

**Dietary Acculturation, Physical Activity, and Body
Image in Limited – Resource Latino Women in
Northern Virginia**

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(ABSTRACT)

The purpose of this study was to collect exploratory data on dietary acculturation, physical activity, and body image in a limited resource Latina population in northern Virginia. Acculturation may be described as a process in which members of one cultural group adopt the beliefs and behaviors of another group. Acculturation has been associated with a variety changes in terms of diet, physical activity and body image. Most dietary acculturation research in the U.S. has focused on Mexican Americans, Cuban Americans, and Puerto Ricans; however this study was composed of mostly Central and South Americans. Eighty-five subjects were recruited from the Arlington County Expanded Food and Nutrition Education Program, Arlington County Women, Infants, and Children program, and the Fairfax County Parklawn Family Center. Demographic information, acculturation, fruit and vegetable intake, saturated fat avoidance, physical activity, and body image were assessed with written survey instruments. The results indicated that this Latina population with limited resources in northern Virginia was mainly from Bolivia and El Salvador, and was not highly acculturated. Almost half of the participants were overweight or obese. About 50% of the population met the 5-A-Day goal for fruit and vegetable intake and almost 95% of participants exhibited at least one form of saturated fat avoidance. Eighty-five percent of the population reported participating in 30 minutes or more leisure-time physical activity less than 3 times each week, though a similar percentage reported that physical activity was important for health. Sixty percent of respondents were on a weight loss diet. While there was a significant relationship between the number of servings of fruit consumed and acculturation, there was no significant relationship between acculturation and any other dietary, physical activity or body image factor measured. The results of this study provide a baseline for further research in the limited resource Latina population in northern Virginia.

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CHAPTER I

Introduction

The Hispanic population is the fastest growing minority group in the U.S. and is expected to comprise 21% of the population by 2020 (U.S. Census, 2000). The public health picture for this group is unique since its members have significantly higher rates of overweight and Type 2 diabetes than non-Hispanic whites, yet they have lower rates of other chronic diseases such as coronary heart disease (Centers for Disease Control, 2002).

As Latinos immigrate to the United States they begin to adapt to American culture through a complex process known as acculturation. Acculturation, the degree to which the majority culture is adopted by a minority culture (Suarez, 1999), impacts a wide range of variables, including religious and social beliefs, self-esteem, and mental and physical health behaviors. For example, higher acculturative status has been associated with increased rates of depression (Gonzales, 2001) as well as changes in smoking rates (Perez-Stable, et al., 2001) and alcohol consumption (Cherpitel, 2002).

In addition, acculturation has been associated with changes in dietary patterns, physical activity, and body image. Dietary quality and variety have been shown to diminish as language preference shifts, one indicator of acculturation (Aldrich & Variyam, 2000). Mexican Americans also demonstrate lower rates of leisure-time physical activity, particularly among individuals preferring to speak Spanish (Crespo, Smit, Carter-Pokras, Andersen, 2000). More acculturated Mexican American women are also more likely to demonstrate disordered eating patterns (Chamorro & Flores-Ortiz, 2000).

Most studies have used gross measures of acculturation, such as language preference or length of residence in the U.S., which do not elucidate the complexity of the acculturative process (Crespo, et al., 2000; Dixon, Sundquist, Winkelby, 2000). In most cases, research has also been carried out in the Mexican American population because they compose the majority of the Hispanic population in the United States.

Given a rapidly growing Latino population, it is important to identify factors that affect health habits to improve health and nutrition education for Latinos in the United States. This is especially true if acculturation to U.S. culture is decreasing the practice of

some healthful habits that individuals practiced prior to immigration. Understanding the relationship between body image, physical activity, dietary patterns and acculturation may help to combat chronic disease in this population.

The Latino population in the United States is also more likely to have limited resources, putting them at an increased risk for poor nutrition and health (CDC, 2001). Populations with limited resources have been shown to be at increased risk for a variety of chronic diseases, including heart disease, Type 2 diabetes, cancers, depression, overweight, and obesity (Stronks, van de Mheen, Mackenbach, 1998). The 2000 Census data determined that 22.7% of Hispanics were living below the poverty line, compared to only 7.7% of non-Hispanic whites (CDC, 2001). In 1999, Virginia had 656,641 persons living at or below poverty, comprising 9.6% of the state's population (USDA Economic Research Service, 2002). To put that information into perspective, an income at or below 185% of poverty level qualifies individuals for a host of assistance programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC, 2003) or 130% of poverty level for the Food Stamp Program (FSP, 2003). Given the potential decrease in healthful habits due to acculturation, Latinos may be at an even greater risk for poor nutrition if they also have limited resources.

For the purpose of this study, limited-resource is defined as an income at or below 185% of the federally defined poverty level. Qualification for a nutrition assistance program was also used as a proxy measure of limited resources because they require an income at or below 185% of poverty. Therefore, if an individual qualified to receive nutrition assistance, their incomes were expected to be with 185% of the federally defined poverty level.

Study Objectives

The goal of this study was to assess acculturative status among Latino women with limited resources in northern Virginia, examining the relationship of acculturation to various nutritional, physical, and psychological factors influencing health. More specifically, the goals were related to dietary patterns, physical activity, and body image.

- 1) Is there a difference in the intake of fruits and vegetables and saturated fat avoidance behavior in Latino women with limited resources based on acculturative status?
- 2) Is physical activity level, including recreational physical activity and habitual physical activity, different among limited resource Latino women with different acculturative status?
- 3) Do Latino women with limited resources have different perceptions of body image based on different acculturative status?

CHAPTER II

Review of Literature

Issues of Ethnicity and Current Research

The term “Hispanic” is used by the Centers for Disease Control (CDC) to refer to persons of Mexican, Puerto Rican, Cuban, Central and South American, and other Latin American or Spanish origins. According to the CDC, persons of Hispanic origin may be of any race (CDC, 2003). The CDC further classifies Hispanics into four categories for the purpose of data analysis: Mexicans, Puerto Ricans, Cubans, and Central and South Americans. However, the vast majority of research in the Latino population has been done with Mexican Americans; the remainder being mainly with Puerto Ricans and Cubans. There is a scarcity of research that has been carried out in Central and South American populations. Therefore, most published research refers to Mexican Americans or Latinos as a whole.

Generalizing the results of these studies to Central and South Americans is done with caution because of differences in culture and genetic admixture. Unfortunately, few studies have investigated dietary acculturation in specific Latino subgroups, such as Guatemalans, Salvadorans, Peruvians, and Bolivians, to name a few. The terms “Latino” and “Hispanic” are often used interchangeably. Although medical literature continues to refer to “Hispanics,” the term Latino will be used here for reasons of cultural sensitivity. In cases when research is cited and researchers used the term Hispanic, the term Hispanic is used.

Heritage and History of Hispanic Cultures

Latinos vary greatly in their immigration histories and their reasons for immigration into the United States. Mexican Americans have the oldest relationship to the United States (Weaver, 1994). Spanish and Mexican heritage extends back to the expeditions that explored the Rio Grande and the California coastline. These areas were eventually annexed to the United States during the nineteenth century. In addition, the Latino population that inhabited these areas was placed under the sovereignty of the United States (Tilley-Lubbs, 2003). The first wave of Mexican immigrants came in the 1910s from the rural areas of Mexico to the urban areas of Mexico and the United States.

Most were young males who were migrant workers, who found higher paying jobs in the United States than they could in Mexico. Migrant agricultural immigration continues today, with Mexican Americans comprising a large percentage of migrant laborers. However, many Mexican Americans established communities in the Southern and Western states of the U.S. decades ago.

The most recent Cuban immigration began under the dictatorship of Fidel Castro. Following the Cuban Revolution in 1959, a large number of middle and upper class Cubans, typically of European descent, sought political asylum in the United States (Weaver, 1994). Newer immigrants to the United States are now reflective of the general working Cuban population and are not necessarily middle and upper class (Rosales, 1993).

Puerto Ricans began moving to the mainland of the United States in the late 1890s, when the United States acquired the island during the Spanish-American War (Weaver, 1994). Puerto Ricans were granted U.S. citizenship in 1920 and in 1958 Puerto Rico was made a Commonwealth of the United States. Many Puerto Ricans tend to migrate to New York but their migration patterns are unique since movement is constant between Puerto Rico and mainland United States. Puerto Ricans often operate in two cultures: the U.S. culture and the Puerto Rican culture.

Salvadorans began migrating to the United States in the 1970s due to massive civil unrest in El Salvador (U.S. Committee on Refugees, 1998). Guerrilla warfare against the Salvadoran government sparked hundreds of human rights violations primarily targeting the peasant populations in El Salvador some of whom have immigrated to the United States (U.N. Security Council, 1993). Since 1997, Salvadorans have begun moving back to El Salvador.

There is little information regarding the immigration history and dietary patterns of other Latino subgroups now living in the United States. These subgroups include Bolivians, Peruvians, and other individuals from Central and South America.

Geographic distribution

According to the U.S. Census Bureau, Latinos tend to be concentrated in certain areas of the United States (U.S. Census, 2000). Latinos of Mexican origin tend to live in

the western and southern areas of the United States. Arizona, California, Colorado, and New Mexico are considered to be western states and Virginia, West Virginia, Washington D.C., Florida, Alabama, and Texas, are considered to be southern states. The majority of Puerto Ricans, about 63%, live in the northeastern states of the U.S., such as New York, New Jersey, Pennsylvania and the New England states. In contrast, the majority of Cubans (80%) live in the south. Latinos of Central and South American descent tend to live in various regions of the U.S., concentrated in the northeast (32%), west (28%) and south (35%)(CDC, 2000). In the northern Virginia and Washington DC area, the location of this study, Latinos number near one million, only 13% of whom are of Mexican descent. The remaining 14.5% is composed of Central and South Americans as well as Caribbean Islanders (U.S. Census, 2000). Differences in geographic clustering are important because research studies conducted in different regions of the United States can be expected to involve Latinos of different nationalities and cultural backgrounds.

Not only do Latinos tend to cluster geographically across the country, nearly half (46.4%) live in central cities within metropolitan areas as compared to only 21% of non-Hispanic whites who live in the same setting (U.S. Census, 2000). A nearly equal portion (45.1%) of the Hispanic population lives in metropolitan areas, but outside of central cities compared to 56.2% of non-Hispanic whites. In addition, a substantial number of migrant farm workers live in rural areas, which may not be accounted for in census data because many are illegal immigrants. The location of this study was Arlington County, Virginia, which borders the city of Washington, D.C., and is considered part of a metropolitan area. When conducting research in Latino populations it is important to know whether subjects are drawn from a rural or metropolitan area.

Acculturation

Definition

Acculturation, briefly, is the degree to which the majority culture is adopted by a minority culture (Suarez, 1999). In this case the majority culture would be the general U.S. culture and the minority culture would be the specific Latino culture. The concept of acculturation, however, extends beyond such a simplification. The Social Science Research Council defines acculturation as:

. . .cultural change that is initiated by the conjunction of two or more autonomous cultural systems. Acculturative change may be the consequence of direct cultural transmission; it may be derived from non-cultural causes, such as ecological or demographic modifications induced by an impinging culture; it may be delayed, as with internal adjustments following upon the acceptance of alien traits or patterns; or it may be a reactive adaptation of traditional modes of life. Its dynamics can be seen as the selective adaptation of value systems, the processes of integration and differentiation, the generation of developmental sequences, and the operation of role determinants and personality factors (Social Science Research Council, 1954).

Acculturation should not be confused with the concept of assimilation, although they are related. Assimilation is a mode of acculturation, in which the acculturating individual “loses his or her original cultural identity as he or she acquires a new identity in a second culture” (LaFramboise, Hardin, Coleman, Gerton, 1999).

Mendoza (1989) proposes a bimodal or “bicultural” model of acculturation has also been proposed. Rather than “giving up” a cultural trait, individuals may simply acquire new traits allowing them to become “fluent” in two cultures. This model of acculturation “helps distinguish between individuals who are similar in their level of immersion into an alternate society but dissimilar in the degree to which they have retained their native customs (1989).”

Responses to Acculturation

The process of acculturation can be viewed as a response to conflict between two cultural views or attitudes, resulting in conflict resolution. Three categories of response have been outlined, which are adjustment, reaction, and withdrawal (Berry, 1980). In adjustment, the individual or group makes changes to minimize conflict between their culture and the dominant culture by adopting beliefs and behaviors that are more similar to the majority culture; however, adjustment does not imply that the native culture is not retained in some aspects. With reaction, the attempt to reduce conflict is by reaction against the source of conflict. With withdrawal, changes are made to remove contact. Of these three, reaction and withdrawal represent negative attitudes toward the dominant culture (Berry, 1980). These types of responses may also influence attitudes towards

health beliefs and other components of a new culture as well as adoption of new behavior.

Language and Acculturation

In cases where a different language is spoken, a language shift may occur to the language of the dominant culture. Individuals may completely adopt the dominant language or choose an intermediate adaptation, resulting in bilingualism or a linguistic merging into a creolized language (Berry, 1980). A creolized language is a pidgin language, with a more evolved and complex grammar and vocabulary than a pidgin language (Linguistic Association of America, 1983). This evolution and development into a creolized language is due to adoption and use as the native tongue by a population. Language is a very common component of assessment scales used in research dealing with acculturation. In most cases language preference and nation of birth are the only variables measured in determining acculturative status (Crespo, et al., 2001; Sundquist & Winkelby, 2000).

Acculturation and Identity

The relationship between cultural identity and acculturation has been a controversial issue, underscored by contradictory research. Cultural identity refers to the characteristics or traits that individuals maintain with regard to the linguistic, social, and psychological dimensions of their culture (Berry & Sam, 1997). Cultural identity also involves personal issues of pride in one's native culture and attitudes, based on cultural beliefs and values. Acculturation is then the manner in which cultural identity may or may not change when an individual is exposed to a new majority culture. Individuals may choose identify with the new majority culture, while others may not. There is also evidence suggesting that individuals may retain traditional religious or ethnic identifiers as demonstrated by terms such as African-American, Hispanic-American, or Irish-American.

Acculturation and Acculturative Stress

Acculturative stress includes “those behaviors and experiences which are generated during acculturation, and which are mildly pathological and disruptive to the individual and his group” (Berry, 1980). It is possible that migrants experience less stress in societies in which several different cultural backgrounds are represented than in unicultural societies because in a multicultural society there is more support to maintain cultural identity than in a unicultural society. A unicultural society has one majority culture, to which the migrant culture must adapt or be in opposition (Berry, 1991).

Factors Influencing Food Choice

Many factors, categorized as sociodemographic and psychosocial determinants, influence food choices (Axelson, 1986). The sociodemographic determinants include income, household size, education, gender, and age, as well as ethnicity and race. Psychosocial determinants include nutrition knowledge, attitudes, and eating types.

The relationship between food purchase and income is described by Engel’s Law, a theory used widely in economics, which relates an increase in income with a decrease in the relative importance of the sum of money spent on food as compared to other expenditures. The need to economize is not as important as income rises (Axelson, 1986). Income is positively related with the consumption of non-citrus fruits, vegetables, and meat, fish and poultry, as well as low-fat milk and whole grain breads.

Foods that are inversely related to income are dried beans, rice and eggs (Cronin, Krebs-Smith, Wyse, Light, 1982). Populations with limited resources have been shown to have lower intakes of fruits and vegetables in several studies (Krebs-Smith, Cook, Subar, Cleveland, Friday, 1995; Patterson, Block, Rosenberger, Pee, Kahle, 1990). The cost of healthy foods has also been identified by low-income populations as a barrier to the purchase and consumption of healthy foods (Omar, Coleman, Hoerr, 2001).

Income has also been shown to increase the amount of food consumed outside of the home. As income increases, consumption of food away from home increases more than consumption of food at home (Putnam & Allhouse, 1997), perhaps due to an increase in dining out behavior as income increases. In addition, foods consumed away from home also tend to have more calories, fat, cholesterol, and sodium, and less calcium, iron and

fiber than foods eaten at home (Lin, Frazao, Guthrie, 1999). Changes that lead to greater income and subsequent increased consumption of food away from home may also lead to increased consumption of calories, fats, cholesterol, and sodium. Current reports from the United States Department of Agriculture Economic Research Service project that by the year 2020, away-from-home food consumption will increase, though only slightly, by 2% from levels in 2000 (Blisard, Variyam, Cromartie, 2003). In addition, consumption of food at home will decrease by 2%. As the consumption of food prepared away from home increases, dietary quality may diminish.

As household size increases, there may be an associated increase in the money spent on foods, though the food quality tends to decrease (Cronin, et al., 1982; Starkey, Gray-Donald, Kuhnlein, 1999). Households with more than five members consumed foods that were less nutrient-dense than smaller households. A recent study of food bank users determined that micronutrient intake was related to household size (Starkey, et al., 1999). Dietary information was obtained from 24-hour dietary recalls throughout a one-month study period. Participants' median intakes of calcium, vitamin A, and zinc were below recommended levels for different ages and genders and related to household size. Household size is used in the calculation of financial assistance from programs such as the U.S. Department of Agriculture (USDA) Food Stamp Program (FSP) and the Special Supplemental Nutrition Program for Women Infants and Children (WIC). (Details about the WIC program can be found on page 26). Families receive more financial support for each additional family member (USDA Food and Nutrition Service, 2003c).

Depending on the study, educational attainment has been shown to be predictive of food related behavior. Generally speaking, higher educational attainment of the mother predicted higher quality of dietary intake (Xie, Gilliland, Li, Rockett, 2003). These results were reflected in a recent study of factors associated with fruit and vegetable consumption among women participating in the Maryland WIC program (Havas, Trieman, Langenberg, 1998). Women who had higher levels of education, or who were currently in school, had higher intakes of fruits and vegetables. Because sociodemographic variables were controlled for, results were unlikely to be explained by income or age.

Food choices change throughout life based on age and gender, often due to physiological needs (Axelson, 1986; Shier, Butler, Lewis, 1999). Women tend to consume more fruits and vegetables. They also tend to consume more dairy products during pregnancy. Pregnancy and lactation were both found to be important predictors of fruit and vegetable intake in the WIC study mentioned above (Havas, et al., 1998). Regression analysis of fruit and vegetable intake by demographic variables revealed that pregnancy and lactation were both significantly related to fruit and vegetable intake. Pregnant and lactating women had higher fruit and vegetable intakes than women who were not pregnant or lactating. Women who were recruited for study from a WIC program also reported a heightened awareness of healthy eating habits (Contento, et al., 1995). However, these results should be viewed with caution as the WIC program also provides nutrition education to clients. Participants in WIC may have a heightened awareness of eating habits due to WIC education or choose to participate in WIC due to heightened nutrition awareness.

Nutritional knowledge has only been found to have a weak predictive effect on the consumption of healthier foods when meta-analytic techniques were applied to existing research (Axelson, Federline, Brinberg, 1985). Data from the 1994-1996 Diet and Health Knowledge Survey found that less acculturated Latinos scored lower in nutrient content knowledge and diet-disease awareness than more acculturated Latinos (Aldrich & Variyam, 2000). Nutrient content knowledge was scored from 0 – 15, with 15 indicating high nutrient knowledge. Scores were reported as 6.39 vs 8.63 for less acculturated versus more acculturated Latinos respectively. Diet-disease awareness scores could range from 0 – 7, with 7 indicating high diet-disease awareness. Reported scores were 5.42 vs 5.69 for less acculturated and more acculturated Latinos respectively. Though less acculturated Latinos scored lower in nutrient content knowledge and diet-disease awareness, they still scored higher on the Healthy Eating Index (Aldrich & Variyam, 2000). This may indicate that knowledge about nutritional value does not necessarily translate into healthier behavior and food choices in the Latino population.

Dietary patterns

Major Sources of Energy and Nutrients in Latinos

The Hispanic Health and Nutrition Examination Survey (HHANES) data set contains information about Latino subjects who provided information regarding health and nutrition behaviors as well as basic demographic information. Block, et al. used the Hispanic Health and Nutrition Examination Survey (HHANES) data set to determine sources of energy and nutrients among Latinos with limited resources (1995). A sub-sample was analyzed including subjects that had incomes at or below 185% of poverty. Dietary information was obtained by a 24-hour recall. Whole milk and hamburgers/cheeseburgers consistently appeared among the top five sources of energy, fat and protein. Carrots, cold cereals and liver were the top three sources of vitamin A intake. About one-third of vitamin C intake came from orange juice, citrus juice and citrus fruits and an additional 18% of vitamin C intake came from fruits drinks, non-citrus drinks and fortified drinks. Whole milk and cheeses, excluding cottage cheese, comprised 45% of the total calcium intake and corn tortillas provided about 7 % to round out the top three sources of calcium. Finally, beans were ranked first and third as sources of iron intake, while fortified foods such as cereals and breads provided about 15% of iron in women. Beef provided about 19% of iron intake. Among these nutrient intake parameters, whole milk, beef, cheeses, citrus fruits, and iron fortified grain products were the most important sources of nutrient intake.

Acculturation and Nutrient Intake

Using data from the Third National Health and Nutrition Examination Survey (NHANES III), Dixon and colleagues (2000), examined the differences in energy, nutrient, and food intakes in a United States sample of Mexican American men and women based on acculturative status. Acculturation was measured by language spoken and nation of origin. There was no difference in the energy intake between Mexican American women born in Mexico and those born in the U.S. regardless of whether they spoke English or Spanish. Women born in Mexico had lower intakes of saturated fats than English-speaking Mexican women born in the United States. Women born in Mexico also consumed more dietary fiber, potassium, and magnesium than English-

speaking Mexican American women born in the United States. Mexican born women had higher intakes of vitamin C, folate, vitamin B6 and calcium than either English- or Spanish-speaking women born in the U.S. In addition, fewer Mexican-born women reported taking supplements than their counterparts.

This report was consistent with previous research that found that first generation Mexican American women had higher dietary intakes of protein, vitamins A, C, folic acid, and calcium, than second generation Mexican American women (Guendelman & Abrams, 1995). First generation women also tended to be of lower socioeconomic status than their second-generation counterparts. The authors concluded that first generation Mexican American women were at a significantly lower risk of eating a poor diet. However, it should be noted that two different measures of acculturation were used in these two studies. Dixon and associates (2000) used the language spoken and the nation of birth as measures of acculturation, whereas Guendelman and Abrams used generational status.

Romero-Gwynn and colleagues measured food change by examining the change in the frequency of consumption of selected foods (1993). Foods that are sensitive to change, due to acculturation, can be measured assuming that there is a continuum from the less acculturated (in this case, foods consumed in Mexico) to the more acculturated (foods consumed in the U.S.). By subtracting the frequency of consumption of foods in Mexico from frequency of consumption in the United States, a sensitivity to change can be assessed and a percentage change calculated.

Three levels of change were described: highly sensitive (40% + change), moderately sensitive (20%-39%), and stable foods (less than 20%). Among highly sensitive foods, foods that were eaten less upon immigration were sweet breads, lard, boiled beans, and “aguas frescas” (fruit flavored water). Foods that were highly sensitive and increased with acculturation were white sliced breads, margarine/butter, breakfast cereals, vegetable salad, flour tortillas, oil, and Kool-Aid. The increase in vegetable salad consumption did not necessarily translate into increased consumption of vegetables, but simply a change in preparation method from cooked to raw.

