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Un-partnered childbearing in Guatemala: Community and individual effects of ethnicity

Abstract

This study examines ethnic differences in the risk of pre-union sexual and reproductive events among Guatemalan women aged 14 to 50. Consistent with the argument that reproduction is more decoupled from union formation in Ladino communities, two-level discrete-time hazard models show that Ladina women have a significantly higher risk of experiencing both pre-union sexual debut and pre-union first childbirth than do indigenous women. However, the low risk among indigenous women is limited to those who reside in predominantly indigenous communities, and their residence in Ladino communities significantly increases the risk of experiencing these events. In contrast, Ladinas' risk is unaffected by the dominant ethnicity of communities. These results suggest that the uni-directional assimilation process from indigenous to Ladino extends to sexuality and reproduction. Furthermore, the hazard of both pre-union sexual initiation and childbearing among indigenous women in Ladino communities, which is even higher than that of Ladinas, invites an inference that their sexual partners are Ladino males, and their relationships have been characterized not only by gender inequality but also by the ethnic hierarchy in which indigenous women are assigned an inferior ethnic status. (187 words)

INTRODUCTION

While un-partnered childbearing and subsequent single motherhood have been historically common in Latin America, recent studies suggest that they have become even more prevalent over the past few decades (Ali, Cleland et al. 2003; Fussell and Palloni 2004). The high incidence of un-partnered childbearing seems ironic considering the Latin American inheritance of the patriarchal ethos from Spanish conquerors, which idealizes the father's role as a protector and provider, in addition to the strong and historical influence of Catholicism in the region, which censures nonmarital sexual relationships (Socolow 2000). The present research explores this well-known paradox of the Latin American patriarchy that "suffers from the absence of the father" (ENLAC 1991) through, first, reviewing the past literature on the unique gender systems in Guatemala and, second, empirically examining the role of ethnicity in women's reproduction and union formation.

Guatemala is a Central American country, whose population is equally divided into two ethnic groups: mestizos, or locally called "Ladinos," who are mixed race individuals between indigenous people and Spanish conquerors, and indigenous people, who are considered to be the descendents of pre-conquest natives and are alternatively called "Maya." Guatemala has one of the highest degrees of income inequalities in the world, in which ethnicity plays a significant role (Hall and Patrinos 2005). Ladinos dominate positions as commercial, cultural, and political intermediaries between indigenous people and the national society, and the indigenous people's poverty is ascribed and attributed to their cultural as well as biological inferiority (Nelson 1998; Casaus A 1999). One important correlate of this ethnic hierarchy is an uneven geographic distribution. During the colonial period, indigenous people were strategically relocated to rural areas, where they were forced to contribute their labor to the Spanish colonists on plantations

(Adams 1994). They are still isolated in rural and often remote areas, which severely disadvantages them in climbing the socioeconomic ladder. However, this geographic isolation, along with extremely high rates of community endogamy, has helped indigenous people to maintain their strong community ties, an ancestry-based identity, and cultural autonomy to the present.

This research first reviews the literature on the two distinct patriarchies in Guatemala: gender relations are profoundly characterized by machismo among Ladino communities while it has been traditionally argued that the indigenous households have maintained more egalitarian partnership and stronger paternal dyads (Maynard 1974). It particularly clarifies how Ladino patriarchy that prescribes responsible fatherhood and machismo that idealizes strength, virility, and sexual assertiveness as masculine traits together contribute to father absence in Ladino families. Based on the array of insightful ethnographic research, I hypothesize that Ladina women are more likely to have their first childbirth before union entry than are indigenous women. In testing this hypothesis, this study pays close attention to the role of the ethnic composition of communities in which women are embedded. Because of the importance of the geographic isolation that allowed indigenous people to maintain their distinctive gender relations, this hypothesized lower risk of un-partnered childbearing among indigenous women is expected to be limited to those who stay in their indigenous communities. Furthermore, guided by the theories of assimilation process among contemporary immigrants, the differential effects of living in a community as an ethnic minority between indigenous and Ladina women are explored in order to demonstrate the uni-directionality of assimilation from indigenous to Ladino.

The risk of un-partnered childbearing is examined in a multi-level discrete-time event history framework, which simultaneously estimates the effects of ethnicity measured at both

individual and community levels. The process of assimilation is explored through assessment of the cross-level interactions between an individual's ethnic identification and the ethnic composition of communities (for the application of a cross-level interaction in multi-level modeling in various disciplines, see Bryk and Raudenbush 1992; Diprete and Forristal 1994; Diez-Roux 2000). The data are drawn from a nationally representative sample of women from the 2002 Guatemalan National Survey of Maternal and Child Health (ENSMI), which was conducted in the style of the Reproductive Health Survey. To my knowledge, this research constitutes the first multivariate attempt to uncover the role of ethnicity in women's un-partnered childbearing and empirically test the cultural models of machismo in Latin America.

