Nativity, Education, and Birth Weight among the Mexican-Origin Population in El Paso, Texas.

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Introduction

The Hispanic population is playing an increasingly important role in American society. Hispanics are now the largest minority group in the nation and their numbers are increasing at a rapid rate. Today, Hispanics account for 12.5 percent of the total population in the US with 67 percent of Hispanics being of Mexican origin. Similar to other minority groups, the Mexican-origin population in the US is in a disadvantaged position compared to the White population on many issues including income, employment, housing, education, and health (Therrien and Ramirez 2001). That is why knowing more about the culture and health behavior of this population is critical to understanding the health outcomes of this segment of the population that in the coming years will likely become the ethnic majority in some states.

Previous research shows that babies born to Mexican-origin women in the United States are healthier than their counterparts of other minority groups and similar in health to those of non-Hispanic White women. This outcome persists in spite of Mexican-origin women living under poor social conditions. This phenomenon is known as the "epidemiological paradox." There are several working hypotheses to explain the paradox. One possible explanation is that better birth outcomes for the Mexican-origin population are explained by misreporting of ethnicity. Other scholars have argued that some Mexican-Americans return to Mexico after the baby is born in the US and, once in their country, infants may die and those deaths are not recorded in the U.S. data. However, these hypotheses don't come into play in this study because the population we are studying a border population on the US-Mexico border where the most of the Hispanic population is from the US so that misreporting of ethnicity is. Further, we are not

worried about return migration because we are examining birth outcomes (birth weight and gestational age) rather than infant mortality.

The hypotheses that we are exploring in this case are "the selective migration hypothesis" and "culture hypothesis." The *selective migration hypothesis* posits that healthy individuals are more likely to migrate to the US to give birth. Therefore, since they are healthier, their offspring, by association, are healthier. The *culture hypothesis* posits that aspects of Mexican culture promote protective behaviors during pregnancy, but that Mexican women lose such protection with "acculturation" to American culture.

To examine the value of each of these hypotheses, we test their validity with a sample of babies born during 1996-1997 in Thomason Hospital and the vital registrations for births in El Paso County for the same years. The El Paso County data allow us to analyze the effect of place of birth on birth weight yet without additional variables to test the *culture hypothesis* other than whether the mother smoked or drank during the pregnancy. The added detail of the hospital-based survey allows us to add place of education into our analysis to test how much explanatory power these variables have. We use three categories of Mexican-origin women within the Thomason data to evaluate the effect of nativity and place of education on birth weight: a) women born and educated in Mexico; b) women born in Mexico and educated in the U.S.; and, finally, c) women born and educated in the U.S.. If selective migration is the only explanation, then all those women born in Mexico (independently of the place where they completed their education) should have better birth outcomes than those born in the US. However, if there also is a difference in birth outcomes between those women born in Mexico and educated in Mexico and those women born in Mexico but who completed their education in the US, then, the *cultural hypothesis* also has a place in explaining the epidemiological paradox.

Objectives

Our first objective is to contrast the factors predicting low birth weight for a survey population in a hospital in El Paso, Texas compared to the general population in El Paso to ascertain to what extent the Thomason sample is similar to the birth outcome patterns for the El Paso County population. We then test the *selective migration* and the *cultural hypotheses* to establish the role that each one plays in explaining birth outcomes for babies born to women from Mexico in comparison to Mexican-origin women born in the US, taking advantage of the variables place of birth and education available in the Thomason sample.

We use ordinal logit regression to establish which variables predict low birth weight for the Thomason sample and the El Paso County population. We then perform an ordinal logit regression adding nativity and cultural variables to evaluate their effects on low birth weight according to where the mother was born and completed her education.

Background

El Paso, Texas lies on United States-Mexico border, an area of the country that historically has had a large Hispanic, primarily Mexican-origin population (Inter-University Program for Latino Research 2004). Five of the seven poorest U.S. Metropolitan Statistical Areas are located in the border area. In 2000, The Census Bureau reported that in El Paso County, 78 percent of the population was of Hispanic origin, with around 85 percent percent of the Hispanic population being of Mexican origin. This county is the poorest in the country. The US side of the US-Mexico border region has lower levels of education and higher levels of poverty than the rest of the country as well as a population growth rate three times higher than anywhere else in the

country. Pregnant women in the U.S. border counties are less likely to obtain or look for prenatal care or to deliver in a hospital compared to women in the rest of country. Nevertheless, pregnancy outcomes in border counties are generally good and similar to those of non-Hispanic White women (US-MEXICO Border Health Commission 1998).

