños siempre deberían hacer las cosas que hagan a sus padres felices.
5. No matter what, children should always treat their parents with respect.		5. Sea lo que sea, los niños siempre deberían tratar a sus padres con respeto.
6. Children should be taught that it is important to have a lot of money.		6. Se les debería enseñar a los niños que es importante tener mucho dinero.
7. People should learn how to take care of themselves and not depend on others.		7. La gente debería aprender cómo cuidarse sola y no depender de otros.

8. God is first; family is second.		8. Dios está primero, la familia está segundo.
9. Family provides a sense of security because they will always be there for you.		9. La familia provee un sentido de seguridad, porque ellos siempre estarán alli para usted.
10. Children should respect adult relatives as if they were parents.		10. Los niños deberían respetar a familiares adultos como si fueran sus padres.
11. If a relative is having a hard time financially, one should help them out if possible.		11. Si un pariente está teniendo dificultades económicas, uno debería ayudarlo si puede.
12. When it comes to important decisions, the family should ask for advice from close relatives.		12. La familia debería pedir consejos a sus parientes más cercanos cuando se trata de decisiones importantes.
13. Men should earn most of the money for the family so women can stay home and take care of the children and the home.		13. Los hombres deberían ganar la mayoría del dinero para la familia para que las mujeres puedan quedarse en casa y cuidar a los hijos y el hogar.
14. One must be ready to compete with others to get ahead.		14. Uno tiene que estar listo para competir con otros si uno quiere salir adelante.
15. Children should never question their parents' decisions.		15. Los hijos nunca deberían cuestionar las decisiones de los padres.
16. Money is the key to happiness.		16. El dinero es la clave para la felicidad.
17. The most important thing parents can teach their children is to be independent from others.		17. Lo más importante que los padres pueden enseñarle a sus hijos es que sean independientes de otros.
18. Parents should teach their children to pray.		18. Los padres deberían enseñarle a sus hijos a rezar.
19. Families need to watch over and protect teenage girls more than teenage boys.		19. Las familias necesitan vigilar y proteger más a las niñas adolescentes que a los niños adolescentes.
20. It is always important to be united as a family.		20. Siempre es importante estar unidos como familia.
21. A person should share their home with relatives if they need a place to stay.		21. Uno debería compartir su casa con parientes si ellos necesitan donde quedarse.
22. Children should be on their best behavior when visiting the homes of friends or relatives.		22. Los niños deberían portarse de la mejor manera cuando visitan las casas de amigos o familiares.

23. Parents should encourage children to do everything better than others.		23. Los padres deberían animar a los hijos para que hagan todo mejor que los demás.
24. Owning a lot of nice things makes one very happy.		24. Tener muchas cosas buenas lo hace a uno muy feliz.
25. Children should always honor their parents and never say bad things about them.		25. Los niños siempre deberían honrar a sus padres y nunca decir cosas malas de ellos.
26. As children get older their parents should allow them to make their own decisions.		26. Según los niños van creciendo, los padres deberían dejar que ellos tomen sus propias decisiones.
27. If everything is taken away, one still has their faith in God.		27. Si a uno le quitan todo, todavía le queda la fe en Dios.
28. It is important to have close relationships with aunts/uncles, grandparents, and cousins.		28. Es importante mantener relaciones cercanas con tíos, abuelos y primos.
29. Older kids should take care of and be role models for their younger brothers and sisters.		29. Los hermanos grandes deberían cuidar y darles el buen ejemplo a los hermanos y hermanas menores.
30. Children should be taught to always be good because they represent the family.		30. Se le debería enseñar a los niños a que siempre sean buenos porque ellos representan a la familia.
31. Children should follow their parents' rules, even if they think the rules are unfair.		31. Los niños deberían seguir las reglas de sus padres, aún cuando piensen que no son justas.
32. It is important for the man to have more power in the family than the woman.		32. En la familia es importante que el hombre tenga más poder que la mujer.
33. Personal achievements are the most important things in life.		33. Los logros personales son las cosas más importantes en la vida.
34. The more money one has, the more respect they should get from others.		34. Entre más dinero uno tenga, más el respeto que uno debería recibir.
35. When there are problems in life, a person can only count on him or herself.		35. Cuando hay problemas en la vida, uno sólo puede contar con sí mismo.
36. It is important to thank God every day for all one has.		36. Es importante darle gracias a Dios todos los días por todo lo que tenemos.