TWO TYPES OF PATRIARCHY

Latin American machismo originated in the gross gender inequality manifested by the conquerors' sexual exploitation of the local women during the Conquest. Ladinos, who are the products of such exploitation, suffer from an inferiority complex "based on the mentality of conquered" (Peñalosa 1968: 682), confusion (Liebman 1976), or "a limitless sexual deficit" (Wolf 1959: 238), which impels them to identify with and imitate their conquerors who sexually subordinated women (Hardin 2002). Machismo idealizes male superiority, liberty, and strength, and ultimately culminates in sexual forwardness, dominance, and even aggression toward women. Prestige is conferred upon men who are successful in the sexual pursuit of women, and such success is publicly displayed by fathering a child (Fuller 1997; De Vos 2000).

The pre-industrial Southern European idea of patriarchy was also brought by the conquerors and emphasizes a responsible economic provider's role (Peñalosa 1968; De Vos 1987; Bastos 1997). In quasi-subsistence agriculture which used to dominate the economy in the region, Ladino fathers were in fact the main breadwinners and managers of the family production

enterprises (Kaztman 1992). However, economic modernization led to mass migration from rural to urban sectors, subjecting urban migrants to precarious labor market situations. The high incidence of unemployment, which was further exacerbated by the 1980s economic crisis and the structural adjustment programs instituted by the governments, has left lower-class men without the means to fulfill the traditional, economic provider role (CEPAL 1995). Furthermore, urbanization and the expansion of mass media have together created aspirations for a higher standard of living, which many urban males are not able to achieve for their families. In addition, while men's economic activity has either declined or remained about the same, modernization has increased female labor force participation and cash acquisition, eroding the males' role as the sole breadwinners and further threatening their authority in their households and, ultimately, their male identities (Arias and Palloni 1999; Barker 2003). As a result, machismo has become an even more important means to construct and reconstruct their masculine identities, particularly for less resourceful Ladino men (Bastos 1997).

Nonetheless, the idea of machismo is by no means limited to lower-class men. It justifies casual sexual relations even among married men with stable jobs and incomes, who may support their wives and children. Contrary to the high sexual latitude for men regardless of their socioeconomic standings, however, class status significantly determines the context in which Ladina women experience their sexuality. Higher-class Ladina women are usually considered to be desirable candidates for legitimate wives as long as they maintain their virginity before union entry, and their sexuality is strictly controlled by their husbands after marriage. On the other hand, lower-class Ladina often fall victim to the promiscuity of men of all classes, are stigmatized as "prostitutes," and hardly attain life-long partners (Smith 1995). Concubinage between lower-class women and higher-class men is not uncommon in Guatemala because it

does not constitute a major sacrifice for these women. They cannot expect stable economic support or companionship from similarly lower-class men anyway, however, they can at least enjoy greater social and sexual freedom, which their higher-class counterparts never attain both before and after union entry (De Vos 1987).

The machismo among Ladinos has traditionally been contrasted with the indigenous culture where rather than being viewed as a means to prove maleness, women's reproduction is respected as a crucial mechanism by which the Mayan communities are culturally and biologically preserved over generations. Indigenous women are expected to avoid contact with Ladino men, enter into unions at an early age with men of the same community, bear children, and instill their community-specific Mayan values in these children (Smith 1995). Furthermore, the fathers' authority in the indigenous patriarchy is not necessarily legitimated by their breadwinning role but by their commitments to their families as well as to their communities, where they take on significant social and ceremonial roles (Wolf 1966). The economic responsibility to sustain the household is shared between husbands and wives in the indigenous households, and their economic partnership works to strengthen the union, rather than to undermine it (Nash 1970; Paul 1974; Bossen 1984; Cabrera Pérez-Armiñán 1992; Glitenberg 1994). Indisputably, these traditional models of gender dynamics in indigenous communities are affected by the increasing dominance of the modern market economy, international tourism, and the violence in the civil war, whose toll comprised of a disproportionately large number of indigenous people in Guatemala (Bossen 1984; Little 2000; Green 2008). However, the indigenous "responsible" patriarchy, which is not founded on the male breadwinning role, is more resistant to modernization and recent economic crisis, which might have weakened and destabilized the males' economic potentials (Bastos 1999).

Conceptual framework: Uni-directional assimilation

One important implication of these two distinct gender systems by ethnicity is that reproduction, particularly among lower-class women, might be more decoupled from union formation and family building in Ladino communities than in indigenous communities. This gives rise to the hypothesis that, holding constant their socioeconomic characteristics, Ladina women are more likely to be at higher risk of un-partnered childbearing than indigenous women. Considering the vital role that is played by the geographic isolation of the indigenous communities in maintaining their distinct gender roles and household economic organization, the expected low risk of un-partnered childbearing is limited to the indigenous women in indigenous communities.