Birth weight, as a measure of infant health, not only has consequences in the short term, but over the child's life course as well. In the short term, it is related to the odds of survival: an infant born with a healthy birth weight (>2500 grams) is more likely to survive and to have fewer health problems (Hummer et al. 1999). Over the life course, birth weight affects the subsequent general development of children: those born with a healthy birth weight perform better in school and possess greater emotional stability than children who were born with low birth weight (Hack et al. 1995).

The association between lower socioeconomic status and negative birth outcomes has been well documented (Cramer 1995). Yet, beyond just socio-economic status, race and ethnicity appear to have an independent effect on birth outcomes (Krieger et al. 1993). However, the identified relationship between poverty and health does not seem to apply as strongly to the birth outcomes of Mexican-origin women as to other ethnic minorities. This population has better birth outcomes than other minority groups who have the same socioeconomic circumstances. Their birth outcomes look more similar to birth outcomes of non-Hispanic Whites (Hummer et al. 1999; Pearl et al. 2001; Buekens et al. 2000). Beyond ethnicity, immigration is also positively associated with better birth outcomes. Mexican migrant women have healthier babies than their Mexican counterparts born in the US. Hummer et al. (1999) showed that immigrants' birth outcomes are favorable to those of US-born women. Markides and Coreil (1986) coined this apparent paradox the "epidemiological paradox." The positive effects of immigrant status on

birth outcomes decreases with time spent in the US among Mexican-origin women (Guendelman and English 1995). Scribner et al. (1992) showed that among Latinas, a preference for English was associated with a higher risk of having a low birth weight infant in contrast to women who preferred Spanish. The authors suggest that language could be a measure of acculturation, and representative of other forms of acculturation which are harder to measure, where the use of English is associated with negative effects on the birth weight of babies born to Latinas, mitigating the positive effect of Hispanic culture. Arguing in support of the *culture hypothesis*, Guendelman et al. (1995) argue that the protective attitude of Mexicans toward pregnant women serves to counteract the negative effects of poverty. Scribner and Dwyer (1989) proposed a positive effect of *selective migration* and a negative effect of assimilation on birth weight to US culture. Using language as a measure of acculturation, English et al. (1997) did not find a linear and negative association between adaptation to the US and birth outcomes. Instead, they found that US-born Spanish-speaking Mexican-origin women showed the highest risk of low birth weight, while Mexican-born Spanish-speaking women had the lowest risk of low birth weight babies.

Landale et al. (2000) support the *selective migration hypothesis* in their study on the infant mortality of children born to Puerto Rican women. Using pooled origin/destination data from the Puerto Rican Maternal and Infant Health Study, they examined levels of infant mortality of recent migrants from Puerto Rico to the US as contrasted to non-migrant women in Puerto Rico and to mainland-born Puerto Rican women. They tested the *culture* and *selective migration hypotheses* comparing these three groups and found that children of migrants have lower risks of infant mortality than do children of mainland-born Puerto Rican women, as well as children of non-migrant women in Puerto Rico. They conclude that selective migration works

well to explain these differences because the migrant group had the lower risks, yet mother's duration of U.S. residence was positively correlated to infant mortality among children of migrants, demonstrating an effect of negative assimilation to US culture.

While some scholars attribute this paradox to the *cultural hypothesis* and others to the *selective migration hypothesis*, it still remains unclear the contribution of each to explain better birth outcomes among the Mexican-origin population.

Methods

Data

We used two data sets: a sample of babies born between May of 1996 and April of 1997 in Thomason Hospital (n=5076) and vital registration data for births occurring in El Paso County for the same period (n=33,002). Thomason Hospital hosted one-third of all the births occurring in El Paso, servicing primarily the low-income population. Between 50 and 80 percent of the mothers giving birth at the hospital were interviewed during the research period. The information about the mothers and their babies born at Thomason Hospital came from her hospital records as well as a post-partum survey administered within 48 hours after the women's delivery. . The main goals of the survey were to explore several reproductive health issues including contraceptive use, the birth weight of her penultimate birth (for multiparous women), the use of prenatal care, and behavior related to maternal and infant health. Birth weight and gestational length were taken directly from the hospital records. The vital registration data for births occurring in El Paso County came from birth certificates that were filed by health workers at hospitals in El Paso County after the birth of a baby. Those births were extracted from the national file of U.S. births that occurred in 1996-97.

