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LOW BIRTHWEIGHT, INFANT MORTALITY, ACCULTURATION, AND NUTRITION: AN EXPLANATION OF BETWEEN GROUP DIFFERENCES AMONG LATINOS

By

David Anthony Lopez

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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ABSTRACT

Low Birthweight, Infant Mortality, Acculturation and Nutrition: An Explanation of Between Group Differences Among Latinos

By

David Anthony Lopez

This study provides an analysis of the correlates of low birthweight among Latinos, Non-Latino Whites, and African Americans with its primary focus on Latinos. Low birthweight is defined as weighing less than 2.500 grams at birth. The study tests two hypotheses. Hypothesis one proposes that the nutrient intake of Puerto Rican women is less than the nutrient intake of Mexican and Cuban women. Hypothesis two proposes that nutritional intake effects low birthweight outcomes more for Puerto Rican women than Mexican and Cuban women. The Hispanic Health and Nutrition Examination Survey. 1982-84, serves as the data source. The data contains information on nutritional intake for the Latino subgroups, low birthweight outcomes among the Latino subgroups, and social and economic information. Several multivariate statistics are used to test the hypothesis. The hypothesis is not supported. Puerto Ricans are not undernourished as compared to Mexicans and Cubans. However, differential patterns in nutritional intake are found to exist among the Latino subgroups. Differences are also found in low birthweight outcomes. Puerto Ricans have the highest rate of preterm low birthweight followed by Cubans. Mexicans have the lowest rate of preterm low birthweight. I argue that Puerto Ricans have a high rate preterm low birthweight because of poor

social and economic conditions and a history of patriarchal dependency on the United States. I suggest that the Cubans who are having the preterm low birthweight babies are those who are recent immigrants to the United States. I propose that the positive outcomes for Mexicans is due to the Mexican experience which is a function of their particular historical circumstances. I suggest that the Mexican experience promotes an environment that results in positive low birthweight outcomes.

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Para mi familia.

Past and present.

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CHAPTER 1

INTRODUCTION

Infant mortality is a common indicator of the health status of a society (Cockerham 1986). Low birthweight is the best predictor of infant mortality (Hogue, Buehler, Strauss, and Smith 1987). Low birthweight is defined as a birthweight of less than 2,500 grams, approximately 5.5 pounds (Brooks-Gunn, McCormick, and Heagarty 1989; Hogue, et al. 1987; Kramer 1987; Michielutte, Ernest, Moore, Mies, Wells, and Buescher 1992, Rumbaut and Weeks 1993; Taffel 1990). Cubans and Mexicans have better low birthweight outcomes than Puerto Ricans and the low birthweight outcomes of Cubans and Mexicans are comparable to the outcomes of Non-Latino Whites (Becerra, Hogue, Atrash, and Perez 1991; Mendoza, Ventura, Valdez, Castillo, Saldivar, Baisden, and Martorell 1991; *Health U.S. 1990* 1992; *CDC* 1993). The guiding research question in this study is: *to what extent does culture effect differential low birthweight outcomes*? Exploring this question will help researchers learn more about low birthweight and this can assist in reducing infant mortality.

The population known as "Latinos" (see Appendix A) is the primary interest of this study. The focus of the study is on nutrition as embedded in culture. It argues that food habits best reflect culture. The study suggests that differential food habits (as a measure of culture) result in differential low birthweight outcomes. Previous studies on low birthweight and Latinos have

not conceptualized measuring culture in this manner. The Hispanic Health and Nutrition Examination Survey, 1982-84, serves as the study's data source.

If it is shown that there are aspects about Mexican and Cuban culture that contribute to favorable low birthweight outcomes, then social programs and policies can be implemented that would serve to learn more about these cultures. The knowledge gained about these cultures would in turn help to reduce low birthweight outcomes for the larger society.

The benefits of this study are: (1) it acknowledges Latino heterogeneity, (2) positive attributes of Latino culture are recognized, (3) it increases knowledge regarding low birthweight and the infant mortality rate, and (4) attributes of Latino culture are viewed as a model for Non-Latino culture.

The research is guided by three main objectives: (1) to demonstrate between group differences among Latinos regarding low birthweight and the degree to which these differences exist, (2) to develop an improved measure of cross-cultural comparison and to systematically combine factors that have not been previously related to low birthweight, and (3) to test hypotheses derived from research on biomedical, demographic, behavioral and cultural correlates of low birthweight and to narrow these hypotheses to a reduced set of variables that would best explain differential low birthweight among Latinos. Due to the cross-disciplinary nature of the study, key concepts are defined in Appendix A.

Selection of Topic

I discovered between group differences in low birthweight while taking a graduate seminar at Michigan State in the fall of 1993. This seminar sparked my interest. The seminar was titled "Topics in Social Inequality" and was taught by Dr. Ruben Rumbaut. Its focus was on global immigration issues and the continuing changing face of the world's population. As part of this discussion, issues associated with immigration and acculturation were addressed. One of these issues was low birthweight. I was not so interested in the medical aspects of low birthweight, but more in the cultural aspect. I had to ask, "what is going on here?" I then began to read more about it and concluded that this was a topic worthy of a dissertation.

Strategy for Literature Review

I needed to learn more about the topic. To do this, I had to consult the experts. In my seminar, I had learned that there was a professor on campus who studies low birthweight issues. This professor is Dr. Nigel Paneth, Director, Program in Epidemiology at Michigan State University. He was the first stop in my formal literature review.

There were three main goals of the literature review. The first goal was to become familiar with and review the biomedical and risk factor literature on the phenomenon of low birthweight. The second goal was to become familiar with and review the literature on low birthweight and Latinos. The third goal was to examine the role of acculturation in relation to low birthweight with a

special emphasis on nutrition as embedded in culture. As the literature review progressed, it became clear that the literature pertaining to acculturation, low birthweight, and nutrition was so important to the primary focus of the study, that separate chapters were developed. Chapter 3 discusses acculturation and Chapter 4 discusses food habits (i.e., nutrition), culture, and low birthweight. Regarding the first goal of the literature review, Dr. Paneth was consulted.

Dr. Paneth suggested three important issues in considering low birthweight. One, the phenomenon is enormously complex and a cause remains largely unexplained. Several risk factors have been identified in researching potential causes. Secondly, he indicated that infant mortality is directly related to low birthweight and is the primary reason that low birthweight is of importance. Lastly, he suggested that a distinction should be made between pretern low birthweight and term low birthweight when conducting research. Term low birthweight is when an infant is born at less than 2,500 grams after 37 weeks gestation. Preterm low birthweight is when an infant is born at less than 2,500 grams prior to 37 weeks gestation (Michielutte et al. 1992). A distinction needs to be made due to the confounding effect of preterm delivery on low birthweight. Dr. Paneth referred me to important studies in the biomedical field relating to the above issues which are reflected in this dissertation (Hogue et al. 1987; Kramer 1987).

Regarding low birthweight and Latinos, I was familiar with some of the literature as a result of the previously mentioned seminar. However, this

literature pertained mostly to immigration issues and low birthweight. For example, the research of Rumbaut (1992), Rumbaut and Weeks (1989: 1993) and Rumbaut, Chavez, Moser, Pickwell, and Wishik (1988), discussed the assimilation of immigrants and their lack of access to health care and subsequent health outcomes. I conducted a more comprehensive library search using the words "Hispanic" and "weight" as my "key" phrases. I also obtained research data from governmental and health agency sources by ordering works directly (e.g., Center for Disease Control, COSSMHO, and the U.S. Census Bureau). Additionally, discussions with various scholars at Michigan State directed me to pertinent articles and research. For example, Dr. Refugio Rochin, my advisor, familiarized me with the works of Drs. Eunice Romero Gwynn and Douglas Gwynn, and Dr. Francisco Villarruel, a member of my committee, acquainted me with the works of Dr. Cynthia Garcia Coll. Finally, in the course of reviewing the literature, I became interested in studies on Mexico and Mexicans regarding low birthweight and these are included in the review. These sources yielded a substantial accumulation of literature on low birthweight and Latinos.

Organization of Literature Review

I first discuss the biomedical aspect associated with low birthweight. This discussion focuses on the relationship between infant mortality and low birthweight. I then address risk factors known to be associated with low birthweight which leads to a discussion on the role of gestation length and low

birthweight outcomes.

I then turn to examining the literature on low birthweight as related to Latinos. However, prior to this section, I discuss low birthweight among African Americans. I do this as a basis of comparison. Also, since Latinos are defined by ethnicity and can be of any racial group, a discussion of low birthweight and African Americans seems in order. African Americans have the highest rate of low birthweight of any group in the U.S. (U.S. Bureau of the Census 1992; *Health United States 1990* 1992; *From the MMWR* 1993). This factor may confound differential outcome rates of low birthweight for Latinos and this is why rates for African Americans are considered in the literature review.

After the discussion of African Americans, Latinos and low birthweight is examined. The literature review on Latinos and low birthweight demonstrates that differential low birthweights do exist among Latinos.

I then discuss acculturation. Since acculturation is such an important factor in relation to health outcomes, Chapter 3 is devoted to its discussion. I view acculturation as a process that incorporates several variables. My definition of acculturation is taken from Garcia Coll and Meyer (1993:11) who write that "acculturation may be conceptualized as a process of learning about a new culture, and deciding what is to be saved or sacrificed from the old culture." The variables that I focus on in my examination of the acculturation process are gender roles, family, and social and economic conditions. Following the discussion on acculturation, the relationship between food habits,

culture, and low birthweight is examined in Chapter 4.

Next, in Chapter 5, I propose a theory of differential low birthweight outcomes among Latinos and develop an operational model. This theory suggests a series of functional relationships between the variables of nutritional intake, food habits, culture, socioeconomic conditions, and history (as related to geography). In the development of the operational model, the methodology of the study is addressed. In this development, formal hypotheses are suggested, variables are operationalized, and the data set is discussed as is the data analysis. Results are presented in Chapter 6. Lastly, the results are interpreted and conclusions are drawn in Chapter 7.

CHAPTER 2

REVIEW OF LITERATURE

The study of low birthweight is epidemiological because its study draws from different academic fields. Epidemiologists explore "human ecology as it relates to the health of human beings and their environment" and epidemiology "draws upon the knowledge and techniques of several scientific fields" (Cockerham 1986:14). Since the study of low birthweight is epidemiological, all possible effects contributing to low birthweight need to be considered. For this reason, biomedical and risk factors are addressed. Low birthweight is related to intrauterine maldevelopment and retarded growth (Yerushalmy 1967). An infant that is born with low birthweight has not developed to its fullest potential in the womb and thus its growth is "retarded." Low birthweight is the most important predictor for infant survival (Hogue et al. 1987). Infants born with low birthweight (2,500 grams at birth) are "five to 10 times more likely to die within the first year of life" (CDC 1994). Additionally, "infant mortality is considered to be one of the most sensitive indicators of the health status of a population" (Garcia Coll 1990:275). The relationship between low birthweight and infant mortality makes the study of low birthweight of importance to a population.

Relationship Between Low Birthweight and Infant Mortality Rate

Low birthweight is the most important predictor of infant mortality. The more we learn about low birthweight, the more we can apply knowledge to

reduce infant mortality. Since Mexicans and Cubans have better low birthweight outcomes than Non-Latino Whites (Becerra, Hogue, Atrash, Perez 1991; Mendoza Ventura, Valdez, Castillo, Saldivar, Baisden, and Martorell 1991; *Health U.S. 1990* 1992; *CDC* 1993), using these groups as models, may reduce the incidents of low birthweight (and infant mortality) in the larger population.

Dr. Paneth (1995) suggested that one of the most comprehensive studies on infant mortality was conducted by Carol Hogue and her colleagues (Hogue et al. 1987). These researchers argue that the most effective method of reducing infant mortality is to reduce low birthweight (Hogue et al. 1987). They collected data from 50 states, New York City, the District of Columbia, and Puerto Rico. Data consisted of birth and death certificates for infants born in 1980 and who died in the first year of life. For the 1980 cohort (all races), it was found that 97.6% of the infant deaths per 1,000 live births were low birthweight infants (Hogue et al. 1987). Six risk factors for infant mortality were identified. These factors were (1) gender, (2) gestational age, (3) live birth order, (4) maternal age, (5) maternal education, and (6) prenatal care.

According to Hogue et al. (1987) more low birthweight males died than low birthweight females. As gestational age increased, birthweight increased. As birthweight increased, infant mortality decreased. Low birthweight infants born second had the lowest infant mortality rate among low birthweight infants. For infants over 2,500 grams, those born first had the lowest infant mortality

rate. The infant mortality rate decreased as the age of mothers increased through 34 years of age. However, the infant mortality rate increased for births to mothers over 35 years of age. Infant mortality associated with younger females is related primarily to low birthweight. As maternal education increased, infant mortality rate decreased. When prenatal care was received in the first trimester of pregnancy, the infant mortality rate was substantially lower. The Hogue et al. (1987) comprehensive study makes clear the association between risk factors, such as low birthweight, and infant mortality.

Unfortunately, Latinos were not included in the Hogue et al. (1987) study. Hogue et al. state that "Hispanics have emerged as a major ethnic group in the United States having distinct reproductive life histories. However, because states use a variety of methods to define Hispanics, a national study of Hispanics could not be launched with the NIMS data" (Hogue et al. 1987). This omission is indicative of early research on Latinos (i.e., they were "left out").

A more recent study (using available 1990 data) on infant mortality rate (*From the MMWR* 1993) found the infant mortality rate for the U.S. to be 9.2 infants per 1,000 births. The data was derived from the National Center for Health Statistics and the Center for Disease Control. For the total population, disorders relating to short gestation and low birthweight were the third leading causes of death. For African American infants, disorders relating to short gestation and low birthweight of the short gestation and low birthweight were the third leading the third leading causes of death and were the first leading causes of death and were the third leading causes of death for Non-Latino White infants (*From the*

MMWR 1993:428). In 1987 (the most recent data at the time of the study), 95% of infant deaths were low birthweight babies. This is a slight decrease from the 1980 statistics used by Hogue et al. (1987).

Infant mortality is not only effected by low birthweight, but a relationship exists between *degree* of low birthweight and incidence of infant mortality. The lower the low birthweight, the more likely an infant will die. Rumbaut and Weeks (1989) in a study on infant mortality among Indochinese dichotomized their sample by four birthweight categories for this very reason. They write:

We have chosen birthweight groups (<500, 500-1,499, 1,500-2,499, and >2,500 grams) that exhibit markedly different risks of death--reflecting the geometric increase in death rates as birthweights decline (Rumbaut and Weeks 1989:156)

The methodology of Rumbaut and Weeks (1989) suggests that when assessing the *effect* of independent variables upon the dependent variable of low birthweight, if a researcher is interested in variance in low birthweight, low birthweight should be dichotomized by categories as they are related to infant mortality.

The research on infant mortality and low birthweight to date suggests that a clear relationship exists between the two. Low birthweight babies are more likely to die than babies who are not born with low birthweight. Furthermore, there are specific indicators of low birthweight (e.g., gender, birth order, mothers age and education, and access to prenatal care). Male low birthweight babies tend to die more often than female babies. Fullterm babies weigh more than preterm babies. First born low birthweight babies are more likely to die than second born low birthweight babies. Mothers who are young, undereducated, and have less access to prenatal care are more likely to have low birthweight babies and babies who die.

Risk Factors for Low Birthweight and Infant Mortality

Certain behaviors and conditions have been demonstrated to bear on low birthweight. These behaviors and conditions are now examined. Two studies, one international and one national, examined the effect of weight gain and nutrition on low birthweight. Kramer (1987), in a meta-analysis of French and English studies conducted between 1970 and 1984, found that weight gain during pregnancy effected intrauterine growth retardation (IUGR). The effect of IUGR was greater for women who were undernourished and for women who experienced "acute nutritional stress" during food shortages. These women were mostly from developing countries which had "hungry seasons." In the United States, Taffel (1980) found that women who gained less than 21 pounds during pregnancy were 2.3 times more likely to have a low birthweight infant. Taffel (1980) also found that the babies of these women were 1.5 times more likely to experience infant mortality. These studies demonstrate the relationship between nutrition, low birthweight, and the infant mortality rate.

Brooks-Gunn et al. (1988:289) identified possible causes of low birthweight to be: "(1) demographic risks, (2) medical risks that can be detected during pregnancy, (4) behavioral and environmental risks, (5) health care risks, (6) physical factors with a role in low birthweight that is still being defined." Brooks-Gunn et al. (1988) also suggest that recent studies indicated environmental stress and no social support, work patterns during pregnancy, maternal health habits, and poor prenatal care as predictors of low birthweight. Brooks-Gunn et al. (1988) concluded that access to prenatal care and maternal education programs are needed to reduce the incidence of low birthweight. However, Brooks-Gunn (1988) did not consider the effects of race or ethnicity on low birthweight outcomes.

Rumbaut and Weeks (1993) in a multivariate analysis found that the "secondary biomedical" independent variable of previous live births was the best predictor of "infant health outcomes" (beta=.261). In this study, being born later put the infant more at risk for infant mortality. These findings may appear contradictory to the Hogue et al. (1987) study which found that first born low birthweight babies were more at risk than second born low birthweight babies. The difference in the studies is that Hogue et al. (1987) looked at *low birthweight* births where the Rumbaut and Weeks (1993) looked at births in general.

In critiquing the Rumbaut and Weeks (1993) study, low birthweight was just one measure of infant health outcomes. The study was based on the San Diego Comprehensive Perinatal Program 1989-1991. The sample included Asians, Latinos, Non-Latino Whites, and African Americans. Although the findings of this study give insight into infant health outcome, it too is limited to a specific geographic area. Also, the study did not subgroup Latinos.

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Preterm Low Birthweight versus Fullterm Low Birthweight

The less time an infant has in the womb, the less it fully develops. A less developed infant is less likely to weigh as much as its fullterm counterpart. Very simply, preterm infants experience low birthweight due to less time in gestation (Paneth 1995). Michielutte et al. state that "failure to distinguish between preterm and term low birthweight would be highly misleading" (1992:103). Differences in preterm low birthweight infants and term low birthweight infants exist. Michielutte et al. (1992) address these differences. The study sample consisted of 25,758 low birthweight singleton births from 20 Counties in North Carolina. Data was collected from physician records. These records included socioeconomic, physical, and medical history factors associated with low birthweight. The majority of the subjects were clients of Public Health Clinics.

Preterm low birthweight was defined as less than 37 weeks gestation and weighing less than 2,500 grams. Term low birthweight was defined as 37 or more weeks gestation and weighing less than 2,500 grams at birth. One thousand seven-hundred twenty-two births were preterm low birthweight and 1,098 births were term low birthweight.

Adjusted odds ratios for all low birthweight, preterm low birthweight and term low birthweight births were conducted. Adjusted odds ratio (AOR) is a measure of association between dichotomous variables. 1.0 indicates no relationship. Michielutte et al. (1992) suggest that an AOR of 1.30 and above is a significantly strong association. A positive AOR indicates a positive relationship. A negative AOR indicates an inverse relationship. Negative AORs are expressed as numbers less than one (e.g., .79). The final risk assessment model included all risk factors with an AOR of above 1.30 (or less than .77). The AOR results of the significant risk factors are given in Appendix B. A discussion of the results is given below.

Age was found to be factor in both term low birthweight and preterm low birthweight. The authors write that "it is especially interesting to note that younger age significantly decreases the risk of term low birthweight, but increases the risk of preterm low birthweight" (Michielutte et al. 1992:104). Adolescents are more likely to have preterm low birthweight infants but less likely to have term low birthweight infants. As Hogue et al. (1987) pointed out, these infants are the most likely candidates for infant mortality. This may be due to the fact that young adolescents themselves are still growing. For many, their bodies may not be able to sustain a longer pregnancy which results in preterm low birthweight. Garcia Coll, for example, argued that "it may be that the extra nutritional requirements associated with pregnancy, coexisting with adolescent growth and economic disadvantage, may be possible additional growth-retarding factors for infants of teenage mothers" (1988:112).

Less education was a factor in low birthweight (Michielutte et al. 1992). The significantly strong factor of "less than nine years of education" implicates education as an important factor in determining low birthweight. The education

factor may be an element of a lack of access to educational institutions or a value system which has not internalized maternal education as a value. If this is the case, receiving education on prenatal care would be less likely. This is corroborated by Seitz and Apfel (1994) who found that of adolescents who gave birth to low birthweight babies, 5.2% were in school as compared to 16.1% who were not in school.

More African Americans had low birthweight infants than Non-Latino Whites (Michielutte et al. 1992). Being African American and having a greater percentage of low birthweight infants is a factor that remains largely unexplained. In the Michielutte et al. (1992) study, even when controlling for socioeconomic status, physical and demographic characteristics, and social context factors, low birthweight was present.