Moderately sensitive foods that were consumed less frequently were tostadas, carne enchilada (meat prepared with chile), cocido (meat and vegetable soup), eggs,

refried beans, rice pudding, fideos (cooked vermicelli) and chilaquiles. Those that were consumed more frequently were ham, quesadillas, cooked vegetables, cookies, plain cooked rice, sour cream, and fruit juices.

Foods that were stable with slight decreased frequency of consumption were corn tortillas, rice, tomatoes, fruit salad, fried tacos, and meats. Foods that had slightly increased frequency of consumption were vegetables, pancakes, soft drinks, milk, cheese, and ice cream.

In summary, the consumption of traditional dishes decreased while breakfast cereal consumption increased, especially as breakfast and dinner food. Though vegetable consumption changed to a salad form, there was also an increase in salad dressing, mayonnaise, and margarine consumption. The traditional dishes like tacos were replaced by sandwiches, and generally speaking, new foods were richer in fats and sugars.

A study completed by Chavez, Sha, Persky, Langenberg and Pestano-Binghay (1994) examined the effect of length of U.S. residence on food group intake patterns in sixty Mexican and thirty-six Puerto Rican women. Based on length of residency in the U.S. and a food-frequency questionnaire, it was determined that the consumption of vitamin A- and vitamin C-rich foods was inversely proportional to length of residency. Women who had lived in the United States for fewer than 5 years had higher intakes of vitamin A- and vitamin C-rich foods than those who had lived in the United States for more than 15 years. This relationship was only significant in Mexican Americans. These results were similar to those of Dixon and associates (2000) and Guendelman and Abrams (1995), though again, different measures of acculturation were used. It is not clear whether length of residence in the United States, generational status, language preference, and nation of birth can be treated as equal measures of acculturative status.

Dietary Fat Intake Patterns

There are conflicting data on dietary fat intake in Latinos. Some suggest that Latinos consume more dietary fat than non-Latino whites while others suggest that they consume less. Latinos tended to consume smaller amounts of dietary fats than their white non-Latino counterparts, according to a study conducted in a community-based sample of limited resource Latinos and non-Hispanic whites (Winkelby, Howard-Pitney, Lin,

Fortmann, 1994). Cross-sectional data were collected, biennially, from the Stanford Five-City Project, during the 1980s. Individuals were 12-74 years old and were selected from two treatment and two control communities. Latinos were less likely to have consumed high-fat foods in the previous 24 hours, such as red meat (68.4% vs 75.7%), cured meat (25.8% vs 39.1%) and cheese (32.7% vs 41.4%), than non-Latino whites. Latinos also consumed fewer calories from total fat (33.3% vs 37.7%) and saturated fat (11.8% vs 13.7%), than non-Latino whites. Whole milk was consumed more by Latinos than non-Latino white adults (66% vs 46.4%). In addition to dietary fat consumption patterns, Latinos were found to consume significantly more dietary carbohydrate and dietary fiber. Not only was a difference found between Latinos and non-Latino whites, but also a graded relationship was found between acculturation and dietary measures, where acculturation was measured by language preference (Winkleby, et al., 1994). English-speaking Latinos' dietary patterns were intermediate between Spanish-speaking Latinos and non-Latino whites. For example, English-speaking Latinos (more acculturated) consumed fewer calories from fat than non-Hispanic whites, but more than Spanish-speaking Latinos (less acculturated). The patterns of saturated fat intake and dietary fiber intake are similar to those found by Dixon and associates (2000) in their analyses of the Third National Health and Nutrition Examination Survey (NHANES III) data set. Both studies employed language preference as a measure of acculturation.

In a comparison of dietary fat intake between Mexican Americans, Cuban Americans and mainland Puerto Ricans, it was found that intakes of saturated fat were significantly different based on ethnic group (Loria, et al., 1995). Mexican Americans and younger Cuban Americans had higher intakes of total fat and saturated fat as a percentage of calories as compared to older Cuban Americans and Puerto Ricans. According to the authors, the similarity between older Cuban Americans and Puerto Ricans, in saturated fat intake, may have been due to greater geographical and cultural similarity as Caribbean Islanders. These similarities may have made their diets different than those of Mexican Americans and younger Cuban Americans. However, acculturation was not addressed in this study, so it is not possible to determine if there were differences within ethnic groups based on acculturative status.

Another comparison study, involving Puerto Ricans, Colombians, Guatemalans, and Dominicans found that Puerto Ricans had higher fat intake than their counterparts (Gans, 2002). Not only did Puerto Ricans consume more dietary fat, they also exhibited a higher prevalence of fat-related eating behaviors. Puerto Ricans were less likely to eat vegetables without added fat, to eat salad without dressing, to remove the skin from chicken, and trim the fat from meat, than Colombians, Dominicans, and Guatemalans. They were also less likely to eat smaller portions of meat, to choose fruits and vegetables for snacks, and to eat fruit for dessert. Acculturation was not assessed in this study, therefore the effect of acculturation on dietary patterns in the different ethnic groups could not be assessed. However, the differences in dietary fat intake emphasize the need to differentiate dietary behaviors between Latino subgroups.

Saturated Fat Avoidance

Three studies have examined saturated fat and cholesterol avoidance behavior in Latinos. Most recently, Woodruff, Zaslow, Candelaria, and Elder (1997) examined a group of 132 Latino men and women to determine fat avoidance behavior. Acculturation was measured using an acculturation scale examining language preference and social interaction preference. Fat avoidance behavior was measured using the saturated fat/cholesterol avoidance scale developed by Knapp and associates (1988). More highly acculturated subjects exhibited significantly higher fat avoidance than those with lower acculturation scores. These results agreed with previous research that found that less acculturated women ate more fat-containing foods or foods cooked with fats (Balcazar, Castro, Krull, 1995). However, as mentioned previously, Winkelby and associates (1994), found that less acculturated Latinos consumed less dietary fat than more acculturated Latinos. The discrepancies between these results may be due to different acculturation assessment methods and different dietary assessment methods. In each case a different method of acculturation assessment was used: an acculturation scale in the study by Woodruff and colleagues study; a combination of language preference and educational attainment in the Balcazar and associates study; or a simple language preference in the study by Winkelby and colleagues. In addition, the relationship between saturated fat avoidance behavior and actual dietary fat intake is not clear. Increased

saturated fat avoidance behavior may not necessarily translate into decreased dietary saturated fat intake.

In contrast, research from the San Antonio Heart Study, has determined that there was no significant difference in saturated fat avoidance between Mexican Americans and non-Hispanic whites (Knapp, et al., 1988). Acculturation was not assessed in this study. Saturated fat avoidance was measured using a 9-item scale with questions targeted toward fat avoidance behaviors such as the types of fats and oils used for cooking, the type of milk consumed, trimming the skin off chicken before eating as well as other saturated fat avoidance behaviors. Though there was no significant difference in saturated fat avoidance between Mexican Americans and non-Hispanic whites there were significant differences found for gender and socioeconomic status. Women were more likely than men to avoid saturated fat, regardless of ethnic group. In addition, individuals with higher socioeconomic status exhibited more saturated fat avoidance than those with lower socioeconomic status.

Chronic Disease

As a group, Hispanics have lower all-cause mortality than non-Hispanic whites (National Vital Statistics Report, 2002). In 2000, the leading two causes of death for Hispanics were heart disease and cancer, though these rates were still lower than those for non-Hispanic whites. Hispanics have higher mortality rates due to diabetes mellitus and chronic liver disease than non-Hispanic whites. However, Hispanics have lower mortality rates due to both chronic and infectious respiratory diseases than non-Hispanic whites (National Vital Health Statistics Report, 2002).

Cancer

Between 1990 and 1998, the incidence of lung, colorectal, breast, and prostate cancer in Hispanics was lower than that of non-Hispanic whites between (Morbidity and Mortality Weekly Report, 2002). Researchers attributed this effect to several factors. These factors included lower cigarette smoking rates (Trapido, et al., 1995), higher dietary fiber intakes and younger age at which Latino women have pregnancies (Tomatis, et al., 1990). However, Latinos do have a higher prevalence of stomach, liver, and

gallbladder cancers (Hanis, Hewett-Emmett, Kubrulsky, 1993; Tomatis, et al.,1990). This increased prevalence may be due to reduced participation in preventive behaviors, seeking primary health care, low socioeconomic status, as well as some food preparation methods such as pickling, smoking, and salting foods (Tomatis, et al.,1990).

Overweight and Obesity

Overweight and obesity are epidemics in the Latino population. Mexicans have a high prevalence of obesity and overweight. According to 2000 U.S. Census data, about 72% of Mexican American women were overweight, 40% were obese, and only 27% were a healthy weight. Mexican Americans represented the population with the greatest prevalence of overweight (U.S. Census, 2000). Poverty also influenced overweight. Among Mexican American women ages 20-74, the rate of overweight was 13% higher in women living below the poverty line as compared to those above the poverty line (Flegal, Carroll, Kuczmarski, Johnson, 1998).

Data from the Hispanic Health and Nutrition Examination Survey (HHANES) revealed that Puerto Rican women and Cuban American women suffered greater risk of overweight and obesity than non-Hispanic white women. Rates of overweight were 58.5%, 52% and 46.8% for Puerto Rican, Cuban American and non-Hispanic white women respectively. Though Puerto Rican women still had higher prevalence rates of obesity than non-Hispanic white women (24.6% vs 23.2%), Cuban American women had lower prevalence rates of obesity (17.8%) than non-Hispanic white women.

Type 2 Diabetes

The Latino population appears to suffer from greater rates of Type 2 diabetes than non-Hispanic whites. According to the National Diabetes Education Program, Type 2 diabetes is the 4th leading cause of death for Latino women (National Diabetes Education Program, 2003). Not only is the incidence of diabetes higher in Latinos, the age of onset is also younger, between 30 and 50 years of age. Prevalence rates for Mexican Americans and Puerto Ricans are 23.9% and 26.1%, respectively. Cuban Americans have lower rates of Type 2 diabetes (15.8%) than their other Latino counterparts, but still suffer from Type 2 diabetes at greater rates than non-Hispanic whites (12%).

Multiple studies have demonstrated that there is an increased prevalence of Type 2 diabetes in Mexican populations (Haffner, Stern, Mitchell, Hazuda, Patterson, 1990; Hazuda, Haffner, Stern, Eifler, 1988). Though it is known that obesity is a major contributor to Type 2 diabetes, there is a two to four-fold greater rate of Type 2 diabetes in Mexican Americans than would be predicted by obesity alone. This has been attributed to Native American admixture (Samet, Coultas, Howard, Skipper, Hanis, 1988). Pima Indians, the Native American culture with which Mexican Americans share genetic lineage, suffer from a 50% prevalence of Type 2 diabetes (Flegal, et al., 1998). Overweight, obesity and Type 2 diabetes are major risk factors for heart disease. Interestingly, as the rates of overweight and Type 2 diabetes increase in Mexican Americans, smoking and blood pressure are declining.

San Antonio Heart Study

The San Antonio Heart Study has been a major source of chronic disease-related epidemiological research in the Mexican American population in the last two decades. Results from the study have provided insight into the health status of Mexican Americans living in the Southwestern United States. In 1999, it was reported that between 1987 and 1996, the incidence of Type 2 diabetes in San Antonio, Texas tripled not only in Mexican Americans, but in non-Hispanic whites as well (Burke, et al., 1999). Although a rising secular trend was found for obesity in both groups, the rise in Type 2 diabetes persisted in Mexican Americans after adjustment for risk factors such as obesity.

One study compared incidence of Type 2 diabetes in San Antonio TX with incidence of Type 2 diabetes in Mexico City, Mexico. After controlling for age, gender, income, demographics, anthropometrics, and metabolic variance, the population of San Antonio was found to have a higher incidence of Type 2 diabetes than the population studied in Mexico City. However, exercise and diet were not considered in the study, which may have contributed to the observed difference (Burke, Williams, Haffner, Willett, Stern, 2001).

Chronic Disease and Dietary Patterns

Fruit and vegetable intake as well as saturated fat intake have been shown to be related to the relative risk of various chronic diseases. Fruit and vegetable intake has been shown to reduce the relative risk of cardiovascular disease (CVD), cancer, Type 2 diabetes, and all-cause mortality. Increased intake of saturated fats is associated with increased risk of cardiovascular disease, though the relationship with Type 2 diabetes, cancer, and all-cause mortality is not clear.

Dietary Patterns and Cardiovascular Disease Risk

Results of the first National Health and Nutrition Examination Survey Epidemiological Follow-Up Study found significant differences in risk for various cardiovascular disease parameters between individuals who consumed three or more servings of fruit and vegetable each day and those who consumed less than one serving each day (Bazzano, et al., 2002). Subjects consuming three or more servings of fruits and vegetables each day demonstrated a 27% lower stroke incidence, 42% lower stroke mortality, 24% lower ischemic heart disease mortality, 27% lower cardiovascular disease mortality, and 15% lower all-cause mortality.

These results were supported by other research in Finnish men. Men who consumed more than 5 servings of fruits and vegetables, also demonstrated lower all-cause, CVD-related and non-CVD-related mortality than men who consumed less (Rissanen, et al., 2003). A cost-analysis of reduction of coronary heart disease by reducing saturated fat intake revealed some surprising results. It was determined that reduction of saturated fat intake by 1-3% would reduce incidence of coronary heart disease by 33,200 to 97,000 events each year (Oster & Thompson, 1996). Whether the same effect would occur in the Latino population specifically is not known.

Dietary Patterns and Cancer

Similar relationships have been found between dietary patterns and reduced risk of many types of cancer. Greater fruit and vegetable intake has been associated with decreased risk of lung cancer (Holick, et al., 2002), stomach cancer (Kelley & Duggan, 2003), colorectal cancer (Michels, et al., 2000), and prostate cancer (Giovannucci, 1999).

The role of saturated fats and the development of cancer is still a controversial topic. A recent meta-analysis of studies that investigated the relationship between dietary fats and lung cancer found no significant relationship between any type of fat or cholesterol and the development of lung cancer (Smith-Warner, et al., 2002). The precise role of different types of fats in the development of breast and prostate cancer is not yet clear (Moyad, 2003).

Dietary Patterns and Type 2 Diabetes

Both total and saturated dietary fats have been associated with insulin insensitivity, a risk factor for Type 2 diabetes. Greater intakes of total and saturated fat were predictive of greater insulin insensitivity (Lovejoy, et al., 2002). These results agree with additional research that found a positive relationship between saturated fat intake and risk of Type 2 diabetes (van Dam, Willett, Rimm, Stampfer, Hu, 2002). However, the effects of total and saturated fat intake were not independent of obesity. While this suggests that obesity may also contribute to risk of Type 2 diabetes it does not exclude the possibility that obesity is the main contributing factor to the development of Type 2 diabetes.

Physical Activity

Regular physical activity can reduce the risk of death from a variety of chronic diseases (Andersen, Schnor, Schroll, Hein, 2000), including coronary heart disease, colon cancer, diabetes and hypertension (Blair, Kohl, Carlow, 1993; Paffenbarger, et al., 1994). Regular physical activity also helps to control body weight, encourages healthy bones and joints, reduces depression and anxiety, and is associated with fewer physician visits and hospitalizations (CDC, 2002). Previous guidelines recommended that 30 minutes of physical activity five times each week was sufficient to achieve protective effects. However, the Institutes of Medicine recently reported that based on their review of literature, one hour of physical activity was more appropriate than 30 minutes to achieve risk reduction (Institutes of Medicine, 2002).

Leisure Time Physical Activity

In general, racial and ethnic minorities spend less of their leisure time participating in physical activity (Crespo, Keteyian, Heath, Sempos, 1996; Yeager, 1993). Results from the Third National Health and Nutrition Examination Survey (NHANES III) demonstrated that the age-adjusted prevalence of leisure time physical inactivity in Mexican American women, age 20 years and older, was 47%. In comparison, Caucasian women had a prevalence of only 22%. In fact, Caucasians aged 70-79 had lower incidence of leisure time physical inactivity than Mexican Americans of any gender or age group (Crespo, et al., 2000). This effect was found regardless of education, family income, occupation, employment, poverty, or marital status. Other research has also demonstrated that populations with limited resources often engage in less physical activity (Giles-Corti, 2002.)

Based on data collected from NHANES III, Spanish-speaking Mexican American women had a lower prevalence of leisure time physical activity (58%) than English-speaking Mexican American women (28%), regardless of their nation of birth (Crespo, et al, 2000). In this case, language spoken was a rough measure of acculturation. English-speaking Mexican Americans were presumed to be more acculturated than their counterparts who spoke Spanish. Physical inactivity was higher among women than men regardless of acculturative status. Interestingly, the prevalence of physical inactivity of English-speaking Mexican American women (28%) was similar to that of the general U.S. population (27%), indicating that acculturation may have a positive effect on physical activity. In addition, subjects living below the poverty line had a higher prevalence of leisure time physical activity than those above the poverty line, regardless of ethnic group.

More recent research has found a relationship between leisure time physical activity (LTPA) and hypertension as well as ethnicity and hypertension (Basset, 2002). According to the National Center for Chronic Disease Prevention and Health Promotion, leisure time physical activity can be defined as discretionary or recreational time for hobbies, sports, and exercise (CDC, 2002a). Using data from the NHANES III database, Basset and colleagues found that Mexican Americans who performed at least five bouts of moderate to vigorous physical activity each week had a 25% lower prevalence of

hypertension compared to those who did not engage in leisure time physical activity. Mexican Americans were also found to have a 25% lower incidence of hypertension regardless of LPTA frequency and other confounding variables, when compared to non-Hispanic whites. The reason for this lower prevalence could have genetic, environmental, or nutritional origins.

Habitual Physical Activity

Habitual physical activity (HPA) or habitual energy expenditure can be thought of as daily activity that results in energy expenditure such as work-related activity, domestic activities, and activity for transportation (CDC, 2002a). This could include regularly taking the stairs instead of the elevator, mowing the lawn, gardening, or walking to the store rather than driving. These types are different than fitness-enhancing activities such as swimming, jogging, weight lifting, and cycling, which also increase energy expenditure, though are not necessarily a part of daily life. There is significant evidence that fitness is associated with reduced risk of many chronic diseases such as insulin resistance (King & Kriska, 1992; Kriska & Bennett, 1992) and hypertension (Paffenbarger, et al., 1983, 1991; Wareham, et al., 2000). Not until recently, has the role of habitual physical activity in prevention of coronary heart disease been more clearly defined. Unfortunately, no research regarding chronic disease risk and habitual physical activity in the Latino population has been published.

Recent research concluded that reduced habitual physical activity was strongly associated with metabolic cardiovascular syndrome (Wareham, et al., 1998), defined as a cluster of metabolic abnormalities including hypertriglyceridemia, low high-density lipoprotein (HDL) cholesterol, glucose intolerance, and hypertension. This effect was found in both males and females between the ages of 30 and 40. In this case total energy expenditure was measured by constant heart rate monitoring and depended on the individualized linear relationship between energy expenditure and heart rate. Further research suggested that overall energy expenditure was important in maintaining or improving glucose tolerance (Wareham, Wong, Day, 2000). Male and female subjects completed glucose tolerance testing and a 4-day physical activity assessment by heart rate monitoring. Two-hour glucose level was negatively correlated with physical activity level

in both males and females. In addition it has been shown that attempts to increase fitness by physical training may not lead to increased overall energy expenditure. Individuals may compensate for intense activity by resting during other parts of the day (Goran & Poehlman, 1992). The authors concluded that it may be counterproductive to emphasize intense physical activity for all individuals, especially those who are overweight or obese and who may have more difficulty with intense physical activity. Emphasizing increased habitual energy expenditure by increasing habitual physical activity may be a more effective way to increase overall energy expenditure.

In addition to the association between improved glucose tolerance and habitual physical activity, results from this same study demonstrated an analogous association between habitual physical activity and blood pressure. Increased habitual energy expenditure was associated with decreased blood pressure in 775 males and females between the ages of 45 and 70 (Wareham, 2000b). The difference between mean systolic/diastolic blood pressure between the top and bottom quintiles of physical activity were 6.3/4.4mmHg in men and 10.7/5.9 mmHg in women.

Physical Activity and Television Watching

Sedentary behaviors, such as watching television, are also linked to obesity. Women who watched four hours of television per day were at least twice as likely to be obese as those watching less than one hour each day (Tucker & Friedman, 1989). More recently, studies have demonstrated the effect of television watching on cardiovascular disease risk factors (Fitzgerald, Kriska, Periera, 1997; Kronenberg, et al., 2000). Television watching had an unfavorable effect of anthropometric measurements including body mass index, waist circumference, waist to hip ratio, and subscapular and tricep skinfold thickness. Triglycerides were significantly positively associated with television watching in women. There was no significant relationship between HDL and television watching in women, though there was in men (Kronenberg, et al., 2000).

Television watching has also been associated with several biochemical markers of obesity and cardiovascular disease. Average number of hours watched weekly was significantly and positively associated with low-density lipoprotein (LDL) cholesterol. In addition, hours watched was significantly and negatively associated with HDL

cholesterol and apolipoprotein A1 (Fung, et al., 2000). High LDL cholesterol, low HDL cholesterol and low apolipoprotein A1 are all associated with increased risk of cardiovascular disease (Wu, 1999). Finally, increased television watching was also significantly positively associated with levels of leptin, a protein elevated in overweight individuals.

Body Image

Body image, according to Braitman and Ramanaiah, are “personal evaluations and affective experiences regarding one’s physical attributes and attractiveness” (1999). People evaluate and change their physical appearance to conform to cultural standards (Bem, 1981). Research has confirmed that Western culture values thinness in the female body (Butler, 1993; Lamb, 1993) and the concept of the ideal figure is getting thinner (Stice, 1994). Women internalize ideals promoted by media messages, leading to the promotion of thinness; consequently women strive toward thinness (Myers, 1992). If the media are able to promote an ideal of body image that strongly, immigrant women might also face the same pressures as they become more acculturated, leading to a distorted body image in this population as well.

There is evidence that body image disturbances and eating disorders develop in women who immigrate to the United States. It has also been suggested that these psychological phenomena are “culture-bound” since culture seems to play a significant role in their development (Crago, 1996; Pate, Pumariega, Hester, Garner, 1992). This is a controversial topic because there is little standardization of research methods. Psychological research has used race, ethnicity, and culture interchangeably, where they are clearly different concepts.

Recent studies of body image and disordered eating patterns, specifically in Latino and/or Mexican American women have revealed some discouraging trends. Several years ago it was determined that body dissatisfaction was associated with increased acculturative stress. Latino women who were not yet highly acculturated chose larger silhouettes of women’s bodies as their ideal body than their more acculturated cohort (Lopez, 1995).