Variables

The dependent variable for this analysis is infant birth weight as registered on birth certificates (vital registration) or hospital records (Thomason) and measured in grams. In both populations, we dropped those cases with birth weights higher than 6000 grams and lower than 500 grams since they were extreme outliers and likely coding errors.

We divided birth weight in several categories according to percentile distributions (<= 10, 10-25, 25-50 and 51+) and analyzed it as an ordered variable. The lowest 10 percent of the cases were lower than 2635 grams, the 25th percentile were lower than 2952 grams, the 50th percentile was lower than 3279 grams and, 51st percentile started at 3280 grams. In the first model we only included mother's nativity. The second model contains socio-demographic variables marital status, mother's age (classified as younger than 20 or older than 35 with 20 to 35 as the reference category), and mother's education (0 to 5, 6-8, 9-11, 12, and 13+ years, with 6 to 8 years of education as the reference category). The third model contains biomedical, behavioral and previous pregnancy history: parity, whether the mother experienced a previous child's mortality, whether the mother smoked or drank during pregnancy, whether the mother had health problems during pregnancy, and the Kotelchuck index. In model three we substituted variables asking for month and times of prenatal care visits with the Kotelchuck index because it is considered a better measure since it also considers gestational length. It was computed in the next way: First we determined the "expected number of visits" based on the gestational age of the baby and the month the mother started prenatal care, according to the next table:

Gest. Age	Month Care Began			
	1st	2nd	3rd	4th
6 - 9	1			
10 - 13	2	1		
14 - 17	3	2	1	
18 - 21	4	3	2	1
22 - 25	5	4	3	2
26 - 29	6	5	4	3
30 - 31	7	6	5	4
32 - 33	8	7	6	5
34 - 35	9	8	7	6
36	10	9	8	7
37	11	10	9	8
38	12	11	10	9

Then, prenatal care was classified as inadequate if mother received fewer than 50 percent of expected visits or if mother started prenatal care after the fourth month of pregnancy –regardless of the number of visits-; it was classified as intermediate if mother had 50-79.9 percent of expected visits; adequate level was that with 80-109.9 percent of expected visits; adequate to plus was considered when mother had 110 percent of more of expected visits; finally, no prenatal care was considered when mother didn't receive any prenatal care (for a deeper discussion of the index refer to Kotelchuck 1994). The kotelchuck index is arranged from the optimum level of care to the worst level. Adequate is the best, followed by an intermediate level, inadequate, adequate plus (worst than inadequate), and finally the worst of all that is not any prenatal care. The final model includes proximate determinants of birth weight: sex of infant and gestational age (treated as ordered as well—less than 32 weeks, 32 to 36 weeks, and 37+ weeks, the reference category being the latter category).

We evaluated the effects of nativity and behavioral factors on predicting low birth weight for each population through ordered logit regression. We evaluated the effect of nativity and place of education for the Thomason sample following three categories: a) women born and educated in Mexico; b) women born in Mexico and educated in the US; and, finally, c) women born and educated in the US. If the *selective migration hypothesis* is the more powerful of the two hypotheses, women born in Mexico should have had better birth outcomes than Mexican-origin women born in the US. The effect of selective migration was evaluated by comparing the effect on birth weight for mothers born in Mexico against those who were born in the US. The effect of the *culture hypothesis* was evaluated by testing whether Mexican women educated in Mexico had better birth outcomes than their counterparts educated in the US, assuming that acculturation to the US (as measured by being educated in the US) has a negative effect on birth outcomes.

Results

Table 1 shows descriptive statistics for the two populations. From this table it is possible to see that the mean birth weights are similar for the Thomason population and the county as a whole. Mother's age is also similar for both populations. Marital status is only slightly different: in El Paso County (70 percent) than Thomason (64 percent). There is greater variation on the education variables. The mean years of education is higher for mothers in El Paso County (11.4 years) than for mothers at Thomason (9.7 years). The percentage of mothers with some years of college or beyond in El Paso County is 29.8 percent but only 11.3 percent for Thomason. The birth event recorded was the first birth for 33 percent of the women in El Paso County and 39

percent for the women at Thomason. Fifteen percent of mothers in El Paso County had lost a previous pregnancy while only 8 percent of mothers at Thomason had.