Then, how does living outside their native indigenous communities affect indigenous women's risk of out-of-union fertility? The insights into the dynamics of the hierarchical structures of groups that define the assimilation process among the individuals can be drawn from the studies on the ethnically-diverse, predominantly nonwhite contemporary immigrants in the U.S. The majority of these recent immigrants faced a significant barrier to entry to the mainstream, which is contrasted with those of the European, white immigrants who arrived before World War I. The experiences of these immigrants can usefully be extended to guide the investigation of the role of ethnicity in fertility patterns (Landale and Hauan 1996). Closely drawing on the three types of assimilation discussed by Portes and Zhou (1993), this research explores the following alternative mechanisms by which indigenous women adapt or do not adapt the different sets of norms and behaviors regarding sexuality, fertility, and union formation after the exposure to Ladino cultures.

The first scenario parallels "assimilation into the white middle-class," in which the ethnic or racial origins of the immigrants do not constitute an obstacle in blending into the dominant

group. In this scenario, indigenous women as well as men in Ladino communities are incorporated into the Ladino gender systems, however, without their lower ethnic status at work in this process. Both Ladinos and indigenous men in Ladino communities expose indigenous women to a higher risk of casual sexual relationships in the same way that Ladino men increase such a risk for their Ladina mates. Therefore, the hazard of un-partnered childbearing among indigenous women should be comparable to that of Ladina women regardless of the ethnicity of their sexual partners. The second scenario takes into account the potential impact of ethnic hierarchical ordering on the nature of sexual relations between indigenous women and Ladino men. Due to their ethnic inferiority, indigenous women may be casual sexual partners, but are less desirable marriage partners for Ladino males, and Ladino men are less willing to bear paternal responsibilities for their children whose mothers are indigenous. Similarly due to their lower ethnic status, indigenous women may only be successful in attracting lower-class Ladino men, whose prospects for entry into a stable union are already minimal. Therefore, to the extent that the male partners of these indigenous women in Ladino communities are Ladino, they should be at even higher risk of out-of-union fertility than Ladina women. This scenario is analogous to "downward assimilation," by which immigrants are incorporated into a lower segment of the host community, which is, in the context of Ladino gender systems, a "prostitute" status. The last scenario, which is analogous to "deliberate preservation of the immigrant community's values and tight solidarity," assumes that immigrants are not assimilated into the host community. Indigenous women in Ladino communities maintain their cultural autonomy, and, following the norms of the communities of origin, they do not seek an intimate or any relationship with Ladino males. Thus, their risk of un-partnered childbearing remains as low as that for their counterparts in indigenous communities.

The lack of data on the characteristics of male partners has hampered past inquiries into the men's role in sexuality and reproduction (Jusid 1988; De Vos 2000; Greene and Biddlecom 2000). This study, through examination of these three scenarios, sheds significant light on the role of ethnicity in the way women experience their sexuality and reproductive events without the knowledge of men's ethnicity. As will be shown, evidence that the risk of un-partnered childbearing among indigenous women in Ladino communities is higher compared not only to their counterparts in Ladino communities but also to Ladina women is consistent with the argument that indigenous women are assimilated into Ladino gender systems in Ladino communities and the assimilation process is characterized by hierarchical ordering of the indigenous and Ladino groups. The significant difference among indigenous women in their risk of un-partnered childbearing by the dominant ethnicity of their communities of residence is contrasted to the insignificant effect of the ethnic composition of communities among Ladina women. This seems to suggest that the partners of Ladina women are always Ladinos regardless of the dominant ethnic group in their communities. There are two explanations, which are not mutually exclusive. First, due to their membership to the dominant ethnic group, Ladinas even in predominantly indigenous communities are less likely to actively seek any partnerships with indigenous men. Second, indigenous people's parochialism and strong preference for endogamy do not welcome Ladina women as potential sexual or union partners. However, the relative importance of these two scenarios for Ladina women cannot be determined by the data.

The present research examines how ethnicity measured at the individual and community levels interactively determines the timing of first birth in conjunction with the timing of union entry, using a multi-level framework in the survival analysis. In order to gain a complete picture of the interrelationship between reproduction and union formation, this study has three important

and unique extensions. First, in addition to un-partnered childbearing, pre-union sexual initiation and pre-union pregnancy are also examined as important steps toward single motherhood. Rather than assuming that the decisions regarding fertility and union entry are made once and for all at the time of childbirth, this study views sexuality, reproduction, and union formation as being dynamic and sequential and attempts to uncover ethnic differences in the patterns and timings of these events (Upchurch, Lillard et al. 2002). Second, union entries before and after childbearing are also investigated. The timing of union entry that is not preceded by childbearing determines the exposure time to the risk of reproduction outside of unions. Women who have not been successful in finding a stable partner may be particularly more likely to have un-partnered childbearing to form a family at a later age because family ties are culturally important and provide the primary safety net against social and financial instability (Berglund, Liljestrand et al. 1997). The analysis of union entry after having experienced un-partnered childbirth will shed light on the prospect of lifetime single motherhood. Lastly, unlike the past research of non-marital childbearing which is usually restricted to teenage girls, the present study investigates all women at the ages between 14 and 50 in order to assess the risk of un-partnered childbearing throughout their reproductive careers. The focus on adolescent single mothers in the past is partly due to their high obstetric risks (Conde-Agudelo, Belizan et al. 2005). However, since women at older ages are not necessarily immune to socioeconomic disadvantages and other underlying reproductive health risks of childbearing outside unions such as coerced sexual relations, unwanted pregnancy, and sexually transmitted diseases, their inclusion is warranted.