Among a sample of female Latino college students, a significant discrepancy was found between self-perceived body image and ideal body image (Altabe, 1998). Self-perceived body image was measured using a variety of different scales, including figure scales and self-ratings, as well as the identification of reported dissatisfaction with different body sites. In addition, these women demonstrated body dissatisfaction almost as high as Caucasian American women. Other research has shown that 6th and 7th grade Latino girls demonstrated more body dissatisfaction than their Caucasian counterparts based on the Body Dissatisfaction Scale of the Eating Disorder Inventory (Robinson, et al., 1996). In this study, body dissatisfaction was less related to actual body fatness in Latino girls than in Caucasian girls, suggesting a greater risk of developing clinical eating disorders.

The effect of acculturation on disordered eating patterns, specifically in Mexican American women, is also significant. Second-generation Mexican American women demonstrated higher pressure to gain weight based on the EAT-26, a 26-item Eating Attitude Test than Mexican American women of other generations (Chamorro & Florez-Ortiz, 1998). The investigators attributed this to adoption of the U.S. societal ideal of thinness, which is likely to conflict with family members' ideals, who still consider a heavier weight healthy. While these women feel the need to match U.S. societal ideals, their family members still encourage a heavier weight.

In contrast, a meta-analysis of 35 research studies that examined the relationship between acculturation and eating pathology attempted to standardize and summarize results of known data of acculturation and eating disorders (Wildes, Emery, Simmons, 2001). Studies that were included met four criteria. First, they contained at least one sample of non-white subjects. Second, there were females in both the control and experimental groups. Third, the study contained at least one type of quantitative measure of body dissatisfaction or eating disturbance. The last criterion required that data be presented in a form allowing the calculation of at least one effect size. Wildes and associates (2001) found no relationship between acculturation and eating disorder in minority women. Based on effect size calculations, comparing whites with non-whites, there was no difference between more acculturated women and less acculturated women. However, there were insufficient data to calculate effect sizes specifically for Latino

groups. Consequently, Latinos were placed in an “other” group and it is difficult to determine the precise role that Latino ethnicity plays in body image, based on this meta-analysis.

In addition to evidence that Latino women are at increased risk of body image distortion, there is evidence that minority women may not seek treatment for eating disorders. Cachelin, Veisel, Streigel-Moore, and Barzegarnazari (2000) found that only 19% of a diverse minority sample of women with documented eating disorders sought treatment. Further investigation into the same population by face-to-face or telephone interview found that 59% reported financial difficulties and 48% reported lack of insurance as barriers to seeking treatment (Cachelin, Rebeck, Veisel, Streigel-Moore, 2001). In contrast, only 10% were concerned about counselors not being of the same ethnic background.

It is clear that Western culture has a distorted image of the ideal female figure, which has led to increased incidence of eating disorders and body dissatisfaction among Caucasian females. If the effect of the media is the same on the Latino population as it is on Caucasian females, it is important to determine if the incidence of body image distortion and eating disorders increases. In addition, it appears that even those minority women with diagnosed eating disorders were unlikely to seek treatment.

Audiences with Limited Resources

The United States Department of Agriculture (USDA) defines limited-resource audiences as “those individuals and families struggling to maintain supportive environments with limited or insufficient resources” (1991). These individuals have incomes at or below 185% of the federally defined poverty level, which is dependent on family size. Individuals that fall into this category include individuals who can be considered “at risk” of falling into poverty.

There are several characteristics common to most limited resource audiences. The first is the notion of constant “crisis” (USDA, 1991). Many of these individuals and families live from paycheck to paycheck and often run out of money before the next source of income arrives. Daily activities and necessities that more affluent populations take for granted, such as having money for food and clothing, become “crises” to limited

resource audiences. Finding money to feed a family three times a day or being able to purchase clothing becomes an incredible challenge.

Constant states of “crisis” also shorten future outlook. As Maslow’s Hierarchy of Needs indicates, an individual is incapable of addressing higher level needs until the most basic needs have been met (Maslow, 1954). In this case, until food security is achieved, long-term goals such as education or even planning a more healthful diet are secondary concerns.

Other important interrelated characteristics of audiences with limited resources are feelings of low self-esteem, feeling of hopelessness, and an external locus of control (Rotter, 1966). Locus of control can be defined as the extent to which people believe that their actions influence and affect their own destiny. Individuals with an internal locus of control tend to have higher self-esteem (Klonsky, 1990). The more external the locus of control is perceived to be, the more they sense that their actions are inconsequential, since they are not in control of their life. All three characteristics combine to perpetuate a feeling of inadequacy. This emphasizes the need to pay attention to limited resource audiences’ needs and the impact their beliefs may have on achieving behavior change.

Expanded Food and Nutrition Education Program

The Expanded Food and Nutrition Education Program (EFNEP) is funded through the Cooperative State Research Education and Extension Service of the United States Department of Agriculture (USDA) and operates within all 50 states in the U.S., as well as American Samoa, Guam, Micronesia, Northern Marianas, Puerto Rico and the Virgin Islands (National Agricultural Research, Extension and Teaching Policy Act, 1977). The goal of the program is to help audiences with limited resources to acquire the knowledge, skills, attitudes and behavior change, needed to develop nutritionally sound diets as well as the improvement of the total family diet.

The program has an adult portion as well as a youth portion. The target adult population includes low-income homemakers who are responsible for preparing the family’s food. Families with young children are emphasized. Adult EFNEP aims to improve food choices, improve management of food budgets, as well as learn how to better process, prepare and store foods safely. Education is conducted in small groups or

individual classes involving 10-12 lessons and hands-on learning activities. Educators are volunteers or nutrition paraprofessionals who tend to live in the areas that they serve. Youth EFNEP also provides nutrition education. However, education is provided in schools or after school programs as well as day and residential camps. The importance of physical activity, avoidance of substance abuse, and other health issues are also addressed in these classes.

Special Supplemental Nutrition Program for Women, Infants, and Children

The Special Supplemental Nutrition Program for Women, Infants and Children, popularly known as WIC, is a federal nutrition assistance program run by the U.S. Department of Agriculture's Food and Nutrition Board. The goal of WIC is to "safeguard the health of low-income women, infants, and children up to the age of five who are at nutritional risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care (USDA FNS, 2003a)." WIC operates at the federal level by granting individual states funding for state-level WIC programs. Eligibility requirements are based on age, pregnancy and income. Pregnant or postpartum women, infants, and children up to age five may participate. The participants' gross income (before taxes are withheld) must fall at or below 185 % of the U.S. Poverty Income Guidelines. In addition, a proof of state residency is required, and individuals must be at "nutritional risk," as determined by a health professional. In January of 2003 alone, Virginia WIC served 122,538 women, infants, and children, and 7,575,914 nationally (USDA Food and Nutrition Service, 2003b). The table below outlines income requirements based on family size and shown in table 2.1.

Table 2.1: Income Eligibility Guidelines (effective 7/1/02 – 6/30/03)

Family Size	Annually	Monthly	Weekly
1	\$16,391	\$1,366	\$316
2	\$22,089	\$1,841	\$421
3	\$27,787	\$2,316	\$535
4	\$33,485	\$2,791	\$644
5	\$39,183	\$3,266	\$754
6	\$44,881	\$3,741	\$864
7	\$50,579	\$4,215	\$973
8	\$56,277	\$4,690	\$1,083
For each add'l family member, add	+\$5,698	+\$475	+\$110

Source: United States Dept. of Agriculture Food and Nutrition Service, 2002

The two major types of nutritional risk that WIC recognizes for program eligibility are:

- 1) Medically-based risks (designated as "high priority") such as anemia, underweight, maternal age, history of pregnancy complications, or poor pregnancy outcomes.
- 2) Diet-based risks such as inadequate dietary pattern.

Based on federal guidelines, a physician, nutritionist, or nurse must determine nutritional risk. This health screening is free to program applicants. In Virginia, WIC participants receive food assistance by monthly, bi-monthly or tri-monthly check distribution to purchase specific WIC-designated foods. WIC-designated foods include iron-fortified infant formula and infant cereal, iron-fortified adult cereal, vitamin C-rich fruit and/or vegetable juice, eggs, milk, cheese, peanut butter, dried beans or peas, tuna fish, and carrots. Special infant formulas and certain medical foods may be provided when prescribed by a physician or health professional for a specified medical condition (USDA Food and Nutrition Service, 2003).

Parklawn Family Center

The Parklawn Family Center (PFC) is supported by the Fairfax County Public School system (Parklawn, 2003). The Parklawn Family Center, in Alexandria, Virginia, was created as a response to a need to improve student performance at Parklawn Elementary School and actively involve parents as partners in their children's education. Their goal is to inform families of the resources in the community that will help support

their learning and well-being. As a part of out-reach, the Parklawn Family Center holds classes on a daily basis that cover a broad variety of content areas, including reading classes, English classes, and nutrition classes.

CHAPTER III

Methodology

This study was designed to be an exploratory study to guide further research studies of Latino women in Virginia. The main goal of the study was to examine general trends in acculturation and various health habits of Latino women with limited resources living in northern Virginia, using a sensitive measure of acculturation. Three objectives of the study were 1) to determine the association between the following dietary behaviors: fruit and vegetable intake and saturated fat avoidance, and acculturative status in limited resource Latino women living in Northern Virginia; 2) to assess the relationship between acculturation and physical activity; and 3) to determine if differences in body image were associated with differences in acculturation in limited resource Latino women. The study design was cross sectional, assessing acculturation, sociodemographic variables, and selected health habits.

The population targeted by this study was Latino women with limited resources, between the ages of 21 and 50 years old, living in northern Virginia. Northern Virginia has a diverse Latino population, which had not previously been studied. Participants in the Arlington County Expanded Food Nutrition Education Program (EFNEP), Arlington County Women, Infants and Children (WIC) program, and women attending classes at the Fairfax County Parklawn Family Center were recruited for the study. All women who were enrolled as study subjects were classified as limited resource and qualified for at least one food assistance program. Limited resource was defined by USDA guidelines.

Overview of Survey Instrument

Each study subject completed a confidential and anonymous questionnaire that provided information regarding sociodemographic data, acculturative status, and selected health habits. Participants filled out two different forms, the Expanded Food and Nutrition Education Program's Family Record and a Health Habits Questionnaire (HHQ). Sociodemographic data such as age, income, and the number of children were collected using the EFNEP Family Record. The subjects' acculturative status was determined using the Short Acculturation Scale for Hispanics (Marin, Sabogal, Marin, Otero-Sabogal,

Perez-Stable, 1987), which was included in the Health Habits Questionnaire. The HHQ was a multipurpose instrument, assembled by the researchers, combining components of different, previously tested instruments. The HHQ provided information about fruit and vegetable intake, saturated fat avoidance, physical activity and body image. In addition, information regarding administration date, location and a researcher-assigned subject ID number was recorded in the Family Record and HHQ to identify subjects while maintaining confidentiality. A trained translator from the Department of Foreign Languages and Foreign Literatures at Virginia Polytechnic Institute and State University translated the entire survey instrument into Spanish. The translation was then reviewed by three other translators, including a native Spanish-speaking Program Assistant familiar with the target population, a native Spanish-speaking faculty member and a non-Native faculty member of the Department of Foreign Languages and Literatures. Program Assistants (PAs) are paraprofessionals employed to teach nutrition education classes. Program Assistants are usually indigenous to their target audience. The language was kept as simple as possible to maintain a low reading level. The number of polysyllabic words was held to a minimum and directions for answering questions kept brief. The questionnaire was determined to be at the eighth grade reading level by the SMOG test (McLaughlin, 1969). The length of the questionnaire was restricted so that the time required to complete the survey instrument was no more than 30 minutes to minimize respondent burden. The Family Record included 22 items, the acculturation scale included 12 items and the HHQ included 17 items. The Institutional Review Board (IRB) for Research Involving Human Subjects at the Virginia Polytechnic Institute and State University approved the survey instrument. (See the Appendix, page A1.)

Acculturation Scale

The Short Acculturation Scale for Hispanics, designed by Marin and associates, was used to assess acculturation (1987). It was a twelve-item questionnaire, designed to assess acculturation by measuring language use, media preference, and ethnic-social relations. The first five questions were “language use” questions. The next three were “media” preference questions and the remaining four questions were “ethnic-social

relations” questions. Scoring was done on a Likert scale. Scores ranged from one to five, with one as the lowest and five as the highest acculturative status.

The overall reliability of the scale produced a Cronbach’s α of 0.92 for all items, 0.90 for the language items, 0.86 for the media preference items, and 0.78 for the social relations items. The overall validity of the acculturation scale was 0.83, 0.86 for the language items, 0.60 for the media preference items, and 0.66 for the social relations items (Marin, et al., 1987).

Fruit and Vegetable Intake

Fruit and vegetable intake was assessed by a self-administered 24-hour dietary recall of only fruits and vegetable. Other methods that are commonly used to assess dietary intake, such as food frequency questionnaires and multiple-day diet records were considered but determined not to be appropriate for this study. Food frequency questionnaires have been shown to be valid and reliable, however, they tend to overestimate actual intake (Jain, Harrison, Howe, Miller, 1982; Mullen, et al., 1984). In addition, food frequency questionnaires do not allow for open-ended responses about different items consumed. As a result, foods that might be culturally unique would not be reported if they were not included in the food frequency questionnaire. Multiple-day diet records were not used because they require several days to complete. Food records also place greater burden on the respondent because of the time required to complete them.

The validity and reliability of the 24-hour dietary recall in population research has been documented (Woteki, 1992). Whereas most dietary recalls assess all foods eaten and the manner in which they were prepared, the recall used in this study was targeted toward fruit and vegetable intake. Dietary recall presented the most feasible option because it could be completed within a 30-minute time frame. In addition, the recall would allow subjects to document intake of uncommon fruits and vegetables and dishes characteristic of their cultural background. Finally, the 24-hour recall could provide sufficient data to assess number of servings of fruits and vegetables as well as the variety of items chosen. (See the Appendix, pages A17-A18).

Subjects were prompted for each meal of the day as well as snacks. They were encouraged to include not only the food or beverage type, but the amount as well. The variety of fruits and vegetables consumed was determined by counting the number of

different items, each of fruits and vegetables, listed in the 24-hour period. The number of servings was calculated if subjects provided sufficient data to determine a serving size. The United States Department of Agriculture's Food Guide Pyramid serving sizes were used as a guide to calculating serving sizes (1996). Data were included if for each item listed, there was 1) a corresponding serving size and 2) an appropriate unit measure. Unit measures for fruits were cup sizes, slices, or an indication of the portion of the fruit consumed. For instance, reporting that one small apple, a half of a grapefruit, a slice of melon, or a medium glass of juice was consumed was considered adequate information. In the case of vegetables, serving sizes were coded if subjects provided the amount of a cup of vegetable or vegetable juice consumed. Finally, if the various components of a mixed dish, such as stew, were included with amounts, these were coded just like fruits and vegetables. If amounts were not provided, these data were not included.

Saturated Fat Avoidance

Saturated fat avoidance was measured using two questions from a saturated fat/cholesterol avoidance scale developed for and tested with Mexican Americans by the San Antonio Heart Study (Knapp, et al., 1988). The two questions chosen focused on food choices representing a range of fats with high, moderate, and low saturated fat content. (See the Appendix, page A18, numbers 18 and 19.) They had been tested by Knapp et al. to meet two criteria. First, they needed to be able to discriminate between subjects who scored in the lowest and highest tertiles of the Keys equation. The Keys equation is used to summarize the atherogenicity of a given diet based on the intake of saturated fat, polyunsaturated fat, and cholesterol in a 24-hour period. Second, the question had to discriminate between subjects who reported eating a low-fat/low-cholesterol diet specifically to prevent a heart attack versus those who did not.

The two questions used in the questionnaire sought to determine the type of milk consumed and the type of oil or fat that was used for cooking. Milk fat was chosen because previous research has shown that 66% of Latinos consume whole milk, as compared to only 46% of non-Hispanic whites (Winkelby, et al., 1994). The type of fat used for cooking was chosen because of previous research that showed changes in the

consumption by Mexican Americans of specific types of fat after immigration to the United States (Romero-Gwynn, et al., 1993).

Responses were scored as 0, 0.5, and 1 for maximum fat avoidance action, moderate fat avoidance action, and minimal fat avoidance action, respectively. The scoring protocol was used as outlined by Knapp and associates. Table 3.1 below shows the scoring criteria for each type of milk or cooking fat used. A total saturated fat avoidance score was determined by adding the scores together.

Table 3.1: Scoring for Saturated Fat Avoidance Scale

Score	Milk Type	Cooking Fat/Oil Type
0	Skim milk Evaporated milk No milk	Vegetable oil No oil or fat
0.5	1% milk 2% milk	Margarine Shortening
1.0	Chocolate milk Whole milk	Meat Fat Lard Butter

Physical Activity

Physical activity and related factors were measured to determine the amount of leisure time and habitual physical activity, the perceived importance of physical activity, and the number of hours of television watched. The use of several different physical assessment tools was considered (Baecke, Burema, Frijters, 1982; Kannel & Sorlie, 1979; National Center for Health Statistics, 1994). However, the use of an entire assessment tool required too much time in conjunction with the acculturation scale, the Health Habits Questionnaire (HHQ), and the Family Record, also included in this study. The questions used in the HHQ were adapted from the habitual physical activity assessment tool designed by Baecke (1982) and associates as well as the Multidimensional Body Self-Image Relations Questionnaire designed by Cash (2000).

In order to obtain a rough measure of physical activity, three questions were designed to obtain information about the amount of time spent engaging in certain activities. One question, adapted from existing physical assessment tools, sought to determine the number of days each week that an individual spent 30 minutes or more

engaged in leisure-time physical activity (LTPA). Another question, also adapted from other assessment tools, was included to determine the number of days each week an individual spent 30 or more minutes engaged in habitual physical activity (HPA). The number of days each week that an individual engaged in at least 30 minutes of either LTPA or HPA was broken down into intervals. The following intervals were used: 1) zero days each week, 2) one to two days, 3) three to four days, 4) five to six days, or 5) seven days each week. These intervals corresponded to a score of 1 to 5 on a Likert scale. In this case, an individual engaging in less than 30 minutes of physical activity each day would score a one on the Likert scale. An individual, who engaged in at least 30 minutes of physical activity three days each week, would score a three on the Likert scale used (See the Appendix, page A19, numbers 20 and 21).

Another question, obtained from the MBSRQ (Cash, 2000) was used to determine the perceived importance of physical activity. Subjects were asked how strongly they agreed with the statement that physical activity was important. The subjects' responses were scored on a Likert scale ranging from one to five. A score of one signified strong agreement that physical activity was important and a score of five signified strong disagreement that physical activity was important. The subjects who did not either strongly agree or somewhat agree that physical activity was important were combined into one category. In other words, those who scored a three, four, or five were placed into one category, with a score of three for the purpose of data analysis. Three new groups were created, whose responses were categorized as strongly agree that physical activity was important, somewhat agree that it is important and did not agree that physical activity was important. Regrouping the responses reduced the influence of the few subjects who disagreed that physical activity was important in later data analyses.

Finally, since it is known that television watching is associated with obesity and overweight, as well as physical inactivity, in the U.S. population, one question describing the number of hours of TV watched per day was included. Responses were also on a Likert scale, reflecting the number of hours that individuals spent watching TV each day. The numbers of hours of TV watched were broken down into the following intervals: 1) 0 - 1 hours; 2) 1.5 - 2.5 hours; 3) 3 - 4 hours; 4) 4.5 - 5.5 hours, and 5) more than 6 hours. These intervals corresponded to scores of one through five respectively on the

Likert scale used. For instance, an individual who watched one or fewer hours of TV each day scored a one on the Likert scale, whereas an individual who watched three to four hours of TV would have scored a three on the Likert scale. See the Appendix, page A20, number 23.)

Body Image

Body image was assessed because of reports that acculturation may be damaging to self-image, potentially leading to body dissatisfaction and eating disorders (Altabe, 1998; Chamorro & Florez-Ortiz 2000; Robinson, et al., 1996). Larger assessment tools were also considered for use in this study, such as the Eating Disorder Inventory (EDI), which had been used in psychological studies (Garner, Olstead, Polivy, 1983). It is a 64-item instrument assessing several behavioral and psychological traits common in two eating disorders, bulimia and anorexia nervosa. The EDI is reported to require approximately 15-20 minutes to complete, making it too long to use with the other assessment tools used in the study. The Eating Attitudes Test – 26 (EAT-26) has also been used to assess eating disorder symptomatology in Latino adolescents (Garner, Olmstead, Bohr, Garfinkel, 1982). It was also too long to be administered in conjunction with the other assessment tools in this study.

Two questions regarding body image were taken from the Multidimensional Body-Self Relations Questionnaire (MBSRQ) (Cash, 2000). The MBSRQ was designed to be used with subjects 15 years and older. The full version is a 69-item with 10 subscales: Evaluation and Orientation vis-à-vis Appearance, Fitness, and Health/Illness, plus Overweight Preoccupation, Self-Classified Weight, and the Body Areas Satisfaction Scale (BASS). The questions selected from the scale were used to assess a fear of being or becoming fat, as well as dieting to lose weight. They were selected because they provided a general assessment of body image and dieting behavior. The assessment tool has been tested for validity and reliability (Brown, Cash, Mikulka, 1990). Responses were recorded on a Likert scale. Scores ranged from one through five, where one corresponded with strong agreement with the statement posed in the question and five corresponded with strong disagreement.

Responses to the body image questions were scored in the same manner as reported importance of physical activity. A Likert scale was used with possible scores ranging from one to five. The first question used to assess body image asked women how strongly they agreed that they were concerned about being or becoming fat. Subjects who strongly agreed that they were concerned about being or becoming fat scored a one on the Likert scale. Likewise, those who strongly disagreed that they were concerned about being or becoming fat scored a five. Very few subjects reported not being concerned with being or becoming fat (responses three, four, and five to question 26). All of these responses were treated as one, creating a ternary scale with responses categorized as strongly agreeing, somewhat agreeing or not agreeing that the subject was concerned about being or becoming fat.

The second question used to assess body image asked women how strongly they agreed that they were on a weight loss diet, with scoring also done on a Likert scale. Subjects who strongly agreed that they were on a weight loss diet scored a one on the Likert scale. Likewise, those who strongly disagreed that they were on a weight loss diet scored a five. Few subjects did not agree that they were on a weight loss diet (responses three, four, and five to question 27). All of these responses were treated as one, creating a ternary scale where responses were categorized as strongly agreeing, somewhat agreeing or not agreeing that the subject was concerned about being or becoming fat. This new ternary scale was used for data analysis.