Chemical intake also affected low birthweight. Smoking is a behavioral factor that can be modified. This factor has long been recognized as contributing to low birthweight. Smoking is more of a factor for term birthweight. Perhaps this is due to the fetus being exposed to toxins for a longer period in the womb.

The physiological processes of previous premature/low birthweight births (preterm low birthweight and term low birthweight) were also indicated as low birthweight factors (Michielutte et. al 1992). These factors may be an element of the woman's physical "stamina" (i.e., the ability to support and recover from impregnation). Also, a genetic component may be operating. These factors are in the realm of medical science and have yet to be explained.

Nutrient intake was presented as a low birthweight factor (Michielutte et al 1992). Weight under 100 pounds is a factor for preterm low birthweight. Women in this category are most likely experiencing some type of nutritional deficiency. Regarding term low birthweight (in order of most risk) shorter women who weigh over 100 pounds are at risk (shorter and heavier), as are taller women who weigh less than 100 pounds (taller and lighter), and women who are shorter and weigh less than 100 pounds (shorter and lighter). Except for the shorter and lighter women, these outcomes suggest that body proportion in relation to weight effects term low birthweight.

Nutrition is a modifiable risk factor. Michielutte et al. propose that "public health clinic patients, a large proportion of whom are likely to have less access to economic resources and nutritional information, could benefit most from dietary intervention" (1992:107). This suggests that members from lower socioeconomic statuses (e.g., Mexicans, see Appendix H) would benefit from "dietary information."

The Michielutte et al. (1992) study offers some excellent insights into the issue of preterm low birthweight and term low birthweight and their similarities and differences. However, the study is limited to North Carolina. A national study of this type would greatly enhance the literature pool on this topic. Lastly, and this is related to the regionalism of the study, Latinos are not addressed.

The studies reviewed suggest that a strong relationship exists between

low birthweight and infant mortality. Other prominent factors are length of gestation, maternal education, smoking, weight, medical history relating to pregnancy, age, education, and nutrition. Appendix C summarizes the findings of the literature on the biomedical and risk factor aspects of low birthweight.

The focus of my study is on nutrient intake. Nutrition, weight, low birthweight, and infant mortality rate are interrelated. Poor nutrition can result in either too little or too much weight gain. Poor nutrition can also result in intrauterine growth retardation. These factors can result in low birthweight. Low birthweight increases the likelihood of infant mortality. Like other health outcomes, the incident of low birthweight and infant mortality among specific racial and ethnic subgroups needs to be examined.

Low Birthweight and African Americans

A considerable volume of literature exists regarding low birthweight and African Americans. This literature is helpful for it frames the low birthweight issue as it is related to Non-Whites. For this reason, some of the pertinent research is discussed.

According to the U.S. Census, in 1989, African Americans had low birthweight rate of 13.2% as compared to 5.7% for Non-Latino Whites (U.S. Bureau of the Census 1992:68). This figure is comparable to the 1988 findings of the Center for Health Statistics which indicate a low birthweight rate for African Americans to be 13.3% (*Health United States 1990* 1992:10). Low birthweight is related to the infant mortality rate. In 1990, the infant mortality

rate for African American infants was 18.0 deaths per 1,000 and for Non-Latino Whites it was 7.6 deaths per 1,000 (*From the MMWR* 1993:427).

Environment and Poverty

Using 1982 and 1983 Illinois vital records and U.S. Census income data for Chicago, (N=93,101) Collins and David (1992) found that infants whose mothers had received prenatal care and came from very poor neighborhoods had a neonatal mortality risk four times that of Non-Latino White infants. The authors suggest that "extrinsic factors closely linked to income and education contribute to the relative birth-weight disadvantage of black infants" (Collins and David 1992:24). Collins and David (1992) suggest that an impoverished environment reduces quality nutrition, housing, and safety.

Poverty is a daily reality for many in the African American community. Forty-six percent of African American children live in poverty in the United States (Huston, McLoyd, and Coll 1994). Low educational levels, single parenthood, and being African American seem to be strong correlates of poverty (Duncan, Brooks-Gunn, and Klebanov 1994). Social and economic needs have to be considered in effecting change in low birthweight among African Americans.

Marital Status

Marital status also appears to be a factor in low birthweight outcomes for African Americans. In their sample of 222,810 live births from Georgia (using Vital Statistics from the Georgia Division of Public Health), Sung et al. (1993) found that married women had lower rates of low birthweight than unmarried women. Marriage may offer additional financial and emotional support. This type of support may contribute to a secure and stable environment. Stability and security are related to the larger socioeconomic condition of African Americans. Better socioeconomic conditions (e.g., adequate wages, housing, and education) can provide for an atmosphere of stability. The authors suggest that "efforts to improve the social milieu will reduce the rate of low birthweight among both Black and white infants" (Sung et al. 1993:134). However, the authors also write that in addition to low birthweight being related to socioeconomic conditions, negative low birthweight outcomes among African Americans may be due to "a yet-to-be determined disadvantage related to being Black" (Sung et al. 1993:133).

For African Americans, the environment of poverty and an unstable social environment (e.g., female headed single parent households) appear to increase low birthweight rates. However, there is much room to explore the "yet-to-be determined disadvantage" related to African American heritage. It may be that years of socioeconomic subjugation have resulted in an unknown physiological adaptive component that increases the rate of low birthweight. Although both Latinos and African Americans have histories of subordinated statuses, African Americans were enslaved. It may be this history of human captivity and brutality that accounts for the high low birthweight outcome.
Low Birthweight and Latinos

As has been discussed, low birthweight is related to infant mortality and this holds true for Latinos. Infant mortality rates are now examined to preface the discussion on Latinos and low birthweight. A differential infant mortality rate exists among Latinos.

Infant Mortality Rate and Latinos

The infant mortality rate for Mexicans is 8.8, for Cubans 8.0, and for Puerto Ricans, 12.3 per 1,000 in the population. The infant mortality rate for Non-Latino Whites is 9.0 (*Health United States 1990* 1992). In Brooklyn, (where 83% of the Latinos are Puerto Rican) the infant mortality rate is 12.3. In Los Angeles, (where 76% of the Latinos are Mexican) the infant mortality rate is 6.9 (*COSSMHO* 1994). The differential infant mortality rate for Latinos is reflected in differential low birthweight data. There is little research that specifically addresses the infant mortality rate and Latinos.

An Overview of Latino Heterogeneity and Low Birthweight Outcomes

Do differences in low birthweight among Latinos exist? Table 1 below suggests that they do. Table 1 presents the results of studies that have specifically addressed the issue of low birthweight among Latinos. These studies are presented because they subgroup the Latino population. Other studies that have not subgrouped Latinos but address Latinos, or, discuss only one particular subgroup are discussed in the text subsequent to Table 1.

Author(s)	Mexican	Cuban	Puerto Rican
Becerra et al. 1992	4.1%	4.0%	6.6%
CDC 1993	5.5%	5.7%	9.0%
Health U.S. 1990 1992	5.6%	5.7%	9.4%
Mendoza et al. 1991	5.7%	5.9%	9.3%
U.S. Census 1992	5.6%	5.8%	9.0%

 Table 1. Low Birthweight Differences Among Latino Subgroups

Literature on Latinos and Low Birthweight

In a San Diego area study, Non-Latino Whites had a low birthweight percentage of 5.1 as compared to a percentage of 5.2 for Latinos (Rumbaut and Weeks 1989). The study focuses on the Indochinese population and Rumbaut and Weeks (1989) suggest that ethnicity factors and language explain most of the low birthweight among the Indochinese living in San Diego. Indochinese have different cultures and experiences than Latinos and the relevance of the Rumbaut and Weeks (1989) study to my study is limited. Additionally, the results are pertinent only to San Diego due to the fact that this is from where the data was drawn.

Hayes-Bautista (1992:36) found that "Latinas have the lowest incidence of low birthweight babies in Los Angeles County: 5.32 percent." He is quoted as saying that the low birthweight rate of Latinas is "half the rate of Black babies and a hair better than Anglos" (Spiegel 1991:A3). This data is most likely referring to Mexicans since the majority of Latinos that live in Southern California are Mexican (COSSMHO 1994). However, this is not indicated.

Using the 1983 and 1984 Linked Birth and Infant Death Data Sets, Becerra et al. (1991) found low birthweights of 4.1% for Mexicans, 4.0% for Cubans and 6.6% for Puerto Ricans. The percentage of low birthweight babies for all Latinos was 4.6 and for Non-Latino Whites 4.0. Becerra et al. state "although better nutritional practices, higher regard for parental roles, and lower rates of smoking and alcohol consumption have been proposed as possible reasons for the better birth-weight distribution among Hispanics, [as compared to Non-Latino Whites] these factors partially explain but do not totally account for the difference" (Becerra et al. 1991).

Data from the 1987 National Vital Statistics System and the Hispanic Health and Examination Survey, 1982-84, indicated low birthweight percentages of 6.2 for Latinos and 5.6 for Non-Latino Whites (Mendoza et al. 1991). Low birthweight for Latino subgroups indicated low birthweights of 5.7% for Mexicans, 5.9% for Cubans, and 9.3% for Puerto Ricans. In a Chicago area study comparing African Americans with Mexicans, a review of medical records indicated that Mexicans had a low birthweight percentage of 5.9 (Dowling and Fisher 1987).

Recent statistics from the Center for Disease Control reflect low birthweight for Mexicans to be 5.5%, Cubans 5.7%, and Puerto Ricans 9.0%.

The percentage of low birthweight for all Latinos was 6.1 and for Non-Latino Whites 5.6 (*CDC* 1993). In another government sponsored study, low birthweight among Mexicans, Central and South Americans, and Cubans ranged from 5.6% to 6.0%. Low birthweight among Puerto Ricans was 9.4% and Non-Latino Whites 5.7%. (*Health United States 1990* 1992). Latest U.S. Census Bureau statistics yield similar results with low birthweight rates for Mexicans of 5.6%, Cubans 5.8%, and Puerto Ricans 9.5%. The rate for all Latinos was 6.2% and the rate for Non-Latino Whites 5.7% (U.S. Bureau of the Census 1992). In 1991, Ventura and Martin found low birthweight rates of 6.1% for Latinos and 5.7% for Non-Latino Whites. In accounting for group heterogeneity, low birthweights were 4.8% for Cubans and 7.9% for Puerto Ricans (in Mendoza 1994). Appendix D summarizes the research reviewed regarding Latinos and low birthweight.

What does this mean? The literature suggests that Mexicans and Cubans have the lowest rate of low birthweight among Latinos and Puerto Ricans have the highest. Heterogeneity exists among Latinos and their low birthweight outcomes. Why is this important? It is important because this means that each Latino subgroup has its own distinct set of circumstances that causes these outcomes. As discussed in the next section, a number of researchers have argued that acculturation explains these differences in low birthweight. I now turn to a discussion of the literature on acculturation and low birthweight among Latinos.

Literature on Acculturation Effects and Low Birthweight

The degree to which one acculturates can effect their behavior. A change in behavior can have an effect on health outcomes. This is seen in low birthweight outcomes among Latinos.

In San Diego, foreign born Latinos (1.9% low birthweight) fared better in terms of low birthweight than U.S. born Latinos (4.1% low birthweight) suggesting that "Angloization" results in poorer health outcomes (Rumbaut and Weeks 1993). Angloization refers to becoming acculturated to the Non-Latino White culture. Fenster and Coye (1990) found that only 1.8% of babies born to a sample of Latinas employed in agriculture in California (N=1,040) were low birthweight (Fenster and Coye 1990).

Using the Hispanic Health and Nutrition Examination Survey, 1982-84, Scribner and Dwyer (1989) found that 4.8% of Mexican infants in the sample were born with low birthweight. Scribner and Dwyer (1989) argue that as acculturation increases, so does the incidence of low birthweight. Acculturation was measured by language preference, nativity, and ethnic identification.

Since the majority of Latinos in the United States are Mexican (U.S. Bureau of the Census 1992), and the majority of Latino immigrants are Mexican (*COSSMHO* 1994), research on pregnancy and birth issues in Mexico is considered. Research on pregnancy and birth issues in Mexico is considered because it gives some insight into possible acculturation effects. Using the National Addiction Survey (NAS) of Mexico, Borges, Lopez-Cervantes, Medina-

Mora, Tapia-Conyer, and Garrido (1993) found an incidence of low birthweight among their sample (N=5,234) of 3.2%. Women who suffered from Alcohol Dependence Syndrome were at very high risk of low birthweight and preterm delivery (odds ratio=12.1). The data on low birthweight was obtained in interviews and was based on mother's recollection. The data suggests that the incidence of low birthweight in Mexico is lower than for Mexicans living in the United States. This supports the notion that Angloization may result in poorer low birthweight outcomes.

Balcazar (1993) also suggests that Angloization results in poorer low birthweight outcomes. Using non-married status, low education, young age at delivery, at least one pregnancy complication, recent illness, at least one labor complication, and no prenatal care as risk factors, Balcazar (1993) found that Mexican Americans had a lower risk for intrauterine growth retardation than did Non-Latino Whites. Also, in the sample of 25,289 Arizonan Mexican Americans, "US-born Mexican American mothers were 1.21 times more likely to have an intrauterine growth retardation infant than were Mexican-born mothers" (Balcazar 1993:172).

Gaviria, Stern, and Schensul (1982), in a sample of 89 women from the Chicago area, found that recent arrivals to the U.S. (immigrated in previous two years) and Mexican American women sought prenatal care later than long term arrivals (been in the U.S. more than two years). What is interesting about this finding is that it lessens the importance of prenatal care in pregnancy outcomes

which has been argued by some (Hogue et al. 1987; Brooks-Gunn 1988) as being very important for positive outcomes. However, the Gaviria et al. (1982) study found that more recent arrivals sought prenatal care later in pregnancy (a low birthweight risk factor). This suggests that it is not just prenatal care that accounts for low birthweight outcomes and other factors (e.g., cultural) have to be considered.

Regarding culture, in Mexico a postpartum practice called *cuarentena* exists (Gaviria et al. 1982). In this practice, the mother has a 40-day rest period following delivery. During this time, the mother focuses on her and her newborn's health. This may include, but not be limited to, nutritional practices. Gaviria et. al. write "specific behaviors may include dietary restrictions (e.g., chili, pork, tomatoes, citrus fruit, and other 'cold foods') and prescriptions (chicken, chicken soup, and fried tortillas)" (1982:986). The authors state "in our sample [N=89] we had information about the *cuarentena* from 56 mothers; of these 34 (60 percent) were planning to observe the *cuarentena* or had observed it" (Gaviria et al. 1988:986). If postpartum practices such as the *cuarentena* exist, pregnancy practices must exist that would influence low birthweight outcomes. These practices may not be what is common to the dominant culture (e.g., prenatal and postpartum care received by a physician or health institution).

Weinman and Smith (1994) in a study of U.S. born and Mexican born adolescent Latina mothers, found that for both groups postpartum follow up was

minimal (17.3% of a sample of 289). Weinman and Smith (1994) suggest that the two groups are more similar than different. Similarity may be a result of persistent cultural norms regarding pregnancy and childbirth. The authors write "Many Mexican-Americans explicitly prefer the traditional assistance of *Pateras* or lay midwives rather than medical institutions" (Weinman and Smith 1994:192).

The literature on acculturation and low birthweight suggests that acculturation is detrimental to positive pregnancy outcomes (i.e., results in a higher incidence of low birthweight). This idea of acculturation as detrimental is especially clear when looking at the low birthweight outcomes for women in Mexico and recent immigrants from Mexico (acculturation will be fully discussed in Chapter 3).

Implications

Methodological problems have been identified with the literature reviewed. Hogue et al. (1987) did not address the role of nutrient intake as a risk factor for infant mortality rate and did not subgroup Latinos. Michielutte et al. (1992) discussed the role of weight gain but did not address nutrient intake specifically as a risk factor of low birthweight. Michielutte et al. (1992) also did not subgroup Latinos. The neglect to subgroup was a common criticism of several studies (Brooks-Gunn et al. 1988; Dowling and Fisher 1993; Fenster and Coye 1990; Gaviria et al. 1982; Hayes-Bautista 1992; Rumbaut and Weeks 1989; Rumbaut and Weeks 1993). Many studies were regional in scope (Balcazar 1993; Dowling and Fisher 1993; Gaviria et al. 1982; Hayes-Bautista 1992; Fenster and Coye 1990; Michielutte et al. 1992; Rumbaut and Weeks 1989; Rumbaut and Weeks 1993; and Weinman and Smith 1994). Regionalism may bias results and it may create problems in generalizing results to larger populations. For example, studies based on data from San Diego may yield results that are different from studies based in Miami. That is to say, the whole cultural milieu may be different.

In addition to problems associated with regionalism and neglecting to subgroup, the role of food habits as related to culture was not discussed in relation to Latinos and low birthweight. This is problematic for this fails to recognize Latino heterogeneity in relation to culture and nutrition as related to health outcomes. In only two articles were food and nutrition specifically related to health outcomes. These articles were the Gaviria et al. (1982) discussion of the *cuarentena* and Garcia Colls recognition of good nutrition as a health promoting lifestyle.

The literature reviewed has indicated that low birthweight is a complex phenomenon that includes biomedical and social correlates. What is known is that low birthweight increases the likelihood of infant mortality and this is why the issue is of importance. Several risk factors contribute to low birthweight. Some of these factors are physiological and some are sociological. However, it is difficult to separate the physical from the social. For example, the rate of low

birthweight babies is greater for babies born preterm than fullterm (physiological correlate). The likelihood of having a preterm baby is effected by social correlates (e.g., mother's age, low education, smoking).

There are other social correlates that can effect low birthweight. Two of these correlates are race and ethnicity. African Americans have the highest incidence of low birthweight. The high rate of low birthweight among African Americans may be due to poverty and poor environmental living conditions. Mexicans and Cubans have better low birthweight outcomes than do Puerto Ricans suggesting cultural heterogeneity.

What is not known about differential outcomes of low birthweight among Latinos is the role that nutrition plays in effecting outcomes. As yet, we do not have a clear understanding of the way food habits are rooted in culture. However, it is plausible to infer a relationship. The next chapter examines acculturation processes that may be related to food habits.

CHAPTER 3

ACCULTURATION AND ACCULTURATION PROCESSES

Early on in this dissertation, borrowing from Garcia Coll and Meyer (1993:11), I defined acculturation as a "process of learning about a new culture, and deciding what is to be saved or sacrificed from the old culture." The key word here is *process*. This chapter examines the process of acculturation as I believe it to operate. By knowing what it means to be acculturated, we can begin to make between group comparisons in terms of *more* or *less* acculturation. This is important because knowing about degrees of acculturation may shed light on why differential low birthweight outcomes exist between Latino subgroups.

Scribner and Dwyer (1989) in their study of acculturation and low birthweight among Latinos measured acculturation by developing an acculturation index using eight variables. Three of these eight variables measured ethnic identification (Scribner and Dwyer 1989:1263). The other variables in the study were language preference and nativity. The ethnic identity variables were scored from "1 (Mexican-Orientation) to 5 (USorientation)" (Scribner and Dwyer 1989:1263). Ethnic identity is similar to cultural identity as discussed by Bean and Tienda (1987).

Bean and Tienda (1987) propose that historical and social processes significantly effect cultural identity. These processes are interactive and impact

the contemporary social and economic situation of Latinos which in turn influence cultural identity. History and social circumstances assist in "interpreting the diverse integration experiences and socioeconomic standing of Hispanics" (Bean and Tienda 1987:15). Change in cultural identity is analogous to acculturation.

My discussion of acculturation processes is similar to the approach of Bean and Tienda (1987). It is difficult (if not impossible) to discuss acculturation in isolation. Diaz-Guerrero articulates this when he writes that the "concept of culture is closely related to the concept of history. Culture at a given time is the result of history; it is actually, in a sense, history at that time" (1977:19). The history of Mexicans, Cubans, and Puerto Ricans is diverse. Each group's culture is the result of their distinct circumstances. The Mexican experience is one of conquest and economic exploitation. The Cuban experience is one of Cold War international politics. The Puerto Rican experience is one of dependency and patriarchy. Appendix E discusses in detail the differential historical circumstances of Mexicans, Cubans, and Puerto Ricans. Although 1 am not going to elaborate on differential historical circumstances here, there is a concept *related* to history that is important to the discussion of acculturation. This concept is that of "life worlds."

Life-Worlds

The interdependent nature of functionalism makes it relevant to this study. As was seen in the literature review, the phenomenon of low birthweight

is related to biological/medical, demographic, behavioral, and cultural factors. These factors are not isolated events but interact with each other. For example, Angloizaton (a cultural factor) interacts with behavioral factors that can increase the incidence of low birthweight births (Balcazar 1993; Borges et al. 1993; Rumbaut and Weeks 1993). The influence of functionalism is seen in Jurgen Habermas' (1976) Legitimation Crisis.