37. Holidays and celebrations are important because the whole family comes together.		37. Los días festivos y las celebraciones son importantes porque se reúne toda la familia.
38. Parents should be willing to make great sacrifices to make sure their children have a better life.		38. Los padres deberían estar dispuestos a hacer grandes sacrificios para asegurarse que sus hijos tengan una vida mejor.
39. A person should always think about their family when making important decisions.		39. Uno siempre debería considerar a su familia cuando toma decisiones importantes.
40. It is important for children to understand that their parents should have the final say when decisions are made in the family.		40. Es importante que los niños entiendan que sus padres deberían tener la última palabra cuando se toman decisiones en la familia.
41. Parents should teach their children to compete to win.		41. Los padres deberían enseñarle a sus hijos a competir para ganar.
42. Mothers are the main people responsible for raising children.		42. Las madres son la persona principal responsable por la crianza de los hijos.
43. The best way for a person to feel good about him or herself is to have a lot of money.		43. La mejor manera de sentirse bien acerca de uno mismo es tener mucho dinero.
44. Parents should encourage children to solve their own problems.		44. Los padres deberían animar a sus hijos a que resuelvan sus propios problemas.
45. It is important to follow the Word of God.		45. Es importante seguir la palabra de Dios.
46. It is important for family members to show their love and affection to one another.		46. Es importante que los miembros de la familia muestren su amor y afecto unos a los otros.
47. It is important to work hard and do one's best because this work reflects on the family.		47. Es importante trabajar duro y hacer lo mejor que uno pueda porque el trabajo de uno se refleja en la familia.
48. Religion should be an important part of one's life.		48. La religión debería ser una parte importante de la vida.
49. Children should always be polite when speaking to any adult.		49. Los niños siempre deberían ser amables cuando hablan con cualquier adulto.
50. A wife should always support her husband's decisions, even if she does not agree with him.		50. Una esposa debería siempre apoyar las decisiones de su esposo, aunque no esté de acuerdo con él.

51. What are five foods you think of as Hispanic or Latino foods.

_____
_____
_____
_____
_____

51. ¿Qué son cinco comidas que le llegan a la mente cuando piensa en comidas Latina o Hispana?

_____
_____
_____
_____
_____

52. What are five foods you think of as American foods.

_____
_____
_____
_____
_____

52. ¿Qué son cinco comidas que le llegan a la mente cuando piensa en comida americana?

_____
_____
_____
_____
_____

53. How healthy do you think Hispanic or Latino foods are?

a) Not at all healthy
b) Slightly healthy
c) Moderately healthy
d) Very healthy
e) Extremely healthy

53. ¿Qué tan saludable piensa usted que son las comidas Latinas/Hispanas?

a) No muy saludable
b) Un poco saludable
c) Saludable
d) Muy saludable
e) Extremadamente saludable

54. How healthy do you think American foods are?

a) Not at all healthy
b) Slightly healthy
c) Moderately healthy
d) Very healthy
e) Extremely healthy

54. ¿Qué tan saludable piensa usted que son las comidas americanas?

a) No muy saludable
b) Un poco saludable
c) Saludable
d) Muy saludable
e) Extremadamente saludable

55. What alternative treatments do you use for health reasons if any? (Prompt: Tea, Herbs, Acupuncture, Massage, etc.)

_____
_____
_____
_____
_____

55. ¿Cuáles tratamientos alternativos usa para razones de salud? (tes, hierbas, acupuntura, masajes, etc.)

_____
_____
_____
_____
_____

56. Which supplements do you use for health reasons if any? (Prompt: aloe vera, nopales, garlic)

_____
_____
_____
_____
_____

56. ¿Cuáles suplementos usa para su salud? (sábila, nopales, ajo)

_____
_____
_____
_____
_____

57. How many consecutive years have you lived in Kentucky?

_____
_____

57. ¿Cuántos años consecutivos ha vivido en Kentucky?