Pilot Testing

The survey instruments were pilot tested by the investigators with six limited resource Latino women, between the ages of 21 and 50, living in Roanoke, Virginia and Blacksburg, Virginia. These women were recruited through a faculty member of the Department of Foreign Languages and Literatures. The women were recruited from a semester-long service-learning program in which students were assigned to help Latinos with limited resources in Southwest Virginia (Tilley-Lubbs, 2003a). Students involved in the service-learning program assist families with basic services ranging from transportation to medical, dental and social service appointments to organizing clothing and toy donations and translating health and social services related brochures. The

service-learning student accompanied the investigator to the homes of the pilot subjects. The majority of respondent were from Mexico, though some were from Honduras, and were anticipated to represent the study's target population. Respondents were asked to fill out the survey and to comment on the clarity of questions, word choice, and any other suggestions they might have to make the survey easier to read and fill out. Several changes in word choice were made during the pilot phase to compensate for slight differences in word choice between different nationalities of Latinos.

Recruitment of Study Subjects

Subjects were recruited from the three previously mentioned programs in northern Virginia. Arlington County and the city of Alexandria were chosen because they had denser Latino populations than other areas in northern Virginia. In addition, the chosen locations served limited-resource Latino women. Fifteen subjects were recruited from the Expanded Food and Nutrition Education Program (EFNEP) by the bilingual Arlington County Program Assistant. Initially, all subjects were to be recruited from the EFNEP program. However, to increase the number of subjects, subjects were recruited from the Women, Infants, and Children (WIC) program in Arlington County. Recruitment occurred on-site with the assistance of bilingual WIC employees who explained the nature of the study to eligible participants. WIC participants and EFNEP participants were expected to be similar because both programs have similar enrollment requirements. In addition, while WIC targets women, infants and children up to five years old, EFNEP targets homemakers with young families. Recruitment from Fairfax County Public School's Parklawn Family Center (PFC) was also begun to increase subject enrollment. The PFC was included as a recruitment site after one of the EFNEP classes was held at the Center. The teachers employed at the PFC agreed to participate and were trained on-site by the researcher. Visitors to the PFC are family-members of students enrolled in Parklawn Elementary School. Though services from the Parklawn Family Center are not restricted to limited resource individuals, the vast majority of individuals qualify for the free or reduced price lunch through the School Lunch Program. The study subjects who were enrolled all qualified for the School Lunch Program according to PFC teachers.

Administration of the Survey Instrument

The instruments were available to study participants in either Spanish or English, depending on their language preference. The investigators, the Arlington County EFNEP Program Assistant, and instructors at the Parklawn Family Center administered the survey instruments. In all cases, the administrator was bilingual and had been trained by the researcher to administer the survey instrument. The Family Record, acculturation scale and Health Habits Questionnaire (HHQ) were administered in three different locations: EFNEP classes, the Arlington County WIC office and the Fairfax County PFC. The method of administration varied somewhat by location due to the nature of the recruitment environments. However, all subjects were required to read and sign an informed consent before proceeding with the survey instrument. If necessary, the informed consent was read to the subject. All subjects were compensated with a \$10 gift certificate upon completion of the questionnaires.

Administration at EFNEP classes

The instruments were administered on the first day of class for subjects recruited through the EFNEP program. Individuals enrolled in EFNEP participate in several nutrition education classes. As stated previously, subjects were surveyed at the beginning of the first day of class so as not to confound data with nutrition knowledge acquired during the duration of the class. Two EFNEP classes were surveyed and it was estimated that 10 subjects would be recruited per class. The first class to be surveyed was held at the Parklawn Family Center. Participants in this class were distinct from individuals that were recruited by the Parklawn Family Center. In the case of the EFNEP class, the Family Center simply provided a location in which classes were held. Both the Program Assistant and researcher were present for questionnaire administration.

A second EFNEP class was recruited for the study as well. This class was held at the Virginia Gardens Community Center in Arlington County and the Arlington County EFNEP Program Assistant administered the questionnaires. All questionnaires were completed individually. Completed questionnaires were mailed or faxed to the investigator at Virginia Polytechnic Institute and State University.

Administration at WIC

The survey instruments were administered to subjects by the researchers at the Arlington County WIC clinic. Instrument administration occurred only during check distribution hours, which occurred Mondays from 1-6 pm, Wednesdays 1-5 pm, and Thursdays 8-12 am. Check distribution days were chosen to minimize the chance of double sampling of the same woman during the study time-span, since participants were only eligible to receive checks once every three months. Two Mondays (2/24/2003 and 3/24/2003), three Wednesdays (2/5/2003, 3/26/2003, and 4/9/2003) and two Thursdays (3/27/2003 and 4/10/2003) were selected for questionnaire administration. These days were selected in order to sample subjects from each possible check distribution. In addition, most data collection sessions were conducted in the same week in order to capture individuals who may have missed a prior appointment and chose to attend the subsequent check pick up session. The Arlington County WIC supervisor estimated that approximately 120-130 Latino women could be recruited during the seven days in which data were collected.

Checks provide participants with additional money to purchase WIC-designated foods. In some cases women had to recertify their enrollment with WIC to ensure that they still met all requirements for participation in the WIC program. Those women who had to recertify their eligibility still received their checks that day and were considered possible study participants.

Each participant signed in with the WIC staff for their appointments. Participants that had signed in were directed to the researchers if they were Spanish speakers or had Latino surnames. The WIC staff members were mostly Latinos or Spanish speakers. The researchers also approached Spanish-speaking women to recruit them for study participation. The questionnaire was completed by subjects in the waiting room of the WIC office while the clients were waiting for their appointments. Waiting times for checks varied by time of day and day of the week. Waiting times on Monday and Wednesday afternoons were between ten minutes and one hour and less than 45 minutes on Thursday mornings. Waiting times on Thursdays mornings were shorter because fewer women made appointments for check pick up those days. Women who had to

recertify their WIC enrollment tended to have longer waiting times than those who did not have to recertify.

Administration at Parklawn Family Center

The Family Record and the Health Habits Questionnaire were administered by native, Spanish-speaking teachers at the Parklawn Family Center at the beginning of four different English reading classes. The teachers who administered the survey instrument had been present during the EFNEP class held at the Parklawn Family Center previously. The researcher also trained the teachers to administer the instrument. Teachers were provided with written instructions and contact information in case they had any questions. The teachers at the facility estimated that 15 subjects could be recruited. Once completed, the instruments were collected by the researcher.

Hypotheses

Dietary patterns

1. More acculturated Latino women have higher intakes of fruits and vegetables, in terms of serving numbers, than less acculturated Latino women.
2. The number of raw fruits and vegetables eaten will be lower among less acculturated Latino women.
3. The variety of fruits and vegetables consumed will be greater in more acculturated women than less acculturated women (as measured by the total number of fruits and vegetables).
4. More acculturated Latino women will exhibit more saturated fat avoidance habits (meaning they will choose foods lower in saturated fat) than less acculturated Latino women.
5. Limited resource Latino women with higher acculturative status will have higher intakes of fruits, in terms of serving numbers.
6. More acculturated Latino women will consume a greater variety of fruits.
7. Limited resource Latino women with higher acculturative status will have higher intakes of vegetables, in terms of serving numbers.
8. More acculturated Latino women will consume a greater variety of vegetables.

Physical Activity

1. Greater acculturative status will be accompanied by increased leisure time physical activity.
2. Greater acculturative status will be accompanied by decreased habitual physical activity.
3. The reported importance of physical activity will be higher in Latino women with a higher acculturative status.
4. More acculturated Latino women spend more time watching television each day than less acculturated women.

Body Image

1. More acculturated Latino women will be more concerned about being or becoming fat.
2. More acculturated Latino women will diet more frequently to achieve weight loss.

Data Handling and Analysis

Information obtained from the survey instruments was entered into data set files by the researcher, using Microsoft Excel 2000, and imported into SAS version 8.02 for data analysis (SAS, 2001).

Descriptive Data of Independent and Dependent Variables

Descriptive data were generated to describe frequency and central tendency of dependent and independent variables. The independent variables that were to be used were tested for correlation using Pearson's Product-Moment Correlation. These variables included age, income, acculturation, the squared term of acculturation, body mass index, the number of children in the household, the practice of breastfeeding, and the location from which the subject was recruited. The squared term of acculturation was included as an independent variable to detect a polynomial relationship between acculturation and dependent variables. Using only the acculturation score would only detect a linear relationship between acculturation and dependent variables. One-way analysis of variance (ANOVA) and Tukey's HSD test were conducted to determine if there was a

significant difference in each of the independent variables based on the location from which they were recruited. One-way ANOVA was also conducted to determine if there were significant differences between the recruitment groups in the independent variables. Univariate analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA) were conducted to test the research hypotheses. One-way analysis of variance (ANOVA) and Tukey's HSD test were also conducted to detect differences in the dependent variables between recruitment groups. The dependent variables regarding dietary patterns were fruit and vegetable intake in terms of variety and serving numbers as well as the saturated fat avoidance score. Dependent variables in the physical activity assessment were the number of hours of leisure time physical activity, hours of habitual physical activity, the importance of physical activity, and hours spent watching television. The dependent body image variables tested were the fear of being and becoming fat as well as dieting to lose weight. The researcher, under the guidance of an experienced statistician, completed all data analyses, with the exception of descriptive analyses. Statistical significance was determined by a p-value less than 0.05.

Women recruited from Women, Infants and Children (WIC), the Expanded Food and Nutrition Education Program (EFNEP) and the Parklawn Family Center were all analyzed together. Women from the Parklawn Family Center were older and had higher household incomes than women from WIC and EFNEP, however, they were treated as one group for several reasons. All three groups qualified for USDA nutrition assistance programs, indicating that they were audiences with limited resources.

Pregnant women were excluded from data analyses for several reasons. Most importantly, it was not possible to accurately assess body mass index in these women due to changes in body weight during pregnancy, especially without knowledge of the stage of gestation. Pregnant women have increased energy demands (Catalano, 1999). An increase in fruit and vegetable consumption or change in type of fat consumed could be due to increased energy needs and not a reflection of differences in acculturative status. In addition, some women develop taste aversions and cravings during pregnancy, which could have possibly influenced food choice (Pope, Skinner, Carruth, 1992; Schwab & Axelson, 1984, Tierson, Olson, Hook, 1985). Finally, it is known that pregnancy can

influence body image in women (Davies & Wardle, 1994; Turton, Hughes, Bolton, Sedgewick, 1999).

Acculturation Score

The Short Acculturation Scale for Hispanics was used to determine a raw and average acculturation score for each participant. The raw acculturation score was the sum of the score for each response to the 12 questions. The average acculturation score was the raw score divided by twelve. Principal Components Analysis (PCA) was used to generate an acculturation score that could be used in later data analyses. The new score that was generated by PCA represented a weighted mean variance score. In other words, it was a condensed score of all 12 questions representing the contribution of each response to an overall acculturation score. The first principal component factor was standardized and used as the new acculturation score. Eigenvector analysis was used to determine the contribution of each question to the overall new acculturation score.

Dietary Patterns

Fruit and vegetable intake hypotheses, as well as saturated fat avoidance were tested using analysis of covariance (ANCOVA). The independent variables used in the ANCOVA were age, income, acculturation, acculturation score squared, body mass index, number of children, breastfeeding and recruitment group. Only univariate analysis of covariance was conducted on fruit and vegetable data. Multivariate analysis of covariance was not considered appropriate. Whereas most subjects provided enough information to determine the number of different fruits and vegetables consumed, most subjects did not provide sufficient information to determine the number of servings of fruits and vegetables. Given these differences in response rate, multivariate analysis would not provide an accurate analysis of data. Multivariate analysis of covariance would have analyzed only those observations for which the variety of fruits and vegetables was available as well as the number of servings of fruits and vegetables. Statistical significance was determined by p-value less than 0.05 for each model.

The overall saturated fat avoidance score was used in the analysis of saturated fat avoidance behavior. Overall saturated fat avoidance was analyzed by univariate analysis

of covariance in which the selected independent variables were age, income, acculturation, the square of the acculturation score, body mass index, number of children and recruitment group.

Physical Activity

Physical activity data were analyzed using a multivariate analysis of covariance (MANCOVA) and univariate ANCOVA. Leisure time physical activity, habitual physical activity, the importance of physical activity and hour of TV watched per day were analyzed together in the multivariate model to determine the effect of each independent variable on physical activity as a whole. The independent variables were age, income, acculturation, the quadratic term of acculturation, body mass index, the number of children, breastfeeding and recruitment group. Univariate analyses of covariance were used to describe how each independent variable influenced LTPA, HPA, importance of physical activity and the hours of TV watched independently. Statistical significance was determined by p-values less than 0.05 for each model.

Body Image

Body image data were analyzed using univariate analysis of covariance to determine the relationship between individual independent variables and two measures of body image. The two body image factors examined were the level of agreement with the statements that the subject was concerned about being or becoming fat and that the subject was on a weight-loss diet. The influence of each independent variable on each body image factor was analyzed using univariate analysis of covariance. The independent variables chosen were age, income, acculturation score, the squared term of the acculturation score, body mass index, the number of children and the recruitment group. Significance was expressed as the p-value for the model. A p-value less than 0.05 was considered to be statistically significant.

CHAPTER IV

Results

Demographics

A total of 85 subjects participated in this study. Sixty-three were recruited from Arlington County Women Infants and Children (WIC)(74.1%), fourteen from the Arlington County Expanded Food and Nutrition Education Program (EFNEP)(16.5%) and eight from Fairfax County’s Parklawn Family Center (PFC) (9.4%). (See Table 4.1) All of the subjects signed consent forms prior to completing the survey instruments. Based on the EFNEP Family Record, all subjects reported living in a suburb of a city with a population over 50,000.

Table 4.1: Survey Location

Survey location	Number of subjects (%)	
Arlington WIC	63	(74.1)
Arlington EFNEP	14	(16.5)
Parklawn Family Center	8	(9.4)
Total	85	(100.0)

The most common countries of origin were El Salvador, Bolivia, and Peru, comprising 37.6%, 28.2% and 9.4%, of the sample population, respectively. The remaining countries of origin included the United States, Mexico and other Central and South American countries (see Table 4.2). When asked to identify their ethnicity, 97.6% (83 out of 85) respondents identified themselves as Latino or Hispanic. Only two subjects identified themselves as Caucasian. In addition, 95.3% (81 out of 85) respondents chose the Spanish language instrument over the English language instrument.

Table 4.2: Country of Origin

Country	Number of subjects (%)	
El Salvador	32	(37.7)
Bolivia	23	(28.2)
Peru	8	(9.4)
Venezuela	6	(7.1)
Mexico	5	(5.9)
Guatemala	3	(3.5)
Honduras	2	(2.4)
Other	5	(6.0)
Total	85	(100.0)

All respondents were categorized as “limited resource,” since they qualified for at least one type of food assistance program. Two women did not respond whether they worked outside of the home or not. Of the 83 that did respond, 56 women, or 67%, reported not working outside of the home. The age, income, the number of children, the number of adults in the household (not including the homemaker) and the mean acculturation scores are summarized in Table 4.3. The range for acculturation scores was from one to five. A score of one described respondents who spoke only Spanish and identified with Latino culture, whereas a score of five identified a subject as preferring only English and identifying with American culture.

Table 4.3: Demographic Information for Each Recruitment Group

Recruitment Group	Age (years ± S.D.)	Income (\$/last month ± S.D.)	Number of children (± S.D.)	Adults in household (± S.D.)	Mean Acculturation score (± S.D.)
Arlington EFNEP (n = 14)	33 ± 4.2 ^b	\$1392 ± 284 ^b	2.1 ± 1	1.6 ± 1.2	1.6 ± 0.3
Arlington WIC (n = 63) ^a	28 ± 6.2 ^{b,c}	\$1064 ± 569 ^{b,c}	1.5 ± 1	1.4 ± 1.0	1.9 ± 0.5
Parklawn Family Center (n = 8)	34 ± 6.0 ^c	\$2010 ± 265 ^c	1.5 ± 1	2.0 ± 0.5	2.1 ± 0.6

a. n = 60 for income; three subjects did not respond

b. EFNEP > WIC; p < 0.01

c. Parklawn > WIC; p < 0.01

Almost half of the women (47.6%) that were recruited from the WIC program were between 21 and 26 years old. In contrast virtually all women (92.9%) recruited from EFNEP (13 out of 14) were between 27 and 38 years old and seven of the eight (87.5%) women recruited from PFC were between 27 and 42 years old. The full details are presented in the table below.

Table 4.4: Age of Participants by Recruitment Groups

Recruitment Group	21 – 26 years (%)		27 – 32 years (%)		33 – 38 years (%)		39 – 44 years (%)		45 – 50 years (%)	
Arlington EFNEP (n = 14)	0	(0.0)	7	(50.0)	6	(42.8)	0	(0.0)	1	(7.2)
Arlington WIC (n = 63)	30	(47.6)	16	(25.4)	13	(20.6)	4	(6.3)	0	(0.0)
Parklawn Family Center (n = 8)	1	(12.5)	2	(25.0)	3	(37.5)	2	(25.0)	0	(0.0)
Total (N = 85)	31	(36.5)	25	(29.4)	22	(25.9)	6	(7.1)	1	(1.1)

Almost half of the 61 WIC subjects that reported household incomes claimed incomes between \$800 and \$1300 per month. Three subjects did not report a household income. The 14 participants recruited from EFNEP reported incomes between \$800 and \$1900 per month. Six of the eight subjects recruited from the PFC reported incomes of at least \$2000 dollars per month. The details of income are described in the table below.

Table 4.5: Household Income of Participants by Recruitment Group

Recruitment Group	\$200 - \$799 last month (%)		\$800 - \$1399 last month (%)		\$1400 - \$1999 last month (%)		\$2000 + last month (%)	
Arlington EFNEP (n = 14)	0	(0.0)	8	(57.1)	6	(42.9)	0	(0.0)
Arlington WIC (n = 60) ^a	15	(25.0)	29	(48.3)	8	(12.9)	8	(12.9)
Parklawn Family Center (n = 8)	0	(0.0)	0	(0.0)	2	(25.0)	6	(75.0)
Total (n = 82)	15	(18.1)	38	(45.8)	16	(19.2)	14	(16.9)

a. Three subjects did not report household income

One-way analysis of variance of age and income revealed a statistically significant difference in mean age ($p < 0.01$) and mean income ($p < 0.01$) between women recruited from WIC and the PFC as well as between women from WIC and EFNEP. There was no significant difference in age or income between women from EFNEP and the PFC. Mean age and mean income are listed in Table 4.3 above. Although there were statistically significant differences in mean incomes between women from Arlington WIC, EFNEP and PFC, all women were classified as limited-resource, based on eligibility for USDA food assistance programs and USDA guidelines.

Sixty-three women from the WIC program reported the number of children they had. Fifty of those women reported having one or two children, accounting for 79.3% of the WIC participants. Similarly, out of the 14 EFNEP subjects reporting, ten reported

having one or two children, accounting for 71.4% of the EFNEP participants. Six of the eight women recruited from the Parklawn Family Center reported having two children. See the table below for more details.

Table 4.6: Number of Children of Participants By Recruitment Group

Recruitment Group	No Child (%)		One Child (%)		Two Children (%)		Three Children (%)		Four Children (%)		Five Children (%)	
	Arlington EFNEP (n = 14)	0	(0.0)	4	(28.6)	6	(42.8)	2	(14.3)	2	(14.3)	0
Arlington WIC (n = 63)	6	(9.5)	29	(46.1)	21	(33.3)	5	(7.9)	0	(0.0)	2	(3.2)
Parklawn Family Center (n = 8)	2	(25.0)	0	(0.0)	6	(75.0)	0	(0.0)	0	(0.0)	0	(0.0)
Total (N = 85)	8	(9.4)	33	(38.8)	33	(38.8)	7	(8.2)	2	(2.4)	2	(2.4)

In addition, there was also no significant difference in the number of children between groups ($p = 0.13$). There was also no significant difference in the number of adults in the household or in breastfeeding practice ($p = 0.20$) between recruitment groups. (See Appendix page 138, Table A.4 for p - values for all independent variables by recruitment group.)

Pregnancy and Body Mass Index

Within all three recruitment groups, 14 of the 85 women who participated, or about 16.5%, stated that they were pregnant. Of all pregnant women, 12 were recruited from the WIC program and only one each from EFNEP and the Parklawn Family Center. Pregnant women were excluded from body mass index and weight calculations because their gestational stage was unknown. The remaining 71 non-gravid women were as follows: 51 women from the WIC program; 13 women from the EFNEP program and seven from the PFC. Pregnant women were excluded for all remaining data analyses except the principal components analysis of acculturation, because their non-gravid body mass index could not be accurately calculated. In addition, body mass index was an

important independent variable used in analyses of covariance to determine the relationship between acculturation and dietary patterns, physical activity and body image.

Only 58 non-gravid women provided both weight and height to calculate their body mass index. Body mass index was calculated as weight in kilograms divided by height in meters squared.

$$\text{BMI} = \text{weight (kg)} / \text{height (m}^2\text{)}$$

According to body mass index, only two of the non-gravid respondents were underweight. The remaining women were categorized as normal weight, overweight, and obese. See Table 4.7.

Table 4.7: Body Weight of Participants

BMI category (kg/m²)	Number of women^a (%)	
Underweight (BMI < 18.5)	2	(3.4)
Normal weight (BMI 18.5 – 24.9)	26	(44.8)
Overweight (BMI 25 – 29.9)	21	(36.2)
Obese (BMI 30 +)	10	(17.2)
Total	58	(100.0)

a. Missing information for BMI for 13 out of 71 non-gravid women

Body mass index was not statistically different between recruitment groups, based on one-way analysis of variance ($p = 0.72$).

Acculturation

Acculturation was measured using a 12-item Likert scale. Based on this acculturation scale, average acculturation scores ranged from one to five. A score of one described respondents who spoke only Spanish and identified with Latino culture, whereas a score of five identified a subject as preferring only English and identifying with American culture. When the scale was divided into three intervals, scores between 1.0 and 2.30 were considered to reflect low acculturative status or Latino-oriented. Scores between 2.31 and 3.60 were considered moderately acculturated. Scores between 3.61 – 5.0 were considered high acculturation status or American-oriented. None of the study subjects scored above 3.3 on the acculturation scale, indicating that none of the women

who participated in this study were of high acculturative status. The distribution of acculturative status based on the recruitment group is shown in Table 4.8.

Table 4.8: Participant Acculturative Status By Recruitment Group

Recruitment Group	Low Acculturative Status (%)		Moderate Acculturative Status (%)		High Acculturative Status (%)	
Arlington EFNEP (n = 14)	13	(92.9)	1	(7.1)	0	(0.0)
Arlington WIC (n = 63)	51	(81.0)	12	(19.0)	0	(0.0)
Parklawn Family Center (n = 8)	3	(37.5)	5	(62.5)	0	(0.0)
Total (n = 85)	67	(78.8)	18	(21.2)	0	(0.0)

Based on one-way analysis of variance, there was no statistically significant difference in acculturation score between the three recruitment groups ($p = 0.20$).