In Legitimation Crisis (1976), Jurgen Habermas discusses crises as related to two integration systems; social and system. The system integration system is representative of the dominant society. It seeks to control and dictate the society. The social system is related to culture, it is based on symbols. Society is always evolving. This evolution is based on what best *functions* for the dominant society. However, what is best for the dominant society is not necessarily best for *all* members of that society and this leads to conflict.

Conflict arises because groups in society seek to maintain their social system and they do this through life-worlds. Life-worlds are the symbols, rituals, and traditions of a culture. Life-worlds facilitate and allow for intergenerational communication and the transmission of a cultural identity. Life-worlds develop a person's sense of self. Life-worlds are borne out of history. Since the history of Latino subgroups varies, the life-worlds vary.

Symbols are the cornerstone of the school symbolic interaction. Symbolic interactionsim finds its roots in the work of Charles Horton Cooley (1962). Cooley (1962) proposed that a person's sense of identity developed out

of how those in the environment reacted to them. He writes that "self and society go together, as phases of a common whole" (Cooley 1962:9). The person cannot separate themselves from the society of which they are a part. Cooley developed the concept of the "looking glass self" in which a person imagines how they appear to others and further imagines how others judge this appearance. The person then feels either "pride or mortification" based on their sense of how others have judged them (Cooley 1962:23).

Symbolic interactionism was further developed by George Herbert Mead. Mead proposed the concepts of the "Me" and the "I." For Mead, the "Me" was the "organized set of attitudes of others which one himself assumes" (19645:320). The "I" was "the response of the organism to the attitudes of

others" (Mead 1964:9). The Me and the I make up the "Self." Mead writes:

When one determines his position in society and feels himself as having a certain function and privilege, these are all defined with reference to an "I" . . . The "I" reacts to the self which arises through taking of the attitudes of others. Through taking those attitudes, we have introduced the "Me" and we react to it as an "I" (1964:229).

For both Cooley (1962) and Mead (1964), the individual does not exist in isolation. The individual forms their sense of who they are based on how others respond to them. Symbols play a part in this interaction between the individual and others. Messages about who the individual is in relation to others and the environment can be communicated through symbols. This communication can then impact a person's sense of self. Symbols, then, are critical in the formation of one's identity. Habermas (1976) recognized this and made the role of symbols of extremely important in his development of the concept of "life-worlds."

Symbols create and maintain life-worlds. I believe that symbols are an important aspect of Latino society. I believe this for I have experienced it in my own life-world. For example, I grew up with *pinatas* and *menudo*. I am still "mijo" to my mother ("mijo" is derived from "mi-hijito" which means "my little one"). Symbols such as these result in the persistence of Latino life worlds. This persistence enable the regeneration of Latino culture and prevents the usurpation of the social integration by the system integration. This promotes the effective internalization of culture. Internalization of culture reduces the effect of acculturation processes which can have positive benefits. In discussing Latinos and acculturation, Magana and Clark (1995:105) write, "there may be particular, compelling, positive elements that prevent acculturation to beliefs and behaviors that put individuals at risk for serious health problems."

Others have also viewed symbols as being an important aspect of Latino society. In discussing the relationship between low birthweight and culture, James (1993) argues that there is an unexplained factor that contributes to the low rate of low birthweight among Mexicans. He asks:

Is it possible that Mexican American women with a predominately Mexican cultural orientation derive important psychological benefits from maintaining contact with identity-preserving symbols? (James 1993:132).

James (1993) suggests that psychological benefits are derived from a Mexican cultural orientation steeped in symbols, and this orientation results in positive

health outcomes. James' (1993) argument is consistent with Habermas' discussion of life-worlds, particularly the emphasis on symbols in the maintenance of culture. Religion has also been proposed as important factor in defining culture.

Magana and Clark (1995:103) write that:

One religious symbol uniquely central to Mexicans and Mexican Americans is the Virgin of Guadalupe . . . She is for Latinos of Mexican descent a symbol of both cultural and religious identity, usually inseparable within Mexican American culture.

According to Magana and Clark (1995), the Virgin of Guadalupe is a religious symbol that provides strength, warmth, and power to Mexicans and particularly to Mexican women. This is due to the connection of the Virgin of Guadalupe with motherhood. The Virgin of Guadalupe is representative of maternal strength, the protection of children, and life itself. Myth has it that the Virgin of Guadalupe (also known as Our Lady of Guadalupe) appeared to a Nahuatl Indian named Juan Diego in what is now Mexico City in 1531. She was said to be the dark-skinned Mother of God (the Virgin Mary).

Magana and Clark (1995) suggest that it is this symbol that contributes to the positive birth outcomes for Mexicans. They argue that because of the maternal association with the Virgin of Guadalupe, Mexican women "are very likely to have the kind of health behaviors that augur toward better birth outcomes and more robust infancy" (Magana and Clark 1995:106). Specifically, Magana and Clark (1995) suggest that women who proscribe to the power of the symbol of the Lady of Guadalupe, in an effort to emulate her, will avoid smoking and alcohol, be modest in their sexual relationships, and maintain a diet based on traditional foods. Magana and Clarks' (1995) suggestion that some Mexican women have an especially strong relationship with the symbol of the Lady of Guadalupe is consistent with a study conducted by Levin (1991) who found that Mexican women *prayed* more for their babies during pregnancy than African American women (although African American women attended church more often).

Habermas' (1976) concept of life-worlds and the importance of symbols in the maintenance of life-worlds, James' (1993) discussion of the role of symbols in promoting favorable low birthweight rates, and Magana and Clarks' (1995) article on the Lady of Guadalupe as a symbol that contributes to a low incidence of low birthweight, demonstrate that others' have considered the importance of culture, symbols, and social psychological phenomenon in explaining low birthweight. I have reviewed these studies to present a theoretical construct in which to frame the discussion of acculturation and acculturation processes. These studies and particularly the concept of lifeworlds provide an alternative way of thinking about culture and acculturation. This is to say that in thinking about acculturation, the role of life-worlds (with its focus on symbols) can not be overlooked or understated.

Acculturation Processes

Marin and Marin (1991) suggest that there are "cultural values" that are common to all Latino groups. They do recognize that Latino heterogeneity

exists but argue that common values are shared due to a common language, historical roots of Spanish colonization, and the shared religion of Roman Catholicism. However, the immediate discussion focuses on acculturation processes as related to subgroup differences. For this reason, Marin and Marin's (1991) discussion of Latino similarities can be found in Appendix F.

The majority of the literature regarding acculturation and Latinos addressees Mexican Americans. This is logical since the majority of Latinos in the U.S. are Mexican. According to the U.S. Census Bureau, 60.1% of the Latino population in the U.S. is Mexican, 12.1% Puerto Rican, and 4.7% Cuban (U.S. Bureau of the Census 1992:21).

The Role of Family

Martinez (1977:30) suggests that Mexican Americans adhere to "traditional family roles" in which the male is dominate ("machismo" see Marin and Marin 1991 in Appendix F) and the female submissive. Martinez proposes that:

Utilizing the apparent adherence of Mexican-Americans to traditional family roles one may begin to develop distinctions between Mexican-American and Anglo-American family structure that should lead to a better understanding of how acculturation forces have changed the Mexican family prototype within the milieu of the current Anglo-American society (1977:30-31).

In this context, not only can Mexican Americans be compared with Anglos, but Mexican Americans can be compared with Cubans and Puerto Ricans. In other words, the degree to which Mexican Americans, Cubans, and Puerto Ricans conform to "traditional" family roles can be used as a measure of comparison. I accept Martinez' assertion that Mexican Americans adhere to traditional family roles, but only to a certain extent. I believe that the degree to which traditional roles are adhered to is a function of acculturation (i.e., the more they are acculturated, the less they adhere to these traditional roles).

Are Latino families really different than Non-Latino White families in family practices and child-rearing and does this effect low birthweight outcomes? Garcia Coll suggests that there are "major sources of influence on the developmental outcome of minority infants: [these sources are] cultural beliefs and caregiving practices, health status and health care practices, family structure and characteristics, socioeconomic factors, and biological factors" (Garcia Coll 1990:271). These factors can influence how an individual develops and the environment in which they develop. Development over the life span is effected by these characteristics which in turn effect health outcomes (i.e., the probability of experiencing risk) (Perkins 1995). Low birthweight is a health outcome. Garcia Coll suggests that the lower rates of infant mortality and low birthweight for Mexican-Americans is puzzling given their low socioeconomic status which points out the "possibility of some protective factors within this population" (1990:275). Dowling and Fisher write that "it is possible that some 'protective sociocultural effect' exists that attenuate some of the negative factors that are linked to race, poverty, and pregnancy outcome" (1987:157). To summarize, and to link the concepts together; the developmental outcome of minority children is influenced by a variety of factors which effect individual

development and environment which can impact exposure to risk (thus resulting in unhealthy outcomes). There may be certain elements about Latino families and family practices that provide a context which influences these factors and development which in turn reduce risk (i.e., they are "protective"). The influences in Latino culture that may protect children from risk may be in the cohesion that is brought about by familialism. The concept of protectiveness is consistent with the concept of familialism as discussed by Marin and Marin (1991) and Baca-Zinn (1994) (see Appendix F).

In discussing modern trends in the Mexican American family, Baca-Zinn (1994) argues that the family should be viewed within the larger context of adaptation to social and economic conditions. Baca-Zinn (1994) suggests that traditional Mexican family values of close relationships and male domination are not deviant, but are adaptive measures in an often inhospitable social environment. In short, an analysis of the family has to consider culture in relation to social structure (Baca-Zinn 1994:166) because "culture and SES are inseparably linked" (Fracasso, Busch-Rossnagel, and Fisher). The modern Mexican family tends to have a lower socioeconomic status than Non-Latino Whites, are more likely to be married and marry at a younger age than Non-Latino Whites (Baca-Zinn 1994:166-67).

The intersection between culture and structure is seen in the interaction between migration, extended family, and economic conditions. Many Mexicans

who migrate to the U.S. already have family in the states. These families form the basis for an extended family network. In times of economic adjustment, the extended family may assist financially and help with child care (Baca-Zinn 1994:168-69).

Gender Roles

Gender roles are directly related to a discussion of the family. Gender roles are connected to the degree of acculturation of the family because in Latino culture, women are associated with the propagation of culture. As gender roles change so does the nature of the family and culture transforms. The connection between gender roles, family, and culture can be analyzed in looking at the Mexican experience. Historically for Mexicans, women's "primary task was to care for their husbands and children and to accept subordination as a natural condition" (Baca-Zinn 1994:164). Not only was a woman's task that of caregiver, she also promoted culture. Baca-Zinn writes:

Besides their roles as worker, wives, and mothers, women in particular guarded Mexican cultural traditions within the family . . . These included folklore, songs, and ballads, birthday celebrations, saint's days, baptisms, weddings, and funerals in the traditional Mexican style. Through the family, Mexican culture was nurtured (1994:165).

Baca-Zinn (1994) suggests that as more Mexican women entered the workplace, egalitarianism increased in Mexican families. This move toward egalitarianism was driven by economic imperatives (i.e., the need for women to contribute to the family income). Although elements of patriarchy still do exist in attitudes toward family and gender roles. "certain social conditions appear to be associated with greater equality for wives" (Baca-Zinn 1994:19). The relationship between gender roles, families, culture, and economic factors provides a basis for a comparison of the degree of acculturation between Latino subgroups. The effect of acculturation on family is seen in a study conducted by Rueschenberg and Buriel (1995).

In a study by Rueschenberg and Buriel (1995) on acculturation and the internal and external functioning of Mexican families (N=45), the authors used measures of acculturation that included "language preference and proficiency, generational status, and recency of immigration" (Rueschenberg and Buriel 1995:17). Rueschenberg and Buriel (199) found that acculturation increased as family members became more involved in U.S. society. Involvement in U.S. society (e.g., family members working) changed the family's culture.

The Cuban family experience demonstrates a pattern similar to that of Mexicans. In pre-Castro Cuba, "the wife and homemaker was the feminine ideal, and most women sought personal realization in the home rather than the workplace" (Garcia 1994:208-9). "Homemaker" is a subordinate role and in this context, it can be argued that the element of *machismo* (see Marin and Marin 1991 in Appendix F) was present in pre-Castro Cuban culture. Women only worked when economics so dictated. Garcia (1994:208) writes:

A single-income household, determined by choice rather than circumstance, was the ideal most working-class families aspired to since it was a symbol of upward mobility; and women often used their incomes to facilitate their family's entrance into the middle class.

However, emigration to the U.S. after the Cuban revolution resulted in

downward mobility for most Cubans. Although many Cubans were credentialed professionals, most could not replicate the economic status they had held in Cuba. Regardless of socioeconomic status in Cuba or skills or educational level, the majority of the emigres came to the U.S. penniless. Therefore, many women were compelled to enter the workplace.

Women began working in menial labor jobs that did not require good English skills and had minimal contact with the public. In 1964, as a result of so many Cuban women seeking employment, the Cuban Refugee Center in Miami instituted a work training program to assist single women and household heads in becoming more employable (e.g., English lessons, transportation stipends, and day care centers).

Governmental assistance afforded to Cuban emigres is an example of a socioeconomic condition which differentiates the Cuban experience with the Mexican experience. Although both groups experienced a transformation of gender roles due to economic conditions, Cubans benefitted occupationally and educationally from governmental assistance programs. No such programs were designed and implemented for Mexicans. This governmental assistance facilitated Cuban women's success in the social and economic world.

Although Cuban women contributed greatly to the economic situation of the family, like Mexicans, they were the propagators of culture "because of the traditional association of culture with the female sphere" (Garcia 1994:212). Garcia writes:

Cuban women were perhaps most influential in cultural matters, specifically preserving *cubanidad*, or those customs, values, and traditions associated with being Cuban (1994:212).

In this regard, Cubans and Mexicans are similar in viewing women as the "guardians of culture." However, social and economic forces prompted changes that differentiated Cuban women from Mexican women. It is my sense that Cubans are more acculturated than Mexicans and Puerto Ricans and Mexicans are more acculturated than Puerto Ricans. I think this because of the greater involvement in of Cubans and Mexicans than Puerto Ricans in economic and educational institutions. Appendix H demonstrates these differences.

I have suggested that acculturation is a process that involves several variables and so far I have focused on family and gender roles. I have further suggested that when family and gender roles change, then so does culture. I have a sense that changes in gender roles may be a result of socioeconomic conditions and these socioeconomic conditions vary by group. However, what I am *not* suggesting is that socioeconomic conditions directly change culture. Socioeconomic conditions are the only variable that I can really measure in my analysis of culture so to argue that a direct relationship exists, would be in error. Although I can hypothesize that socioeconomic conditions may effect family and gender roles and this effects culture, there is no definitive process of measuring this theoretical relationship.

The pertinent question here is, "what does acculturation have to do with

low birthweight?" Low birthweight is a pregnancy outcome. I argue that differences in these outcomes are related to acculturation. In a study on maternal-infant attachment and acculturation, Fracasso et al. (1994:145) suggest that "if patterns of parenting behavior are culturally distinct, then they should vary with respect to levels of acculturation." I am arguing that if patterns of low birthweight are culturally distinct (which they are) then they should vary with respect to levels of acculturation. The Fracasso et al. (1994) study is an attempt ascertain if acculturation is "relevant in explaining variability in parenting behavior and attachment." I am attempting to explain whether or not acculturation is relevant in variability in low birthweight. I use food habits as an indicator of culture. The relationship between food habits, culture, and low birthweight is discussed in the next chapter.

CHAPTER 4

FOOD HABITS, CULTURE, AND LOW BIRTHWEIGHT

This chapter examines the relationship between food habits, culture, and low birthweight. The discipline of nutritional anthropology is introduced and its relevancy to this study is established. The chapter concludes with a discussion of the role of nutrients as they relate to positive pregnancy outcomes.

Food Habits

Every human has to eat and "food is needed to supply energy for metabolic processes, growth, and reproduction, and to supply substrates for building the components of the organism" (Sanjur 1982:5). Certain dietary essentials are necessary for the maintenance of the human organism. These essentials are known as nutrients. Nutrients are composed of "minerals, amino acids, and the energy sources, fats and carbohydrates" (Sanjur 1982:5). However, different human social groups derive these nutrients from different foods. The foods people eat vary by culture. Sanjur (1982:3) writes:

Food habits are fundamentally *cultural* habits. Food habits are culturally determined; that is, the individual's subcultural background and orientation, as well as his or her personal characteristics and perceptions, ultimately determine what his or her dietary patterns will be (emphasis in original).

Food habits are defined as:

Habits of a group that reflect the way a culture standardizes behavior of the individuals in the group in relation to food so that the group comes to have a common pattern of eating (Lowenberg, Todhunter, Wilson, Feeney, and Savage 1968:85).

Nutritional Anthropology

The study of culture is associated with the field of anthropology. The

study of foods in relation to culture is known as nutritional anthropology.

Nutritional anthropology is defined as:

The application of anthropological data and methods to the solving of the cultural aspects of human nutritional problems, or as the study of the interrelationships between diet and culture and their mutual influence upon one another (Freedman 1977).

Johnston (1987) elaborates upon the nature of the field of nutritional

anthropology and demonstrates its focus on culture as opposed to biology. He

writes that nutritional anthropology is:

That branch of anthropology which deals with nutrition as a process and as a science . . . and brings anthropological concerns to the study of food and, since food is defined culturally (rather than biologically), has a predominant social and cultural focus (Johnston 1987:ix).

Given the above, my analysis of food is in the tradition of nutritional

anthropology, since its focus is on the cultural aspect of food. It should be

noted, however, that the study is not purely cultural anthropology. The

approach is more similar to "social anthropology" since it focuses on

contemporary groups.

Differential historical and geographic conditions have created differential

socioeconomic conditions which have molded and shaped the cultures of

Cubans, Mexicans, and Puerto Ricans. Food is directly related to culture.

Lowenberg et al. (1968) write:

Food habits vary from one cultural group to another because each group, in its own evolution, sets up a complex pattern of standardized behaviors. Individuals within a culture respond to the approved behavioral pressures by selecting, consuming, and using those foods which are available (1968:87)

Back (1977) suggests that food is not only related to culture, but to one's

identity. He suggests that:

The way in which food is prepared and served, the food people eat together, the food they do not eat in companionship--all express the ways in which individuals in different societies project their identities (Back 1977:31).

Therefore, the foods of each Latino subgroup will be different. Differential food habits will result in differential outcomes.

Culture and Food Habits

This difference in subgroup food habits is seen in the differential intake of healthy and unhealthy food between Latino subgroups. Using the Hispanic Health and Nutrition Examination Survey, 1982-84, Marks, Garcia, and Solis (1990) found subgroup differences in dietary practices among Latinos. The authors created a diet index which contained two components. One component measured the degree to which one's diet was balanced, and one measured "junk food" intake. A balanced diet meant that the person was frequently consuming foods from each food group (meats, dairy, fruits, vegetables, and grains). Candy, non-diet sodas, cake, cookies, sugar, etc., were considered junk food.

Cuban women had the best scores on the balanced diet component, followed by Mexican American women, with Puerto Rican women having the lowest scores. This suggests that Mexican and Cuban women were eating much better than Puerto Rican women. Regarding junk food, Mexican American women have the best scores (i.e., they don't eat much junk food) followed by Mexican American men. Puerto Rican men had the worse score for junk food intake (i.e., they eat a lot of junk food). It seems that Puerto Rican men have succumbed to what I call the "McDonald's Factor."

The most important aspect of the Marks et al. (1990) study is that it supports the notion of subgroup differences in diet. It also suggests that Puerto Ricans are at greater risk for negative health outcomes because of diet. The heterogeneous nature of Latino foods is seen in Table 2. Table 2 compares dietary patterns and practices associated with the major food groups by Latino subgroup.

The data in the Table 2 is based on the work of Romero Gwynn and Gwynn (1993; 1994). Romero Gwynn and Gwynn, used the Hispanic Health and Nutrition Examination Survey, 1982-84, and "analyzed data from this survey . . . to determine differences in food consumption" (1993:4). Romero Gwynn and Gwynn (1993:4) evaluated "the nutritional status and food consumption of selected traditional and non-traditional foods." In addition, Romero Gwynn and Gwynn (1993) examined food patterns of immigrant families from Mexico and Mexicans born in the United States. As part of this study, interviews were conducted in which "Hispanic food practices and beliefs" were ascertained (Romero Gwynn and Gwynn 1993:4). The 1993 study of

Romero Gwynn and Gwynn established Latino heterogeneity in food habits. In a later monograph, Romero Gwynn and Gwynn (1994) expanded on the history and food types as related to Latinos of Mexican descent and noted differences in dietary patterns by geographic region in Mexico. Table 2 was developed by summarizing the major conclusions of the above works of Romero Gwynn and Gwynn (1993; 1994).