_____
_____

58. How many consecutive years have you lived in United States?

_____
_____

58. ¿Cuántos años consecutivos ha vivido en los Estados Unidos?

_____
_____

59. What is your country of ethnic origin?

    (Prompt: Colombia, Cuba, Dominican Republic, Honduras, Mexico, Puerto Rico, El Salvador, Venezuela, USA)

    _____

    _____

59. ¿Cuál es su país de origen étnico?

    (Inducir: Colombia, Cuba, República Dominicana, Honduras, Mexico, Puerto Rico, El Salvador, Venezuela, Estados Unidos)

    _____

    _____

60. What language(s) do you prefer to receive health information?

    ☐ English
    ☐ Spanish
    ☐ Both
    ☐ Other (please specify)
    _____

60. ¿En qué idioma prefiere recibir información sobre la salud?

    ☐ Ingles
    ☐ Espanol
    ☐ Ambos
    ☐ Otro (especifique):
    _____

61. With whom do you currently live? Select all that apply.

    ☐ Alone
    ☐ With spouse/partner
    ☐ With children
    ☐ With parents
    ☐ With grandparents
    ☐ With other relatives and extended family, (aunts, uncles, cousins, etc.)
    ☐ Friends
    ☐ Other (Specify):
    _____

61. ¿Con quien vive ahora? Marque todas las respuestas que apliquen.

    ☐ Solo
    ☐ Con esposa/esposo
    ☐ Con Hijos
    ☐ Con Padres
    ☐ Con Abuelos
    ☐ Con otros parientes o famila extendida (tias/tios, primas/primos, etc.)
    ☐ Con Amistades
    ☐ Otro (especifique):
    _____

62. What is your marital status?

    ☐ Single, never married
    ☐ Married or domestic partnership
    ☐ Widowed
    ☐ Divorced
    ☐ Separated

62. ¿Cuál es su estado civil?

    ☐ Soltero/a
    ☐ Casado/a
    ☐ Viudo/a
    ☐ Divorciado/a
    ☐ Separado/a

63. What is your employment status?

- ☐ Employed full-time in one position (average of 40 hours or more per week)
- ☐ Employed part-time in one position (less than 30 hours per week)
- ☐ Homemaker
- ☐ Unemployed
- ☐ Retired
- ☐ Student
- ☐ Military
- ☐ Disabled, unable to work
- ☐ Other: _____

64. On a scale of 1 (very poor) to 5 (very rich), how would you describe your household's income/money status?

- ☐ Very less money (very poor)
- ☐ Less money
- ☐ Enough money
- ☐ More than enough money
- ☐ Lots of money (very rich)

65. What is the highest grade of education you completed?

_____

_____

_____

66. Where did you complete your education?

- ☐ U.S.
- ☐ Mexico
- ☐ Other (please specify): _____

63. ¿Cuál es su estado de empleo?

- ☐ Empleado tiempo complete en una posición (promedio de 40 horas o más por semana)
- ☐ Empleado medio tiempo en una posición (menos de 30 horas por semana)
- ☐ Ama de casa
- ☐ Desempleado
- ☐ Jubilado
- ☐ Estudiante
- ☐ Militar
- ☐ Deshabilitado(a), no puede trabajar
- ☐ Otro: _____

64. En una escala de 1 (muy pobre) a 5 (muy rico), como describe el ingreso de su familia?

- ☐ Muy poco dinero (muy pobre)
- ☐ Menos dinero
- ☐ Suficiente dinero
- ☐ Mas que suficiente dinero
- ☐ Mucho dinero (muy rico)

65. ¿Cuál es el grado más alto de educación que obtuvo?

_____

_____

_____

66. ¿En qué país consiguió su educación?