Responses to the individual items in the acculturation scale were analyzed using principle components analysis (PCA). Principle components analysis was used to determine the appropriate contribution to variability in acculturation scores of each question and develop a weighted acculturation score. As a result, those questions that had the greatest influence over the overall acculturation score could be weighted accordingly. The first principle component of the acculturation score accounted for the most variability in acculturation scores. The first eigenvalue for the first principal component was 4.5488 and described 37.9% of the variability in acculturation. (See Appendix page 138 for a complete list of eigenvalues.) Below, in Table 4.9, is a list of the first eigenvectors for the twelve items of the acculturation scale. Eigenvectors represented the amount that each question contributed to the overall variability in the first principal component of the acculturation scores. The larger the eigenvector, the larger the contribution of the question to the overall acculturation score.

Table 4.9: Eigenvector Scores for Acculturation Scale

Item	Eigenvector
Language of TV programs watched	0.36
Language spoken	0.35
Language subjects thought in	0.33
Language of radio programs	0.32
Language spoken with friends	0.30
Language spoken at home	0.30
Language preference for media	0.29
Ethnicity of visitors	0.27
Ethnicity of guests at parties attended	0.27
Language spoken as a child	0.24
Ethnicity of close friends	0.21
Preferred ethnicity of children's friends	0.17

Correlation of Independent Variables

The Pearson Product-Moment Correlation Coefficient was calculated for the independent variables to be used in analyses of covariance to test the research hypotheses, listed in the previous chapter. The independent variables tested were age, income, acculturation, and the squared term of acculturation, the ranked score of acculturation, the squared term of the ranked acculturation, body mass index, and breastfeeding practice. The values reported by pregnant women for these independent variables were not included in correlation calculations. These values were excluded because the dietary pattern, physical activity and body image data provided by pregnant women was also excluded from further analyses.

Age and income were significantly correlated with each other ($r = 0.259$; $p = 0.02$). Age and the number of children were also significantly correlated with each other ($r = 0.282$; $p = 0.02$). Different expressions of the acculturation score, the square term of acculturation, the ranked score of acculturation and the squared term of the ranked score, were also significantly correlated with each other. However, this was expected since they were simply different expressions of the same variable. Table 4.10 depicts all of the correlation coefficients of the independent variables. The squared term of the acculturation variable was not included in this matrix, but can be found in the appendix (page A34).

Table 4.10 : Pearson Correlation Coefficients for Independent Variables

r-value p-value n	Age (years)	Income	Acculturation	Body Mass Index	Breastfeeding status	Number of children
Age (years)	1.000 71	0.272 *0.02 68	-0.102 0.40 71	0.181 0.17 58	-0.127 0.29 71	0.282 *0.02 71
Income		1.000 68 ^a	0.051 0.67 68	-0.02 0.90 58	-0.043 0.72 68	0.157 0.19 68
Acculturation			1.000 71	-0.004 0.97 58	0.167 0.16 71	0.075 0.53 71
Body Mass Index				1.000 58 ^b	0.015 0.91 58	0.185 0.17 58
Breastfeeding status					1.000 71	-0.084 0.48 71
Number of children						1.000 71

* p<0.05

a. 3 WIC subjects did not report income

b. 13 subjects did not provide sufficient information for BMI

Dietary Patterns

Response rates for fruit and vegetable intake data were highly variable. The 14 pregnant women were not included in any of the analyses of fruit and vegetable intake, leaving 71 non-gravid women for further analyses. Of the 71 non-gravid women, 61 (86.0%) provided dietary information in the 24-hour recall.

Fruit intake

All of the 61 women providing dietary information reported information about fruits consumed in the previous 24 hours. Fifty-one of those women (83.6%) provided sufficient information about the amounts of fruits that they ate to calculate a serving size. The range, means, standard deviations of the number of different fruits consumed and the number of servings of fruits consumed are summarized in Table 4.11.

Table 4.11: Fruit Intake of Participants

Measure of fruit intake	N	Range	Mean	SD
Number of different fruits	61	0 - 7	2.6	1.3
Number of servings of fruits	51	0.2 - 10.75	3.3	2.4

Thirty-seven (60.7%) of the 61 subjects reported consuming two to three different types of fruits in the previous 24 hours. Details are shown in Table 4.12.

Table 4.12: Variety of Fruits Consumed

Number of different fruits consumed	Number of women (%)
0 – 1	13 (21.3)
2 – 3	37 (60.7)
4 – 5	8 (13.1)
6 – 7	3 (4.9)
Total	61 (100.0)

Of 51 participants for whom serving sizes were calculated, 22 (43.1%) had consumed between two and four servings of fruits in the previous 24 hours. In addition, 14 out of 51 (27.4%) reported having consumed four or more servings of fruits. Overall, 36 out of 51 (60.5%) respondents met or exceeded the USDA Food Guide Pyramid recommendation to consume two to three servings of fruit each day (USDA, 1996). Details are shown in Table 4.13.

Table 4.13: Servings of Fruit Consumed

Number of fruit servings	Number of Women (%)
0 – 1.9	15 (29.4)
2.0 – 3.9	22 (43.1)
4.0 – 5.9	5 (9.8)
6 – 7.9	5 (9.8)
≥8	4 (7.8)
Total	51 (100.0)

The fruit most commonly reported by the 61 women was the banana. Bananas were reported 64.0% of the time. Oranges, apples, grapes, and strawberries were reported 50.8%, 42.6%, 19.7%, and 14.8% of the time, respectively. These five fruits (bananas, oranges, apples, grapes, and strawberries) were the most commonly consumed.

Based on analysis of variance, there was no significant difference in the number of different fruits consumed between recruitment groups ($p = 0.082$). There was also no significant difference in the number of servings of fruits consumed between recruitment group ($p = 0.182$). (See the Appendix, page A35 for the p-values of one-way analysis of fruit intake by recruitment group.)

The relationship between fruit intake and acculturation was determined by analysis of covariance. The two measures of fruit intake were the number of different fruits consumed and the number of servings of fruits consumed based on the 24-hour recall. Fruit intake was analyzed based on the following independent variables, age, income, acculturation, the square term of acculturation, body mass index, breastfeeding or not breastfeeding, the number of children, and the recruitment group to which the subject belonged.

Since body mass index was used as an independent variable in the analyses of covariance and 13 women did not provide sufficient information to calculate a BMI, those 13 observations were lost. In addition to the 14 women already excluded, of the 48 remaining women available for analysis, three did not report an income and could not be included in the analyses of covariance. A total of 45 observations were used in the analysis of covariance of factors related to the number of different fruits consumed. Only 35 observations were used to analyze the number of servings of fruit because, as mentioned previously, ten of the women did not report enough information to calculate serving sizes of fruits.

The overall model for the analysis of covariance (ANCOVA) for the number of different fruits was not significant ($p = 0.538$). The model for the ANCOVA for the number of servings of fruits was significant ($p = 0.034$). There was also a positive and significant relationship between the number of servings of fruits consumed and acculturation ($p = 0.026$). The results of the analyses of covariance for fruit intake measures are summarized in Table 4.14.

Table 4.14: Effect of Sociodemographic Factors on Fruit Intake

Measures of Fruit Intake	Number of Different Fruits ^a (p-value)	Servings of Fruits ^b (p-value)
Age	0.748	0.395
Income	0.806	0.230
Acculturation	0.607	0.026*
Acculturation squared	0.157	0.084
Body Mass Index	0.482	0.182
Breastfeeding status	0.351	0.922
Number of children	0.774	0.373
Recruitment group	0.573	0.937
Model	0.538	0.034*

* p < 0.05

a. n = 45, b. n = 35

Vegetable Intake

All of the 61 women who provided dietary information reported information about vegetables consumed in the previous 24 hours. Thirty-six of those women (59.1%) provided sufficient information about the amounts of vegetables that they ate to calculate a serving size. The range, means, standard deviations of the number of different vegetables consumed and the number of servings of vegetables consumed is summarized in Table 4.15.

Table 4.15: Vegetable Intake of Participants

Measure of fruit intake	n	Range	Mean	SD
Number of different vegetables	61	0 - 8	2.6	2.0
Number of servings of vegetables	36	0 - 6.25	1.6	1.6

Twenty-eight (45.9%) of the 61 participants who completed the 24-hour recall reported consuming two to three different types of vegetables in the previous 24 hours. Over all, almost 75% of non - gravid women consumed at least two different types of vegetables (44 of 61). Details are shown in Table 4.16.

Table 4.16: Variety of Vegetables Consumed

Number of different vegetables	Number of Women (%)	
0 – 1	17	(27.9)
2 – 3	28	(45.9)
4 – 5	9	(14.8)
6 – 7	6	(9.8)
8	1	(1.6)
Total	61	(100.0)

Of the 36 participants for whom serving sizes were calculated, 14 (38.9%) had consumed less than one serving of vegetables in the previous 24 hours. In addition, only 7 out of 36 (19.4%) reported having consumed three or more servings of vegetables. The minimum number of servings of vegetables recommended by the USDA Food Guide Pyramid is three servings of vegetables each day (USDA, 1996). Therefore, 80.6% of the non – gravid women in this study did not consume the minimum number of vegetable servings recommended. Details are shown in Table 4.17.

Table 4.17: Servings of Vegetables Consumed

Number of vegetable servings	Number of women (%)	
< 1.0	14	(38.9)
1.0 – 1.9	7	(19.4)
2.0 – 2.9	8	(22.2)
3.0 – 3.9	2	(9.8)
4.0 – 4.9	4	(7.8)
5.0 – 5.9	0	(0.0)
6.0 +	1	(2.8)
Total	36	(100.0)

The vegetable most commonly reported by the 61 women was the potato. Potatoes were reported 44.3% of the time. Tomatoes, carrots, lettuce and broccoli were reported 42.6%, 34.4%, 32.8% and 19.7% of the time, respectively. These five (potatoes, tomatoes, carrots, lettuce and broccoli) represented the five most commonly reported vegetables.

Based on analysis of variance, there was no significant difference in the number of different vegetables consumed between recruitment groups ($p = 0.168$). In addition, there was no significant difference in the number of servings of vegetables consumed

between recruitment groups ($p = 0.247$). (See the Appendix, page A36, table A5 for one-way analysis of variance of vegetable intake patterns by recruitment group.)

The relationship between vegetable intake and acculturation was determined by analysis of covariance. The two measures of vegetable intake were the number of different vegetables consumed and the number of servings of vegetables consumed based on the 24-hour recall. Vegetable intake was analyzed based on the following independent variables, age, income, acculturation, the square term of acculturation, body mass index, breastfeeding or not breastfeeding, the number of children and recruitment group. Since body mass index (BMI) was used as an independent variable in the analyses of covariance and 13 women did not provide sufficient information to calculate a BMI, an additional 13 observations were lost. In addition, of the 48 remaining women available for analysis, three did not report an income and could not be included in the analyses of covariance. A total of 45 observations were used in the analysis of covariance of factors related to the number of different vegetables consumed. Only 27 observations of those 45 could be used to analyze the number of servings of vegetables because, as mentioned previously, 18 of the women did not report enough information to calculate serving sizes of vegetables.

The overall model for the analysis of covariance (ANCOVA) for the number of different vegetables consumed was statistically significant ($p = 0.048$). Age was positively and significantly related to the number of different vegetables consumed ($p = 0.029$). None of the other independent variables, including acculturation, were significantly related to the number of different vegetables consumed. In contrast, the overall ANCOVA model for the number of servings of vegetables consumed was statistically significant ($p = 0.005$). Age and breastfeeding were both positively and significantly related to the number of servings of vegetables consumed, ($p = 0.047$ and $p = 0.01$, respectively). Again, acculturation was not significantly related to vegetable intake. The results of the analyses of covariance for vegetable intake measures are summarized in the Table 4.18.

Table 4.18: Effect of Socio-demographic Factors on Vegetable Intake

Measures of Vegetable Intake	Number of Different Vegetables ^a (p-value)	Servings of Vegetables ^b (p-value)
Age	0.029*	0.047*
Income	0.699	0.053
Acculturation	0.219	0.590
Acculturation squared	0.580	0.181
Body mass index	0.559	0.103
Breastfeeding status	0.056	0.010*
Number of children	0.955	0.875
Recruitment group	0.073	0.055
Model	0.048*	0.005**

* p < 0.05, ** p < 0.01

a. n = 45, b. n = 27

Combined Fruit and Vegetable Intake

The combination of fruit and vegetable intake was also examined. Only twenty-six women (42.6%) provided enough information for analyses. The range, means, standard deviations of the number of different fruits and vegetables consumed and the number of servings of fruits and vegetables consumed is described in Table 4.19.

Table 4.19: Fruit and Vegetable Intake of Participants

Measure of combined fruit and vegetable intake	n	Range	Mean	SD
Number of different fruits and vegetables	61	1 - 12	5.2	2.6
Number of servings of fruits and vegetables	26	1 - 12.5	6.0	3.4

Seventy-two percent of women consumed one to six different types of fruits and vegetables in the previous 24 hours. Details are shown in Table 4.20.

Table 4.20: Variety of Fruits and Vegetables Consumed

Number of different fruits and vegetables consumed	Number of women (%)	
1 – 3	16	(26.2)
4 – 6	28	(45.9)
7 – 9	15	(24.6)
10 – 12	2	(3.3)
Total	61	(100.0)

Of the 26 participants for whom serving sizes were calculated for fruits and vegetables combined, a little more than half (53.8%) had consumed more than five servings of fruits and vegetables in the previous 24 hours. The National Cancer Institute (NCI) recommends consuming at least five servings of fruits and vegetables each day to promote better health and prevent various chronic diseases (NCI, 1991). Details are shown in Table 4.21.

Table 4.21: Number of Servings of Fruits and Vegetables Consumed

Number of servings of Fruits and vegetables	Number of women (%)	
1 – 4.9	12	(46.2)
5 – 8.9	6	(23.1)
9 – 12.9	8	(30.7)
Total	26	(100.0)

Based on analysis of variance, there was a significant difference in the combined number of different fruits and vegetables consumed between recruitment groups ($p = 0.036$). This difference was significant between women recruited from EFNEP and the Parklawn Family Center. Women enrolled in EFNEP consumed a smaller number of different fruits and vegetables than did those attending the Parklawn Family Center. (3.75 vs 6.71, $p < 0.05$). In contrast, there was no significant difference in the combined number of servings of fruits and vegetables consumed between recruitment groups ($p = 0.397$).

The relationship between fruit and vegetable intake and acculturation was determined by analysis of covariance. The two measures of combined fruit and vegetable intake were the combined number of different fruits and vegetables consumed and the combined number of servings of fruits and vegetables consumed based on the 24-hour recall. Fruit and vegetable intake was analyzed based on the following independent variables, age, income, acculturation, the square term of acculturation, body mass index, breastfeeding or not breastfeeding, the number of children the subject had and the recruitment group in which the subjects was.

Since body mass index was used as an independent variable in the analyses of covariance and 13 women did not provide sufficient information to calculate a BMI, these 13 observations were not included. In addition, of the 48 remaining women

available for analysis, three did not report an income and could not be included in the analyses of covariance. A total of 45 observations were used in the analysis of covariance of factors related to the number of different fruits and vegetables consumed. Of these 45, only 15 reported information to calculate serving sizes for both fruits and vegetables.

The overall analysis of covariance (ANCOVA) for the number of different fruits and vegetables was not significant ($p = 0.067$) and no factors were found to be significant ($p > 0.05$). The ANCOVA for the number of servings of fruits and vegetables was not significant ($p = 0.397$). The results of the analyses of covariance for fruit intake measures are summarized in the Table 4.22.

Table 4.22: Effect of Sociodemographic Factors on Combined Fruit and Vegetable Intake

Measures of Fruit and Vegetable Intake	Number of Different Fruits and Vegetables ^a (p-value)	Servings of Fruits and Vegetables ^b (p-value)
Age	0.019	0.460
Income	0.740	0.103
Acculturation	0.637	0.409
Acculturation squared	0.450	0.624
Body mass index	0.195	0.409
Breastfeeding status	0.273	0.381
Number of children	0.674	0.350
Recruitment group	0.065	0.302
Model	0.067	0.397

a. $n = 45$, b. $n = 15$

The relationship between acculturation and the consumption of raw and cooked vegetables could not be tested. Respondents did not provide sufficient information to determine whether foods listed in the 24-hour recall were cooked or raw.

Saturated Fat Avoidance

Saturated fat avoidance was measured using two items, to determine the type of milk consumed and the type of fat or oil used for cooking. A total of 70 out of 71 possible non-gravid women provided information about the type of milk that they consumed. The two most common types of milk reported were whole milk (43.4% of all responses) and 2% milk (46.4% of all responses). A few women reported consuming more than one type

of milk. Rates of consumption for the different types of milk consumed are shown in Table 4.23.

Table 4.23: Type of Milk Consumed by Participants

Type of Milk	Number of women (%)	
Whole Milk	30	(43.4)
Chocolate Milk	8	(11.6)
2% Milk	32	(46.4)
1% Milk	4	(5.8)
Skim Milk	4	(5.8)
Did not consume milk	7	(10.1)

Seventy out of the 71 non-gravid women reported the type of fat or oil that they used for cooking. Vegetable oil was the most commonly used type of fat or oil (91.4%). No subjects reported using lard, meat fat or shortening for cooking. A few women reported using more than one type of fat or oil for cooking. Table 4.24 describes the types of fat and oil used for cooking.

Table 4.24: Type of Fat or Oil Used for Cooking

Type of Fat/Oil	Number of women (%)	
Lard	0	(0.0)
Meat fat	0	(0.0)
Butter	8	(11.4)
Margarine	9	(12.8)
Shortening	0	(0.0)
Vegetable oil	64	(91.4)

The results of the saturated fat avoidance scores are based on the scoring criteria outlined in the saturated fat and cholesterol avoidance scale designed for the San Antonio Heart Study, by Knapp and associates (1988). As described in the previous chapter, consumption of whole or chocolate milk and cooking with lard, meat fat or butter, were considered to be minimal saturated fat avoidance. Individuals who reported consuming 1% or 2% milk, or cooked with shortening or margarine demonstrated moderate saturated fat avoidance. Finally, consumption of skim milk or no milk at all and cooking with vegetable oil or no fat at all, were considered to be maximal saturated fat avoidance.

Table 4.25: Saturated Fat Avoidance of Participants

Source of fat	Minimal avoidance (% of respondents)	Moderate avoidance (% of respondents)	Maximal avoidance (% of respondents)
Milk ^a	45%	40%	13%
Cooking oil or fat ^a	10.5%	12%	77.5%
Total saturated fat avoidance	4.5%	82.5%	12.7%

a. n = 70

The total saturated fat avoidance score was a sum of the milk fat avoidance and cooking fat avoidance scores. Only 4.8% of respondents displayed no saturated fat avoidance at all, while 12.7% displayed total saturated fat avoidance. The remaining 82.5% exhibited at least one form of saturated fat avoidance. (See table A5 in the Appendix on page A36.)

Saturated fat avoidance was not significantly different between women based on their recruitment group ($p = 0.489$). The analysis of covariance for saturated fat avoidance was also not found to be statistically significant ($p = 0.348$). Therefore, there was no significant relationship between acculturation and saturated fat avoidance.

Physical Activity

Rates of physical activity were reported on a Likert scale based on how many days per week individuals engaged in either leisure time physical activity or habitual physical activity for at least 30 minutes. Possible scores ranged from one to five, and corresponded to the number of days each week that an individual engaged in at least 30 minutes of physical activity. For example, an individual who did not engage in at least 30 minutes of leisure time physical activity any day of the week scored a one on the Likert scale. An individual who engaged in at least 30 minutes of physical activity three to four days of the week scored a three on the Likert scale.

Fourteen pregnant participants were excluded from analyses of physical activity. Only one non-gravid woman did not respond to the physical activity questions and 70 women did respond, producing a 98.6% response rate. The results are summarized in Table 4.26.

Table 4.26: Leisure Time and Habitual Physical Activity

Days per week	Number of Women Engaging in Leisure-time Physical Activity (%)		Number of Women Engaging in Habitual Physical Activity (%)	
0	36	(51.6)	19	(27.3)
1 - 2	23	(32.8)	23	(31.8)
3 - 4	9	(12.5)	17	(24.2)
5 - 6	2	(3.1)	5	(7.6)
7	0	(0.0)	6	(9.1)
Total	70	(100.0)	0	(100.0)

There was no significant difference between recruitment groups in the number of days each week that women engaged in at least 30 minutes of leisure time physical activity ($p = 0.76$) or habitual physical activity ($p = 0.90$).

Seventy women responded when asked to rate the importance of physical activity. The vast majority of women, 84.9%, reported that they strongly agreed that physical activity was important. No subjects disagreed that physical activity was important and there was no difference between recruitment groups ($p = 0.41$).

Of the 70 women that reported how many hours of television they watched each day, only about 4.5% (3 women) of the subjects reported watching more than four hours of television each day. There were no significant differences in the number of hours of television watched in women between the three different recruitment groups ($p = 0.122$).

See Table 4.27.

Table 4.27: Hours of Television Watched

Hours of television watched per day	Number of women (%)	
0 – 1	24	(34.3)
1.5 - 2.5	29	(41.4)
3 – 4	14	(20.0)
4.5 - 5.5	1	(1.4)
6+	2	(3.0)
Total	70	(100.0)

Multivariate analysis of covariance (MANCOVA) was conducted to examine the relationship between all of the independent variables and all physical activity variables. The independent variables were age, income, acculturation, the squared term of acculturation, body mass index, breastfeeding, number of children and recruitment group.

The dependent variables were number of hours of leisure time physical activity, habitual physical activity, the importance of physical activity and hours of TV watched. Based on Wilks' Lambda, the MANCOVA showed a significant relationship between age and physical activity variables ($p = 0.020$), though there was no significant relationship between physical activity and other independent variables. See Table 4.28 below for a summary of results.

Table 4.28: Effect of sociodemographic factors on physical activity

Independent variable	Wilks' Lambda (p-value)
Age	0.02*
Income	0.85
Acculturation	0.52
Acculturation squared	0.36
Body mass index	0.43
Breastfeeding status	0.60
Number of children	0.05
Recruitment group	0.81

* $p < 0.05$

When the univariate analyses of covariance were examined for each physical activity variable separately (LTPA, HPA, hours of television watched, and importance of physical activity), none showed statistical significance. The univariate analysis of covariance for leisure time physical activity was not significant ($p = 0.98$). Univariate analyses of covariance were also not significant for habitual physical activity ($p = 0.500$), for importance of physical activity ($p = 0.110$), nor for number of hour of television watched ($p = 0.122$). (See the Appendix, page A37, table A6 for the effect of sociodemographic variables on individual physical activity factors.) Although age, based on the multivariate analysis of covariance, was significantly related to all physical activity factors taken together, age was not a statistically significant independent variable in any of the individual univariate analyses of covariance for each individual physical activity factor.

Body Image

About half of the 71 non-gravid women who responded to questions regarding their body image, strongly agreed that they were concerned about either being or

becoming fat. In comparison, only 26 of the 71 of respondents (37.1%) strongly agreed that they were on a weight loss diet. The remaining results are shown in Table 4.29.