Finally, the present study considers several important community characteristics in addition to ethnic composition and examines the way in which the effects of structural characteristics of communities are moderated by an individual's ethnicity. For example, based on

the past literature on the difference in the way the two patriarchies react to the force of modernization, I expect that living in a modernized community, by reducing males' economic resources, delays Ladina women's union entry and increases their likelihood of sexual debut and reproduction not preceded by union entry while the indigenous women's prospect of union entry and the risk of pre-union sexuality and reproduction remain relatively unaffected. Using socioeconomic characteristics measured at the community level has significant advantages over those measured at the individual level, especially in a study that utilizes cross-sectional data such as the present research. Although retrospective reproductive history data are available, socioeconomic conditions of the respondents are usually recorded only at the time of the survey and may not accurately reflect these conditions when the reproductive events of interest occurred. Therefore, biased estimates may result due to reverse causality if these variables are measured at the individual level. On the other hand, the same variables measured at the aggregate level are much less problematic because they are substantially less likely to be determined by sexual and reproductive behaviors of individuals, albeit the causal relationship may still not be definite (Kravdal 2002). Several other important community-level socioeconomic characteristics considered in this study include the level of education, economic status, access to information through mass media, and residential stability, which are often available in the Reproductive Health Surveys and Demographic and Health Surveys.

DATA AND METHOD

The data for this study are drawn from the fourth version of the ENSMI, which has been conducted in the style of the Demographic and Health Survey since 1987 by the Ministry of Public Health and Social Assistance (MSPAS). It is a nationally representative sample of 9,155 women and 2,538 men, who were interviewed between April and November 2002. It utilized

multi-stage cluster sampling based on the census tracts constructed for the 1994 census, which define communities for the purpose of the present analyses. First, Guatemala was stratified into its 22 administrative departments; then, a subset of census clusters was randomly selected from each department to proportionally represent each of the seven regions (each of which consists of three to four departments). Thirty households were randomly selected from each census cluster; then, one female respondent of reproductive age was randomly selected from each household for the women's sample utilized for this study.[1] The final sample had a total of 373 census clusters and a response rate of 89% (MSPAS 2003). For this study, a total of 9,035 women who had information on ethnicity and complete sexual and birth history data were initially included in the analysis. Sampling weights were applied throughout the analysis to correct for the unequal selection of households within a cluster and of individuals within a household.

Modeling Strategy

I use two-level logistic regression analyses to estimate discrete-time hazard models. They assess the effects of both the individual- and community-level characteristics on the hazards of the following five events: first union entry not preceded by childbirth, pre-union first sexual intercourse, pre-union first pregnancy which led to a live birth, pre-union first live birth, and entry into a first union after childbearing. The analysis thus consists of five models. For this study, unions refer to both consensual and formal marital unions,[2] and entry into unions is

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[1] Although the same information on reproductive and union histories was available for men as it was for women, this study did not use the men's sample because the preliminary analyses showed that, not surprisingly, men reported substantially fewer cases of impregnation and resulting births prior to union entry than did women and would not yield any sensible analysis.

[2] Consensual union is a common alternative to marriage in Latin America De Vos, S. (1987). "Latin-American households in comparative perspective." Population Studies **41**(3): 501-517.. About 33% of all current unions were reported to be consensual rather than marital. Although it would be of much interest to take into account the differences in prestige and stability between these two types of unions Yaukey, D. and T. Thorsen (1972). "Differential Female Age at First Marriage in 6 Latin-American Cities." Journal of Marriage and the Family **34**(2): 375-379, Goldman, N. (1981). "Dissolution of first unions in Colombia, Panama and Peru." Demography **18**: 659-680, Goldman, N. and A. R. Pebley (1981). "Legalization of Consensual Unions in Latin-America." Social Biology

considered to take place at the onset of cohabitation. All events of interest are examined in competing risks frameworks except union entry after childbearing. The first model examines the propensity for union entry with pre-union childbearing as a competing risk (Landale and Hauan 1996). The subsequent three models treat union entry as their competing risk, test the hypothesis regarding the ethnic differences in the risk of pre-union sexual initiation, first pregnancy, and first birth, and explore the three scenarios regarding the assimilation process through examination of the interactive effects of ethnicity measured at the individual and community levels.