- ☐ Estados unidos
- ☐ México
- ☐ Otro (especifique): _____

APPENDIX C: 24-HOUR RECALL

24-Hour Dietary Recall 5-Step Approach

Getting started

- Break the ice
- Explain why the assessment is being done
- Reassure the subject this will be kept confidential

USDA 5-Step Approach

1. Quick List – Collect a list of foods and beverages consumed the previous day
   - What was the 1st thing you ate after you got up yesterday?
     - Avoid terms like breakfast or lunch
   - Record only food at this time; don't worry about portion sizes until later
   - Allow extra space for adding things later
   - Do NOT interrupt
2. Forgotten Foods – Probe for foods forgotten during the Quick List
   - Your turn to talk
   - Probe with open ended questions (how, what, describe)
   - Don't forget…
     - Condiments
     - Beverages
     - Alcohol
     - "Little bites" of food
   - Frequently missed foods
3. Time & Occasion – Collect time and eating occasion for each food
   - Review the day to them
   - Ask the subject to tell you the time of day each food was eaten
   - Ask if there are additions or corrections
4. Detail Cycle – For each food, collect detailed description, amount, and additions. Review 24-hour day
   - Obtain 4 kinds of info about each food/beverage
   - Kind of food/Beverage
     - Fresh, frozen, canned
     - Skim, 2%, whole
   - Preparation of food
     - Fried or baked
     - Ingredients added
   - Portion size of food
     - Participant may underestimate so use models or examples
     - Make sure EVERY item has some measuring unit
   - How served
     - Butter, gravy, or cream added?
   - If you are not sure about a food, ask the participant to describe it to you
     - For example, Joe tells you he has a Gatorade® every morning after breakfast
     - Find out what is a Gatorade®…
       - Is it a drink?
       - An energy bar?

        - Get details (color, ingredients, etc)
    - Your mom's BBQ is not going to be the same as his/her mom's
- Record dietary supplements or vitamins/minerals
- Record any herbal or home remedies

5. Final Probe – Final probe for anything else consumed
    - Remember…
        - Double-check name on each dietary assessment form
        - Check for completeness

Participant ID _____
Recorder Initials _____ Date _____

24-Hour Recall Sheet

Q1. How many times/week do you eat meals with your family? _____
Q2. How many times/week do you eat breakfast? _____

Time of the Day	Food Items	Amount/Portion	What were you doing?	Where were you eating?

Q3. Do you have a problem with digesting fluid milk?" yes or no
Q4. "Was this a normal day?" yes or no

APPENDIX D: PROTOCOL FOR IDENTIFYING VALID 24-HOUR RECALLS

Research Design

Content analysis was conducted to identify key missing information in 24-hour recalls that limit the analysis and interpretation of the dietary intake of participants.

Sampling

Initial ANOVA testing revealed that there were significant differences in dietary intake that differed by data collector. The most experienced data collector had the most calories, and the least experienced data collector had the lowest calories. We reviewed 58 recalls from the least experienced data collector for accuracy and completeness. Participant ID number correlated to collector. The recalls conducted by the researcher with the most experienced, were coded as participant ID numbers 100-299 (JP), the recalls conducted by the medial experienced researcher were coded by participant ID numbers 500-699(AE). Recalls collected by least experienced researcher were coded as participant ID numbers 300-499 (SC).

Coder Training

Coding for exclusion of the dietary recalls was conducted independently by two trained, registered dietitian nutritionists (RDN). The primary coder created the exclusion criteria and then trained the second coder. The primary coder and secondary coder met twice to review coding protocol and make changes to exclusion criteria. At the first meeting, the primary coder reviewed reasons for exclusion of the 24-hour recalls. The RDNs coded independently and in the second meeting the coders reviewed the protocol to reach consensus. Each of the 24-hour recalls were reviewed, and the exclusion criteria was confirmed.

Processing/Preparing of Content

The deidentified 24-hour recalls were originally handwritten. These files were scanned and saved in pdf format in a shared, private Microsoft Office drive. To examine the validity of the 24-hour recalls, two registered dietitian nutritionists reviewed the 24-hour recalls of the Mexican and Cuban heritage participants. The following procedure applies for preparing the data for exclusion criteria.