Table 4.29: Participants' Body Image

	Concerned about being or becoming fat (%)		On a weight loss diet (%)	
Strongly agree	36	(50.7)	26	(37.1)
Mostly agree	17	(23.9)	16	(22.9)
Neither agree nor disagree	11	(15.5)	7	(10.0)
Mostly disagree	3	(4.2)	8	(11.4)
Strongly disagree	4	(5.6)	13	(18.6)
Total	71	(100.0)	71	(100.0)

There was no significant difference between women in the different recruitment groups in their reported concern of being or becoming fat ($p = 0.28$) or being on a weight loss diet ($p = 0.50$).

Univariate analyses of covariance were used to determine the relationship between acculturation and concern about being or becoming fat as well as being on a weight loss diet. Independent variables used in these analyses were age, income, a ranked acculturation score, and the square term of the ranked acculturation score, body mass index and recruitment group. The practice of breastfeeding was not included as an independent variable. The total number of observations that were used in the ANCOVAs was 55, instead of 71. Thirteen women did not provide adequate information to calculate a BMI and an additional three did not provide information about their incomes. The results of both analyses are summarized in Table 4.30.

Table 4.30: Effect of Sociodemographic Factors on Body Image

	Concern about Being/Becoming Fat ^a (p-value)	On a Weight Loss Diet ^a (p-value)
Age	0.310	0.224
Income	0.691	0.684
Acculturation	0.362	0.887
Acculturation squared	0.070	0.281
Body mass index	0.040	0.026
Number of children	0.590	0.165
Recruitment group	0.590	0.423
Model	0.070	0.075

a. n = 55

The overall ANCOVA models for concern over being or becoming fat and being on a weight loss diet were not significant, ($p = 0.070$ and $p = 0.075$), respectively. Within the model, body mass index had a p -value less than 0.05. However, since the overall model was not significant, the effect of body mass index was not considered to be significant.

Chapter V

Discussion

Demographics

Demographically, the distribution of nationalities in the study sample was consistent with US Census data. According to 2000 U.S. Census data, 87% of the Latino population of Arlington County is from Central and South America, 8% Mexican American, 3% Puerto Rican and 1.4% Cuban American. The study sample reflected this distribution, as 91% of the subjects were from Central and South America, 6% Mexican American and 1% Cuban American, though there were no Puerto Ricans in the sample. All subjects lived in the same area, suburbs of Washington D.C., which is designated in the Expanded Food and Nutrition Education Program (EFNEP) as a suburb of a central city with a population over 50,000.

Subject Age

The results indicated that subjects recruited from Women Infants and Children (WIC) were significantly younger than those from the Parklawn Family Center (PFC). To be eligible for WIC support, women must be pregnant or have a child five years of age or younger. In contrast, the Parklawn Family Center attracts the families of children enrolled as students in Parklawn Elementary School. As mothers of school-aged children, women were more likely to be older than women enrolled in WIC with toddlers. There was no significant difference in age of EFNEP women compared to WIC mothers or women from the PFC. This can be explained by the fact that EFNEP includes young pregnant women as well as families with at least one child who is aged 12 years or less.

Household Income

Participants recruited from the WIC program also reported significantly lower household incomes than women from the Parklawn Family Center. One possible explanation is that women recruited from the Parklawn Family Center all reported their household incomes as dollars per year as opposed to dollars for the previous month. For the purpose of data analysis, the household income for the previous month had to be

derived from the yearly income resulting in an average income per month. Fluctuations in income from month to month could not be captured using average income per month. In families with unstable incomes, it is possible that incomes were low in the month prior to data collection, for unknown reasons. In contrast, women from WIC and EFNEP reported income for the previous month, so fluctuations in income per month for the WIC and EFNEP population could be detected.

Based on conversations with the study subjects, WIC staff and teachers from Parklawn, women enrolled in WIC were more likely to be recent immigrants. Therefore a second possible explanation is that Parklawn women or their husbands were more likely to have found stable sources of income than WIC families. Although length of residence in the United States and legal versus illegal immigrant status was not measured, it is also possible that these factors influenced income as well. Women or their spouses who have lived in the U.S. longer may have found more stable jobs. In addition, legal immigrants may have better access to jobs than illegal immigrants. Regardless, women from all recruitment groups qualified for at least one food assistance program and could be classified as having limited resources. Finally, there was a weak, though significant correlation between age and household income ($r = 0.272$, $p < 0.05$). This suggested that older women were more likely to have higher household incomes.

Food Assistance Programs

All subjects qualified for at least one food assistance program. The most common assistance program reported was Women Infants and Children (WIC). This was not surprising since almost 75% of the sample was recruited from WIC. In addition, WIC is one of few food assistance programs that does not require participants to prove that they are legal aliens. About one-third of the study subjects received assistance from Head Start, the Food Stamp Program, Child Nutrition, the School Lunch Program and Aid to Families with Dependent Children (AFDC) or Temporary Assistance for Needy Families (TANF). None of the participants from WIC, EFNEP, or the Parklawn Family Center had previously been enrolled in the Expanded Food and Nutrition Education Program. Based on conversations with study participants, many women were not aware of other food assistance and nutrition education programs available to them.

Pregnancy and Lactation

Fourteen of the women (16.7%), who were recruited for the study, were pregnant. Approximately one quarter of women (21 out of 85) who were enrolled in this study reported that they currently were breastfeeding their babies. The vast majority of breastfeeding mothers were recruited from WIC. This was not surprising since WIC targets pregnant and lactating mothers, as well as their children. As opposed to pregnant women, they were not excluded from this study. Still, the practice of breastfeeding was included as a variable in analyses of covariance to test the relationship between acculturation and dietary patterns, physical activity and body image.

Body Weight

Body mass index was calculated for all non-gravid women who provided both a weight and a height. Thirteen women failed to provide height, weight, or both, and so their BMI was not calculated. Forty-four percent of the non-gravid women were normal weight, according to CDC standards. About half were either overweight or obese. Though a 50% rate of overweight and obesity in this study seems high, the CDC reports rates of overweight and obesity as high as 72% in Latino women (2002). This indicated that subjects in this study were slimmer than Latinos across the nation.

There are several reasons why women may have failed to provide their height or weight. First, they may not have known their height or weight values. In addition, some women may have been sensitive about their body size and did not want to report this information.

Acculturation

The findings illustrated a relatively narrow range of acculturation scores. When the average acculturation score was divided into tertiles, representing low, moderate, and high acculturation, none of the subjects was of high acculturative status. In addition, only four out of 85 respondents chose to fill out a survey in English. There was no significant difference in acculturative status between different recruitment groups. According to anecdotal information from subjects and employees of WIC, EFNEP, and the Parklawn Family Center, the vast majority of subjects were the first generation to live in the United

States. First generation immigrants tend to retain their original culture the most. This likely made it less likely that women in this study would have a high acculturative status. In addition, the acculturation scale used assumed that acculturation occurs as a linear progression, in which individuals adopt new cultural habits in place of old habits. Some models of acculturation have treated the phenomenon as a bimodal entity, allowing for fluency in two cultures. It is possible that a bimodal model and not a linear model could have better described this study population because the acculturation scale used here was not designed to detect fluency in both Latino and U.S. culture. If the acculturation model used was not sensitive enough to detect differences in acculturative status, then it would also have been difficult to detect differences in variables, such as vegetable intake, that were analyzed based on acculturation.

Dietary Patterns

One of the primary goals of this investigation was to determine the effect of acculturation on fruit and vegetable intake patterns and saturated fat avoidance behavior in limited resource Latinas in northern Virginia. The role of acculturation in fruit and vegetable intake patterns was assessed by the number of different fruits and vegetables consumed and the number of servings of fruits and vegetables consumed. Response rates to the 24-hour recall of fruits and vegetables were lower than anticipated. Only 61 out of the 71 non-gravid recruited subjects provided information in the 24-hour recall. Of these 61 subjects, only 26 provided sufficient information to calculate serving sizes for both fruits and vegetables. The number of different fruits and vegetables consumed ranged from one to twelve, with about half of the subjects consuming between four and six different fruits and vegetables. Though the number of servings of fruits and vegetables ranged from one to twelve and a half, only half of the study subjects consumed five or more servings, the recommended intake for chronic disease prevention.

It was hypothesized that more acculturated women would consume fewer servings of fruits and vegetables, as well as a smaller variety of fruits and vegetables. However, the analyses of covariance for fruit and vegetable intake patterns did not reveal a significant relationship between acculturation and measures of combined fruit and vegetable intake. In addition, there was no significant relationship between fruit and

vegetable intake and any of the following independent variables; age, household income, the number of children a woman had, and breastfeeding. Interestingly, there was no significant relationship between the recruitment group and fruit and vegetable intake patterns, considering that one-way analysis of the number of different fruits and vegetables consumed by women from each recruitment group showed that women from Parklawn consumed almost twice as many different fruits and vegetables as those from EFNEP. The differences in age, income, and the other independent variables apparently accounted for the variability in fruit and vegetable consumption between the two groups.

Post hoc analyses of separate fruit and vegetable intake patterns were also completed. As mentioned above, 61 non-gravid women responded to the dietary recall. The number of different fruits consumed ranged from one to seven. Most women consumed two to three different fruits. The most common fruits consumed were bananas, oranges, apples, grapes, and strawberries. This was surprising because fruits that are common in Latino countries, such as papaya, pineapple, and guava, were not reported as previously expected. It is possible that bananas, oranges, apples, grapes, and strawberries are more available and economical. The reported consumption of fruit juices and non-fruit drinks was lower than expected. In contrast to these results, analysis of the Hispanic Health and Nutrition Examination Survey data set revealed that non-fruit drinks were more common than actual fruit or fruit juice consumption (Block, et al., 1995). In addition, fruit juices were consumed more than raw fruits. Though many of the women in this study distinguished between fruits and fruit juices, it is still possible that some juice consumption may have gone unreported.

Although the number of servings of fruits consumed ranged from 0.2 to 10.75, most women consumed at least two servings of fruits each day. Still, about one-third of the women who reported serving sizes did not meet the minimum recommended servings of fruits according to the Food Guide Pyramid.

It was anticipated that more acculturated women would consume fewer servings of fruits and a smaller variety of fruits than less acculturated women. Not only was there no significant difference in fruit intake patterns between recruitment groups, there was no significant relationship between acculturation and the number of fruits consumed. The narrow range of acculturation scores may explain why there was little variability in the

number of different fruits consumed. However, there was a positive and significant relationship between acculturation and the number of servings of fruits consumed ($p < 0.05$), with more acculturated women consuming more servings of fruits than less acculturated women. This was in agreement with previous research that found an 11% increase in fresh fruit consumption in Mexicans after immigration to the United States (Romero-Gwynn, et al., 1993).

Of the 61 women who provided information about vegetable intake patterns, only 36 provided sufficient information about serving sizes. The range of the number of different vegetables consumed was between zero and eight. Twenty-eight percent of women reported consuming one to no vegetables at all in the previous 24 hours. The majority reported consuming two or three different vegetables. The most common vegetables consumed were potatoes, tomatoes, carrots, lettuce, and broccoli. These results are similar to those based on food-frequency data from the HHANES data set, which found that green salad and salad vegetables, tomatoes, and potatoes were most commonly consumed by Latinos (Block, et al., 1995). Unfortunately, respondents did not consistently describe how the vegetables were prepared. For example, potatoes could be boiled, baked, French-fried or be in the form of potato chips. Therefore it is difficult to assess overall dietary quality. The nutrient characteristics of boiled or baked potatoes are significantly different than French fries or potato chips in the amount of fat added during preparation, and this certainly affects overall dietary quality.

Serving sizes for vegetable intake varied between zero and six and a half. Fourteen of the 36 women who reported serving sizes of vegetables consumed less than one serving of vegetable. Only seven of the 36 women reported consuming at least three servings of vegetables, the minimum recommended by the USDA Food Guide Pyramid. Since most Latinos consume vegetables as part of a mixed dish, it is possible that some vegetables were consumed but not reported. Conversely, the consumption of mixed dishes also declines after immigration to the United States (Romero-Gwynn, et al., 1993).

There was no significant difference in vegetable intake patterns between women from different recruitment groups. This was contradictory to the initial hypothesis that more acculturated Latino women would consume a greater number of different vegetables. However, there was a significant and positive relationship between age and

the number of different vegetables consumed and the number of servings of vegetables consumed. Moreover, there was also a positive and significant relationship between the number of servings of vegetables consumed and breastfeeding. There are several reasons why breastfeeding women may have consumed more vegetables. First, breastfeeding women may be more conscious of the nutrients being passed along to their baby. Moreover, women who choose to breastfeed may already be more health conscious and therefore choose to breastfeed their child. Third, increased vegetable consumption may simply be a product of increased energy consumption. Finally, the vast majority of breastfeeding women were recruited from the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), where participants receive nutrition education and vouchers for food purchase. WIC allows women only to buy certain WIC-designated foods, which tend to be fruits, vegetables, and other nutrient-dense foods.

Furthermore, a study of WIC mothers, though not specifically Latinos, found that there was a significant and positive relationship between breastfeeding and fruit and vegetable consumption (Havas, et al., 1998). In summary, acculturation was significantly related only to the number of servings of fruit consumed. This did not support the post hoc hypothesis that increased acculturative status would be related to a decrease in the number of fruit servings. Acculturation was not significantly related to any other measures of fruit and vegetable intake. Measures of vegetable intake patterns and combined fruit and vegetable intake patterns both suffered from poor response rates for serving sizes. The self-administered 24-hour dietary recall of fruits and vegetables may not have been able to provide precise information regarding fruit and vegetable intake since response rates were so poor. In addition, the post hoc nature of fruit intake pattern analyses and vegetable intake pattern analyses raise questions of reliability. However, the issues of fruit and vegetable intake patterns, as a function of acculturation, merit further research with larger sample sizes and methods that ensure higher response rates.

Response rates for saturated fat avoidance questions were higher than for the 24-hour recall. Seventy of the 71 non-gravid women described the type of milk and the type of fat or oil that they typically consumed. The majority of milk intake was from whole milk (43%) and 2% milk (46%). Previous research has shown that consumption of whole milk is common in Latinos in the United States (Block, et al., 1995 ;Romero-Gwynn, et

al., 1993). However, analysis of Hispanic Health and Nutrition Examination Survey (HHANES) data revealed that consumption of 2% milk and skim milk was only 11% (Block, et al., 1995). The vast majority of women reported using vegetable oil for cooking. Butter and margarine were reported by 11.4% and 12.8% of women, respectively. Interestingly, none of the women reported meat fat, lard and shortening. These were similar to those of Romero-Gwynn and associates (1993). After immigration, consumption of butter and margarine increased from 10% to 60%. Similarly, vegetable oil consumption increased from 36% to 80% after immigration to the United States. Unlike butter, margarine and vegetable oil, the consumption of lard decreased from 67% to 28%.

The vast majority of subjects exhibited some form of saturated fat avoidance. This was mostly due to the consumption of vegetable oil and 2% milk, as opposed to options that were higher in saturated fats, such as whole milk, butter, and lard. However, when sociodemographic variables were controlled for, there was no significant relationship between saturated fat avoidance behavior and acculturation. This was contrary to the hypothesis that women with higher acculturative status would exhibit more saturated fat avoidance. Again, this may have been due to the narrow range of acculturation scores, which might explain variability in saturated fat avoidance scores as well.

However, previous research has been conflicting. In one case, more acculturated Latino women consumed less saturated fat than less acculturated Latinos (Woodruff et al., 1997). In two others, less acculturated individuals consumed less saturated fat than more acculturated individuals (Balcazar, et al., 1995; Winkelby, et al., 1994). A fourth found no significant difference in saturated fat avoidance between Latino women, though this last study did not assess acculturation. Variability in results could be due to differences in acculturation assessment. The different acculturation measures used were an acculturation scale (Woodruff, et al., 1997) as compared to language preference (Winkelby, et al., 1994) or a combination of both (Balcazar, et al., 1995). Regardless, it does appear that the majority of women were consuming sources of dietary fat that were lower in saturated fat, with the exception of whole milk.

An additional concern is that the saturated fat avoidance scale did not address the issue of *trans*-unsaturated fat avoidance. Recent research suggests that *trans*-unsaturated

fats may be at least as atherogenic as saturated fats (Hu & Willett, 2002). Margarine and shortening, depending on the brand may be sources of trans-unsaturated fats. Avoidance of these types of fat may also be important for the prevention of atherosclerosis and therefore should also be addressed. No participants in this study reported consuming shortening, though some did report consuming margarine.

Physical Activity

Physical activity factors were reported by all but one non-gravid woman. Only 3% women reported engaging in at least 30 minutes of leisure time physical activity five days each week as recommended. Half of the women reported not engaging in any leisure time physical activity. This was consistent with analyses of the Third National Health and Nutrition Examination Survey (NHANES III), in which one half of Latinos reported no form of leisure time physical activity, such as jogging, swimming, or weight lifting (Crespo, et al., 2000). Rates of habitual physical were higher, though only about one fifth of subjects reported at least 30 minutes of habitual physical activity at least five days of the week. Job type was not reported frequently by subjects, but could have served as a proxy measure for the amount of habitual physical activity. Individuals employed as manual laborers would have had higher energy expenditures during the day than those who worked at a desk. In addition, the majority of women also reported not working outside of the home, so the amount of habitual physical activity would have been difficult to determine. When sociodemographic variables were controlled for, there was no significant relationship found between leisure time or habitual physical activity and acculturation. The initial hypotheses that more acculturated Latino women would engage in more leisure time physical activity and less habitual physical activity were not supported.

In contrast to the relatively low engagement of physical activity, 85% of women strongly agreed that physical activity was important. Why women did not engage in physical activity despite its perceived importance is puzzling. It is possible that the perceived importance of physical activity was not translated into behavior. A study by Bull, Eyster, King, and Brownson (2001) found that based on the Health Belief Model, 46% of Latino women were in either a precontemplation, contemplation, or preparation

stages of change for engaging in physical activity. Precontemplation, contemplation, and preparation stages of change describe the stages of change in which women may not even consider engaging in physical activity, are considering engaging in more physical activity, or are preparing to engage in more physical activity. A study of stages of change based on the Health Belief Model in the current study population might have been able to elucidate reasons for not engaging in physical activity, despite its perceived importance. There was also no significant relationship found between acculturation and perceived importance of physical activity, after sociodemographic variables were controlled.

A final measure of physical activity was the number of hours spent watching television. About two-thirds of women reported watching up to two hours of television each day, almost one half of whom watched one or less hours of TV each day. When sociodemographic variables were controlled for, there was no significant relationship between acculturation and the number of hours of television watched. No reports of studies were found in the literature on television watching by adult Latinos in the U.S. for comparison with these results. However, it has been found that TV watching and physical activity were positively associated with obesity prevalence in Mexican children in Mexico City (Hernández, 1999). The relationship between obesity and television watching in Latino adults has not been conducted. It is not known whether television watching in Latino adults is positively associated with obesity, but it is possible that this pattern exists in the Latinos in the United States. Several women asked, during the questionnaire administration, whether it mattered if they were sedentary while watching television as opposed to having the television on while doing chores. This question should have addressed the issue of whether or not women were sedentary while watching television. If subjects were doing household chores such as vacuuming or playing with their children, while watching television, they would have been expending energy.

When the effect of sociodemographic variables on the four physical activity measures combined was considered, age was significantly and negatively related to physical activity. However, age was not significantly related to any of the individual physical activity measures, nor were any other of the other sociodemographic variables or acculturation. This suggested that as age increased, women might be less likely to engage in physical activity. Based on the data collected from this study it is not possible to

determine why older women may engage in less physical activity. It is possible that older women may have poorer health, decreased energy levels and more responsibilities that demand time that might otherwise be available to engage in physical activity.

In addition to the limitations already mentioned, the fact that types of leisure time and habitual physical activity were not reported in this study was a significant limitation. Another limitation to these measures was that the amount of time spent participating in each bout of physical activity was not assessed. It is possible that individuals may engage in one or more hours of physical activity, though only three times each week. These individuals would have been recorded as only participating in at least 30 hours of physical activity three times each week. In addition, the vigorousness of physical activity was not assessed. An individual who spends thirty minutes jogging may expend more energy and gain more cardio-respiratory fitness than one who spends thirty minutes walking. A seven-day physical activity recall, considered too burdensome for this exploratory study, would have been more effective in obtaining a complete assessment of type of physical activity, intensity and duration.

Body Image

Concern about being or becoming fat and dieting for weight loss were the two measures of body image used in this study. While half of the 71 non-gravid women strongly agreed that were concerned about being or becoming fat, only 37% strongly agreed that they were on a weight loss diet. An additional 24% of women somewhat agreed that they were concerned about being or becoming fat which corresponded to 23% somewhat agreeing that they were on a weight loss diet. Neither of the two measures of body image was significantly related to acculturation, or any other independent variable, including age, income, body mass index, and the number of children. Again, the original research hypotheses were not supported. Dieting behavior and the fear of being or becoming fat was not significantly increased in more acculturated women. These results are contrary to results from previous research. Several studies have found a relationship between acculturation and body image factors. For example, Chamorro and associates (2000) found a significant and positive correlation between acculturation and Factor III score on the Eating Attitudes Test-26 (2000). Factor III of the EAT-26 describes control

of eating and perceived pressure from others to gain weight. Other studies have shown that rates of weight-related body image distortion were as high in Latino females as they were for non-Hispanic white females (Altabe, 1998) if not higher than non-Hispanic whites (Robinson, et al., 1996). One reason why no significant relationship was found between acculturation and body image factors is that only two questions were used to assess body image, rather than a full test, such as the EAT – 26 (Garner, et al., 1979) or the Eating Disorder Index (Garner, et al., 1981). In addition, the range of acculturation scores was narrow, with no highly acculturated subjects. Highly acculturated women may have exhibited more dieting behavior and concern about being or becoming fat. Furthermore, many of the study subjects were from nations with high rates of food insecurity and lower rates of obesity, such as Bolivia and El Salvador. Consequently, a more robust body frame may be valued as a sign of health. Further research with the same population to obtain a larger sample size might clarify whether this association is truly significant.

Limitations

There are several limitations to this study. The participants represented a self-selected study group, a relatively small sample size, and did not reflect the variability in acculturative status that was expected. Since the study group was a self-selected group it is not possible to determine whether there was a systemically common characteristic among the participants that led them to participate or not to participate in this study. Most importantly, they may have had a heightened sense of awareness about nutrition and felt inclined to participate in the research study. Greater nutritional knowledge or greater concern about dietary habits may have influenced responses. In addition, those individuals who did participate may have been more literate than others who chose not to participate.

The seasonal influence on food availability and consumption was not considered in this study. Data were collected through out winter months. It is possible that the types of fruits and vegetables as well as the servings of fruits and vegetables consumed may differ in different seasons. In addition, the price of produce varies based on seasons. When a given fruit or vegetable is in its growing season, its price in the grocery score

tends to go down and make the food item more affordable. In a limited-resource population such as this one, it is possible that the price of the produce may have influenced intake patterns.