This series of events is explicitly treated as sequential as shown in Figure 1. All women are at risk of either pre-union sexual initiation or first union entry not preceded by sexual debut. Therefore, the first (denoted as 1 in the diagram) and second (denoted as 2) models both use the full sample of women. The third model only uses a sub-sample consisting of women who had pre-union sexual intercourse. The fourth model uses a further reduced sample of women who experienced pre-union pregnancy. Lastly, the likelihood of post-childbirth union entry is examined for those who had their first live births outside of unions. For the second through fourth models, the competing risk is union entry as denoted by the dotted lines. Through comparisons of these sequential models, stages at which ethnic differences emerge will be identified.

Data are structured into person-year records for each of these five models. The dependent variables are dichotomous indicators of whether or not first union entry, first sexual intercourse, first pregnancy, or first birth occurred in the interval between any two years, respectively. The risk for each event is assumed to start for all women at the youngest age at which the event

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28(1-2): 49-61., the distinction is not made in the present study because only the union type at the time of the survey is available, and union status when couples initiated cohabitation is unknown from the data.

actually occurred in the sample, except for union entry after childbearing, whose risk starts in the year when their own first births took place. For this last model, women's age is added as a time-varying covariate. In order to establish whether sexual and reproductive events occurred within the context of unions, the chronological order of the two competing events is determined by comparing the months and years during which each event took place. When they occurred in the same month and year, union entry is assumed to precede the reproductive event. Two usual analytic approaches to competing risks are either to use multi-response models that assume the independence of competing risks or to censor respondents who experience either one of the competing events. Since the independence of risks is highly suspect, the latter approach is used throughout the present analysis. In the first model, after the year in which a single woman gives birth to her first child, she is censored from the data because she is no longer at risk of union entry that is not preceded by childbearing. For the second through fourth models, after the year in which a woman enters into a union, she is censored because she is no longer at risk of pre-union first sexual or reproductive events.

There are three important issues to note in interpreting the results. First, information on spontaneous or induced abortions and stillbirths is not available in the data (although due to the official ban in Guatemala, induced abortions in particular are likely to be underreported had the respondents been asked about such abortions in the survey). Therefore, only pregnancies that led to live births are investigated in the present study. Although no official statistics on abortions and stillbirths are available, recent studies estimate the annual induced abortion rate to be 24 per 1,000 women aged 15 to 49 in Guatemala (Singh, Prada et al. 2006), a figure close to the Latin American average of 31 per 1,000 women aged 15 to 49 (Sedgh, Hensaw et al. 2007), and report that a typical woman who seeks abortion is non-indigenous, younger than 20, and from urban

areas (Prada, Kestler et al. 2005). The latter finding suggests that the effects of these characteristics on pre-union pregnancy and childbearing might be particularly underestimated in the present research.

Second, current union status might be misreported. Women with children who have never been in a union or are in "visiting unions" in which they have some regular sexual relations but do not live in the same households with their partners or concubines with children might prefer reporting, inaccurately, being or having been in consensual or marital unions because of the stigma attached to childbearing outside of these two types of unions (Werthemer 2006). Therefore, the incidences of pre-union sexuality and fertility are likely to be more prevalent than the present study can uncover. Moreover, because pre-union sexual relations and un-partnered childbirths are more highly stigmatized within Ladino than within indigenous cultures (Bossen 1984), it is likely to be Ladina women whose sexual and reproductive events are underestimated.

The last issue is the lack of information on family background such as respondents' mother's experience of pre-union childbearing and their educational attainment, which are often considered to be important determinants of women's pre-union sexual and reproductive behaviors. To the extent that these mothers' characteristics are correlated to respondents' schooling, the effect of the latter might be overestimated.

Explanatory Variables

Individual characteristics

In order to adequately estimate the effects of ethnicity,[3] several individual and community characteristics are controlled. The most important individual-level control is educational attainment. In addition to its generally negative effects on fertility (Kravdal 2002)

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[3] The ethnicity in the 2002 ENSMI was determined by the interviewers. This could have underestimated the number of indigenous women because those who wore Western clothing and spoke Spanish, yet considered themselves to be indigenous, could have been reported as Ladinas in the survey.

and on premarital childbearing among adolescents in particular (Gupta and Leite 1999; Heaton, Forste et al. 2002; Upchurch, Lillard et al. 2002; Gupta and Mahy 2003), educational attainment serves as a proxy for socioeconomic status. A higher socioeconomic status is in turn closely related to a higher likelihood of union entry not preceded by childbearing and a lower risk of sexual and reproductive events outside of unions, particularly among Ladinas because stable unions, especially legal marriages, are the privilege of upper-class Ladina women (who maintained their virginity). Ladinos' strong preference for class endogamy and weakened economic potential among lower-class men in contemporary Guatemala together imply that the prospect of union entry not preceded by childbearing is severely undermined among lower-class Ladina women while their risk of un-partnered childbearing is increased. Educational attainment is ideally measured as a time-varying variable in hazard models because of the possible reverse causality: women may leave school due to early union entry or pregnancy, resulting in their low educational attainment (Gupta and Leite 1999; Ali, Cleland et al. 2003; Manda and Meyer 2005). In the absence of information on school enrollment history, I limit educational attainment to three categories with the highest threshold set low as a remedy: no school, some elementary school, and elementary school graduate or above. Students generally graduate from elementary school at the age of 12, and union formation or reproduction occurs after this age.[4]