Health behavior was better within the El Paso County population. Only 2.6 percent of that population smoked during pregnancy and only 0.9 percent drank during the same period. In comparison, 6.2 percent of Thomason mothers smoked and 2.5 percent drank alcohol during the pregnancy. The former started prenatal care earlier than their counterparts at Thomason and a lower percentage had a medical condition during pregnancy. Women who delivered at Thomason had a greater number of prenatal care visits, but that might be because they had more problems during pregnancy. These differences show that women at Thomason were at a social disadvantage in comparison to women in the El Paso County population since Thomason women had lower levels of education, fewer of them were married, they had poorer health behavior, started prenatal care later, and had more medical conditions. All of these characteristics are risks for low birth weight.

Our preliminary results for El Paso County (Table 2) show that 7.0 percent of mothers gave birth to low birth weight babies (<2500 grams) with 1.1 percent of them being very low birth weight (<1500). 87.1 percent of the mothers were of Mexican origin, 9.6 percent White and 1.7 percent Black. Low birth weight was more frequent among Black, Asian and Native American/Hawaiian mothers, with more than 10 percent of their births being low birth weight (these groups together only represent the 2.6% of the population). 7.6 percent of White non-Hispanic mothers and 7.4 percent of Other Hispanic gave birth to a low birth weight infant. The group with the lowest proportion of low birth weight infants was Mexican-origin mothers: only 6.7 percent of their babies were low birth weight. Of these mothers, 49.7 percent were born in the US and 50.2 percent were born in foreign countries. Among women born in the US, 7.8

percent had low birth weight babies compared with only 6.2 percent of those mothers who were foreign-born. Mothers residing in Mexico had a lower percentage of low birth weight babies: 2.9 percent in contrast to mothers residing in the U.S..

Through ordered logit regression, we established which variables were most likely to predict birth weight in the El Paso County population (Table 3). Most of the coefficients behave in the way that we would expect. Birth weight is significantly lower when gestational age is shorter, when the mother smokes, and when the baby is female. Women born in the US are more at risk for delivering a baby of low birth weight than women born in foreign countries. Lower birth weight is also found among teenage and single mothers, nulliparous women, and among women who lost a previous pregnancy. All of these variables are significant in spite of the presence of the gestational age variable. Contrary to expectations, those using an intermediate level of prenatal care are more likely to have heavier babies than those with an adequate level of prenatal care. Adequate plus actually has a negative effect on birth weight. Education presents divergent results. Mothers who completed elementary school had the same birth outcomes as mother who completed secondary school. Mothers with 6 to11 years of education were most likely to have a low birth weight infant, with mothers who completed 9-11 years of education the most likely to give birth to a low birth weight infant.

The birth weight distribution for Thomason Hospital shows that 5.8 percent of the women gave birth to low birth weight infants (1500-2499 grams) and that 1.0 percent of the women gave birth to very low birth weight infants (<1500 grams) (Table 4). To assess the influence of culture and selective migration, we divided the Thomason population into women 1) educated in Mexico (n=3085), 2) born in Mexico but completed education in the US (n=704), or 3) born and educated in the US (n=1176). A very small number of respondents who had been born in other

countries were excluded from the analysis. Of the women who were educated in Mexico, 0.8 percent gave birth to a very low birth weight infant and 5.2 percent gave birth to a low birth weight infant. Women who were born in Mexico and educated in the US had slightly worse outcomes. One percent of these women gave birth to a very low birth weight infant and 5.5 percent gave birth a low birth weight infant. Women born in the US and educated in the US fared the worst. Within this group, 1.2 percent gave birth to a very low birth weight infant and 7.5 percent gave birth to a low birth weight infant. Therefore, in spite of the disadvantages of mothers born and educated in Mexico, their birth outcomes were the best of the three categories.