The relatively small sample size was a limitation for several reasons. Measurement of fruit and vegetable intake patterns suffered from low response rates. In most cases, it was not possible to determine the serving sizes of fruits and vegetables consumed. A larger sample size would have captured more subjects who could have provided all of the information necessary to interpret results more accurately. There are several ways in which recruitment could have been increased. Women enrolled in the Expanded Food and Nutrition Education Program (EFNEP) participants in counties where there were no bilingual Program Assistants could still have been recruited. The survey instrument would then have to be administered by a trained bilingual administrator or one of the researchers in sessions set up for data collection. Other organizations that commonly serve limited resource Latinos, such as free clinics or Latino churches could also have been used as recruitment sites.

Two unexpected events may have influenced the number of subjects available for recruitment. Heavy snows during the beginning months of the study made data collection impossible on certain previously chosen study days. In addition, employees of the Arlington County Women, Infants and Children program (WIC) office reported that inclement weather often was associated with decreased office visits by WIC participants.

The beginning of the U.S. conflict in Iraq, surprisingly, also seemed to be associated with decreased WIC participant office visits. Several WIC employees believed that the reduced numbers were due to fear of terrorism in the Washington D.C. area. Potential study participants who may have already been exposed to civil strife in their own homelands may have been too frightened to leave their homes. Individuals who are illegal immigrants to the United States may also be reluctant to provide personal information given the heightened awareness of immigration of potential terrorists (Tilley-Lubbs, 2003b).

Other WIC employees felt that the decrease in participants was simply due to occasional fluctuation in WIC participant population. Anecdotally, the cost of living in Arlington County is too high for most immigrants. During the time period of this study

more immigrants may have chosen to move to neighboring areas, such as Fairfax County, where the cost of living is somewhat lower.

Educational attainment was not assessed in this study which was a potential drawback since differences in education could not be assessed. Therefore, the relationship of education to acculturation was also not assessed. In addition, the relationship between education and the independent variables assessed in this study was not determined. Variability in educational attainment may have influenced the ability of participants to read and understand the survey instrument. Although literacy in English or Spanish was assumed, the researchers did provide assistance to subjects requesting help reading or responding to the questionnaire. Anecdotally, approximately 10 subjects requested help reading or responding to the questionnaire. However, it is unknown how many subjects may have required assistance but did not request it. Assessment of literacy may need to be addressed in further research in this population to ensure that survey instruments are at an appropriate reading level for subjects. In the pilot-study, none of the subjects had difficulty reading the questionnaire; therefore the questionnaire was not revised or adapted for a lower literacy level. In addition, it appeared that most of the study subjects were immigrants and may have completed their educations prior to immigration. It would also be difficult to compare the educational attainment of individuals from different countries, unless it was known that education in different grade levels was equivalent in different Latino countries.

The narrow range of acculturation scores was also a limitation. A wide range of scores was expected, from low acculturation to high acculturation. However, scores only ranged from low to middle. The results of this study cannot be generalized to more acculturated populations because it is unknown how higher acculturative status would have affected the measurements of dietary behavior, physical activity and body image. It is also possible that if more individuals in the study would have had higher acculturative status, the relationship between acculturation and dietary patterns, physical activity, and body image would have been statistically significant.

As mentioned earlier, the choice of acculturation scale may have limited the ability to properly assess acculturative status. Most acculturation scales assume a linear progression through acculturation in which individuals replace old cultural habits with

recently acquired habits. However, a bicultural approach has been proposed, which states that acculturation may reflect degrees of fluency in two or more cultures (Mendoza, 1989). According to a linear approach to acculturation, retention of Latino culture might indicate that an individual has not adopted the predominant U.S. culture. However, according to a bicultural approach, retention of a Latino cultural habit may simply indicate that the given individual is still fluent in their native culture. This same individual may also be fluent in U.S. culture. Though a bicultural approach to acculturation is more complex, it may be a more accurate measure of changes that occur during the acculturative process. If a bimodal approach to acculturation is a more accurate approach, it might have been more sensitive and better able to differentiate acculturative status in this population. In addition, this may explain the lack of significance found for the relationship between acculturation, physical activity, and body image factors.

In addition, Mendoza also stated that social context may influence social behavior (1989). Individuals may respond differently to people of different cultures. For instance, in the presence of members representative of the mainstream culture, individuals may exhibit behaviors reflective of mainstream culture. In this study, the environment in which the survey instrument was administered may have influenced the respondents. The researchers and the various programs in which respondents were enrolled may have represented mainstream U.S. culture. The employment of bicultural administrators as opposed to only bilingual administrators may reduce the possible perceived influence of U.S. culture.

Chapter VI

Conclusions

Previous investigations of acculturation and the Latino population have focused primarily on Mexican Americans, Puerto Ricans or Cuban Americans, using rough measures of acculturation. This investigation sought to employ a more complex acculturation measure, to account for changes not only in language use, but also preferences for media and social factors. The study population used was also novel, because it represents a diverse Latino population composed mostly of Central and South Americans. This population has not received as much attention as Mexican Americans because they comprise a smaller proportion of the Hispanic population in the United States. The subjects were also recruited from an area in the United States in which no research has been done regarding Latinos, acculturation and their health practices. The results of this study represent exploratory investigations into the limited-resource, Latino population in northern Virginia and provide baseline data for a further, more detailed study.

Most of the hypotheses tested were not supported by the results of this study. There was no significant relationship found between acculturation and physical activity or body image. There was a significant relationship between acculturation and the number of servings of fruits consumed. Health and nutrition educators may be able to capitalize on this relationship and foster the continued intake of fruits. Unfortunately this relationship was not found for acculturation and vegetable consumption. This area could be a target for nutritionists and health educators to try to increase the consumption of vegetables. Further research with larger sample sizes and improved response rates is needed to verify and reexamine dietary patterns more thoroughly.

Saturated fat avoidance was not significantly related to acculturation. However, the high level of whole milk consumption in this population may also be a target for nutrition educators. Convincing women to switch from whole milk to low fat milk would reduce their caloric intake as well as reduce the amount of saturated fats consumed.

The low levels of physical activity reported were not surprising considering previous research. Despite low physical activity, the overwhelming majority of women

agreed that physical activity was important. Perceived importance of physical activity may be capitalized upon in health education programs to try to increase both leisure time physical activity as well as habitual physical activity. In addition, assessment of potential barriers to regular physical activity may clarify why so many Latino women are not physically active.

Finally, the lack of relationship between acculturation and body image factors was surprising. Mental health in Latinos has been studied extensively and several studies have shown relationships between acculturation and body image disturbance, eating disorder symptomatology as well as depression. Most likely, the presence of highly acculturated Latino women in this study population would have helped to accentuate differences in body image between women of different acculturative status.

The results of this study cannot be widely generalized to the Latino population with limited resources for several reasons. Most importantly, individuals who seek nutrition assistance and nutrition education may be more aware of their health and the result of different health behaviors. Second, this population was highly diverse in nationality. The grouping of Central and South Americans into one large demographic group has been done repeatedly rather than specify different nationalities. Just as Bolivians and Peruvians differ from Mexicans or Puerto Ricans, who are usually considered in isolation, so to are immigrants from the various countries in the Central and South American continent. The dynamic of shared culture between different nationalities living so closely together also cannot be captured by a simple study of acculturation.

The results of further investigations, stemming from this pilot study, could be valuable to the educators of food assistance programs that serve the Latino population. If, for example, acculturation has beneficial effects on vegetable intake, these changes should be capitalized upon and reinforced. If saturated fat avoidance is not associated with increased acculturative status, it could be taught to help protect individuals from the danger of adding too many foods with saturated fat to their diets. In addition, programs such as Women Infants and Children (WIC) and the Expanded Food and Nutrition Education Programs (EFNEP) provide avenues to encourage healthy habits because participants are seen on a regular basis. However, in the case of EFNEP, where classes

may only be held for several weeks, it may not be possible to encourage the maintenance of new health habits.

Further Research

Each of the major areas investigated here should be studied in greater depth using more sensitive survey instruments. For example, dietary information could be assessed with interviewer guided dietary recall to maximize the reporting of all foods consumed. In addition, qualitative research, utilizing focus groups might be useful to determine barriers to fruit and vegetable consumption, such as economic concerns, or issues of availability in grocery stores.

Leisure time physical activity should be assessed by an instrument that can detect not only the type of physical activity, but also the duration and intensity of physical activity. A seven-day physical activity record may be one method to obtain this information. The assessment of habitual physical activity would also be best assessed using an instrument designed specifically for assessment of habitual physical activity. Though the results of this study did not indicate a relationship between habitual physical activity and acculturation, it is possible that the instruments used for assessment were not sensitive enough to detect variability in levels of physical activity. Several scales already exist, such as the one developed by Baecke and associates (1982).

Further investigation into body image should include the use of a full body image assessment scale. In addition, the knowledge of a psychologist should be employed to determine the most appropriate assessment tool. Differences between body image distortion, eating disorder symptomatology, and diagnosed eating disorders should be distinguished, and can best be done with the assistance of psychologists.

If time and resources allow, a longitudinal study following a prospective cohort of Latinos from the time of immigration would provide valuable information not only about dietary acculturation, but also about the acculturation process itself. This type of research project would best be conducted with a multi-disciplinary team of researchers, including anthropologists, psychologists, nutritionists, public health experts, and physicians. Information about changes in acculturation, dietary habits, psychological variables, and health behaviors and their respective effects on morbidity and mortality could be collected and analyzed.

Regardless of research methodology, the role of acculturation in dietary and health habits in Latinos warrants further investigation. Further research should include more detailed assessments of acculturation and outcome measures. Though Mexican Americans, Cuban Americans and Puerto Ricans represent the greatest portion of the U.S. Latino population, more attention should be paid to Latinos of Central and South American descent. As the Latino population grows in the United States, healthful habits need to be identified and encouraged in Latinos. Those habits that appear to promote health in Latinos should be investigated for their health promoting potential in the entire U.S. population.

Appendices

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Institutional Review Board

Dr. David M. Moore
IRB (Human Subjects) Chair
Assistant Vice Provost for Research Compliance
CVM Phase II - Duckpond Dr., Blacksburg, VA 24061-0442
Office: 540/231-4991; FAX: 540/231-6033
e-mail: moored@vt.edu

MEMORANDUM

TO: Elena Serrano HNFE 0430
Margarethe Goetz HNFE 0430

FROM: David M. Moore 

DATE: June 19, 2002

SUBJECT: **Expedited Approval** – “Assessment of Dietary Acculturation in Mexican American Women” – IRB #02-323

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective June 19, 2002.

Approval of your research by the IRB provides the appropriate review as required by federal and state laws regarding human subject research. It is your responsibility to report to the IRB any adverse reactions that can be attributed to this study.

To continue the project past the 12 month approval period, a continuing review application must be submitted (30) days prior to the anniversary of the original approval date and a summary of the project to date must be provided. My office will send you a reminder of this (60) days prior to the anniversary date.

cc:File
Carrie Earthman HNFE 0430

Informed Consent for Participants in Research Projects Involving Human Subjects

Title of Project Assessment of Dietary Acculturation among Latino Women

Principal Investigator Elena Serrano, Ph.D.

Co-Principal Investigator Margarethe Goetz

I. Purpose of this Research/Project

This study will help us:

- 1) evaluate the main foods eaten by adults living in diverse areas of Virginia and assess differences in diet based on culture; and
- 2) study changes in body image and physical activity related to culture.

A total of 120 Latino women between the ages of 21 and 50 will participate in the study.

II. Procedures

You will be asked to answer questions about nutrition, physical activity, and your attitude towards your body. Each survey takes about 30 minutes to fill out.

III. Risks

There are no known risks associated with this project.

IV. Benefits

There are no direct benefits for participating in this study. The results, however, will help us design culturally appropriate teaching materials for nutrition programs. No promise or guarantee of benefits has been made to encourage you to participate.

V. Extent of Anonymity and Confidentiality

Your answers will be kept anonymous and confidential. Only the researchers will be able to read your answers. No names will be attached to the questionnaire. We will not know who you are, instead, we will assign you a number. The user number will be used on the survey. The key will be kept in a secure location.

VI. Compensation

You will be given a \$10 gift certificate, once the survey has been turned in to the investigator.

**Consentimiento Informado Para
Participar en un Proyecto de Investigaciones**

Título del Proyecto Estudio de Aculturación en Latinas viviendo en los EE.UU.
(Assessment of Dietary Acculturation among Latino Women)

Investigadora Principal Elena Serrano, PhD
Co-Investigadora Margarethe Goetz, MS candidate

I. Propósito del Proyecto

Este estudio nos ayudará:

- 1) evaluar las comidas principales de adultos viviendo en el estado Virginia y las diferencias en el comer, basadas en la cultura.
- 2) evaluar cambios en la actitud sobre el cuerpo y la actividad física, basadas en la cultura.

120 Latinas viviendo en los EE.UU., entre las edades 21 y 50 años, participarán en este estudio.

II. Procedimientos

Le pedimos a Ud. que llene un cuestionario que tiene preguntas sobre la nutrición, la actividad física, y su actitud sobre su cuerpo y peso. Se requiere unos 30 minutos para llenar el cuestionario.

III. Riesgos

No hay riesgos conocidos que se asocian con este proyecto.

IV. Beneficios

No hay beneficios directos que se ganen como resultado de este estudio. Los resultados nos ayudarán a desarrollar materiales educativos que son apropiados para poblaciones hispanas. No hay promiso ni garantía de beneficios para animarle a Ud. a participar en este estudio.

V. Anonimidad y Confidencialidad

Todas las respuestas serán anónimas y confidenciales. Serán usadas solamente para los propósitos del proyecto. Para proteger a las participantes, los investigadores usarán un número de identificación. El número de identificación será guardado en un lugar seguro, asegurando la confidencialidad.

VI. Compensación

Usted recibirá un regalo que vale \$10, tan pronto como Ud. ha llenado el cuestionario y lo ha devuelto a las investigadoras.

VII. Retirar de Participar

Usted tiene el derecho de retirar del estudio a cualquier momento. Tiene el derecho de omitir cualquier pregunta que Ud. escoja sin pena.

VIII. Aprobación del Estudio

Este estudio ha sido aprobado, como se requiere, por la Comité Institucional para las Investigaciones que Emplean a Sujetos Humanos en Virginia Polytechnic Institute and State University por el Departamento de Nutrición Humana, Alimentos y Actividad Física.

XI. Responsabilidades del Participante

Yo participo voluntariamente en este estudio. Tengo la responsabilidad de llenar el cuestionario del estudio, lo mejor posible. Recibiré un regalo que vale \$10.

X. Permiso del Participante

He leído y entiendo el consentimiento informado y reglas de este estudio. He recibido respuestas para todas las preguntas que tengo. Con mi firma, reconozco que he leído y entiendo la información exponida y firmo voluntariamente:

Nombre del Participante (Letras de molde)

Firma del Participante

Fecha

Firma de la Investigadora o Co-Investigadora

Fecha

Si tengo preguntas sobre este estudio, los derechos de los participantes, y con quien ponerse en contacto si hay herida a causa del estudio, puedo llamar a:

Elena Serrano Ph.D.
Investigadora

540.231.3464,serrano@vt.edu
número de teléfono / e-mail

Margarethe Goetz
Co-Investigadora

540.231.3464, mgoetz@vt.edu
número de teléfono / e-mail

Micheal Houston, Ph.D.
HNFE Director del Departamento

540.231.4640, houstonm@vt.edu
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David M. Moore
Chair, IRB
Office of Research Compliance
Research and Graduate Studies

540.231.4991, moored@vt.edu
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Virginia Cooperative Extension
EFNEP and SCNEP Programs

EFNEP AND SCNEP FAMILY RECORD

(Use with Young Families)

REVISED 2001

PUBLICATION 360-090

Complete on each family at ENTRY into EFNEP/SCNEP and again at EXIT. Program Assistant should fill in shaded items.

1. PA's Name & ID#:		2. Check: ENTRY ___ EXIT ___	
3. Unit ID: _____	5. Enrolled in EFNEP before? (circle Yes OR No) Yes No	7. Age: _____	8. Sex: Female ___ Male ___
4. Homemaker's ID: _____	6. If Yes, did you receive a Certificate of Completion? Yes No		
Homemaker (First) (MI) (Last) a) Name _____ b) Street _____ c) City _____ Zip _____ d) Phone _____		*10. Pregnant (circle one) YES NO *10a. Breast Feeding (circle one) YES NO * (If YES, Complete Perinatal Record(s))	
11. Race: Check the category you identify with 1-00 ___ White (non-Hispanic) 2-00 ___ Black (non-Hispanic) 3-00 ___ Am Indian/Alaskan Native 4-00 ___ Hispanic 5-00 ___ Asian or Pacific Islander	12. Place of Residence: circle number 1 Farm 2 Towns under 10,000 & rural non-farm 3 Towns & Cities 10,000 to 50,000 4 Suburbs of Cities over 50,000 5 Central Cities over 50,000	13. Total Household Income Last Month: \$ _____ Homemaker works outside home Yes No	
14. Household Members: Children by Age List First Name of Children (through Age 19)	Age (Years)	15. Number of Other Adults in Household _____ (do not count Homemaker)	
1.		16. Lesson type (Check one): 1 ___ Group 3 ___ Both 2 ___ Individual 4 ___ Other	
2.		Total number of lessons recieved (AT EXIT): _____	
3.		17. SUBGROUP-CODES: (see page 3)	
4.		[] [] [] [] [] []	
5.			
6.			
7.			

18. Entry Date:	Complete this section only when homemaker graduates or drops from program	
19. Programs/agencies from which Family received assistance at ENTRY: (Circle YES or NO)	20. Exit Date:	22. Did your family get help from one or more of programs below, due to referral or suggestion by EFNEP/SCNEP Program Assistant? Yes ___ No ___
WIC/CSFP Yes No	21. Exit Reason: (circle)	If YES, check all that apply:
Food Stamps Yes No	1 Educational Objective Met	___ WIC
Commodities (TEFAP) Yes No	2 Returned to School	___ Food Stamps
Head Start Yes No	3 Took Job	___ Commodities (TEFAP)
Child Nutrition Yes No	4 Family Concerns	___ Head Start
AFDC/TANF Yes No	5 Staff Vacancy	___ Child Nutrition
Other _____ Yes No	6 Moved	___ AFDC/TANF
	7 Lost Interest	___ Other _____
	8 Other	



Virginia Cooperative Extension programs and employment are open to all, regardless of race, color, religion, sex, age, veteran status, national origin, disability, or political affiliation. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. J. David Barrett, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; Lorenza W. Lyons, Administrator, 1890 Extension Program, Virginia State, Petersburg.
VT638/0101/10M/212394/360090



FOOD PRACTICE CHECKLIST

Date Taken:	Check if answers were written in by Program Assistant <input type="checkbox"/>	Check One	Entry <input type="checkbox"/>	Exit <input type="checkbox"/>	Other <input type="checkbox"/>	No. ___
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This is a survey about ways you plan and fix foods for your family. As you read each question, think about the recent past. This is not a test. There are no wrong answers. If you do not have children, just answer the questions for *yourself*. For these questions, think about how you usually do things.

Please put a check [✓] in the box that best answers each question.	(1) Never	(2) Seldom	(3) Some-Times	(4) Most of the time	(5) Almost Always
(1) How often do you plan meals ahead of time?					
(2) How often do you compare prices when you buy food?					
(3) How often do you run out of food before the end of the month?					
(4) How often do you shop with a grocery list?					
(5) This question is about <i>meat</i> and <i>dairy</i> foods: How often do you let these foods sit out of the refrigerator for more than two hours?					
(6) How often do you thaw frozen food at room temperature?					
(7) When deciding what to feed your family, how often do you think about healthy food choices?					
(8) How often have you prepared foods without adding salt?					
(9) How often do you use the "Nutrition Facts" on the food label to make food choices?					
(10) How often do your children (or you) eat something in the morning within 2 hours of waking up?					

Virginia Cooperative Extension
EFNEP and SCNEP Programs

EFNEP AND SCNEP FAMILY RECORD

(Use with Young Families)

REVISED 2001

PUBLICATION 360-090

Complete on each family at ENTRY into EFNEP/SCNEP and again at EXIT. Program Assistant should fill in shaded items.

1. PA's Name & ID#:		2. Check: ENTRY _____ EXIT _____	
3. Unit ID: _____	5. ¿Ha participado Ud. en EFNEP? Sí ___ No ___	7. Edad: _____	8. Género: Hembra: _____ Varón: _____
4. Homemaker's ID: _____	6. Si respondió "Sí" ¿Recibió certificado de completación? Sí _____ No _____		
9. Participante a) Nombre: _____ b) Calle: _____ c) Ciudad _____ Zip _____ d) Número de teléfono: _____		10. Está Ud. embarazada: SÍ NO 10a. Da de pecho? SÍ NO	
11. Raza: Marque la categoría que le describe 1-00 ___ blanco(a) o caucásico(a) 2-00 ___ negro(a) o afro-americano(a) 3-00 ___ indígena o nativo de Alaska 4-00 ___ latino(a) o hispano(a) 5-00 ___ asiático(a) o nativo de islas Pacíficas	12. Lugar de residencia: circule el número 1. granja 2. pueblo menos de 10,000 y area rural 3. pueblo o ciudad 10,000-50,000 4. suburbia de ciudad mas de 50,000 5. ciudades centrals mas de 50,000	13. Total del ingreso de casa último mes: \$ _____ participante trabaja a fuera de casa Sí No	
14. Miembros de la Casa: Hijos y edad Indique el nombre del hijo (hasta 19 anos)	Edad	15. Numero de otro adultos en el hogar _____ (no incluye el participante)	
1.		16. Tipo de enseñanza: 1 ___ grupo 3 ___ los dos 2 ___ individual 4 ___ otro Número de lecturas recibidas (AL SALIR) _____	
2.			
3.			
4.			
5.			
6.			
7.			
		17. Código del subgrupo: _____	

18. Fecha de entrada:	Complete this section only when homemaker graduates or drops from program	
19. Programas/agencias en que participó al ENTRAR: (circule Sí o No)	20. Fecha de salir	22. Did your family get help from one or more of programs below, due to referral or suggestion by EFNEP/SCNEP Program Assistant? Yes ___ No ___ If YES, check all that apply: ___ WIC ___ Food Stamps ___ Commodities (TEFAP) ___ Head Start ___ Child Nutrition ___ AFDC/TANF ___ Other _____
	21. Razón para salir: (circule)	
WIC/CSFP Sí No	1. Meta educative realizado	
Food Stamps Sí No	2. Devolvió a la escuela	
Commodities(TEFAP) Sí No	3. Empezó a trabajar	
Head Start Sí No	4. concierna de familia	
Child Nutrition Sí No	5. falta de empleado	
AFDC/TANF Sí No	6. Se mudó	
Otro _____	7. perdió interesa	
	8. otro	



Fecha:	Check if answers were written by Program Assistant <input type="checkbox"/>	Check One	Entry <input type="checkbox"/> Other <input type="checkbox"/>	Exit <input type="checkbox"/> No. ___
--------	---	-----------	--	--

Este cuestionario trata de las maneras en que planea y prepara comida para su familia. Al leer las preguntas, piensa en el pasado reciente. Esto no es un examen. No hay respuestas de mal. Si Ud. no tiene hijos, responde para *Ud. misma*. Para estas preguntas, piensa en la manera normal de hacer cosas.