Current school enrollment is created as a time-varying variable based on the information on the age at which the respondents report having left school, assuming that they have continuously attended school up to that age. Current school enrollment is expected to have negative effects particularly on pre-union pregnancy as well as union entry not preceded by

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[4] Approximately 1 % of women included in the model for pre-union pregnancy reported having left elementary school due to either union entry or pregnancy. The results of sensitivity analyses showed virtually no change in coefficients or standard errors before and after the inclusion of these women, suggesting no serious bias due to reverse causality. Therefore, I retained these cases in the final analyses.

childbearing because family formation is often incompatible with school work. This variable is included in the analyses of union entry not preceded by childbearing and pre-union sexual debut and pregnancy, but not pre-union childbearing, which should have inevitably interrupted school attendance.

Another individual variable is religion. Catholics and (mostly evangelical) Protestants are measured as dichotomous indicators, for which women who identify themselves as being either Catholic or Protestant and participate in its activities at least once a year are respectively coded 1 and 0 otherwise. Catholic Church affiliation, in particular, is expected to have negative effects on pre-union sexual and reproductive risks because of its strong condemnation of any sexual relationships outside of the context of marriage as well as of the use of family planning methods (Replogle 2005; Shiffman 2005).

Community characteristics

In addition to the proportion of indigenous people and the proportion of people involved in non-agricultural economic activities, I construct several other measures of socioeconomic status of communities. To explore the potentially positive effects of a higher level of educational attainment at the community level in addition to individuals' levels of schooling, I use the proportion of women who completed at least elementary school. The presence of educated women in a community might lead to the wider contraceptive prevalence, reducing unwanted, pre-union pregnancy even among less-educated women, who learn about family planning methods from their well-educated neighbors.

A continuous measure of economic status of communities is also tested. A higher level of economic status suggests a larger fraction of affluent neighbors in the community, who may serve as role models for economic success as well as increase collective social control,

discouraging others from becoming single mothers. In the absence of household income in the ENSMI 2002, a proxy index for household economic status is created based on asset ownership and characteristics and quality of housing. The assets that are considered include laundry machines, cars, and other items that are likely to represent the household's economic standing. Housing characteristics include the type of toilet facilities and availability of electricity. Housing quality is evaluated using three levels ranging from low to high for the main materials that make up the walls, roofs, and floors, respectively (Arias and De Vos 1996). I use principle-components analysis (Filmer and Pritchett 2001) to determine the weights for each of these items, characteristics, or levels. The sums of the weighted scores are rescaled to range from 0 to 1; then the average score is assigned to each community. In a developing country like Guatemala, this proxy can represent long-term accumulation of wealth conducive to general economic well-being better than income because of a large proportion of informal employment and unstable remittances from both internal and external migrants.

The proportion of households with television sets is included to capture the potential influence of mass media. There are two possible mechanisms by which mass media increases the risks of pre-union reproduction. First, the portrayal of a higher standard of living particularly in foreign television programs raises expectations about male partners' earning potential, thereby delaying union entry, which in turn prolongs women's exposure time to the risks of pre-union sexual initiation and fertility. Second, Western ideas about affectionate heterosexual relationships outside the context of unions transmitted through these television programs can especially influence adolescents who are most susceptible to new, global culture, potentially increasing pre-union sexual relationships and childbearing (Caldwell, Caldwell et al. 1998). Lastly, ownership of housing is designed to capture a degree of residential stability in

communities. A high degree of population turnover may indicate a lack of community ties, which in turn reduces the social cost of non-marital sexual relations and un-partnered childbearing (Browning, Leventhal et al. 2004). Furthermore, migration can place women in a new environment where they have to begin a new search for a union partner (Lindstrom 2003), delaying their union entry.

Analytic Strategy

The five models are estimated using two-level discrete-time logistic regression with random intercepts. Random coefficients for ethnicity are also included when significant cross-level interactions are present. The logit of the hazard of having an event at time t can be expressed as:

$$\ln(h_{ijt}/1\text{-}h_{ijt}) = \alpha_{j0} + \alpha_1(CRAGE_{ijt}) + \alpha_n(CRAGE^n_{ijt}) + \beta_{j1}(INDIGENOUS)_{ij} + \beta_p X_{pij} \qquad (1)$$

$$\alpha_{j0} = \gamma_{00} + \gamma_{01} Z_{qj} + \sigma_{j0} \qquad (2)$$

$$\beta_{j1} = \gamma_{10} + \gamma_{11} Z_{qj} + \sigma_{j1} \qquad (3)$$

where h_{ijt} is the hazard of an event of interest for person i in community j at risk age t, α_{j0} is the intercept, *CRAGE* represents a continuous variable for risk age, *CRAGE^n* is its squared and higher polynomial terms, *INDIGENOUS* is an individual's ethnicity as measured by being indigenous (versus Ladina), and X_{pij} is individual covariates X_p for person i in community j. *CRAGE^n* are included in each model as long as they maintain significant additional explanatory power at a p<.05 level as assessed by log likelihood tests; thus, α_1 and α_2 through α_n jointly give the shape of the baseline logit hazard curve. The first equation may contain interactions between an individual's ethnicity and *CRAGE, CRAGE^n*, and other person-level characteristics X_p, again as long as their coefficient estimates are statistically significant. Intercept, α_{j0}, is random and is

determined by community characteristics Z_q for community j. Similarly, the coefficient for