Food Group	Mexicans	Cubans	Puerto Ricans
Corn/Maize & Bread	eat more tortillas than bread	eat more bread than tortillas	eat more bread than tortillas
Beans	eat more beans than other two groups and prefer pinto beans	eat more black beans than pinto beans	eat more black beans than pinto beans
Rice/Pasta	rice is often fried	eat more rice and pasta than Mexicans	eat more rice and pasta than Mexicans
Dairy Products	milk in drinks and cheese 3x week	milk in drinks and cheese 3x week	milk in drinks and ch eese 3x week
Meats	more beef than Puerto Ricans	more beef than Puerto Ricans	more poultry than Mexicans and Cubans and slightly more fish
Vegetables	1x week but more Puerto Ricans	1x week but more than Puerto Ricans	1x week

Table 2. Major Food Groups and Food Practices by Latino Subgroups

Source: Romero Gwynn and Gwynn 1993; Romero Gwynn and Gwynn 1994.

Not only does Table 2 suggest subgroup differences among Latinos in

types of foods consumed, but it also suggests differences in frequency of

consumption. Frequencies were calculated by Romero Gwynn and Gwynn

(1993; 1994) from the data in the Hispanic Health and Nutrition Examination

Survey, 1982-84. These calculations were presented in their work in the form

of percentages. For example, Romero Gwynn and Gwynn (1993:9-10) write:

In the United States most Cubans (87.7%) and Puerto Ricans (86.4%) do not eat corn tortillas. In contrast, almost a third (31.6%) of the persons of Mexican descent living in the United States eat corn tortillas on a daily basis and at least a third more (37.3%) consume them on a weekly basis . . . Cubans (62.8%) and Puerto Ricans (51.5%) are more likely to consume bread on a daily basis than Mexican Americans (44.4%).

Romero Gwynn and Gwynn's (1993) discussion on the subgroup differences in bread and tortilla intake is translated into Table 2 as Mexicans eating more tortillas than Cubans and Puerto Ricans, and Cubans and Puerto Ricans eating more bread than Mexicans. This was how Table 2 was developed.

Nutrition and Low Birthweight

An interesting phenomenon presented itself in reviewing the culture and foods literature. This phenomenon is the interactive nature of beans and maize/rice in relation to protein. Beans are a staple of the Latino diet and is often eaten with tortillas, bread, or rice (Romero Gwynn and Gwynn 1994). Dewalt and Pelto suggest that "the classic trilogy of the Mesoamerican diet - maize, beans and squash - is a well known ethnographic fact" (1977:79). Sanjur (1982:247) writes:

When eaten combined, the lysine deficiency of rice completely disappears owing to the large contribution of lysine by the bean protein. Conversely, we can expect the amounts of methionine and cystine to increase (relative to the amount found in beans alone) owing to the contribution of the rice protein. In short, rice and beans contain *Complementary Proteins*— that is, by combining them, not only do we increase total amount of protein, we also improve the quality of both components of the mixture (emphasis in original).

And Dewalt and Pelto find the same phenomenon for beans and maize and state:

Many anthropologists with limited nutritional knowledge understand the significance of the protein complementarity of maize and beans. When lysine-deficient maize is eaten together with tryptophane-deficient beans, the limiting amino acids in each are "complemented," making the combination a more nutritionally complete protein (1977:79)

What makes this bean and maize/rice protein complementary mix so

interesting, is the role protein plays in pregnancy. Sanjur writes that "the diets

of pregnant women are influenced by the same factors that are important

in determining diets in general" (1982:259). This means that pregnant Latinas

who are eating beans and maize/rice would be receiving a good amount of

protein.

Eckstein (1980) conducted an analysis of nutrient intake

recommendations for pregnant women. She found that an increase in energy caloric intake is necessary "to supply the extra tissues as well as growth and development needs" (1980:451). The recommended increase in caloric intake is a mean of 300 calories a day above nonpregnant levels. A woman who is deprived of food will be unable to meet this need. However, women who have access to food may increase the calorie to a level that results in a negative

outcome. This usually occurs when a pregnant woman decreases her activity level in the last trisemester while maintaining the increased energy intake which results in unwanted weight gain. Eckstein recommends a mean increase of 30 grams of protein a day above nonpregnant levels "which is used for growth and development of accessory maternal tissue and fetal tissue" (1980:451). Additionally, to develop bones and teeth, it is recommended that calcium and phosphate intakes are increased to 400 milligrams per day above nonpregnant levels. Iron is needed for fetal blood stores and maternal blood loss associated with delivery. The recommended iron intake increase is 30 to 60 milligrams a day above nonpregnant levels (Eckstein 1980:452).

lodine and sodium levels are met through "normal iodized salt intake" (Eckstein 1980:452). Research has been inconclusive regarding a recommended increase in magnesium intake. A 5 milligram increase of zinc is recommended to bolster fetal stores of zinc (Eckstein 1980:452).

It is recommended that the intake of vitamin A is increased to approximately 20-25% above nonpregnant levels. Vitamin A meets needs for "Cell growth in accessory maternal as well as fetal tissues and tooth and bone formation" (Eckstein 1980:453). Vitamin B supplies added energy and the recommended increase is .6 milligrams per day above nonpregnant levels. It is recommended that ascorbic acid (vitamin C) is increased to "support normal hemoglobin concentrations" and the recommended daily intake increase is 10 milligrams above nonpregnant levels. Eckstein writes (1980:453): From the above, it is clear that necessary increases for most nutrients *are only modest* (emphasis added). A common rule is: IF protein needs are met, THEN all other nutrient needs are likely to be met, with the exceptions of vitamins A, C, and D (caps in original).

What Eckstein suggests, is that *protein* is the most important nutrient in effecting a positive pregnancy outcome. Other nutrient requirements (except for A, C, and D) are met through the intake of protein.

I discussed the above passage with Dr. Sharon Hoerr of the Department of Food Science and Human Nutrition at Michigan State University regarding the role of the above nutrients in positive pregnancy outcomes (Hoerr 1995). She concurred that the nutrients of protein and vitamins A, C, and D were indeed "crucial." However, she also stated that energy, folacin and iron were also essential for positive for pregnancy outcomes (Eckstein (1980) viewed these nutrients as being met in the intake of protein).

Dr. Hoerr stated that curvilinear, not linear, relationships exist among nutrients and pregnancy outcomes. A woman can intake too *many* calories or too much protein. This is consistent with Eckstein's (1980) assertion that pregnant women who over consume are at risk for unwanted weight gain.

This chapter has analyzed the relationship between food habits, culture, and low birthweight. The role of nutrition was addressed regarding positive pregnancy outcomes. A theory of differential low birthweight and an operational model to test hypotheses associated with the theory are now proposed in the next chapter.

CHAPTER 5

THE THEORY AND THE OPERATIONAL MODEL

This chapter proposes a theory of differential low birthweight and develops an operational model. I first develop a conceptual framework which identifies and lists the variables of food, acculturation, socioeconomic conditions, and the experiential histories of people. It is in this framework that the theory is proposed. The operational model is then discussed. In this discussion the variables are addressed and specific hypotheses proposed. The data source is then discussed as is the data analysis.

Conceptual Framework: Functional Relationships and Theory

Functional Relationships: In the equation below, I propose the following functional relationships:

LOW BIRTHWEIGHT=f(FOOD HABITS AND OTHER)

Furthermore, since food habits are a function of culture:

FOOD HABITS=f(ACCULTURATION)

And, since culture interacts with social and economic conditions:

CULTURE=f(SOCIOECONOMIC CONDITIONS)

Lastly, socioeconomic conditions are a result of historical circumstances:

SOCIOECONOMIC CONDITIONS=f(HISTORY)

Theory: I propose that differential historical circumstances have created differential socioeconomic conditions which have resulted in varying degrees of

acculturation between Mexicans, Cubans, and Puerto Ricans. Mexicans, Cubans, and Puerto Ricans each have their own distinct cultures. Food habits are directly related to culture. Food habits create variance in nutritional intake and it is this variance that results in differential low birthweight outcomes.

Food habits, socioeconomic circumstances, and history have been discussed in relation to acculturation. "OTHER" refers to variables that may have an impact on low birthweight but are not the primary focus of this dissertation. For example, Scribner and Dwyer (1989) used language as a measure of acculturation in examining the effect of acculturation on low birthweight. Brooks-Gunn et al. (1988) and Michielutte et al. (1992) have identified mother's educational level as predictors of low birthweight.

Primary Hypothesis

I now hypothesize about the effect of the variables on low birthweight. I expect poor food habits (i.e., undernourishment) to result in high rates of low birthweight. Since Puerto Ricans have the highest rate of low birthweight, I expect that Puerto Rican women have poorer nutrition than Mexican and Cuban women.

I also tested the "OTHER" category in examining the low birthweight issue. I tested the "OTHER" variables so I would have a basis of comparison in analyzing low birthweight outcomes. For these reasons, as part of the "OTHER" variables referred to in the above functional relationship, I will be looking at the effect of language and education on low birthweight outcomes.
Operational Model

The operational model is now developed. The independent and dependent variables are discussed and hypotheses proposed. The data source is addressed as is the data analysis.

Independent Variables

Eckstein (1980), Hoerr (1995), and others discussed in Chapter 4 have identified the following as important for comparing low birthweight, intake of (1) calories, (2) protein, (3) vitamin A, (4) vitamin C, (5) vitamin D, (6) folacin, and (7) iron. I have attempted to measure low birthweight in terms of these factors in a logistic regression model.

To frame the variables consistently, some clarification of nutritional terminology is in order. Vitamin C is also known as ascorbic acid (Eckstein 1980:624). Vitamin D is obtained through the "absorption of calcium and phosphorous" (Hinton and Kerwin 1981:7). Since calories are made up of nutrients, the term "nutrient" will mean calories and nutrients unless specified otherwise.

The independent variables will be referred to as the "Nutrient Intake Variables." They are measured based on 100 grams of the edible portion of a food. This is the way nutrient intake is measured in USDA Administrative Report 378 (U.S. Department of Agriculture 1994). The data set from which the independent variables are drawn (the Hispanic Health and Nutrition Examination Survey 1982-84), uses Administrative Report 378 as its measure

of nutrient intake.

Dependent Variables

Low birthweight, the dependent variable, was dichotomized based on four categories of low birthweight. These categories were <500 grams, 500-1,499 grams, 1,500-2,499 grams, and >2,500 grams (Rumbaut and Weeks 1989). Creating these categories resulted in 4 dependent variables. These dependent variables are as follows:

- 1. Very, Very Low Birthweight = <500 grams
- 2. Very Low Birthweight = 500-1,499 grams
- 3. High Low Birthweight = 1,500-2,499 grams
- 4. Normal Birthweight = >2,500 grams

A birth weight of less than 2,500 grams was used as the standard criterion for low birthweight in *all* of the studies pertaining to low birthweight cited in the literature review. I also used this standard as a measure of low birthweight. The independent and dependent variables are expressed in hypotheses below.

Functional Relationships of Variables

- H1: NUTRIENT INTAKE=f(ETHNICITY)
- H2: LOW BIRTHWEIGHT=f(NUTRIENT INTAKE)

Hypotheses and Subhypotheses

H1: The nutrient intake of Puerto Rican women is less than the nutrient intake of Mexican and Cuban women.

Subhypothesis 1. The calorie intake of Puerto Rican women is less than the calorie intake of Mexican and Cuban women.

Subhypothesis 2. The protein intake of Puerto Rican women is less than the protein intake of Mexican and Cuban women.

Subhypothesis 3. The vitamin A intake of Puerto Rican women is less than the vitamin A intake of Mexican and Cuban women.

Subhypothesis 4. The vitamin C intake of Puerto Rican women is less than the vitamin C intake of Mexican and Cuban women.

Subhypothesis 5. The vitamin D intake of Puerto Rican women is less than the vitamin D intake of Mexican and Cuban women.

Subhypothesis 6. The folacin intake of Puerto Rican women is less than the folacin intake of Mexican and Cuban women.

Subhypothesis 7. The iron intake of Puerto Rican women is less than the iron intake of Mexican and Cuban women.

H2: Nutritional intake effects low birthweight outcomes more for Puerto Ricans than for Mexicans and Cubans.

Operational Definitions

Nutritional intake is defined as the amount of a specified nutrient as measured in either calories, grams, milligrams, or micrograms. The intake is based on 100 grams of the edible portion of a food.

"Less than" is defined as being numerically less (based on 100 grams of the edible portion of a food) as measured by calories, grams, milligrams, or micrograms.

Low birthweight outcomes are defined as birthweights that are in the <500 grams, 500-1,499 grams, and 1,500-2,499 grams categories.

<u>Data</u>

The Hispanic Health and Nutrition Examination Survey, 1982-84, (HHANES) was recognized as a useful research tool by many scholars (Scribner and Dwyer 1989, Mendoza 1991; Romero Gwynn and Gwynn 1993). These are seen as endorsements of the instrument.

The HHANES data was collected by the National Center for Health Statistics. Romero Gwynn and Gwynn state that "the best source of data on the current nutritional status and food practices in the United States is the national HHANES" (1994:4). The data contains sixteen components with particular focus on nutritional practices and physical health (ICPSR 1994).

The Hispanic Health and Nutrition Examination Survey, 1982-84

The sample in the Hispanic Health and Nutrition Examination Survey, 1982-84, (HHANES) consists of three subgroups of Latinos. These groups are Mexicans (from Texas, Colorado, New Mexico, Arizona, and California), Cubans (from Dade County Florida), and Puerto Ricans (from the New York City area and parts of New Jersey and Connecticut). The sample is a multistage, stratified, cluster of the three groups "that yielded an 87% net coverage rate of the 1980 Mexican-origin population living in the five southwestern states, about 90% of the Puerto Rican-origin population in the defined universe for the New York City area, and about 96% of the Cuban-origin population living in Dade County, Florida" (Trevino, Moyer, Valdez, and Stroup-Benham 1991).

Limitations

The data was collected in 1980, fifteen years ago. We know little about how this data compares with today's conditions and this may result in possible bias. The measure of acculturation is unsophisticated (based on language and self identity). Also, acculturation is only measured for Mexicans and not for Cubans and Puerto Ricans. A precise measure of low birthweight is not offered. The birthweight data is retrospective based on mother's recollection. It does not use medical or birth records. A more accurate measure of birthweight would increase the validity of any findings. Also, gestation is based on the recollection of mothers. It is measured by mothers' response to a question which read, "was the child bom earlier than expected, when expected, or later than expected."

The data do not reflect nutrient intake *during* pregnancy. The Hispanic Health and Nutrition Examination Survey, 1982-84, only gives data on nutrient intake in general for the Latino groups. Although the data does not specifically address nutritional intake during pregnancy, if these needs are not being met in general, there is little reason to believe they would be met during pregnancy.

Data in the Hispanic Health and Nutrition Examination Survey, 1982-84 (HHANES), does not measure nutrition based on Recommended Daily Allowances (RDA). This makes it difficult to measure nutrient intake using

RDAs as it is used in most literature regarding nutrient intake recommendations for pregnant women. For example, Eckstein (1980) and Hinton and Kerwin (1981) suggest that the caloric RDA for pregnant women (19-22 years of age) is 2,400 calories a day. However, this can not be directly tested using the HHANES because the HHANES uses as its measure of nutrient intake 100 grams of the edible portion of a food.

<u>Strenaths</u>

The Hispanic Health and Nutrition Examination Survey, 1982-84, (HHANES) is a national sample. Romero Gwynn and Gwynn (1993:4) write that "the best source of data on the current nutritional status and food practices of Hispanics in the United States is the national *Hispanic Health and Nutrition Examination Survey* (HHANES)." The characteristic of nationalism will decrease problems associated with regionalism. The data also accounts for heterogeneity. It is one of the few data sets that allows the researcher to conduct systematic cross group comparisons using the same data set. The seven nutrients identified as being most important in effecting positive pregnancy outcomes are found in the HHANES. The hypotheses are realistically testable given the data in the HHANES.

Data Analysis

In a perfect world, a scholar's data set will enable them to answer all of their research questions. We do not live in a perfect world and the Hispanic Health and Nutrition Examination Survey, 1982-84, (HHANES) fell short of

allowing me to answer some of my questions as well as I had wanted. The biggest problem is in combining components. Data for nutrient intake was drawn from the Dietary Practices, Food Frequency, and Total Nutrient Intake component of the HHANES. Data for low birthweight was drawn from the Child History Questionnaire component of the HHANES.

The Child History Questionnaire component does not identify adults in a low birthweight household by gender. Therefore, I had no way of directly testing the nutrient intake of Latinas in households with low birthweight babies. The Total Nutrient Intake component did identify adults by gender. I combined the two sets and matched the Latina cases in the Total Nutrient Intake component with low birthweight birth cases. By proxy, I inferred that these Latinas were the mothers of the low birthweight infants. To best achieve this, I selected Latinas over 15 years of age. To cross check this, I examined the relationship of this group is to head of the house. I found that 72.1% of the group were either the heads of house or married to heads of house or grandchildren of the low of house). Given this, I can reasonably say that at least 70% of the Latinas used for measuring nutritional intake in relation to low birthweight could be mothers of low birthweight infants.

The Sample

In the Hispanic Health and Nutrition Examination Survey, 1982-84 (HHANES), respondents self identify as either "Other, Mexican/Mexicano,

Mexican American, Chicano, Puerto Rican, Boricuan, Cuban, Cuban American, Hispano, Latin American/Spanish, Spanish American, or Spanish/Spain." | eliminated those who self identify as "Other, Hispano, Latin American/Spanish, Spanish American." and "Spanish/Spain." I did this because Mexicans. Cubans, and Puerto Ricans are the largest three Latino subgroups in the United States. Marin and Marin (1991:10) write that the term "Other Hispanics is a label of convenience that designates a wide range of individuals who do not trace their family background to Mexico, Cuba, or Puerto Rico . . . 'Other Hispanics' refers to a very heterogenous group encompassing professional, white-collar employees, and blue-collar workers who left their countries in search of better education or employment or in reaction to political changes." Additionally, "when individuals self-identify as group members . . . they may be said to have a high ethnic identity" (Phinney 1995:58). What I am suggesting is that those who identified as "Other, Hispano, Latin American/Spanish, Spanish American, Spanish/Spain" are not of Mexican, Cuban, or Puerto Rican descent, which is the focus of my study.

Those who identified as Mexican/Mexicano, Mexican American and Chicano I collapsed into the group "Mexican." Those who identified as Puerto Rican or Boricuan I collapsed into the group "Puerto Rican." Those who identified as Cuban or Cuban American I collapsed into the group "Cuban."

The issue of Latino identity is one that I recognize poses some problems for researchers. It is one that is not easily solved given that Latinos are such a

heterogeneous and diverse group. For example, someone who is Mexican may self-identify as "Spanish" even though they descend from Mexico. As such, my sample and not perfect and this study is limited by using ethnic self identification as a method of construting the sample. However, with the data set, it seemed the most workable and I am comfortable with this approach.

There were 3,472 children in the Child History Questionnaire component of the HHANES. Of these children, 68.2% were Mexican, 7.8% were Cuban, and 24.0% were Puerto Rican.

There were 6,548 Latinos over 15 years of age in the Dietary Practices, Food Frequency, and Total Nutrient Intakes component of the HHANES. of these, 43.3% were male and 56.6% were female. Sixty percent were Mexican, 15.2% were Cuban, and 24.4% were Puerto Rican.

Statistical Procedures

I need to clarify that there were two low birthweight issues that I addressed. First, I looked at *total* low birthweight among the Latino population. I did this to give an overall picture of subgroup differences. The second issue addressed involved low birthweight in relation to nutrient intake of Latinas.

In my comparison of subgroup differences in total low birthweight, I separated out preterm and fullterm outcomes of low birthweight. Social and economic characteristics of households with low birthweight children were then computed. This was done by Latino subgroup and by preterm and fullterm birth outcomes. Data for the nutrient intake sample was then computed. This data consists of the social and economic characteristics of households of the sample. Crosstabs were then conducted on gestation length by ethnic group and ethnic group by birthweight category. Chi-square tests of significance were conducted on the crosstabs. As a test of H1 and subhypotheses 1 through 7, 1 conducted an analysis of variance (ANOVA) test on Latinas by Nutrient Intake for Birthweight Category.

For the ANOVA, I created a variable labeled "Latinas." This variable was composed of the three different Latina subgroups. Therefore, the variable Latina, was composed of three different measures, Mexicans, Cubans, and Puerto Ricans. The ANOVA was on Latinas by nutrient intake. A Bonferroni test of significance was conducted to assess where, if any, between group differences occurred.