Por favor, marque el cuadrado bajo la respuesta que le describa lo mejor.	(1) Nunca	(2) Un poco	(3) A veces	(4) Mucho	(5) Siempre
(1) ¿Con que frecuencia planea Ud. la comida antes de cocinar?					
(2) ¿Con que frecuencia compara los precios cuando compra alimentos?					
(3) ¿Con que frecuencia se queda sin comida antes del fin del mes?					
(4) ¿Con que frecuencia va de compras con una lista?					
(5) Esta pregunta trata de carne y productos lacteos: ¿Con que frecuencia deja estas comidas a fuera del refrigerador más de dos horas?					
(6) ¿Con que frecuencia deja comida congelada en temperatura ambiente para descongelarse?					
(7) Cuando Ud. decide qué va a comer la familia, ¿Con que frecuencia piensa en comida sana?					
(8) ¿Con que frecuencia prepara comida sin añadir sal?					
(9) ¿Con que frecuencia usa las etiquetas de alimentos (se llama "Nutrition Facts") para escoger los alimentos?					
(10) ¿Con que frecuencia come Ud. y sus hijos algo dentro de dos horas despues de despertarse?					

PA's Name: _____

Assigned Check Pick-up Date: _____

VT ID # _____

Date ____ / ____ / ____

Location _____

The goal of this survey is to understand health and dietary habits of Latino women in Virginia. Your answers will be used to improve nutrition education programs. Please circle the best answer for each question. Thank you for your time and effort!

1. What city and country are you from? _____

These questions will ask you what language you prefer to use.

2. In general, what language(s) do you read and speak?

- A** Only Spanish
- B** Spanish better than English
- C** Both equally
- D** English better than Spanish
- E** Only English

3. What language(s) did you use as a child?

- A** Only Spanish
- B** Spanish more than English
- C** Both equally
- D** English more than Spanish
- E** Only English

4. What language(s) do you usually speak at home?

- A** Only Spanish
- B** Spanish more than English
- C** Both equally
- D** English more than Spanish
- E** Only English

5. In which language(s) do you usually think?

- A** Only Spanish
- B** Spanish more than English
- C** Both equally
- D** English more than Spanish
- E** Only English

6. What language(s) do you usually speak with your friends?

- A** Only Spanish
- B** Spanish more than English
- C** Both equally
- D** English more than Spanish
- E** Only English

7. In what language(s) are the TV programs you usually watch?

- A** Only Spanish
- B** Spanish more than English
- C** Both equally
- D** English more than Spanish
- E** Only English

8. In what language(s) are the radio programs you usually listen to?

- A** Only Spanish
- B** Spanish more than English
- C** Both equally
- D** English more than Spanish
- E** Only English

9. In general, in what language are the movies, TV and radio programs you prefer to watch or listen to?

- A Only Spanish
- B Spanish more than English
- C Both equally
- D English more than Spanish
- E Only English

These next questions will ask you about your friends and family. For these questions, Latinos include people from Mexico, Puerto Rico, Cuba and other Latin American countries. Non-Latinos include those who are not from Latin American countries.

10. Your close friends are:

- A All Latinos
- B More Latinos than non-Latinos
- C About half and half
- D More non-Latinos than Latinos
- E All non-Latinos

11. You prefer going to social gatherings or parties at which the people are :

- A All Latinos
- B More Latinos than non-Latinos
- C About half and half
- D More non-Latinos than Latinos
- E All non-Latinos

12. The persons you visit or who visit you are:

- A** All Latinos
- B** More Latinos than non-Latinos
- C** About half and half
- D** More non-Latinos than Latinos
- E** All non-Latinos

13. If you could choose your children's friends, you would want them to be:

- A** All Latinos
- B** More Latinos than non-Latinos
- C** About half and half
- D** More non-Latinos than Latinos
- E** All non-Latinos

Try to remember the fruits, vegetables and fruit juices/drinks you ate or drank yesterday. Mark the items on this list that you ate/drank yesterday.

Fresh roasted corn	Vegetable salad
Canned or frozen corn or boiled corn on the cob	Vegetable soup (caldo de verduras)
Red Salsa	Garlic
Green Salsa	Orange juice
Green tomatoes/tomatillos	Apple, grape, or grapefruit juice
Tomatoes/jitomates	Fruit drinks (Hi-C, Kool-Aid, Tang, Sunny Delight, Tampico)
Spaghetti sauce	Aguas frescas o naturales o de limón
Jicama	Oranges or grapefruits
Chile Peppers (red and green)	Bananas
Green Peppers	Apples
Guacamole, avocado	Mangos or mango juice
Cabbage	Pineapple or pineapple juice
Sweet potatoes, yams	Cantaloupe
Broccoli, cauliflower	Watermelon
Spinach	Raisins or prunes
Potato Chips/French Fries	Grapes
Potatoes (not chips or fries)	Strawberries
Squash--orange or winter (chayote), zucchini (calabacitas)	Peaches, nectarines
Peas	Apricots
Yucca/cassava	Guavas or guava juice
Carrots	Prickly pear (nopales) or young cactus leaves (nopalitos)
Lettuce salad	Papayas or papaya juice

14. What did you eat and drink for breakfast that had fruits and vegetables?

Fruits and vegetables

amount

_____	_____
_____	_____
_____	_____
_____	_____

15. What did you eat and drink for lunch yesterday that had fruits and vegetables?

Fruits and vegetables

amount

_____	_____
_____	_____
_____	_____
_____	_____

16. What did you eat and drink for dinner yesterday that had fruits and vegetables?

Fruits and vegetables

amount

_____	_____
_____	_____
_____	_____

17. Did you eat and drink any snacks or desserts yesterday with fruits and vegetables?

Fruits and vegetables

amount

_____	_____
_____	_____
_____	_____
_____	_____

The next two questions are about your food choices.

18. If you drink milk, circle the type of milk that you yourself usually drink.

Whole milk (4%)

Chocolate milk

2% milk

1% milk (low fat milk)

Evaporated or condensed milk

Skim, non-fat or powdered milk

19. If you use fat or oil to cook, circle the type you use most.

Lard

Meat fat

Butter

Shortening

Margarine

Vegetable oil

The next questions are about your physical activity. Physical activity means taking part in any kind of movement or exercise. This activity can be planned, such as running, walking or playing soccer. However, chores, such as walking the dog or working in the yard are also forms of physical activity.

20. What is your main job? _____

How many hours each week do you work this job? _____

21. How often do you play soccer, play basketball, jog or run, etc... for 30 or more minutes?

- A. 0 days each week
- B. 1-2 days each week
- C. 3-4 days each week
- D. 5-6 days each week
- E. 7 days each week

22. How often do you do chores or yard work such as weeding, mowing the grass, carrying loads, taking the stairs, walking to the grocery store, etc... for 30 or more minutes ?

- A. 0 days each week
- B. 1-2 days each week
- C. 3-4 days each week
- D. 5-6 days each week
- E. 7 days each week

23. I feel that it is important to be physically active.

- A. strongly agree
- B. mostly agree
- C. neither agree nor disagree
- D. mostly disagree
- E. strongly disagree

24. How much time do you spend each day watching TV each day?

- A. 0 - 1 hours
- B. 1 ½ - 2 ½ hours
- C. 3 - 4 hours
- D. 4 ½ - 5 ½ hours
- E. more than 6 hours

The next questions will ask you how you feel about your body.

25. If you know your own height and weight please write them here.

Height _____ Weight _____

26. I am constantly worried about being or becoming fat.

- A. strongly disagree
- B. mostly disagree
- C. neither agree nor disagree
- D. mostly agree
- E. strongly agree

27. I am on a weight loss diet.

- A. strongly disagree
- B. mostly disagree
- C. neither agree nor disagree
- D. mostly agree
- E. strongly agree

The final questions concern your children.

28. Do you have any children between 9 and 12 years old?

No _____ Yes _____

29. If you answered yes to the last question, please answer the next few questions.

1. How old is this child? _____

2. Please circle the gender of this child:

male female

3. Do you consider this child

- A. underweight
- B. average weight
- C. overweight

4. If you know, what is this child's weight? _____
height? _____

Thank you for all of your time and effort!

PA's Name: _____

Assigned Check Pick-up Date: _____

VT ID # _____

Date ____/____/____

Location _____

La meta de esta encuesta es para entender las costumbres de alimentación y salud de latinas que viven en Virginia. Sus respuestas serán usadas para mejorar los programas educativos sobre la nutrición. Favor de poner un círculo alrededor de la mejor respuesta para cada pregunta. ¡Gracias por su tiempo y esfuerzo!

1. ¿De qué país y ciudad viene Ud. ? _____

Estas preguntas le preguntarán cuál idioma Ud. prefiere usar.

2. Por lo general, ¿ qué idioma(s) lee y habla usted?

- A** Sólo el español
- B** El español mejor que el inglés
- C** Ambos por igual
- D** El inglés mejor que el español
- E** Sólo el inglés

3. ¿Cuál fué el idioma(s) que habló cuando era niño(a)?

- A** Sólo el español
- B** Más el español que el inglés
- C** Ambos por igual
- D** Más el inglés que el español
- E** Sólo el inglés

4. Por lo general, ¿en qué idioma(s) habla en su casa?

- A** Sólo el español
- B** Más el español que el inglés
- C** Ambos por igual
- D** Más el inglés que el español
- E** Sólo el inglés

5. Por lo general, ¿en qué idioma(s) piensa?

- A** Sólo el español
- B** Más el español que el inglés
- C** Ambos por igual
- D** Más el inglés que el español
- E** Sólo el inglés

6. Por lo general, ¿en qué idioma(s) habla con sus amigos(as)?
- A** Sólo el español
 - B** Más el español que el inglés
 - C** Ambos por igual
 - D** Más el inglés que el español
 - E** Sólo el inglés
7. Por lo general, ¿en qué idioma(s) son los programas de televisión que usted mira?
- A** Sólo el español
 - B** Más el español que el inglés
 - C** Ambos por igual
 - D** Más el inglés que el español
 - E** Sólo el inglés
8. Por lo general, ¿en qué idioma(s) son los programas de radio que usted escucha?
- A** Sólo el español
 - B** Más el español que el inglés
 - C** Ambos por igual
 - D** Más el inglés que el español
 - E** Sólo el inglés

9. Por lo general, ¿en qué idioma(s) prefiere oír y ver películas, y programas de radio y television?

- A** Sólo el español
- B** Más el español que el inglés
- C** Ambos por igual
- D** Más el inglés que el español
- E** Sólo el inglés

Las siguientes preguntas le preguntarán sobre sus amigos y su familia. En estas preguntas, la palabra “latinos” incluye a la gente de México, Puerto Rico, Cuba, y otros países latinoamericanos. La palabra, “americanos”, incluye a la gente que no son Latinos.

10. Sus amigos y amigas más cercanos son:

- A** Sólo latinos
- B** Más latinos que americanos
- C** Casi mitad y mitad
- D** Más americanos que latinos
- E** Sólo americanos

11. Usted prefiere ir a reuniones sociales/fiestas en las cuales las personas son:

- A** Sólo latinos
- B** Más latinos que americanos
- C** Casi mitad y mitad
- D** Más americanos que latinos
- E** Sólo americanos

12. Las personas que usted visita o que le visitan a usted son:

- A** Sólo latinos
- B** Más latinos que americanos
- C** Casi mitad y mitad
- D** Más americanos que latinos
- E** Sólo americanos

13. Si usted pudiera escoger a los amigos(as) de sus hijos(as), ¿quisiera que ellos(as) fueran:

- A** Sólo latinos
- B** Más latinos que americanos
- C** Casi mitad y mitad
- D** Más americanos que latinos
- E** Sólo americanos

Ahora trata de recordar las verduras/vegetales y fruta que comió ayer y jugos de fruta que bebió ayer. Marque las comidas en la lista abajo que comió y/o bebió ayer.

Elote fresco asado	Ensalada de verduras/vegetales
Elote en lata, congelado, o en la mazorca	Caldo de verduras/vegetales
Salsa roja	Ajo
Salsa verde	Jugo de naranja
Tomatillos	Jugo de manzana, uva, o toronja
Tomates/jitomates	Bebidas de fruta (Hi-C, Kool-Aid, Tang, Sunny Delight, Tampico)
Salsa de tomate	Aguas frescas o naturales
Jícama	Naranjas o toronjas
Chiles (rojos y verdes)	Plátanos/bananas
Pimientos verdes o chiles dulces	Manzanas
Guacamole, aguacate	Mangos o jugo de mangos
Repollo/col	Piñas o jugo de piñas
Camote/batata	Melónes (cantalupos)
Brécol/bróculi, coliflor	Sandías
Espinaca	Pasas o ciruela pasas
Papas fritas, papitas o papas a la francesa (french fries)	Uvas
Papas hervidas, al horno, puré de papa, otras papas (no fritas)	Fresas
Calabaza, calabacitas	Duraznos/melocotones, nectarinas
Guisantes/chícharos	Albaricoques
Yucca/cassava	Guavas o jugo de guavas
Zanahorias	Nopales o nopalitos
Ensalada de lechuga	Papayas o jugo de papayas

En la siguiente sección, queremos saber de todas las frutas y verduras (vegetales) que Ud. comió y bebió ayer. Esto incluye frutas y verduras que están en licuados y guisados. Por favor, díganos cuánto comió o tomó Ud. Por ejemplo, si Ud. tomó un vaso de jugo de naranja, describa el vaso (grande o pequeño), una lata de soda o una botella de “fruit drink” (Fruitopia, etc) Para la comida, díganos si era plato o cuenco grande, medio, o pequeño.

Ejemplo: Haga una lista de las frutas y/o verduras que Ud. almorzó ayer.

<i>Frutas y Verduras</i>	<i>cantidad</i>
Guisado- <u>yuca</u>	<u>1/4 taza</u>
<u>calabaza</u>	<u>1/4 taza</u>
<u>chicarros</u>	<u>1/2 taza</u>
<u>Jugo de manzana</u>	<u>1 vaso chico</u>

Estas son ejemplos de las frutas y verduras que Ud. puede incluir. Puede incluir otras que no estén incluidas en esta lista.

<u><i>Frutas</i></u>	<u><i>Verduras (Vegetales)</i></u>
manzana	jitomates
plátano	lechuga
naranja	chiles
fresa	col
melones	aguacate
kiwi	papa
piña	zanahoria
mango	brócoli
papaya	coliflor
peras	cebolla

14. Haga una lista de todas las frutas y verduras que Ud. desayunó ayer.

Frutas y verduras

cantidad

_____	_____
_____	_____
_____	_____
_____	_____

15. Haga una lista de todas las frutas y/o verduras que Ud. almorzó (lonche) ayer.

Frutas y verduras

cantidad

_____	_____
_____	_____
_____	_____
_____	_____

16. Haga una lista de todas las frutas y/o verduras que Ud. cenó ayer.

Frutas y verduras

cantidad

_____	_____
_____	_____
_____	_____
_____	_____

17. Haga una lista de cualquier fruta y/o verdura que Ud. comió como un bocadillo o un postre ayer.

<i>Frutas y verduras</i>	<i>cantidad</i>
_____	_____
_____	_____
_____	_____
_____	_____

Las dos preguntas siguientes tratan de sus opciones de alimentación.

18. Si Ud. toma leche, circule el tipo que normalmente toma Ud.

Leche sin desnatar

Chocolate con leche

Leche de 2% de grasa

Leche de 1% de grasa (tipo “low fat”)

Leche evaporada o leche condensada.

Leche desnatada, leche sin grasa, o leche en polvo (tipo “skim”)

19. Si Ud. usa grasa o aceite para cocinar, circule el tipo que más usa.

Manteca de cerdo

Grasa de carne

Mantequilla

Manteca

Margarina

Aceite

Las tres preguntas siguientes tratan de sus actividades físicas. En las dos preguntas siguientes, estar activa físicamente significa participar en cualquier tipo de movimiento o ejercicio. Esta actividad puede ser planeada, como correr, caminar o jugar fútbol. Sin embargo, las tareas como llevar al perro de paseo o trabajar en el jardín también son formas de actividad física.

20. ¿Cuál es su trabajo principal? _____

¿Cuanto tiempo pasa Ud. trabajando cada semana?

21. ¿Cuántas veces juega Ud. al fútbol o al básquetbol, o hace jogging, etc... o actividades como estas, por 30 minutos o más?

- A. 0 días cada semana
- B. 1-2 días cada semana
- C. 3-4 días cada semana
- D. 5-6 días cada semana
- E. 7 días cada semana

22. ¿Cuántas veces hace usted tareas como llevar al perro de paseo, trabajar en el jardín, cargar cosas pesadas, subir las escaleras, etc... por 30 minutos o más?

- A. 0 días cada semana
- B. 1-2 días cada semana
- C. 3-4 días cada semana
- D. 5-6 días cada semana
- E. 7 días cada semana

23. Creo que es muy importante estar activa físicamente.

- A. totalmente de acuerdo
- B. principalmente de acuerdo
- C. Me es indiferente
- D. principalmente en desacuerdo
- E. total desacuerdo

24. ¿Cuánto tiempo pasa Ud. mirando la tele cada día?

- A. 0 - 1 horas
- B. 1 ½ - 2 ½ horas
- C. 3 - 4 horas
- D. 4 ½ - 5 ½ horas
- E. más de 6 horas

Las dos siguientes preguntas le preguntarán como se siente sobre su cuerpo.

25. Si Ud. sabe su peso y altura, indíquelos aquí.

Altura _____ Peso _____

26. Estoy constantemente preocupada por ser gorda o ponerme gorda.

- A. totalmente de acuerdo
- B. principalmente de acuerdo
- C. me es indiferente
- D. principalmente en desacuerdo
- E. totalmente en desacuerdo

27. Estoy a dieta.

- A. totalmente de acuerdo
- B. principalmente de acuerdo
- C. Me es indiferente
- D. principalmente en desacuerdo
- E. totalmente en desacuerdo

Las últimas preguntas pertenecen a sus hijos.

28. ¿Tiene Ud. hijo o hija que tenga entre 9 y 12 años?

No _____ Sí _____

29. Conteste cada pregunta para solo un hijo o una hija.

1. ¿Cuántos años tiene este hijo? _____
2. Ponga un círculo alrededor del sexo: Femenino Masculino
3. Considera Ud. que este hijo es
 - A. de peso insuficiente
 - B. normal
 - C. gordo/a
4. ¿Si Ud. sabe, cuánto pesa este hijo? _____
¿qué altura tiene ? _____

¡ Gracias por todo su tiempo y esfuerzo!

Table A.1: Pearson Correlation Coefficients for Independent Variables

r-value p-value n	Age (years)	Income	Acculturation	Acculturation squared	Body Mass Index	Breastfeeding status	Number of children
Age (years)	1.000 71	0.272 *0.02 68	-0.102 0.40 71	-0.142 0.24 71	0.181 0.17 58	-0.127 0.29 71	0.282 *0.02 71
Income		1.000 68 ^a	0.051 0.67 68	0.016 0.89 68	-0.02 0.90 58	-0.043 0.72 68	0.157 0.19 68
Acculturation			1.000 71	0.613 * <0.001 71	-0.004 0.97 58	0.167 0.16 71	0.075 0.53 71
Acculturation squared				1.000 71	0.033 0.807 58	0.079 0.513 71	0.238 0.05 71
Body Mass Index					1.000 58	-0.004 0.97 58	0.167 0.16 58
Breastfeeding status						1.000 71	-0.084 0.48 71
Number of children							1.000 71

* $p < 0.05$

a. 3 WIC subjects did not report income

b. 13 subjects did not provide sufficient information for BMI

Principle Components Analysis of Acculturation

Table A2: Eigenvalues of the Correlation Matrix

Principle Component	Eigenvalue	Difference	Proportion
1	4.54880683	2.87574649	0.3791
2	1.67306033	0.46271625	0.1394
3	1.21034408		0.1009

Table A3: Eigenvectors of the First Three Principle Components

Acculturation scale item	First Principle Component	Second Principle Component	Third Principle Component
Language spoken	0.349228	-.336222	-.033571
Language spoken as a child	0.239358	-.301983	0.114954
Language spoken at home	0.301864	-.284797	-.114533
Language thought in	0.334291	-.191417	-.237941
Language spoken with friends	0.297310	.306085	-.086742
Language of TV programs	0.355935	0.232449	-.235460
Language of radio programs	0.321020	0.301619	0.008100
Preferred language of media	0.291323	0.264388	-.377921
Ethnicity of close friends	0.211800	0.220986	0.543987
Ethnicity at parties	0.266491	0.319851	0.172724
Ethnicity of visitors	0.265794	-.126704	0.617156
Preferred ethnicity of childrens' friends	0.168364	0.449692	-.058583

Table A4: ANOVA Sociodemographic Factors by Recruitment Group

Sociodemographic variable	p-value of ANOVA
Age	0.004 ^{a,b}
Income	<0.001 ^{a,b}
Acculturation	0.274
Body Mass Index	0.720
Breastfeeding status	0.208
Number of children	0.060

a. Parklawn and WIC

b. EFNEP and WIC

Table A5: ANOVA Dietary Pattern, Physical Activity and Body Image Variables by Recruitment Group

Variable	p-value of ANOVA
Number of different fruits	0.082
Number of different vegetables	0.168
Number of different fruits and vegetables	0.036
Number of fruit servings	0.182
Number of vegetable servings	0.247
Number of fruit and vegetable servings	0.339
Saturated fat avoidance score	0.489
Leisure-Time Physical Activity	0.714
Habitual Physical Activity	0.849
Importance of Physical Activity	0.285
Hours of Television Watched	0.122
Concerned of being/becoming fat	0.073
On a weight loss diet	0.557

Table A.6: Effect of Sociodemographic Factors on Physical Activity Factors

Measures of Physical Activity	Leisure Time Physical Activity (p-value)	Habitual Physical Activity (p-value)	Importance of Physical Activity (p-value)	Hours of Television Watched (p-value)
Age	0.483	0.641	0.004	0.603
Income	0.724	0.598	0.587	0.461
Acculturation	0.261	0.679	0.632	0.328
Acculturation squared	0.864	0.268	0.139	0.730
Body Mass Index	0.845	0.561	0.630	0.026
Breastfeeding status	0.456	0.200	0.231	0.271
Number of children	0.258	0.100	0.452	0.014
Recruitment Group	0.836	0.738	0.644	0.072
Model	0.857	0.600	0.104	0.057

VITA

Margarethe Goetz was born July 22, 1979 in Washington, D.C. She received a Bachelor of Arts degree in Cognitive Science from the University of Virginia in 2001. She also completed paramedic training at Virginia Commonwealth University in 2001. She will receive a Master of Science degree in Human Nutrition, Foods and Exercise from Virginia Polytechnic Institute and State University in August 2002. Ms. Goetz plans to continue medical and nutrition education in the future.