INDIGENOUS, β_{j1}, is determined by community characteristics Z_q for community j. The average

effect of *INDIGENOUS* across communities is expressed by γ_{10} and the coefficients γ_{11} represent

cross-level interactions between *INDIGENOUS* and Z_{pj}. However, only Z_q in equation (3) that

are statistically significant are retained in the final model. Therefore, if none of the community

variables is significant in the preliminary analysis, no random effects are introduced for

INDIGENOUS, reducing it to a random intercept model. The error terms, σ_{j0}, and σ_{j1} if included,

are assumed to be normally distributed. All the models were estimated using M-plus version 4.21

(Muthén and Muthén 2006).

RESULTS

To first gain a basic understanding of how indigenous and Ladina women differ in the

key characteristics, their descriptive statistics are briefly summarized by ethnicity. Table 1 shows

that indigenous women are significantly less educated and are less likely to be enrolled in school

than Ladinas. The large ethnic differences in the proportion of indigenous residents and in the

measure of modernization at the community level together suggest that the indigenous people are

geographically concentrated in agricultural communities. In addition, indigenous women are

significantly more likely to live in a community with lower educational and economic statuses as

well as a lower proportion of ownership of television sets. The proportion of households owned

by the residents is higher for the indigenous group, suggesting their lack of geographical

mobility compared to Ladinas.[5]

Table 2 presents the results of bivariate analyses for the three sexual and reproductive

events by union status and ethnicity. Approximately 17% of indigenous women were single

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[5] This may be somewhat surprising considering their lower socioeconomic status; however, hosing ownership does not necessarily reflect a high socioeconomic standing in Guatemala, and indigenous people's typical housing is more humble than that of Ladinas.

when they had their first sexual intercourse as compared to 30% of Ladina women. This difference is statistically significant. Pregnancy and childbearing show similar patterns: indigenous women are more likely to be in unions at the time when each of these reproductive events occurred than Ladinas. However, when sub-samples of women who had their first sexual experiences and those who became pregnant are respectively considered, the occurrence of un-partnered reproduction does not seem to differ by ethnicity: regardless of ethnicity, approximately 60% of all already sexually experienced women became pregnant prior to union entry while 45% of all pregnant women remained single till childbirth. These results suggest that the ethnic difference lies in the differential risk of sexual initiation before union entry.

Finally, I turn to the results of multivariate analyses focusing on how ethnicity measured at both the individual and community levels interactively determines women's risks of union entry and pre-union sexual and reproductive events while other individual and community characteristics are controlled for. The coefficient estimates are shown in Table 3[6]. A series of graphs of hazard functions across risk age are presented to better demonstrate the effects of individuals' ethnic identification and, if the cross-level interaction is present, the ethnic composition of communities. In the absence of the interaction, the graphs illustrate the differences between two individuals, indigenous and Ladina women, who are assumed to possess typical characteristics of the entire sample by setting other explanatory variables at their respective means (including categorical variables). Four types of individuals are presented when

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[6] The interpretation of the coefficients needs some caution when interactions are included in the model. For example, according to the coefficient estimates for union entry presented in the first column of Table 3, being indigenous has a negative effect on union entry although such an effect is not statistically significant. However, the presence of the significant interactions involving ethnicity requires that all main effects and interactions should be interpreted jointly. For this model, the interactions between ethnicity and risk age and between ethnicity and the proportion in the non-agricultural sector suggest that the negative effect of being indigenous solely pertains to an indigenous woman at the age of 11, who lives in a community whose economy is entirely based on agriculture. The significant interaction between ethnicity and risk age also suggests that the timing of union entry between indigenous and Ladina women is significantly different, which can be well illustrated in a graph.

the ethnic composition of communities differentially affects the hazard by an individual's ethnic identification in a statistically significant manner. They represent a typical indigenous woman in a predominantly indigenous community, an indigenous woman in a predominantly Ladino community, a Ladina woman in a predominantly indigenous community, and a Ladina woman in a predominantly Ladino community. A predominantly indigenous community is defined as a community with 95% indigenous residents and a predominantly Ladino community is defined as a community where only 5% of the residents are indigenous. These percentage points are set to reflect the range of the proportions of indigenous residents that are actually observed for both indigenous and Ladina women in the sample. However, in order to assess the sensitivity of the results by the definitions of communities' ethnicity, I also present the predicted hazard for an indigenous woman in a Ladino community, which is more conservatively defined as 90% of residents being Ladino. To clarify, the hazard at risk age t is the probability of experiencing the event of interest at age t, conditional on having experienced neither the event of interest nor the competing event by age $t-1$.