The Bonferroni test of significance is a multiple comparison test. This test adjusts observed significance levels based on the number of comparisons being made (Norusis/SPSS Inc. 1994:185). It makes this adjustment because the more observations that are made, the more likely that pairs will be statistically different even if means are equal. Norusis/SPSS Inc. (1994:185) explain it this way, "if you are making 5 comparisons, the observed significance level for the original comparison must be less than 0.05/5, or 0.01, for the difference to be significant at the 0.05 level."

In the ANOVA, the Bonferroni test told me which subgroups were

statistically significant in the difference between the means. Put simply, although an ANOVA may tell me that a significant F exists for my three measure variable Latina and a certain nutrient, it does not tell me where the differences are. The Bonferroni test did this for me.

I then tested H2. I used logistic regressions to see what nutrients best explain the incidence of low birthweight for Latinas by birthweight category. I used logistic regressions so that my research model was consistent with my research guestion. My research guestion was whether or not nutrition effected low birthweight outcomes. The best way to test this was to dichotomize the dependent variable of low birthweight based on birthweight categories and conduct regression analyses. Birthweight categories were selected based on the Rumbaut and Weeks (1993) study which was discussed in the literature review. So, for the first category, birthweights of less than 500 grams were coded a 1 and all other birthweights coded a 0. For the second category, 500-1,499 grams, birthweights from 500-1,499 grams were coded a 1 and all other birthweights coded a 0. For the third category, birthweights from 1,500-2,499 grams were coded a 1 and all other birthweights coded a 0. For the fourth category, birthweights of over 2,499 were coded a 1 and all other birthweights coded a 0. However, in the sample, only one birth was less than 500 grams. Therefore, although I set out to study the effect of nutrition on low birthweight outcomes, I included births over 2,500 grams to give more opportunity for comparisons.

As a test of the "Other" variables and their effect on low birthweight, logistic regression analyses were conducted. Again, birthweight categories were dichotomized as above as the dependent variable and education and language served as the independent variables. In the Hispanic Health and Nutrition Examination Survey, 1982-84, (HHANES) education was measured by "highest grade or year of regular school head of family has ever attended" from kindergarten through graduate school. Language was measured by Language preference for completing the Interview questions of the HHANES. English was scored a 1 and Spanish a 2. The language measure was recoded as an indicator variable (i.e., English is coded a 0 and Spanish a 1) for the logistic regression equation.

Logistic Regression Models

The first three logistic regressions address the role of nutrition in low birthweight. The next three regressions examine the role of education on low birthweight. The last three regressions evaluate the role of language on low birthweight.

1. Birthweight of 500-1,499 grams (coded as 1, all others coded as 0) = $\beta_{\sigma} + \beta Calories + \beta_2 Protein + \beta_3 Vitamin A + \beta_4 Vitamin C + \beta_5 Calcium +$

 β_{s} Phosphorous + β_{7} Folacin + β_{s} Iron + e.

2. Birthweight of 1,500-2,499 grams (coded as 1, all others coded as 0) = $\beta_0 + \beta_1$ Calories + β_2 Protein + β_3 Vitamin A + β_4 Vitamin C + β_5 Calcium + β_6 Phosphorous + β_7 Folacin + β_8 Iron + *e*. 3. Birthweight of >2,500 grams (coded as 1, all others coded as 0) =

 $\beta_0 + \beta_1$ Calories + β_2 Protein + β_3 Vitamin A + β_4 Vitamin C + β_5 Calcium +

 β_{e} Phosphorous + β_{7} Folacin + β_{a} Iron + e

4. Birthweight of 500-1,499 grams (coded as 1, all others coded as 0) = $\beta_n + \beta_1$ Education + e.

5. Birthweight of 1,500-2,499 grams (coded as 1, all others coded as 0)

= β_0 + β_1 Education + e.

6. Birthweight of >2,500 grams (coded as 1, all others coded as 0) = $\beta_0 + \beta_1$ Education + e.

7. Birthweight of 500-1,499 grams (coded as 1, all others coded as 0) = $\beta_0 + \beta_1$ Language + e.

8. Birthweight of 1,500-2,499 grams (coded as 1, all others coded as 0) = $\beta_0 + \beta_1$ Language + *e*.

9. Birthweight of >2,500 grams (coded as 1, all others coded as 0) = $\beta_0 + \beta_1 \text{Language} + e$.

Relation of the Model to the Theory

I expected Puerto Ricans in the very, very low birthweight (VVLBW) category to have poor nutrition, low education, and speak Spanish. I also expected Puerto Ricans in the very low birthweight (VLBW) category to have poor nutrition, low education, and speak Spanish. I expected Mexicans and Cubans in the high low birthweight (HLBW) and normal birthweight (NBW) categories to have good nutrition, high education, and speak English. Furthermore, I expected that there would be more Puerto Ricans in the preterm low birthweight categories than Mexicans and Cubans, and I expected that there would be more Mexicans and Cubans in the fullterm low birthweight category. Table 3 presents these expectations.

Table 3. Expectations of Relationships Between Independent and Dependent Variables

Dependent \	/ariable	VVLBW	VLBW	HLBW	NBW
Independent	Variables				
Nutriti	on				
	Me xican Cuban Puerto Ricans	Good Good Poor	Good Good Poor	Good Good Good	Good Good Good
Educa	ation				
	Mexican Cuban Puerto Ricans	High High Low	High High Low	High High High	High High High
Langu	lage				
	Mexican Cuban Puerto Ricans	Engl. Engl. Span.	Engl. Engl. Span.	Engl. Engl. Engl.	Engl. Engl. Engl.

Collinearity

	Table	4. Co	rrelatio	n Matr	ix of In	depend	dent Va	ariables
	Calci	Cals	Fol	Iron	Phos	Prot	Vit A	Vit C
Calci	1.0							
Cals	51***	1.0						
Fol	.66***	47***	1.0					
Iron	.59***	54***	.86***	1.0				
Phos	.95***	56***	.61***	.69***	1.0			
Prot	04*	.44***	.04	.07**	.08**	1.0		
Vit A	04*	.44***	02	.00	08**	.47***	1.0	
Vit C	.76***	41***	.80***	.70***	.74***	.04	.00	1.0

p = < .05. p < .01. p < .001.

Table 4 indicated that high correlations existed between several of the independent variables. Many of these correlations were statistically significant. I checked for colinearity following a method suggested by Dr. Broman. Dr. Broman stated that variables can be collinear without there being a problem. However, problems may arise if coefficients are effected by this collinearity. To check to see if coefficients were effected, I re-estimated a series of regression equations that removed one variable at a time. I removed variables that were strongly correlated with other variables. I removed the following variables in the following order: calories, phosphorus, calcium, folacin, vitamin C, and iron. I removed these variables in this order because calories

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was correlated with seven other variables and the rest correlated with five other variables (all at the .30 level or above).

Using this method, it was found that Iron and calcium were collinear. This is because when calcium was removed from the regression equation, the coefficient for Iron changed dramatically. Voght (1993:144) writes that when colinearity exists, "it makes it difficult if not impossible to determine their [the collinear variables] separate effects on the dependent variable." This means that if iron or calcium prove to be significant in my logistic regressions, I have to take into consideration their collinear relationship in my interpretation of the results. Chapter 6 now turns to the results.

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CHAPTER 6

RESULTS

This chapter begins with a descriptive discussion of the sample relating to low birthweight outcomes. I then present the social and economic characteristics of the sample. The results of the tests of the hypotheses are then presented.

Low Birthweight, Gestation Length, and Racial and Ethnic Identity

In the literature review, it was seen that subgroup differences exist among Latinos regarding low birthweight. The question here is "to what degree did subgroup differences exist among the sample for my study?"

Of the total births, for all terms, one hundred seventy-two (5.2%) of the Latino children were born low birthweight. Bifurcating for subgroup, 4.4% of the Mexican children were low birthweight, 5.5% of the Cuban, and 7.7% of the Puerto Rican. There were four African American Latino children born low birthweight. Of the African American low birthweight children, one was of Mexican ethnicity and three of Puerto Rican ethnicity.

Of the low birthweight Latino children, 60.9% were born preterm and 39.0% were born fullterm. Two of the African American children were born preterm and two were born fullterm. Of the African American children born preterm, both were of Puerto Rican ethnicity.

For Mexicans, 2.1% of the total births were preterm low birthweight births

and 2.2% fullterm low birthweight births. For Cubans, 4.3% of the total births were preterm low birthweight births and 1.8% fullterm low birthweight births. For Puerto Ricans, 5.0% of the total births were preterm low birthweight births and 1.01% were fullterm low birthweight births. Table 5 presents a crosstabs of low birthweights that bifurcates by ethnic group and gestation length.

Ethnic Group	Preterm Births	Fuliterm Births	Total
Mexican	47	48	95
	(45.8%)	(71.5%)	(55.1%)
Puerto Rican	45	24	61
	(42.9%)	(35.7%)	(35.5%)
Cuban	13	5	16
	(12. 4%)	(7. 5%)	(9.2%)
Total	105	67	172
	1	1	

 Table 5. Crosstabs of Birthweight and Gestation Length by Ethnic Group

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 $X^2 = 12.7$

 X^2 at .01 where df = 2, is 9.21, Significant, $\underline{p} < .01$. X^2 at .05 where df = 2, is 5.99, Significant, p < .05.

The crosstabs indicated that the majority of low birthweight births were preterm births. A Chi-square test found significant differences between the observed frequencies and expected frequencies at the .01 and .05 significance levels.

Social and Economic Characteristics of Low Birthweight Households

In Chapter 2, I argued that low birthweight can not be examined in isolation. Additionally, the hypothesis of this dissertation states that the

outcome of low birthweight is a function of nutrition which is an indirect function

social and economic conditions. Therefore, the social and economic

characteristics of the sample from the Hispanic Health and Nutrition

Examination Survey, 1982-84, were calculated to assess if the results are

consistent with data discussed in Appendix H which found that Puerto Ricans

tend to have less income and less education than Mexicans and Cubans.

Grp.	% White	% Aff. Amer.	% Fem. Head Hse.	% Marr.	% Frgn. Born	% Emp.	Med. Fam. Inc. ^b	% 4 Yrs. Coll. Year
Mex.	88.1	3.0	15.9	81.7	44.9	80.7	13-14	.9
Cub.	92.9	0.0	21.4	92.9	92.8	57.1	25-30	7.1
P.R.	77.4	12.9	58.1	40.3	1.5 *	30.6	10-11	1.6

 Table 6. Social and Economic Characteristics of Households with Low Birthweight Children

Note. Data is for reported head of house.

a. 69.4% born in Puerto Rico and are not considered foreign born.

b. Median income is annual for combined family and is in thousands.

There are more Puerto Rican African Americans than Mexican and

Cuban African Americans. More than half of the Puerto Rican households are

headed by women. Less than half of the Puerto Rican heads of households

are married. The majority of Puerto Ricans are unemployed and Puerto Ricans

have the lowest income. Mexicans are undereducated in terms of years of

college.

Grp.	% White	% Aff. Amer.	% Fem. Head Hse.	% Marr.	% Frgn. Born	% Emp.	Med. Fam. Inc. ^b	% 4 Yrs. Coll
Mex.	81.1	3.8	9.4	88.7	34.0	83.0	17-18	0.0
Cub.	100.0	0.0	27.3	90.9	90.9	54 .5	25-30	0.0
P.R.	88.1	9.5	57.1	38.1	2.4ª	28.6	9.5- 10.5	0.0

 Table 7. Social and Economic Characteristics of Households with Low Birthweight Children Born Preterm

Note. Data is for reported head of house.

a. 71.4% born in Puerto Rico and are not considered foreign born.

b. Median income is annual for combined family and is in thousands.

More than half of the Puerto Rican households are headed by women.

Less than half of the Puerto Rican heads of household are married. The

majority of Puerto Ricans are unemployed and Puerto Ricans have the lowest

income.

 Table 8. Social and Economic Characteristics of Households with

 Low Birthweight Children Born Fullterm

Grp.	% White	% Aff. Amer.	% Fem. Head Hse.	% Marr.	% Frgn. Born	% Emp.	Med. Fam. Inc. ^b	% 4 Yrs. Coll.
Mex.	96.2	1.9	21.2	76.9	57.7	78.8	12.5- 13.5	3.0
Cub.	66 .7	0.0	0.0	100.0	100.0	66.7	30-35	0.0
P.R.	61.5	7.7	61.5	46.2	0.0ª	30.8	10-11	0.0

Table 8 (cont'd).

Note. Data is for reported head of house.

- a. 53.8% born in Puerto Rico and are not considered Foreign born.
- b. Median income is annual for combined family and is in thousands.

More than half of the Puerto Rican households are headed by women.

Less than half of the Puerto Rican heads of households are married. The

majority of Puerto Ricans are unemployed and Puerto Ricans have the lowest

income. Mexicans have the most years of college education.

Tests of Hypotheses

Ethnic Group	500-1,499°	1,500-2,499	>2,500	Totai
Mexican	4	55	1,021	1,080
	(57.0%)	(57.3%)	(66.4%)	(66.0%)
Cuban	1	4	118	123
	-	(4.2%)	(7.7%)	(7. 4%)
Puerto Rican	2	37	396	435
	(28.6%)	(38.4%)	(25.8%)	(26.5%)
Total	7	96	1,535	1,638

Table 9. Crosstabs of Ethnic Group by Birthweight Category

Note.

a. Only one birth was less than 500 grams and this birth was to a Mexican woman.

 $X^2 = 8.06$ X^2 at .001 where *df* = 4, is 18.46, Not Significant, <u>p</u> > .001. X^2 at .01 where *df* = 4, is 13.28, Not Significant, <u>p</u> > .01. X^2 at .05 where *df* = 4, is 9.49, Not Significant, <u>p</u> > .05.

The crosstabs indicated that for all three subgroups, the majority of the births were not low birthweight (i.e., > 2,500 grams). Of the births under 2,500 grams, the majority of the births occurred in the higher range (1,500-2,499 grams). However, a Chi-square test found no significant difference between the observed frequencies and the expected frequencies. The means of birthweight category by subgroup are presented in Table 10 below.

 Table 10.
 Means of Birthweight Categories by Ethnic Group

Ethnic Group	500-1, 499	1,500-2,499	>2,500
Mexican	1,150	2,223	3,459
Cuban	1,162*	2,352	3,436
Puerto Rican	1,431	2,324	3,338

Note.

a. This figure is for the one Cuban in this category.

I now turn to the results of the statistical tests of the hypotheses. I begin with the results of the analysis of variance tests (ANOVA). The logistic regression analyses results follow for nutrition and low birthweight and education and language on low birthweight.

Table 11. One-way Analysis of Variance of Latinas by Nutrient Intake forBirthweight Category

	Means			
Nutrient	Mexican	<u>Cuban</u> *	Puerto Rican	F-Ratio ^b
	Very Low Bi	rthweight 500	-1,499 Grams	
Calories (small calories)	7.5	N.A.	1.5	7.91*°
Protein (grams)	5.5	N.A.	2.0	1.84
Table 10 (cont'd).				
Vitamin A (retinol equivalents)	425.0	N.A.	500.0	2.82
Vitamin C (milligrams)	125.6	N.A.	66.8	1.13
Calcium (milligr a ms)	604.5	N.A.	530.6	0.48
Phosphorus (milligrams)	983.6	N.A.	991.1	0.17
Folacin (micrograms)	207.5	N.A.	92.9	3.11
lron (milligrams)	11.0	N.A.	8.78	1.54
	High Low Birt	hweight 1,50	0-2,499 Grams	
Calories (small calories)	8.4	2.6	3.0	0.06
Protein (grams)	3.4	4.0	2.8	0.49

Table 11 (cont'd).				
Vitamin A (retinol equivalents)	320.7	500.1	305.6	0.46
Vitamin C (milligrams)	332.6	385.1	259.0	0.40
Phosphorus (milligrams)	489.1	426.9	372.8	0.89
Folacin (micrograms)	911.4	764.5	761.0	0.16
lron (milligrams)	56.0	32.5	40.78	0.59
	Normal B	irthweight >2,	500 Grams	
Calories (small calories)	2.6	2.7	3.7	13.1** ^d
Protein (grams)	2.6	2.6	3.8	16.6***
Vitamin A (retinol equivalents)	274.6	258.6	356.2	11.2** ^f
Vitamin C (milligrams)	223.7	395.5	230.4	0.13
Calcium (milligrams)	4 61.7	295.9	191.0	1.71
Phosphorus (milligrams)	636.6	440.8	356.0	1.43
Folacin (micrograms)	247.3	959.3	166.0	0.26
Iron (milligrams)	142.4	50.1	155.2	0.13

Table 11 (cont'd).

Note.

a. Only one Cuban in this category.

b. The F-test is a test of statistically significant differences between the means for Mexicans, Cubans, and Puerto Ricans for the nutrient intake variables.

c. A Bonferroni test indicated a significant difference between Mexicans and Puerto Ricans. There was no significant difference between Mexicans and Cubans or Cubans and Puerto Ricans.

d. A Bonferroni test indicated significant differences between Mexicans and Puerto Ricans and Cubans and Puerto Ricans. There was no significant difference between Mexicans and Cubans.

e. A Bonferroni test indicated significant differences between Mexicans and Puerto Ricans and Cubans and Puerto Ricans. There was no significant difference between Mexicans and Cubans.

f. A Bonferroni test indicated significant differences between Mexicans and Puerto Ricans and Cubans and Puerto Ricans. There was no significant difference between Mexicans and Cubans.

*<u>p</u> < .05, **<u>p</u> < .001

A significant difference exists between the means among Latinas for the

intake of calories at for 500-1,499 grams level. This difference is between

Mexicans and Puerto Ricans with Mexicans taking in more calories than Puerto

Ricans.

At the above 2,500 grams level, significant differences between the

means among Latinas for the intake of calories, protein, and vitamin A exist.

For calories, Puerto Ricans are taking in more calories than Mexicans and

Cubans. For protein, Puerto Ricans are taking in more protein than Mexicans

and Cubans. For vitamin A, Puerto Ricans are taking in more vitamin A than

Mexicans and Cubans.

Variable	<u>Mexican</u>	<u>Cuban</u> ª	<u>Puerto Rican</u>
	Very Low Birthwe	9 ight 500-1,4	99 Grams
Calories	1.68	N.A.	-1.31
Protein	.53	N.A.	-1.64
Vitamin A	0.02	N.A.	-3.02
Vitamin C	9.86	N.A.	4.37
Calcium	-5.25	N.A.	-7.34
Phosphorous	-3 .57	N.A.	12.3
Folacin	-36.6	N.A.	-14.5
Iron	44.5	N.A.	-94.3
-2 log likelihood	42.5	N.A.	11.0
Chi-square	10.0	N.A.	14.4
D.F.	8	N.A.	8
Number of cases	1080	N.A.	435
Education	08	N.A.	.22
-2 log likelihood	52.2	N.A.	24.3
Chi-Square	.57	N.A.	1.06
D.F.	1	N.A.	1
Number of cases	1080	N.A .	435
Language	-8.02	N.A.	.75*
-2 log likelihood	49.5	N.A.	248.2
Chi-square	3.26	N.A.	4.70
D.F.	1	N.A .	1
Number of cases	1080	N.A.	435
	High Low Birthwei	ght 1,500-2,	499 Grams
Calories	00	73	12
Protein	.32	.30	29
Vitamin A	.21	1.80	04
Vitamin C	1.13	6.09	-2.26
Calcium	1.17	3.63	-2.32
Phosphorus	-2.09	3.12	.88
Folacin	-9.11	-2.21	.77

Table 12.	Logistic Regression Coefficients for Independent Variables on
	Birthweight Category for Latinas

Table 12 (cont'd).

Iron	4.7	-3.3	9.5
-2 log likelihood	415.0	21.5	246.6
Chi-square	12.9	6. 68	5.9
D.F.	8	8	8
Number of cases	1080	123	435
Education	.01	04	06
-2 log likelihood	434.5	35.3	251.1
Chi-square	.187	.100	1.91
D.F.	1	1	1
Number of cases	1080	123	435
Language	22	.53	-8.34
-2 log likelihood	433.7	35.0	23.5
Chi-square	.522	.272	2.04
D.F.	1	1	1
Number of cases	1080	123	435
	Normal Birthy	veight >2,500) Grams
Calories	12	.60	.19
Protein	33	.33	.34
Vitamin A	17	-1.12	.13
Vitamin C	-2.38	-4.42	2.46
Calcium	-1.19	7.31	2.43
Phosphorous	2.08	-3.10	62
Folacin	9.35	1.66	47
Iron	-4.8*	3.0	-7.1
-2 log likelihood	436.7	30.1	254.3
Chi-square	14.1	5.10	7.55

-2 log likelihood	436.7	30.1	254.3
Chi-square	14.1	5.10	7.55
D.F.	8	8	8
Number of cases	1080	123	435
Education	01	-0.01	.045
-2 log likelihood	457.6	41.7	261.1
Chi-square	.044	.010	1.28

Table	12 ((cont'd)).
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D.F.	1	1	1
Number of cases	1080	123	435
Language	.32	95	61
-2 log likelihood	456.1	40.6	258.8
Chi-square	1.17	1.08	3.42
D.F.	1	1	1
Number of cases	1080	123	435

Note.

a. Cubans were so few that the regressions did not converge. *p < .01.