The variables that predict birth weight within the Thomason sample are different than those of the El Paso County sample (see Table 5). According to sociodemographic variables in model one and model two, mothers born in the US are at a disadvantage for lower birth weight. Yet, when we introduce the Kotelchuck index, that difference is not significant anymore although being born in the US has a consistently negative effect through all the models. Not surprisingly, the most significant effect on birth weight is gestational age. Shorter gestational length corresponds to lower birth weight. The sex of the baby, mother's parity, and the Kotelchuck index are also significant. Having no prenatal care, adequate plus and inadequate prenatal care, in that order of importance, decrease birth weight as compared to receiving adequate prenatal care. Regarding education, mothers who received 9-11 years were more likely to have a low birth weight infant than mothers who had receive 6-8 years of education. This is an interesting finding because the effect remains significant net of the highly predictive variables of gestational length and the Kotelchuck index. Whether the mother smoked behaved in the expected way, but is not significant in the Thomason model (while it remained significant in the El Paso County model). This could be because of the amount of smoking in which the mother

was engaging. Sixty percent of the Thomason respondents who said they smoked during pregnancy smoked less than four cigarettes per day. Unfortunately, we don't have more disaggregated information for El Paso County, but one could hypothesize that the mothers in El Paso County were smoking more than the Thomason mothers. Gestational length, parity, dropping out of school before the 12^{th} year, the sex of the baby, and prenatal care are the principal predictors of birth weight for the Thomason sample.

The descriptive statistics for some characteristics of the mothers show that those born and educated in Mexico are at a disadvantage in relation to mothers educated in the U.S. and to those born and educated in the U.S.. For example, fewer mothers born and educated in Mexico use prenatal care, they have lower education levels, more mothers are 35 years of age or older, and a this sample contains higher percentages of high parity women than mothers in the other categories. Being single and having a pre-term birth were more likely for mothers born and educated in the U.S. (Table 4). Analyzing gestational length shows the same pattern (Table 6). Women born and educated in Mexico had the lowest proportion of babies born before the 37 gestational week, while women born in the U.S. had the highest proportion of those, being women born in Mexico and educated in the U.S. in an intermediate level.

In the final model, we used ordered logits to test the effect of place of birth and education of the mother on birth weight within the Thomason sample (Table 7). This division demonstrates the anticipated relationships. Having a mother either born in Mexico and educated in the US or a mother born and educated in the U.S. decreases the baby's birth weight compared to mothers born and educated in Mexico. Although the negative effect of being a mother born in Mexico and educated in the U.S. is not significant in any model, it behaves in the expected way. However, the effect is statistically significant for those born and educated in the US but it does

not hold in Model 4 when gestational length is included. Nevertheless, the effects are consistent for both categories in all the models.

Because the difference in birth weight is only significant between those born and educated in Mexico as compared to those born and educated in the U.S., this could be interpreted as the result of selective migration to US because culture (as measured by place of birth and education) is not having a significant effect on birth weight. Yet, other variables do not act as predictably. While having studied only 5 years of education or less has the same effect as having 6 to 8 years of education, having 9 to 11years of education has a negative effect and it is consistent and significant through all the models. Having a first-born is highly predictive of low birth weight. The Kotelchuck index is also strongly predictive. Being in the intermediate category of the index doesn't make any difference as contrasted with adequate prenatal care, but less than adequate has a negative effect in birth weight. The other variables that are highly significant with low birth weight are gestational length (<37 weeks) and baby's sex (female):

Discussion

We evaluated the variables that have an effect on birth weight for both the vital statistics of El Paso and for the Thomason Hospital data set. The lack of research on the role of selective migration and cultural factors in explaining better birth outcomes of Mexican women residing in the US border region motivated us to compare the effects of nativity on birth weight within this unique population. Because of the added detail of the Thomason survey, we were able to test the effects of place of birth and place of completed education on birth weight. We expected to find that mothers born and educated in Mexico would have better birth outcomes than mothers born

in Mexico and educated in the U.S. who would have better outcomes than those Mexican origin women born and educated in the U.S.

All the variables behaved as expected in the El Paso County data. However, we found some differences in Thomason sample. Whether the mother smoked wasn't significant for the Thomason sample but showed a very strong association for the El Paso County population. This difference may be a result of cultural differences between these two populations. The Thomason sample has a larger proportion of Mexican origin women than the El Paso County sample, and although more women in Thomason said they smoked during pregnancy, the difference could be in the frequency of smoking. The results seem to suggest that mothers in the El Paso County sample were heavier smokers than mothers in the Thomason sample, thus weakening the effect of smoking as a predictor for low birth weight within this population. Education did not behave as expected. Better-educated women were at a disadvantage in birth outcomes as compared to those with only 6 to 8 years of education. Having fewer years of education doesn't seem to have a significant effect.