1. Initially, the primary coder went through the 136 total recalls and identified who collected each recall. The recalls conducted by the researcher with the most experienced, were coded as (JP) the recalls conducted by the medial experienced researcher were coded by (AE). Recalls collected by least experienced researcher were coded as (SC).
2. A total of 58 from the 136 recalls in the data set were collected by the research assistant with the least experience. For these recalls, the participant ID was recorded in an excel spreadsheet.

3. The primary coder then went line by line of each item of the 24-hour recalls looking for possible reasons to exclude it from the data due to missing data that 3.could result in an inaccurate dietary intake.
4. The reasons for exclusion were then recorded electronically next to the participant ID number in the excel spreadsheet.
5. The primary coder then collated the reasons for exclusion to generate categories. These categories are described in the subsequent section titled “List of reasons for exclusion.”

Coding Procedures

Coding decisions for the exclusion criteria are described below. The primary coder, a registered dietitian, used nutrition knowledge, expertise, and experience to make decisions for exclusion. For example, a 24-hour recall where it was noted that the participant was breastfeeding was not considered to be a valid and accurate recall. Women who are breastfeeding are consuming more calories than normal to support lactation for breastfeeding.

Codes describing reasons for exclusion

Excluded codes:
1 = Unusual recall due to fasting for labs.
2 = The participant reported a not usual intake
3 =. Inaccurate report: Missing portions of foods, no specific toppings, or servings identified. Examples of this include: a key ingredient or flavor in the food item was missing, such as type of pizza, type of tortilla, type of rice, type of beans, whether or not the food was made at home or from a restaurant, and food preparation methods not specified.
4 = Intake was not plausible; it was considered too high or too low.
5 = The food preparation method was missing on the main dish of a meal
6 = The participant was breastfeeding

APPENDIX E: LINEAR REGRESSION

	Familism Support		**Traditional Gender Roles**		**Religion**	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Acculturation	0.08	-0.90[a]	1.32[a]	-1.53[a]	2.53	0.56[a]
Years in the U.S.	0.08	-0.94[a]	1.32[a]	-1.55[a]	2.53	0.54[a]

Model 1: unadjusted linear regression (Main outcome variable: Total HEI score)
Model 2: adjusted for gender, age, education, marital status, employment status, income, and either acculturation or years in the US.
[a] = age in years

APPENDIX F: TERMINOLOGY

Acculturation- the process in which individuals adapt to a new living environment where they may adopt norms, values, and practices of their new society.[6]

Attitudinal Familism- Consisting of four characteristics of familism among Latinx; subjugation of self for family, familial honor, family support, familial interconnectedness.[80]

Caballerismo- originating from the Spanish word horse and horsemen; refers to masculine chivalry.[99]

Culture- the values that shape behaviors and give substance to the development of individual identity.[5]

Cultural Sensitivity- a term defined by two dimension, surface and deep level structures used to become aware of the similarities and differences between people. [8]

Familismo- a Latinx concept of family; a value indicating loyalty to the extended family above the needs of the individual.[40]

Family Cohesion- the emotional bonding family members have towards one another.[41]

Familial honor- the belief that individuals have the duty to upkeep and protect the family name, honor it, and if need be actively defend it.[80]

Familial Interconnectedness- the belief that adults should keep a physical and emotional bond with the family.[80]

Familial support- a large part of familismo; seeking encouragement, advice, and direction from a large number of family members.[80]

Hispanic or Latino Health Paradox- the epidemiological phenomenon that despite high rates of poverty, neighborhood segregation, discrimination, poor healthcare access, and high rates of obesity, diabetes, and undiagnosed and late-stage diagnosed disease, Hispanics generally experience better physical health and lower mortality than non-Hispanic Whites.[35]

Latinx – a term used to challenge the gender binaries encoded in the Spanish language.[164]

Machismo- a cultural value that falls under traditional gender roles; a concept used for Hispanic men to prove their masculinity. [46]

Marianismo- a cultural value that falls under traditional gender roles; a concept rooted in Christian values defining the woman has a nurturing and spiritual pillar of the family. [44, 45]

Respeto- The Spanish word for respect.

Subjugation of Self for Family- the belief that family comes before the individual.[80]

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