The only significant logistic regression coefficient was iron for Mexicans at the above 2,500 grams birthweight category. There were no significant logistic regression coefficients for education variable for any of the three subgroups at any birthweight category level. Language was the only significant logistic regression coefficient and this was for Puerto Ricans at the 500-1,499 grams birthweight category. The next chapter, Chapter 7, now interprets the results.

CHAPTER 7

INTERPRETATION OF RESULTS AND CONCLUSIONS

This chapter interprets the results of Chapter 6. It begins with a discussion of the Objectives in the context of the results. Next, I discuss the relationship between gestation length, Latinos, and low birthweight. This is followed with a discussion of low birthweight and social and economic characteristics. The results are then addressed in relation to the hypotheses. I then discuss the theory I proposed and how this compares with the results of the study. I follow this with a section on the relationship between societal transition and Latino food habits. I finish this chapter with discussions on the relevance of the study, the importance of culture in low birthweight research, and recommendations for further research.

The Objectives

My Objectives were to demonstrate between group differences among Latinos regarding low birthweight, develop an improved measure of crosscultural comparison, and to test hypotheses based on correlates of low birthweight. It was demonstrated that between group differences exist for my sample. Puerto Ricans have the highest rate of low birthweight followed by Cubans and then Mexicans. These findings are consistent with those cited in the literature review (Becerra et al. 1991; *Health United States 1990* 1992; Mendoza et. al 1993; U.S. Census Bureau 1992; *CDC* 1993).

Regarding Objective Two, I can not definitively say that my measure of cross-cultural comparison is an *improvement* over others previously used. I would rather think of my measure as an *enhancement* to measures of cross-cultural comparison that currently exist. Although I did find nutritional intake differences among certain nutrients, to say that this completely measures culture would be in error.

What I have offered in this dissertation is another way to look at culture, one that has not been used before with this population in such a systematic manner. My measure is an alternative to others that can be incorporated into comparisons of culture. Given this, I feel confident saying that a *modification* of Objective Two was accomplished. My measure may not be an improvement, but my measure may improve the way we think about comparing culture. However, I do think that research that uses nutrient intake as a measure of culture, should use Recommended Daily Allowances (RDA) as the measure of nutrient intake. This will allow for a broader range of comparisons since most studies use RDA as a measure of nutrient intake.

Like Objective Two, Objective Three was accomplished, in part. Did I develop hypotheses related to research on low birthweight and did test these hypotheses? I would have to say "yes." Did these hypotheses best explain differential low birthweight among Latinos? I would have to say "no" because in the logistic regressions, only iron was found to be significant for Mexicans, and, this is difficult to assess given the collinear relationship iron had with calcium.

Additionally, this was significant only for birthweight above 2,500 grams. In other words, the effect of iron was on births that were not low birthweight. This means that iron may effect the *incidence* of low birthweight rather than having an effect on low birthweight outcomes (which was my primary research question).

Gestation Length, Latinos, and Low Birthweight

In the literature review, I cited Michielutte et al. (1992) who indicated that the difference between preterm and term low birthweight should be distinguished when conducting research on low birthweight. This sentiment was also stated by Dr. Paneth (1995). As such, I dichotomized low birthweight results for Latino subgroups by gestation length.

What I found supported the above. If Puerto Rican women can go fullterm, they have *better* results for low birthweight than for Mexicans and Cubans. If Puerto Rican women go fullterm, they improve low birthweight outcomes by almost three times. Gestation length is a significant factor in low birthweight as was indicated by the results of the Chi-square. My study has reinforced the argument that gestation length has to be controlled for in conducting low birthweight research.

Puerto Ricans have many more preterm infants followed by Cubans and then Mexicans. Cubans are much closer to Puerto Ricans in preterm outcomes. For fullterm low birthweight, Puerto Ricans have the *best* outcomes followed by Cubans and then Mexicans. In controlling for gestation, outcomes for low birthweight become asymmetric. What this tells me, is that infant mortality related to low birthweight is more of an issue of *premature* birth than an issue of low birthweight.

Low Birthweight and Social and Economic Characteristics

I believe it is the lower socioeconomic status of Puerto Ricans that accounts for their higher incidence of preterm low birthweight. In comparing the differences between household types, it was found that Puerto Ricans generally tend to be worse off in terms of social and economic characteristics. Puerto Ricans have less stable environments, meaning that they tend to be single households headed by women. Additionally, Puerto Ricans have lower rates of employment and lower incomes. These results are consistent with the findings of the data in Appendix G.

Puerto Rican households with preterm low birthweight babies fare slightly worse than Puerto Rican households with fullterm low birthweight babies. More fullterm households have a head of household that is married, have a higher rate of employment, and a slightly higher median family income. However, preterm households tend to have a lower percentage of female headed households.

Given the results on low birthweight by ethnic group and gestation length, it seems that the social and economic factors of a stable household have an impact on the preterm outcome of low birthweight for Puerto Ricans. Puerto Ricans have the highest percentage of unstable households and the highest percentage of low birthweight preterm infants.

The relationship between socioeconomic status and low birthweight outcomes is of importance because some researchers have espoused the "paradox" of positive low birthweight outcomes in the face of poor social and economic conditions (Rumbaut and Weeks 1993). This paradox may be true, but it is only true for Mexicans, *not* Puerto Ricans. This demonstrates the need to be careful when stating that "Latinos" have positive low birthweight outcomes. They do, but only *some* do. Furthermore, *type* of low birthweight needs to be considered (i.e., preterm versus fullterm). These issues were made very clear to me in doing this dissertation.

Hypothesis One

Hypothesis one proposed that the nutrient intake of Puerto Rican women would be less than the nutrient intake of Mexican and Cuban women. The hypothesis one was partially supported. The intake of calories for Puerto Ricans was significantly less than intake of calories for Mexicans in the 500-1,499 grams category (support for subhypothesis one). However, in the above 2,500 grams category, Puerto Ricans had significantly higher intakes of calories, protein, and vitamin A than Mexicans and Cubans. This contradicted my expectations.

What I suggest is occurring, is that the Puerto Rican women who are in the 500-1,499 gram category and have a low intake of calories, are the ones having the preterm low birthweight births. However, given the limitations of the

Hispanic Health and Examination Survey, 1982-84, (HHANES) as critiqued in Chapter 5, there is no way to directly test this. This makes it even clearer the limitations of the HHANES and raises the question of whether it is time to conduct a "new and improved" HHANES II. I think it is.

My findings suggest that subgroup differences in dietary practices exist. These practices do not seem to be related to low birthweight outcomes. However, these practices may be related to the *incidence* of low birthweight for Puerto Ricans. I say this because Puerto Rican women in the above 2,500 gram category have significantly higher intakes of calories, protein, and vitamin A.

Hypothesis Two

Hypothesis two proposed that nutritional intake would effect low birthweight outcomes more for Puerto Rican women than Mexican and Cuban women. None of the logistic regression coefficients in the low birthweight categories were statistically significant. The hypothesis was not supported.

Additionally, the crosstabs of ethnic group by birthweight category was not significant. There was no difference between the observed frequencies and expected frequencies. The null hypothesis could not be rejected. There was no statistically significant difference between Latinos in birthweight category. This is interpreted as meaning that nutrition does not have an effect on low birthweight outcomes, let alone more of an effect for Puerto Ricans.

The Effect of Education and Language on Low Birthweight

The only regression coefficient that was statistically significant was language for Puerto Ricans in the 500-1,499 grams category. This means that Puerto Rican women in this category preferred using Spanish more than English. Using language as measure of acculturation as did Scribner and Dwyer (1989), this would suggest that Puerto Ricans are the *least* acculturated.

If Puerto Ricans are the least Angloized, then this result is contrary to research that suggests that poor health outcomes are a consequence of acculturation (Scribner and Dwyer 1989; Balcazar 1993; Borges et al. 1993; Rumbaut and Weeks 1993). This finding is particularly relevant to the Scribner and Dwyer (1989) study.

Scribner and Dwyer (1989) found that a higher acculturation index (using language as one of their measures) resulted in higher rates of low birthweight. The contrary findings may be due to the fact that language was just one measure in the Scribner and Dwyer (1989) study. Scribner and Dwyer (1989) also used nativity and ethnic identification as measures of acculturation. What I believe may be happening in my study, is that the Puerto Ricans in the sample who preferred Spanish are the same ones who are taking in less calories.

Incidence of Low Birthweight and the Theory

It can not be said that the theory was supported for based on the **research** model, there was little statistically significant support for hypotheses one or two. However, the finding of differential incidence of low birthweight
among the Latino subgroups deserves discussion.

Puerto Ricans have the lowest socioeconomic status. Contributing factors to the lower socioeconomic status of Puerto Ricans are a high rate of female heads of households, low income, and unemployment. And, as has been seen, Puerto Ricans are highest in preterm low birthweight. These factors cannot be taken in isolation. I see it as no mere coincidence that Puerto Ricans have a high rate of preterm low birthweight. The interdependent nature of correlates that effect the incidence of low birthweight is now discussed in the context of the theory that was proposed.

Regarding Puerto Ricans, the roots of the functional relationship as proposed in the theory begins with the historical social and economic oppression that Puerto Ricans have experienced. These conditions evolved into poor social and economic circumstances. It is this lack of economic resources that may contribute to the high incidence of Puerto Rican children born preterm low birthweight.

Puerto Ricans are mired in poverty. This translates into poor living conditions and little hope of social advancement. The situation of Puerto Ricans is similar to African Americans. African Americans have a high degree of single female headed households and many African American children live in poverty (Duncan et al. 1994; Huston et al. 1994). African Americans also have a high incidence of low birthweight and infant mortality (*Health United States 1990* 1992; U.S. Bureau of the Census 1992; *From the MMWR* 1993).

The Puerto Rican situation is due in large part to the patriarchal and dependent relationship Puerto Rico has with the U.S. In Appendix E, I discussed the history and consequences of this history on Puerto Ricans. Puerto Ricans have a "second class citizenship" and have been relegated to the lowest echelons of society. African Americans have had a similar experience. Where African Americans were enslaved in chains, Puerto Ricans were psychologically enslaved through the loss of their independence and the subsequent reliance on the U.S. for mere subsistence. Until this relationship changes, Puerto Ricans will continue to be stymied by the oppressive specter of poverty.

Like Puerto Ricans, Cubans also had a high incidence of preterm low birthweight. It is my speculation that these Cubans are recent immigrants. Not all Cubans came in the first "wave." As reflected in the study of Oropesa and Landale (1995), the socioeconomic status of second generation Cubans ("nativeborn children with at least one foreign-born parent") falls significantly from the first generation. I suggest that it is these Cubans who are the ones experiencing poorer social and economic conditions. These are not the "Golden Wavers" of the early sixties. These women are the maids, nannies, and seamstresses of the Cuban population. I call them the "Lumpencuban." They are the minority of the Cuban population (as evidenced by the socioeconomic data), but they exist nonetheless. I would venture that as the status of "glamour refugee" continues to decline for Cubans, the number of Cuban women in this situation will

increase.

Mexicans pose an unique case. They have almost the same number of preterm low birthweight infants as fullterm low birthweight infants. Given the low level of Mexican preterm low birthweight infants, I am led to believe that Mexican women are doing something "right" in terms of issues related to pregnancy and childbearing. These issues may be part and parcel of the overall Mexican experience.

I believe that the low incidence of preterm low birthweight for Mexicans is a result of a sense of stability that is a manifestation of their history in the United States. This history is related to the geographical proximity of Mexico to the United States. This sense of stability and history has been critical in the development of the Mexican life-world. It is this life-world that accounts for the low incidence of preterm low birthweight.

The Mexican Life-World and How do you Test This?

I drew upon Habermas' (1976) concept of life-worlds in my discussion of acculturation. In explaining between group differences in low birthweight outcomes among Latinos, I propose that the life-world of Mexicans is more durable than that of Cubans and Puerto Ricans. I believe this because of the historical and geographical experience of Mexicans. It is in this Mexican lifeworld that a sense of stability and continuity exists. This continuity is conducive to a low incidence of preterm low birthweight.

The best way I can define what I believe to be the Mexican life-world is

by contextualizing it in history and geography. In discussing the differential historical circumstances of the three Latino subgroups (Appendix E), I stated that because much of the United States was once Mexico and because of the contiguous border, a sense of history and tradition is associated with the land. Psychologically, for many Mexicans, a border does not exist. This sense gives Mexicans a deeper feeling of security and this makes it easier to survive in a hostile environment. It is this historical, social psychological phenomenon that results in the Mexican life-world. This is not to say that Mexicans have not suffered at the hands of oppression and racism, rather, because of geographical and historical conditions, Mexicans were in a position to better adapt.

Neither Cubans or Puerto Ricans have this relationship with the land that do Mexicans. Cubans and Puerto Ricans who immigrate to the United States immigrate to a land that was never once their country. I believe that this connection with the land and history has been instrumental in developing the Mexican life-world.

One major problem. How does one measure this life-world? This question is a dissertation in itself and an area that I may pursue in future research. At present, it seems like an unsurmountable task to try and measure the psychology of an entire people, people who are quite varied by region, socioeconomic status, acculturation, etc. However, I am convinced it is out there.

A Reasonable Question

In looking at the differential outcomes of low birthweight among Latinos, it is reasonable that one may ask, "if preterm low birthweight is being controlled for and Mexicans have a higher incidence of fullterm low birthweight, doesn't that mean Mexicans have *negative* pregnancy outcomes?" I want to address this question because to do otherwise would be a glaring oversight as a researcher.

Yes, this does mean that Mexicans have a higher incidence of fullterm low birthweight than Cubans and Puerto Ricans which can be interpreted as a negative outcome. However, it is more likely that an infant will die if it is born preterm low birthweight than fullterm low birthweight. More than 70% of the fetal and neonatal deaths in the U.S. occur among preterm infants (Adams 1995:739). This is why I interpret Mexican low birthweight outcomes as better than Cubans and Puerto Ricans. Furthermore, the Mexican fullterm low birthweight outcome is still low when compared to the low birthweight outcome for Non-Latino Whites.

Why do Mexicans have a higher rate of fullterm low birthweight? It may be that Mexicans are more similar to Non-Latino Whites than the acculturation argument that was made in Chapter 3 would have suggested. Although I argued that the Mexican life-world may be conducive to positive low birthweight outcomes, there may be a portion of the Mexican population that has incorporated the comparatively unhealthy habits of Non-Latino Whites (i.e., have

become Angloized).

This is consistent with the research by Marks et al. (1990) which compared the degree of a balanced diet among Mexicans, Cubans, and Puerto Ricans. Mexican American women had the second best scores on the balanced diet component. It could be that the women who contributed to the middle range scores on this measure (i.e., the ones who were *not* eating a balanced diet) are the ones having the fullterm low birthweight infants.

The results for Mexicans are meaningful for they can serve to guide health researchers in examining low birthweight. A more intensive study of what *exactly* these women are doing, or not doing, seems to be in order. Early on in this dissertation, I stated that this study was valuable because the knowledge gained about Latinos could be beneficial for the society as a whole. I believe that the findings on Mexicans opens the door for this learning.

Societal Transition and Latino Food Habits

One of my criticisms of the Hispanic Health and Nutrition Examination Survey, 1982-84, (HHANES), is that it is dated. This poses the question of relevancy to 1996. In other words, it has to be considered if the dietary patterns of Latinos is the same now as it was in 1982-84.

I would argue that society has been in transition since the early 1980's in relation to work patterns. An uncertain economic climate and higher costs of living are requiring more families to have dual incomes and more women to work. For example, in 1980, 51.5% of the females aged 16 years and over were

in the civilian labor force. In 1990, this figure increased to 67.0%. It is projected that by the year 2000, 69.3% will be in the civilian labor force (U.S. Bureau of the Census 1992:381). The trend similar for Latinas with 47.4% in the civilian labor force in 1980, 53.0% in 1990, and 69.3% projected for the year 2000 (U.S. Bureau of the Census 1992:381).

With more families requiring both parents to work and with many single mothers working, the practice of having formal, sit-down "family meals" may be impractical. Preparing a meal takes time and effort, a luxury that many families do not have. This may lead to more families eating at restaurants and consuming more "fast foods" and not eating home prepared meals.

The effect of more families eating restaurant and fast foods has led to a proliferation of these type of establishments. As an example, I was listening to a report on National Public Radio last week and heard that 3,000 new "McDonald's" restaurants open every day. Additionally, it seems that when ever a new "McDonald's" is opened, soon after a new "Burger King" or "Taco Bell" are built on the same street block, if not next door.

Furthermore, with the number of fast food "ethnic" restaurants like "Taco Bell" increasing at an phenomenal rate, it has to be wondered what this means to the whole concept of eating "traditional foods." Has traditional ethnic food been bastardized in modern society? In other words, do people think they are really eating "Mexican food" when they eat at "Taco Bell?" Do *Mexicans* feel they are eating traditional Mexican food when they are eating at "Taco Bell?"

I think that Non-Latino Whites could interpret "Taco Bell" as "real" Mexican food for they just have not had the experience of authentic traditional Mexican food. I further think that Mexicans who are more Angloized could interpret "Taco Bell" as traditional. I say this about Mexicans in the context of the argument that was made in this dissertation that food is a cultural indicator and the more one is removed from their culture of origin, the less they would practice tractional food habits.

Given that eating traditional Latino foods is healthy (Romero Gwynn and Gwynn 1993;1994), if the "Taco Bells" of the world are seen as traditional, then there may be some people who feel that eating at "Taco Bell" is healthy. This can be problematic for I can not see eating fast food as being healthy. This is something that researchers who espouse the virtues of eating traditional foods need to be aware of and clarify in their work. "Traditional" does not mean "Taco Bell" or "Chi-Chi's." "Chi-Chi's is more formal restaurant than "Taco Bell," but it is an "Americanized" version of Mexican food. In fact, they even seem to invent foods under the guise of being "Mexican" that are not recognized as traditional in Mexican culture (based on the work of Romero Gwynn and Gwynn 1994). As an example of this in my own life, growing up I never even *heard* of something called a "Chimmi-Chonga" (one of Chi-Chi's specialties).

The Latino population is increasing in the United States. This increase means that there will be more Latinos with disposable incomes. This is a trend that has not gone unrecognized by the fast food industry and their advertising

departments. In fact, I was recently watching "Univision" (a Spanish station broadcast on cable television) and a commercial for "McDonald's" was aired that portrayed a Latino family in which both parents came home from work and took the family to "McDonald's."

My point here is that due to the societal transition that has occurred since the early 1980's, the dietary practices of Latinos have changed. If this is the case, then any impact that culture has on dietary practices would be diluted. It has been suggested by Romero Gwynn and Gwynn (1993: 1994) that the diet of Latinos is healthy and that the more acculturated Latinos become, the more unhealthy that diet becomes. If a diet is unhealthy then there can be consequences for health outcomes (e.g., obesity, high blood pressure, heart disease, etc.).

Clearly, this is a situation that health practitioners should be aware of and monitor, especially those that work with Latinos. If a health care practitioner who works with Latinos should observe a health change in one of their patients for the worse, they would be wise to inquire about any changes in diet. This inquiry should pay particular attention to any changes as related to a move away from traditional foods to more Angloized foods.

Given that society is in transition and Latinos in the United States are included in this transition, perhaps there is a better way to use food habits as a cultural indicator than focusing on nutritional intake. One method that I suggest is to examine the role of food in celebrations and rituals. I believe that food takes on very unique meanings in the context of rituals and celebrations. For example, the symbolic wafer in Catholic masses. This approach is consistent with the symbolic interactionist (Cooley 1962; Mead 1969) and Habermasian (1976) approaches with its emphasis on the importance of symbols in the definition of reality and social environment.

Furthermore, this approach is consistent with the research of James (1993) who noted the importance of symbols in cultural identity and Magana and Clark (1995) who discussed the role of the Lady of Guadalupe as a defining symbol for Mexicans. The foods of "enchiladas," "tamales," "menudo," and "mole" may not have the same importance for Mexicans as the Lady of Guadalupe, but I would argue that as symbols, they have a special role in defining cultural identity.