Regarding the divisions that we created in the Thomason data set to evaluate the selective migration and the culture hypothesis; we found evidence that provides support for selective migration. Mexican mothers born and educated in Mexico had babies with higher birth weight than those in the other two categories. Although this difference is not significant in the full model, the effect works in the same direction through all the models. The explanation for the selective migration hypothesis states that selectivity can act through two possible processes, selecting those individual that are healthier in their places of origin and, once they have migrated, retaining those who succeed in securing temporary residence in the U.S. (Palloni & Morenoff 2002). The results showed for those born in Mexico is very interesting because

selective migration still works as an explanation for this population when 43.06 percent of the women in the Thomason sample (59 percent of those born in Mexico) were born in the border city of Juárez and 13.95 percent (19.2 percent of those born in Mexico) were born in the border state of Chihuahua. If selectivity works through the two processes mentioned above they could be expected to have less power in explaining differences in a border population due that migration process is relatively easier for a population living in the border that for people who come from inner country. On the other hand, because of the strong links between the twin cities the retention in the U.S. could also be facilitated for the resources in both sides for a border population. However, in spite of these differences selective migration makes the better explanation for the difference in birth outcomes in this population.

Although the difference between Mexican women born and educated in Mexico and their counterparts born in Mexico and educated in the U.S. is not significant in any of the models although the relationship holds the expected effect, showing support for the negative health effect of acculturation to the U.S. culture. This is an important finding because the strong connection and exchange between the Mexican-origin population living in El Paso and the Mexican population living in Juárez could erase completely any difference in culture, however the negative effect of place of education, yet not significant, is shown in the regression. Thus, we could say that selective migration is the better explanation for better birth outcomes among the Mexican-origin population, while acculturation to American culture erodes the positive effect of selective migration.

We need to continue to strive for a better sample of infant birth weights along the US-Mexico border. The border represents a very interesting situation. Because of the geographic characteristics of both cities and their interdependent economies, as evidenced by the exchange

of people crossing the border in both directions (for either familial reasons or professional reasons), one could hypothesize that there would exist a common set of values and knowledge for all the Mexican-origin community on both sides of the border. Yet in spite of these circumstances, the negative effect of being educated in the U.S. is shown in the regression. Therefore, the transmission of information is more complex than we could capture with the data sets available to us, pointing to the need for further study of this region.

We need to look deeper into the cultural factors so as to identify how negative acculturation is affecting the birth outcomes of Mexicans educated in the US. Some results about culture seem controversial. For example, women born and educated in Mexico had a higher percentage of mothers who smoked during the pregnancy than those born in Mexico but educated in the US. Beyond smoking, we need to evaluate the effect of other variables that can help us to better understand how culture is distinctly affecting these populations

Is important to emphasize that the measurement for evaluation we adopted was birth weight evaluated as ordered categories. Thus, a different measure of birth weight could lead to different results.

These results show that the Thomason population provides us with unique information to analyze the cultural and selective migration hypotheses. The database contains information on a population who is at high risk for low birth weight; but the differences in low birth weight according to where the mother completed her education and her place of birth show that these risks can impact birth outcomes differently. One of the problems in this study is that we are analyzing a very particular population, women who delivered at Thomason Hospital, one of the poorest populations in the poorest county in the country. Thus, generalizations that can be made from this study are limited to populations with similar characteristics. This knowledge could

contribute to the design of health policies for the Mexican-origin population, and to the extent that other minority groups share similar characteristics, we can extend our solutions to them as well.

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Table 1. Descriptive Statistics for Analysis of Birth Weight for El Paso County and Thomason Hospital Survey, for births occurring in 1996 and 1997

	El Paso County	Thomason
Birth Weight	3261.2 (548)	3256 (542)
Mother US born	49.7	26.3
Mother < 20 years of age	16.1	15.8
Mother> =35 years of age	9.5	9.4
Mother marital status		
Married	69.3	64.0
Education (Mean)	11.42 (2.9)	9.7 (2.9)
Level of education		
0 to 5	1.8	4.2
6 to 8	12.2	26.0
9 to 11	27.5	37.8
12	28.7	20.7
13 +	29.8	11.3
Mother's first birth	33.3	39.0
Mother has lost a previous pregnancy/infant	15	8.0
Mother is smoker	2.6	6.2
Mother is drinker	0.9	2.5
Month prenatal care started (mean)	3.0 (1.9)	3.4 (2.04)
Number of prenatal visits (mean)	8.9 (4.7)	9.7 (4.5)
Kotelchuck index		
adequate	28.4	35.4
intermediate	20.0	11.0
inadequate	25.0	31.3
adequate plus	20.2	18.1
no prenatal care	6.4	4.4
Mother had health problems during pregnancy	21.5	28.4
Gestational Length in Weeks		
<=32	2.2	1.7
33-36	9.6	7.4
37+	88.2	91.0
Baby is male	51.0	51.0

El Paso County N= 33002,
Thomason Hospital Survey N= 5074
Standard deviations in parentheses

Table 2. Birth Weight and Ethnicity in El Paso County, Tx: 1996-1997

Birth Weight	**%**	
<1500	1.1	
1500-2499	5.9	
2500-2999	19.2	
3000-3499	41.9	
3500 +	31.9	
Mothers Ethnicity	%	*Low Birth Weight baby?* Yes (%)
White	9.6	7.6
Mexican-Origin	87.1	6.7
Black	1.7	12.5
Other Hispanic	0.9	7.4
Asian	0.7	13.7
Native Am/Hawaiian	0.1	10.8
Birth Place of mother		
Mother US born	49.7	7.8
Mother foreign born	50.3	6.2
State of residence		
Texas	89.2	7.2
New Mexico	3.8	8.7
Mexico	6.9	2.9
Others	0.1	12.8

Vital records for El Paso County, 1996-1997

Table 3. Ordered logits for birthweight in El Paso County*, 1996-1997

	Model 1	Model 2	Model 3	Model 4
N	32950	32903	27095	27095
Mom Born in US	-0.14 **	-0.10 **	-0.12 **	-0.08 *
Mother is under age 20		-0.27 **	-0.19 **	-0.14 **
Mother is 35 and plus years old		-0.14 **	-0.11 *	-0.07 .
Mother is married		0.17 **	0.13 **	0.10 **
0 to 5 years of education		-0.20 *	-0.18 *	-0.13
6 to 8 years of education	--	--	--	
Mother studied some high school (9-11)		-0.15 **	-0.17 **	-0.19 **
Mother completed high school (12)		-0.12 *	-0.13 *	-0.15 **
Mother studied college and more (13 +)		-0.05	-0.04	-0.09 *
Mother's first baby			-0.22 **	-0.26 **
Mother has lost a previous infant/pregnancy			0.08 *	0.07 *
Mother smoked during pregnancy			-0.47 **	-0.45 **
Mother drank during pregnancy			0.10	-0.01
Adequate prenatal care				
Intermediate prenatal care			0 *	0.07 *
Inadequate prenatal care			-0.07 *	-0.02
adequate plus prenatal care			-0.54 **	-0.19 **
No prenatal care			-0.18 **	-0.08
Mother had health problems during pregnancy			-0.59 **	-0.42 **
Gestation less than 32 weeks				1.45 **
Gestation 32 - 36 weeks				3.20 **
Gestation 37 +				
If baby is male				0.39 **

*p< .05 **p<.001

*All ethnic groups

Data: Vital registries of El Paso County, 1996-1997.

Table 4. Descriptives for Thomason According to Place of Birth & Education

	Total	Mother Was Educated in Mexico	Mother Born in Mexico and Educated in US	Mother Born & Educated in US
Birth weight		(n=3117)	(n=706)	(n=1183)
Very low	1.0	0.8	1.0	1.2
Low	5.8	5.2	5.5	7.5
Normal	93.2	93.9	93.5	91.3
Age of Mother				
<20 years	15.9	10.1	26.0	25.1
20-34	74.7	78.3	69.9	68.0
35+	9.3	11.5	4.1	6.8
Married				
Yes	64.0	68.5	59.0	55.0
Level of education				
0 to 5	4.0	6.0	0.1	0.5
6 to 8	26.0	36.0	14.0	8.0
9 to 11	38.0	36.0	48.0	39.0
12	21.0	13.0	28.0	36.5
13 +	11.0	9.0	9.0	16.0
Parity				
First birth	38.9	34.2	45.9	46.9
Low parity	44.3	48.0	38.8	37.8
High parity	16.8	17.7	15.2	15.3
kotelchuck Index				
adequate	35.4	34.0	41.5	35.2
intermediate	10.8	11.2	9.9	10.4
inadequate	31.3	33.6	25.4	29.6
adequate plus	18.1	16.4	20.5	20.9
No-prenatal care	4.4	4.8	2.7	3.9
Received WIC				
Yes	74.7	69.2	84.8	82.8

Table 5. Ordered logit coefficients for birthweight in Thomason Sample, 1996-1997.