To examine this, a research study could be designed that specifically examined the role of food in rituals and celebrations. This study would consist of interviews of Latino families which asked questions about types and frequencies of traditional foods in rituals and celebrations. A ethnic identity type of instrument could also be administered. The results of the interviews could be compared with the results of the ethnic identity instrument to assess whether those who used traditional foods in celebrations and rituals had a stronger sense of ethnic identification. I believe that they would.

Relevance of Study

I now address the issue of where the study has taken the field and where the study may lead the field. Although the hypotheses were not supported, support for the concept of Latino heterogeneity was found. This was found in comparisons of history, social and economic conditions, and differences in birthweight. It seems clear that Latino heterogeneity must be considered in doing research on Latinos and this study has promoted this approach.

The study also points out that the Puerto Rican situation is in dire need of attention. Puerto Rican infants are at great risk of dying due to the high rate of preterm low birthweight. The rate is alarming. Some proactive measures need to be taken to address this situation. I believe that improving the social and economic situation of Puerto Ricans would help alleviate the situation. This task falls on the government that contributed to their current conditions, the United States. In the long run, resources that are committed to improving the plight of Puerto Ricans will decrease the costs associated with health problems related to preterm low birthweight.

In my interpretation of the low birthweight outcomes for Mexicans, I suggested that Mexican culture may be beneficial for positive pregnancy outcomes. This is something that health care professionals really should take note of. More needs to be learned about this culture in terms attitudes toward pregnancy and childbirth. Mexican culture is a recourse waiting to be tapped. Doing so would benefit the population as a whole.

The question still remains, "what *causes* low birthweight?" I do not have an answer. I can say that among Latinos, in this study, nutritional differences do not seem to effect low birthweight outcomes. This little bit of knowledge can be added to the store of information on low birthweight research. I have eliminated just one explanation. This topic and research on this topic has by no means reached its pinnacle. As mentioned previously, studies can be conducted that investigate symbols as related to food habits and studies can be conducted on attitudes and behaviors of Mexican women during pregnancy. However, I do believe that the Hispanic Health and Nutrition Examination, 1982-84, (HHANES) has reached its usefulness as a data source.

Along with the methodological issues that were addressed regarding the HHANES, because of the transitional nature of society, dietary practices may have changed since the HHANES was conducted. Furthermore, the total Latino population has increased from 1980 to 1990 (U.S. Bureau of the Census 1992). An increase in numbers may have the effect of changing majority/minority dynamics in some geographical regions. The reader may wonder, "if this is the case, why did I use the HHANES in the first place?" I used the HHANES because I discovered these problems and considered these issues as part of doing this research. Perhaps by addressing them in this dissertation and commenting on my experience with the limitations and shortfalls of the HHANES, I may spare some researcher some frustration in the future.

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The Importance of Culture in Low Birthweight Research

I now answer the question of "to what degree is culture important in low birthweight outcomes?" In Chapter 2, the biomedical risk factors of low birthweight were discussed. To be sure, the physiological can not be removed from the sociological. As I have argued throughout this dissertation, an interdependent relationship may exist between variables that effect low birthweight. However, it seems that the role of culture in effecting low birthweight has not been given its full due in the scientific community.

Although no statistical support was found to support this notion, I do believe that culture is *just as important* as biomedical factors in considering low birthweight outcomes. I believe this because of the important role that culture has (and the role symbols play in culture) in effecting how people interact in their environment (Cooley 1962; Mead 1969; Habermas 1976). Knowing the biomedical effects upon low birthweight is only half the story. To fully understand the phenomenon of low birthweight, culture should be considered. If only the biomedical aspects of a group's behavior are addressed, then researchers are only focusing on the *machinery* of being human, not what *makes* humans human.

For me, at this point in my research, I see culture as the avenue to explore as an explanation for differential low birthweight outcomes. I was just not able to demonstrate the impact of culture in *this* particular study. However, it has given me a path to follow for further research.

Further Research

No research problem can be completely explained in one short work. I think that good research often ends with more questions to pursue. One question that I was left with is "what are Mexican women doing that results in positive low birthweight outcomes?" The key word here is "doing." I do not believe that this can be discovered using purely quantitative methods. However, one way to get at what Mexican women are doing regarding pregnancy and pregnancy outcomes, is to ask them. This would mean a more qualitative approach.

The everyday behaviors of pregnant Mexican women should be studied. I think that in depth case studies would be the means to accomplish this type of study. If I had the means, I would design an ethnographic study to assess how pregnant Mexican women behave and what they believe during pregnancy. I would have interviewers talk to a sample of pregnant Mexican women on a daily basis. They would be asked about what they did or did not do in terms of their daily activities. Furthermore, questions would be asked about the role of religion, the family, values, and beliefs in pregnancy. The special emphasis of this study would be on the role symbols play for these women and their families as related to family, children, and childbirth. It is my hope that soon in my career, I will be able to pursue this type of research.

Conclusion

This study began with the argument that nutrition, as a cultural indicator, is the best explanation of low birthweight among Latino subgroups. I can not say that food habits are the best predictor of low birthweight outcomes, but I can say that this study offers another way to look at culture that has not been previously considered in such a systematic manner. Differences were found in nutrient intake among Latino subgroups which can be seen as a cultural indicator. I believe that my study has given the scholarly community another tool in which to consider culture.

What the research especially points out, is that a complicated issue like low birthweight can not be examined in isolation. It appears to be an interdependent phenomenon. This lends support for interdisciplinary approaches to research. With so much information out there in so many different fields and subfields, it is almost impossible for one researcher alone to completely explain phenomenon. I foresee a future of more "team" type approaches to research. I know that this study would have been lacking in its conceptual development without the input received from those in other fields.

APPENDICES

APPENDIX A: KEY CONCEPTS

Acculturation - A process of learning of a new culture while evaluating the old culture. In evaluating the old culture, some things are kept and some are discarded (Garcia Coll and Meyer 1993).

African Americans - African Americans living in the mainland United States.

Cubans - Cuban Americans living in the mainland United States.

Cubanos - Same as Cubans.

Cubanas - Cuban women.

Culture - A complete way of life.

Infant Deaths/Infant Mortality - Deaths occurring within the first year of life.

Infant Mortality Rate - Infant deaths per 1,000 live births in a population.

Latinas - Cuban, Mexican, and Puerto Rican women.

Latinos - Cubans, Mexicans, and Puerto Ricans.

Low Birthweight - Weight of less than 2,500 grams (5 pounds, 5 ounces) at birth.

Mexicans - Mexican Americans living in the mainland United States.

Mexicanas - Mexican women.

Non-Latino Whites - Those outside the groups of Cuban, Mexican, and Puerto Rican, except for African Americans. Has commonly been known as "White."

Nutrition - Level of nutrient intake.

Nutritional Practices - Food habits.

Prenatal - Previous to birth.

Preterm/Premature - Births occurring prior to 37 weeks gestation.

Puerto Ricans - Puerto Ricans living in the United States mainland.

Puerto Ricanas - Puerto Rican women.

Sociocultural Context - Nationality, occupational, attitudinal, personal identity, food, activity preference, and social group preference characteristics (Garcia Coll and Meyer 1993:11).

Socioeconimc Status - Social and economic characteristics. Comprised of the variables of education, income, occupation, and having a single parent household status (U.S. Bureau of the Census 1992; Oropesa and Landale 1995; Rumbaut 1995). Also used as measures of social and economic characteristics are marital status, being foreign born, and having a female head of household.

APPENDIX B: SIGNIFICANT RISK FACTORS FOR LOW BIRTHWEIGHT PRETERM AND FULL TERM INFANTS (MICHIELUTTE ET AL. 1993)

	All LBW AOR	P-LBW AOR	T-LBW AOR
Age (16-17 years old) (15 or younger)	1.58 1.58	1.43 2.34	N.S. 0.38
Education (9 years or less)	2.10	1.96	2.24
Race (African American)	2.10	1.96	2.24
Smoking	2.16	1.72	2.61
No Previous Live Birth	1.79	1.61	1.94
Under 5 feet tall	1.54	N.A.	N.A.
Weight under 100 lbs.	2.45	2.41	N.A.
<5 ft. & > 100 lbs.	N.A.	N.A .	2.53
>5 ft. & < 100 lbs.	N.A.	N.A.	2.53
<5 ft. & <100 lbs.	N.A.	N.A.	2.12
Previous premature LBW birth	3.78	4.14	2.41
Two or more 1st trimester abortions	1.42	1.58	N.A.
One or more 2nd trimester abortions	1.80	1.94	N.A.
Last birth < 1 year ago	1.63	1.78	N.A.
Uterine anomaly/ DES Exposure	2.80	3.81	N.A.

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APPENDIX C: SUMMARY OF SELECTED LOW BIRTHWEIGHT (LBW) STUDIES

Author(s)	<u>Data</u>	<u>Results</u>	Conclusion/Critique
Brooks-Gunn et al. 1988	Literature review	Possible factors in LBW are demographics, medical risks during conception and pregnancy, behavioral risks, environment, physical factors, lack of social support, work patterns, health habits, and a lack of prenatal care.	Access to prenatal care and maternal education are needed to reduce the incidence of LBW. A hospital in Harlem was used as an example of attempts made to accomplish the above. However, no data was given on the success of the attempts.
Hogue et al. 1987	NIMS	97.6% of all infant deaths for cohort were LBW infants.	Factors identified as increasing the risk of infant mortality were male gender, short gestation, for or third (or later) birth order for LBW infants, younger or older mothers less maternal education, and lack of prenatal care received the first trimester. National sample.
Kramer 1987	Meta- analysis of French and English publications.	Weight gain is associated with IUGR.	Women who are under- nourished are more at risk for IMR and LBW infants. International sample.

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Michielutte et al. 1992	Physician Records	Differences exist between P-LBW and T-LBW	Age, education, race, smoking, weight, previous premature/LBW birth and and uterine anomaly/DES are most associated with LBW. The main differences between P- LBW and T-LBW are in the age, weight, and previous premature/LBW and uterine anomaly/DES exposure factors. Study did not address chemical use or Latinos. Study was limited to North Carolina.
Rumbaut and Weeks 1993	San Diego Compre- hensive Perinatal Program	Previous live birth was the best predictor of "infant" health outcomes.	LBW was one measure of outcomes. Study limited to San Diego. Latinos not subgrouped.
T affel 1990	U.S. Dept. Health & Human Services	Women who gained less than 21 pounds during pregnancy were 2.1 times more likely to have an LBW infant and 1.5 times more likely to experience infant mortality	Proper nourishment is essential for expectant mothers. Lack of proper nourishment can result in negative outcomes. National sample.

APPENDIX D: SUMMARY OF STUDIES ON LATINOS AND LOW BIRTHWEIGHT (LBW), PREGNANCY, AND CHILDBIRTH

Author(s)	<u>Data</u>	LBW I	Results	; (% of	Births	LBW)	Conclusion/
		* <u>L</u>	<u>NLW</u>	M	<u>C</u>	<u>PR</u>	Cundue
Becerra et al. 1991	Linked Birth and Infant Deaths Data Set	4.6	4.0	4.1	4.0	6.6	Results contrary to SES expectations. Latinos are a heterogeneous group. Puerto Ricans have a higher incidence of LBW. National sample.
Borges et al. 1993	NAS	-	-	3.2 (Mexic	- xo)	-	Heavy drinking during pregnancy increases the risk of LBW and preterm delivery. Study was a survey study that used mother's recollection of LBW. Mexican National sample.
CDC 1993	Monthly Vital Statistics Report	6.1	5.6	5.5	5.7	9.0	Statistical document. No interpretation or conclusions discussed.

Author(s)	<u>Data</u>	LBW Results					Conclusion/
		L	<u>NLW</u>	M	C	<u>PR</u>	Critique
Dowling and Fisher	Hospital Birth Records	-	-	5.9	-	-	Results contrary to SES expectations. May be due to "protective sociocultural effect" and selective immigration. Study was limited to Chicago. Study did not subgroup Latinos.
Fenster and Coye 1990	Hospital Birth Records	1.8	-	-	-	-	Agricultural wok did not increase incidence of LBW. May be due to selective migration. Study did not subgroup Latino sample. Study was limited to two agricultural counties in California.
Gaviria et al. 1982	Interviews of 89 Pregna Women in Chicago	- ant	-	-	-	-	Recent arrivals to U.S. and Mexican American women sought prenatal care later than did long term arrivals. Study limited to Chicago area.
Hayes- Bautista	County Govt. Statistics	5.32	-	-	-	-	Article did not subgroup Latinos. Data limited to Los Angeles County.

Author(s)	Data	LBW Results					Conclusion/	
		F	<u>NLW</u>	Μ	<u>C</u>	PR	Chuque	
<i>Health</i> U.S. 1990, 1992	Nat. Ctr. Health Statistics	-	5.7 to 6.0	5.6 to 6.0	5.7	9.4	Results contrary to SES expectations. Latinos are a heterogeneous group. Calls for a more research to explain differential LBW. National sample.	
Mendoza et al. 1991	Nat. Vital Statistics	6.2	5.6	5.7	5.9	9.3	Results contrary to SES expectations. Latinos are a heterogeneous group. Calls for more research to explain differential LBW. National sample.	
Rumbaut & Weeks 1989	Linked Birth/ Infant Death Records	5.2	5.1	-	-	-	Results contrary to SES expectations. Latinos not subgrouped. Study limited to San Diego area.	
Rumbaut & Weeks 1993	San Diego Comprehen- sive Perinatal	4.1 (U.S. 1.9	- born)	-	-	-	Latinos not subgrouped. Study limited to San Diego area.	

(foreign born)

Program

Author(s)	<u>Data</u>	LBW	Results	<u>8</u>	Conclusion/		
		Ŀ	<u>NLW</u>	М	<u>C</u>	PR	Critique
Scribner 1989	HHANES	-	-	4.8	-	-	As acculturation increases, incidence of LBW increases. Measures of acculturation do not include nutrition variables. National sample.
U.S. Census Bureau 1992	U.S. Census Data	6.2	5.7	5.6	5.8	9.0	Statistical document. No interpretations or conclusions discussed. National sample.
Ventura & Martin 1991 (in Mendoza 1994)	Dept. Health & Human Services	6.1	5.7	-	4.8	7.9	Mexicans not discussed. Puerto Ricans have a higher incidence of LBW than Cubans. National sample.
Weinman & Smith 1994	Medical Records of Adolescent Latinas Presenting for Delivery	-	-	-	-	-	U.S. born and Mexican born Latinas both did not follow-up with postpartum visits. Suggests groups are similar and rely on alternative, culturally related care regarding pregnancy and childbearing. Study limited to Houston.

*L=Latino; NLW=Non-Latino White; M=Mexican; C=Cuban; PR=Puerto Rican

APPENDIX E: HISTORICAL AND GEOGRAPHIC CIRCUMSTANCES OF MEXICANS, CUBANS, AND PUERTO RICANS

Hernandez (1994) discusses five stages of Anglo-American policy that had ramifications for Latinos in the U.S. These stages are "(1) exclusive occupation of conquered lands, (2) internal colonization as a conquered minority, (3) restricted citizenship through statehood, (4) external colonization by political dependence, [and] (5) subordination in a world economic system" (Hernandez 1994:18). Prior to when the first Anglo immigrants arrived in the 1600s, the Latino presence had already been a part of the New World for about one hundred years.

Spain had colonies in what is present day Texas, California, Colorado, Utah, Nevada, New Mexico, Arizona (identified as the southwest and California), Mexico, Louisiana, Florida, Guam, the Philippines, Cuba, Puerto Rico, the Dominion Republic, and Central and South America. Table 13 below shows that a considerable number of Latinos were living in areas that were later to be conquered by the U.S.

Geographic Area	Estimated Population
Southwestern U.S. & California	5,200,000
Cuba	160,000
Puerto Rico	50,000

 Table 13. Population Estimates of New Spain Colonies Prior to 1776

Source: Hernandez 1994:18

In Stage 1 (1776-1834), exclusive occupation, the U.S. sought to increase its wealth by expanding its agricultural base in the south. This was accomplished by land purchases from Spain in 1819 which prompted the takeover of Florida. Anglos then began to move into the entire southeastern region of the U.S. This influx of Anglos resulted in many Latinos returning to Spain or migrating to Cuba (Hernandez 1994:19).

Internal colonization (1835-1859), Stage 2, came soon after Mexico won its independence from Spain in 1821. The new country encouraged northern migration into its territories. However, the need for Anglos to have more land precipitated Texas' "independence" and the War with Mexico. The end of the War in 1848 resulted in Mexico losing its northern territories (the southwest and California).

Almost overnight, Mexicans were relegated to a lower class status. The influx of Anglos into these territories due primarily to the gold rushes of 1849 (California) and 1858 (Colorado) reduced Mexicans to a numerical minority. By 1858, in Texas and California, Latinos made up little more than 20% of the population (Hernandez 1994:20). Due to corrupt legal decisions, disproportionate numbers, and racism, many Latinos lost property, and ranching, mining, and farming rights. Not only had Latinos become the numerical minority, they had become an ethnic minority with a subordinate status.

Between 1860 and 1897, Stage 3 occurred. During this stage of

restricted citizenship, many of the lands that were Spain's and Mexico's became states of the U.S. Statehood increased political control and coercion that further isolated and distanced Latinos. Agribusiness in California called for many laborers to perform uniform tasks during certain seasons. This created a large pool of menial laborers who were mired in poverty and low status.

Hernandez writes that "the stigma of defeat combined economic poverty with cultural alienation" (1994:21). Being isolated economically and politically, Latinos maintained a culture distinct to themselves. Latinos may have been citizens, but they were not allowed to be "Americans" and fully participate in all of the benefits of citizenry.

After the Spanish-American War in 1898, the U.S. gained control of Puerto Rico and occupied Cuba until 1902. During this fourth stage (1898-1956) of external colonization, the U.S. sought to increase its power internationally. The islands of Puerto Rico and Cuba were seen as places to expand economic markets, particularly the crop of sugar cane. Additionally, the location of the islands were seen as militarily important, places for naval ports and a first line of defense in the case of a southern Atlantic sea attack.

Acquiring Puerto Rico as a territory and Cuba as a protectorate increased the Latino population of the U.S. The Latino population of Puerto Rico was 1 million and the Latino population of Cuba 1.7 million in 1898 (Hernandez 1994:22). Large U.S. companies went into the islands and proceeded to monopolize the sugar cane crops. Latino inhabitants of the

islands were expected to provide cheap labor while becoming Anglozied and "Americanization was imposed to acculturate the external colonies to their functions as outposts of the United States" (Hernandez 1994:22). However, as with Latinos on the mainland, cultural traditions and values "defined their [Puerto Ricans and Cubans] identity as distinct from the Anglo culture they learned in school" (Hernandez 1994:23).

During this stage, the number of Latinos increased in the U.S. In 1910, Latinos comprised 2 percent of the total U.S. population. Most of these Latinos lived in the geographic areas that was New Spain. However, groups began to migrate at this time. For example, in 1910, Puerto Ricans and Cubans formed their first communities in New York City. Most came to work in cigar factories and "garment sweatshops" (Hernandez 1994:23). Immigration also increased from Mexico. Between 1910 and 1930, approximately 1 million Mexicans came and settled in California or the north central states (Hernandez 1994:24).

Most of the immigrants came for economic reasons. The attitude of the Non-Latino White dominate culture toward immigrants was one of acceptance of the immigrant as a worker, but non-acceptance as a person. When they were needed, they were welcome. When they did not serve the needs of the economy, they were deported. For example, the *Los Braceros* program began during World War II and was "designed to supply labor for U.S. agriculturalists, underwrote Mexicans' travel costs, insured a minimum wage, and guaranteed jobs and equitable treatment" (Alicea 1994:38). The program continued until

1964. However, during the depression many Mexicans were "repatriated" by force to Mexico (many were U.S. citizens). From 1924-30 "more than 400,000 Mexicans were forced to leave the country" (Alicea 1994:38).

Puerto Ricans came in large numbers "when American political and economic influences displaced plantation workers in Puerto Rico and encouraged one third of the island's workers to move to New York City and other northern cities during the 1950s" (Hernandez 1994:25). Due to racism, most immigrants were only offered unskilled labor occupations and had to live in segregated, dangerous, deteriorated neighborhoods.

Cubans who came after the revolution in 1959 were, by comparison, more fortunate than Mexicans or Puerto Ricans. Since the revolution 800,000 Cubans have immigrated to the U.S. (Alicea 1994:50). The majority of these immigrants settled in the Miami area. The strategy of the U.S. was to claim a political victory over Cuba by offering capitalist America as a haven from communism. In 1960, The Cuban Refugee Program helped emigres find jobs, provided financial assistance, health care, and funds for relocation outside of Miami (Alicea 1994:52).

Stage 5, economic subordination began in 1960 and continues. In economic subordination, Latinos play the role of the exploited. They are overrepresented in low paying, low skill occupations with little room for advancement. Their status in the dominate society is to fill a need in occupations that are undesirable. They fill this need due to economics. Recent Cuban immigrants are finding themselves in the same situation as Mexicans and Puerto Ricans. The atmosphere of the Cold War has warmed and their status as a symbol has diminished. Thus, they are finding themselves as laborers and service people.

Although many Latinos have dispersed throughout the U.S., "demographic data indicate that Hispanics remained in their historical places and in central city neighborhoods with limited economic potential, segregated from Anglo and African Americans, regardless of U.S. region" (Hernandez 1994:27). The Latino population of the southwest and California is dominated by Mexicans, Florida by Cubans, and the New York City area by Puerto Ricans. These geographical concentrations can be traced to historical trends. As I addressed in the above discussion, these trends are related to issues of conquest and occupation, economic exploitation, and immigration. Table 14 below indicates this dispersion.

Region Represented/City	% Latino	Largest Latino Group (% of Latinos that are of that group)
Southwest/ Albuquerque	34.5	Mexican 53.0
Southwest/ Denver	23.0	Mexican 70.0
Southwest/ El Paso	69.0	Mexican 96.0

 Table 14.
 Latinos by Region (Selected Cities)

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Table 14 (cont'd).

California/ Watsonville	20.0	Mexican 86.0
California/ Los Angeles	39.9	Mexican 76.0
North Central States/ Chicago	19.6	Mexican 93.0
New York City/ Brooklyn	20.1	Puerto Rican 83.0
Florid a/ Miami	62.5	C uban 59.0

Source: COSSMHO 1994 and 1990 U.S. Census data.

The contemporary Cuban socioeconomic status may be attributed to the governmental assistance offered during the early 1960s (see Appendix H). This allowed first "wave" Cubans to become established and be in a position to better assist subsequent Cuban immigrants. Mexicans, although a "conquered" people, have the distinguishing characteristic of having much of what is the U.S. once being Mexico. This allows for a sense of cohesion and uniformity, especially since Mexico is contiguous with the U.S. A deep sense of history and tradition may be associated with the land and psychologically, borders are nonexistent. This may make it easier for Mexicans to survive in a hostile environment (in other words, they are not really "alien"). Lastly, Puerto Ricans have the unfortunate status of being paternally dependent on the U.S. When the island was industrialized, many were forced to become dependent on the U.S. and forced into low status occupations or public assistance.

APPENDIX F: MARIN AND MARIN'S (1991) DISCUSSION OF CULTURAL SIMILARITIES AMONG LATINOS

Marin and Marin (1991) argue that issues associated with allocentrism, simpatia, familialism, power distance, personal space, time orientation, and gender roles, reflect values that are common to all Latinos.

According to Marin and Marin (1991) allocentrism is a form of collectivism in which the needs of the "in group" of are primary concern. Marin and Marin define allocentic societies as emphasizing "the needs, objectives, and points of view of an ingroup while individualistic cultures determine their social behavior primarily in terms of personal objectives, attitudes, and values that resemble little if at all those of the ingroup" (1991:11). Yep (1995) defines allocentrism as "a cultural trait associated with the preference for interpersonal relationships in ingroups that are nurturing, empathetic, loving, intimate, respectful, and willing to sacrifice for the welfare of the group" (Yep 1995:201). Allocentric societies can be thought of being similar to Durkheim's (1984) concept of a society that operates on the basis of mechanical solidarity. A mechanical society moves and operates as one. Its primary allegiance is to societal needs and not individual needs.

Marin and Marin (1991) suggest that *simpatia* is related to allocentrism. *Simpatia* "emphasizes the need for behaviors that promote smooth and pleasant social relationships" (Marin and Marin 1991:12). Empathy, dignity, and respect for others are behaviors characteristic of *simpatia*. *Simpatia* seeks to reduce conflict and allow for harmonious interactions.

Familialism has been identified by Marin and Marin (1991) as one of the strongest values shared by Latinos. Baca-Zinn (1994:167) defines familialism as "an assortment of beliefs and behaviors associated with family solidarity and the extended family." Marin and Marin define familialism as an "individuals strong identification with and attachment to their nuclear and extended families, and strong feelings of loyalty, reciprocity, and solidarity among members of the same family" (1991:13). Three "value orientations" are associated with familialism. These orientations involve giving emotional and financial support to extended family, relying on relatives for support, and viewing the family as a reference for attitudes and behavior (Marin and Marin 1991:13).

The concept of "fictive kin" is also an element of familialism. Fictive kin are friends of the family who assume a relational status. This status as a family member is imbued due to the close relationship between the parents and the friend or the friends involvement in the raising of children. These fictive kin are referred to as *compadres* (Marin and Marin 1991:14).

Power distance "supports the notion that societies have powerful individuals as a result of inherent traits (e.g., intelligence) or of inherited or acquired characteristics (e.g., money, education)" (Marin and Marin 1991:14). This is similar to Weber's (1946) concept of traditional authority. In traditional authority, the authority figure rules due to some type of "divine right." Power is ascribed and not achieved. In power distance societies, those in power seek to

maintain the status quo and the society tends to "support these power differentials" (Marin and Marin 1991:15). In these societies, obedience, conformity, and deference to autocratic authority is valued. Marin and Marin (1991) suggest that the notion of "power distance" is common to Latino culture.

Regarding physical proximity to others, Marin and Marin argue that Latinos "have been shown to prefer shorter distances than non-Hispanic Whites. Hispanics, like other 'contact cultures,' feel comfortable when physically close to others and are less likely to feel that their personal space has been invaded when a stranger comes close to them" (1991:15). This value is of importance because it may cause for awkwardness in situations where Latinos are interacting with Non-Latino Whites. The Non-Latino White may feel infringed upon and the Latino may feel insulted.

A society that is present time oriented is "often described as unable to delay gratification or to plan for the future and as inefficient and not punctual" (Marin and Marin 1991:16). A present time orientation is one in which the concept of time is malleable, it is an orientation that lacks structure and consistency. Marin and Marin (1991) suggest that researchers have shown that Latinos are present time oriented and are more flexible in their attitude toward time. Like physical proximity, this value has potential for problems when interacting with the Non-Latino White population which tends to be present time oriented. For example, late arrival at meetings and social events may be perceived as negligence. However, given the values of *simpatia*, the *quality* of

the time spent may be of more importance to Latinos.

Lastly, regarding gender roles, Marin and Marin suggest that much has been written about the Latino male "being strong, in control, and the providers for their families ('machismo')" (1991:16). Conversely, Latino women "are described as submissive and lacking in power and influence" (Marin and Marin 1991:16). However, the issue of gender roles is in flux given the ever changing social and economic circumstances of Latino families. Some researchers are convinced that *machismo* exists and others view it as a cultural stereotype (Casas, Wagenheim, Banchero, and Mendoza-Romero 1995:235-6).

Marin and Marin's (1991) discussion concerning "power distance" suggests that Latino society is highly stratified. Almost every man is subordinated to an other. If a man lives in a world in which he is constantly at the boot heels of an other, the home may be the only place where he may occupy the highest status. *Machismo* keeps women subordinated and is a microcosm of the larger society.

Although Marin and Marin's (1991) discussion on Latino values appears to over generalize, it provides a basis in which to begin to compare differences among Latino groups. Issues involving the interactive nature of gender roles, family, and culture are paramount to a discussion of acculturation.
APPENDIX G: SOCIAL AND ECONOMIC CHARACTERISTICS OF LATINO SUBGROUPS AND THE ACCULTURATION PROCESS

Differences exist among the Latinos subgroups for social and economic variables. The higher level of socioeconomic status for Cuban immigrant women is demonstrated in Table 15 below. Social and economic variables may impact gender roles and the family. This impact may be related to acculturation.

Table 15. Social and Economic Characteristics of Cuban and Mexican WomenWho Immigrated to the U.S. Between 1960 and 1970

Ethnic Group	% 4+ Yrs. High School	% 4+ Yrs. College	% in low Skill Labor	% Profess. Occup.	Annual Earnings (mean in 100s)
Cuban	22.2	5.4	0.1	16.8	35.08
Mexican	7.4	0.8	17.3	9.4	22.36

Source: Pedraza-Bailey 1985:89-112

Ortiz (1994) using 1980 U.S. Census data, also shows a differential socioeconomic status between Cuban, Mexican, and Puerto Rican women (Puerto Ricans will be discussed later in this subsection). Although the data for employment is only reflective of professional occupations, it is useful for it bifurcates these measures of socioeconomic status by ethnic group.

 Table 16. Educational Attainment and Those in Professional Occupations:

 Cuban, Mexican, and Puerto Rican Women

Ethnic Group	% High School Graduate	% College Graduate	% Professional Occupation
Cuban	53.3	13.2	15.7
Mexican	36.3	3.7	10.8
Puerto Rican	39.1	4.8	13.4

Source: Ortiz 1994:26-30

Tables 15 and 16 show that Cuban Latinas are better educated than Mexican Latinas. Higher education increases earning power. Differential economic characteristics of Cubans and Mexicans is seen in Table 17.

Table 17. Economic Characteristics of Cubans and Mexicans

Ethnic Group	% Below Poverty Line	% Receiving Public Assistance	Per Capita Income
Cuban	14.6	15.2	\$ 13,786
Mexican	26.3	12.5	\$7,447

Source: Rumbaut 1995:6

Cubans have a higher per capita income and have less people below the poverty line than Mexicans. Cubans do have a slightly higher number of people on public assistance, but this may be due to Mexicans having a higher number of undocumented workers in the U.S. Although this data is not bifurcated for gender, Tables 16 and 17 suggest that Cuban women are important contributors to the comparatively higher level of socioeconomic status of the Cuban population. Cuban women are more educated, earn more, and have higher status occupations than Mexican women. Additionally, Mexican women have a higher unemployment rate than Cuban women. In 1991, 10.0% of Mexican women (aged 16 years or older) were unemployed as compared to 8.6% of Cuban women (U.S. Bureau of the Census 1992:382).

As Mexicans can be compared to Cubans by looking at education and income, Puerto Ricans be compared to these two other Latino subgroups. Table 18 below compares the percent of college graduates for Cubans, Mexicans, and Puerto Ricans.

 Table 18. Percent of Cubans, Mexicans, and Puerto Ricans Who are

 College Graduates (persons aged 25 years or older)

Ethnic Group	% College Graduate
Cuban	16.5
Mexican	6.3
Puerto Rican	9.5

Source: Rumbaut 1995:6

Cubans are more educated than Mexicans and Puerto Ricans, but Puerto Ricans are more educated than Mexicans. As difference in educational levels exist, so do differences in economic characteristics as seen in Table 19.

Ethnic Group	% Below Poverty Line	% Receiving Public Assistance	Per Capita Income
Cuban	14.6	15.2	\$ 13,786
Mexican	26.3	12.5	\$7,447
Puerto Rican	31.7	26.9	\$8,403

Table 19. Economic Characteristics of Cubans, Mexicans, and Puerto Ricans

Source: Rumbaut 1995:6

Cubans are better off than Mexicans and Puerto Ricans in terms of having fewer people below the poverty line and a higher per capita income. Mexicans have fewer people below the poverty line than Puerto Ricans but have a lower per capita income. Puerto Ricans may have a higher proportion of people on public assistance because of U.S. citizenship. Puerto Ricans may be more inclined to apply for governmental aid because the fear of deportation does not exist as it may for undocumented Cubans and Mexicans. The slightly higher per capita income for Puerto Ricans may be because Mexicans tend to have slightly larger families (*COSSMHO* 1994:66-170). As another basis of economic comparison, family income in 1990 is presented in Table 20.

Income Range (% per 1,000)	Cuban	Mexican	Puerto Rican
< \$5,000	5.7	5.7	11.0
\$5,000-\$9,999	8.1	11.5	22.7
\$10,000-\$14,000	9.0	13.7	10.1
\$15,000-\$24,999	17.6	22.4	18.8
\$25,000-\$34,999	19.7	17.7	11.3
\$35,000-\$49,999	16.1	16.9	12.1
\$50,000 +	23.9	12.2	14.1
Median Income (dollars)	\$31,439	\$23,240	\$18,008

Table 20. Total Family Annual Income for Cubans, Mexicans,and Puerto Ricans

Source: U.S. Bureau of the Census 1992:41

Table 20 makes the economic picture of the three groups a little clearer. It is seen that for most income ranges, Cubans are better off than Mexicans and Mexicans are better off than Puerto Ricans. The only exceptions are in the less than \$5,000 range where Cubans and Mexicans are even, the \$10,000-\$14,000 range where there are less Puerto Ricans than Mexicans, and the \$35,000-\$49,000 range where there are only slightly more Mexicans than Cubans. "Better off" means that there are a smaller proportion of the group in the lower ranges and a higher proportion of the group in the higher ranges. Also, median income reflects the gradation of Cuban, Mexican, and Puerto Rican from better off to worse off.

Lastly, occupational status is considered in comparing social and

economic forces that may effect gender, family, and culture. The result of this comparison is not surprising given the findings of educational level and income for each group. Based on data from the U.S. Census for 1990, the occupational distribution for each Latino subgroup is given in Table 21 below.

Table 21.	Occupational Distribution for Cubans, Mexicans, and Puerto Rica	INS
(%	per 1,000 in population for persons aged 16 years and older)	

Occupation	Cuban	Mexican	Puerto Rican
Managerial and Professional	25.1	10.4	17.9
Tech., Sales, and Admin. Support	33.1	22.5	32.0
Services	12.0	18.9	17.5
Precision Production, Craft, and Repair	12.8	13.9	10.7
Operators, Fabricators, and Laborers	15.6	25.9	20.7
Farming, Forestry, and Fishing	1.4	8.4	1.2

Source: U.S. Bureau of the Census 1992:382

Cubans tend to be in the higher status occupations (managerial and professional) while Mexicans tend to occupy the lower status occupations (operators, fabricators, laborers, farming, forestry, and fishing). Puerto Ricans do better than Mexicans in the higher status occupations and have slightly less people in the lower status occupations. However, they do not fare as well as Cubans.

When considering group comparisons, generational differences need to be considered. This is because "generational comparisons are central to most efforts to understand the prospects for the assimilation and acculturation of immigrant groups into the mainstream of American society" (Oropesa and Landale 1995:4).

I have argued thus far that Cubans fare better than Mexicans and Puerto Ricans, and Mexicans better than Puerto Ricans. Oropesa and Landale (1995) examined socioeconomic indicators for 3 generations of Latino children (17 years of age and younger) using 1990 U.S. Census data. First generation children were defined as "foreign-born children of foreign-born parents," second as "native-born children with at least one foreign-born parent," and third as "native born children with native-born parents" (Oropesa and Landale 1995:11). Table 22 below compares the socioeconomic indicators of median household income, poverty rate, educational attainment, and "white collar" occupational status for Cubans, Mexicans, and Puerto Ricans. This comparison is important for it puts into context the effect of immigration and acculturation on the socioeconomic conditions of Latino subgroups.

Ethnic Group/ Gener.	Median Househid. Income (100s)	% Below Poverty Line	% Receiving Public Assist.	% Head Househid. College Grad.	% Head Hou se hid White Collar
Cubans First Second Third	23.0 38.0 32.6	25.8 13.1 22.2	11.7 7.5 9.2	10.8 21.7 20.2	8.9 25.2 25.5
Mexicans First Second Third	19.0 22.0 25.0	44.2 31.6 28.1	16.7 10.0 12.5	3.2 3.6 8.2	4.0 6.2 13.3
Puerto Ricans First Second Third	14.1 21.0 19.0	51.5 38.0 40.5	23.1 28.4 21.4	10.1 7.0 8.1	10.5 10.8 13.9

Table 22. Socioeconomic Status Measures for Latino Children by Generation

Source: Oropesa and Landale 1995:19

It is seen that first, second, and third generation Cubans have higher median incomes than Mexicans and Puerto Ricans of the same generations, and first, second and third generation Mexicans have higher median incomes than Puerto Ricans of the same generations. More first, second, and third generation Puerto Ricans are below the poverty line and on public assistance than Cubans and Mexicans of the same generations, and more first second and third generation Mexicans are below the poverty line and on public assistance than Cubans of the same generations.

More first, second, and third generation Cuban heads of households have

college degrees than Puerto Ricans. More second generation Puerto Ricans have college degrees than Mexicans of the same generation. However, by the third generation, Mexicans and Puerto Ricans are about equal in the percentage of heads of households with college degrees. The increase in second to third generation heads of households with college degrees is greater for Mexicans than Puerto Ricans.

More first generation Puerto Ricans are in white collar occupations than Cubans and Mexicans of the same generation and more first generation Cubans than Mexicans are in white collar occupations. However, by the second generation, Cubans overwhelmingly overtake Puerto Ricans in heads of households in white collar occupations. Mexicans slightly improve but still remain behind Cubans and Puerto Ricans. By the third generation, Cubans minimally improve but are still ahead of Puerto Ricans and Mexicans, Puerto Ricans slightly improve, and Mexicans improve almost twice from the second generation but are much closer to Puerto Ricans.

Except for percent heads of households in white collar occupations, and percent heads of households with college educations, Cubans are better off than Mexicans and Puerto Ricans, and Mexicans are better off than Puerto Ricans. This is consistent with other data that has been presented in this study in comparing socioeconomic status indicators among Latinos. Regarding percentage heads of households in white collar occupations, it could be that Puerto Ricans who immigrate to the U.S. are unable to replicate their status on

the island in the U.S. Cubans who immigrate may have more extended family who have been successful (due to governmental assistance programs) to help the second generation in accessing white collar occupations. Most Mexican immigrants come into menial positions and by the third generation may have been "promoted" to a white collar position over newly arrived immigrants. Educationally, second and third generation Mexicans may have learned the language and thus been able to better succeed at college. Puerto Ricans may be more familiar with the language due to the territory's commonwealth status (i.e., English is taught in the schools and is more often used as a "second language").

The above discussion demonstrates that differences exist among Cubans, Mexicans, and Puerto Ricans pertaining to socioeconomic conditions. These differential socioeconomic conditions may effect gender roles and the family which may effect acculturation. Social and economic conditions are related to history.

Bean and Tienda (1987) argue that because Mexicans have a longer history than the other Latino subgroups, they are more "generationally diverse." This diversity has resulted in some of the urban "upwardly mobile" Mexican Americans forming a cultural allegiance with the United States. This occurred because the transition from a rural, agricultural worker to an urban industrial worker was seen by some Mexican Americans as an improvement of their life circumstances. This perceived improvement facilitated a move toward cultural

assimilation with the dominant culture. Hope (although misplaced) was put by many in the "American Dream." Bean and Tienda write that "cultural manifestations of changes associated with the urbanization experience include the trend toward a language shift away from Spanish, the declining isolation of the barrio, and indicators pointing to a greater degree of assimilation into Anglo society" (1987:22).

Cubans had the benefit of economic assistance from the United States. However, many came thinking that some day they would return to Cuba. When it became clear that Castro was not going to be overthrown by any counterrevolution, Cubans quickly turned their energies toward becoming successful in the United States. This promoted assimilation into the dominate culture where "Cubans aggressively sought to learn English and new skills necessary for the economic rewards that would eventually signal their social integration" (Bean and Tienda 1987:31).

Puerto Ricans have a dependent, patriarchal relationship with the United States. Although Puerto Ricans are citizens, the country of their citizenship has done little to promote economic and social mobility. Puerto Ricans are second class citizens who fare little better than African Americans in their socioeconomic status. Many Puerto Ricans go back and forth between the island and the mainland (circular migration) which results in a shared culture between the two geographic locales. This circular migration and "relegation to the lowest level of the socioeconomic ladder are two important defining features of the ethnic

structuring process for Puerto Ricans" (Bean and Tienda 1987:26). Because of this lower status and perpetual life of poverty, Puerto Ricans have maintained strong ethnic communities and rejected a "quick transfer of cultural identity" (Bean and Tienda 1987:27).

Given the role that gender and family plays in culture (Baca-Zinn 1994), it seems that a change in gender roles (as prompted by economic conditions) may result in an acculturation effect. The chart below demonstrates the acculturation process as I theorize it to operate. However, the only variable that is measurable in this chart is socioeconomic conditions. Whether or not these relationships truly exist, remains to be determined.

Figure 1.	Path	Chart	of	Acculturation	Processes
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Historical & Geographical Circumstances I Contemporary Social & Economic Puerto Ricans Conditions-----> Mexicans Cubans I I I v Possible transformation of family and culture due to changing role of women. This may result in varying degrees of acculturation.

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