	Coefficients, (SE)			
	Model 1	Model 2	Model 3	Model 4
N	5029	5017	4944	4911
Mom born in USA	-0.21 **	-0.14 *	-0.10	-0.07
Mother is under age 20		-0.32 **	-0.20 *	-0.13
Mother is 35 and plus years old		-0.19 *	-0.19 *	-0.19
Mother is married		0.13 *	0.08	0.08
0 to 5 years of education		-0.27	-0.25	-0.26
6 to 8 years of education		-- --	-- --	-- --
Mother studied some high school (9-11)		-0.17 *	-0.19 **	-0.24 *
Mother completed high school (12)		-0.10	-0.10	-0.13
Mother studied college and more (13 +)		-0.22 *	-0.12	-0.16
Mother's first baby			-0.31 **	-0.31 **
Mother has lost a previous infant/pregnancy			-0.14	-0.04
Mother smoked during pregnancy			-0.17	-0.18
Mother drank during pregnancy			-0.12	-0.13
Adequate prenatal care				---
Intermediate prenatal care			0.002	0.05
Inadequate prenatal care			-0.27 **	-0.17 *
adequate plus prenatal care			-1.03 **	-0.57 **
No prenatal care			-0.98 **	-0.66 **
Mother had health problems during pregnancy			-0.03	-0.02
Gestation less than 32 weeks				-4.93 **
Gestation 32 - 36 weeks				-2.36 **
Gestation 37 + weeks				
If baby is male				0.50 **

*p< .05 **p<.001

Data: Thomason Survey

Table 6. Place of Birth and Education and Gestational Length

Gestational length	Educated in Mexico	Born and Mexico & Educated in US	Born & Educated in US	Total
<= 32	1.34	1.29	2.67	1.65
33-36	6.82	7	8.96	7.35
37-41	82.67	85.29	79.16	82.21
42 +	9.17	6.43	9.22	8.79

Table 7. Ordered logits for birthweight in Thomason Sample, 1996-1997

	Model 1		Model 2		Model 3		Model 4	
N	4963		4954		4881		4849	
Educated in Mexico	--		--		--		--	
Born in Mexico and educated in US	-0.12	0.079	-.06	0.082	-0.06	0.08	-0.08	0.09
Born and educated in US	-0.26**	0.064	-.18*	0.07	-0.15*	0.07	-0.11	0.07
Mother is under age 20			-.30**	0.076	-0.18*	0.08	-0.12	0.09
Mother is 35 and plus years old			-.18	0.095	-0.18	0.1	-0.174	0.10
Mother is married			.14*	0.057	0.08	0.06	0.0883	0.06
0 to 5 years of education			-.25	0.142	-0.22	0.14	-0.228	0.15
6 to 8 years of education			--	--	--	--	--	--
Mother studied some high school (9-11)			-.15*	0.07	-0.17*	0.07	-0.22*	0.07
Mother completed high school (12)			-.07	0.085	-0.06	0.09	-0.094	0.09
Mother studied college and more (13 +)			-.19	0.1	-0.086	0.1	-0.121	0.11
Mother's first baby					-0.32**	0.06	-0.32**	0.06
Mother has lost a previous child					-0.09	0.1	0.0085	0.11
Mother smoked during pregnancy					-0.182	0.12	-0.185	0.12
Mother drank during pregnancy					-0.087	0.18	-0.15	0.19
Adequate prenatal care					---	---	--- ---	---
Intermediate prenatal care					0.01	0.1	0.0573	0.1
Inadequate prenatal care					-0.27**	0.07	-0.18*	0.07
adequate plus prenatal care					-1.03**	0.08	-0.57**	0.08
No prenatal care					-0.99**	0.14	-0.67**	0.15
Mother had health problems during pregnancy					-0.04	0.06	-0.02	0.06
Gestation less than 32 weeks							-4.92**	0.4
Gestation 32 - 36 weeks							-2.38**	0.12
Gestation 37 to plus weeks							---	---
If baby is male							0.51**	0.06