First, the timing and patterns of union entry not preceded by childbearing are examined to assess the exposure time to pre-union sexual activity and fertility. Figure 2 shows that the hazard of union formation is very similar for both ethnic groups up to the age of 19, after which the hazard becomes clearly higher among Ladinas than among indigenous women into early 30s. The peaks of the hazard are at slightly earlier ages among indigenous than among Ladina women. The low hazard of union entry throughout the 20s and 30s indicate that indigenous women are more likely to spend these reproductive years as single, potentially exposing themselves to a higher risk of pre-union sexual and reproductive events than Ladina women.

Finally, I test the hypothesis that Ladina women are at higher risk of pre-union sexual and reproductive events than indigenous women and identify the scenario that best explains the assimilation process as it relates to these events. Figure 3 highlights the significant interactive effect of the proportion of indigenous residents and individual ethnicity on the hazard of pre-union sexual initiation. In the absence of significant interactions between ethnicity and risk age, which are thus not included in the final model, the timing of the hazard of sexual debut outside of unions does not differ by ethnicity in the figure. An indigenous woman who lives in an indigenous community has a hazard of slightly over 0.06 at its peak, which is lower than Ladinas in both indigenous and Ladino communities, clearing supporting my hypothesis. The hazard of her counterpart in a Ladino community almost doubles and reaches 0.12 at its peak. This hazard (and the hazard for an indigenous woman in a more conservatively defined Ladino community) is even higher than Ladina women in both types of communities, lending support to the second scenario. The difference in Ladinas' hazards by the ethnicity of the dominant group in the community is relatively very small and not statistically significant as shown in Table 3[7], indicating the absence of assimilation from Ladina to indigenous.

Now I limit the sample to single women who have already experienced sexual debut outside of unions to assess their hazard of pregnancy before union entry. The absence of a significant interaction between individual and community ethnicity in the model suggests that the ethnic composition of communities does not seem to play a major role in determining the risk of pre-union pregnancy conditional on pre-union sexual debut. Therefore, Figure 4 contrasts two indigenous and Ladina women with otherwise the same individual and community characteristics. The hazard of pre-union pregnancy constantly increases and peaks at around age

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[7] In the presence of the interaction between an individual's ethnicity and the proportion of indigenous residents, the coefficient for the proportion of indigenous people pertains to Ladina women.

25, then constantly decreases for both indigenous and Ladina women. Indigenous women appear to be at a slightly lower risk of pregnancy than Ladinas across all risk ages, with a hazard of slightly less than 0.35 at its peak, while it is close to 0.4 for a Ladina. However, this difference, as represented by the coefficient for being indigenous in the third column of Table 3, is not statistically significant as shown in Table 3.[8]

Subsequently, the sub-sample of women who became pregnant before union entry is analyzed and their propensity to remain single until their first births is assessed. Figure 5 illustrates the significant cross-level interaction between the individual and aggregate ethnicity presented in the fourth column of Table 3. The hazard of childbearing before union entry for an indigenous woman in an indigenous community is between 0.04 and 0.05 at its peak around the ages of 23 and 24, and consistent with my hypothesis, it is substantially lower than Ladinas in both types of communities. The risk of her counterpart in a Ladino community almost triples, reaching a hazard between 0.12 and 0.13. Consistent with the second scenario, this hazard is even higher than that of Ladinas whose peaks are at around 0.09. Similarly to the pattern with the risk of pre-union sexual initiation, the difference between Ladinas in two communities is small and insignificant as shown in Table 3.

The last event of interest is entry into unions after having experienced pre-union childbearing; therefore, a subset of single mothers is analyzed. The positive but insignificant effect of being indigenous shown in the fifth column in Table 3 suggests that once a woman fails to enter into a union before bearing a child, her chance of entering into a union is no longer significantly affected by ethnicity. The only significant determinant is not the years that elapsed

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[8] The coefficient for individual ethnicity can be interpreted more straightforwardly because of the absence of interactions.

since the childbirth but age. Its negative effect suggests that the older the mother is, the lower the likelihood that she is to enter into a union.

DISCUSSION

The bivariate results suggest that the ethnic difference in risk emerges only for pre-union sexual initiation and that the hazards of pregnancy and childbearing outside of unions are comparable between indigenous and Ladina groups when sexually experienced women and pregnant women are considered respectively. However, the multivariate analyses demonstrate that the ethnic compositions of communities and an individual's ethnic identification interactively determine women's pre-union fertility beyond sexual debut, uncovering the unique role of ethnicity in reproduction in Guatemala. It is demonstrated that despite Ladina women's generally higher risk of union entry not preceded by childbearing than indigenous women, Ladina women have a higher risk of experiencing pre-union sexual debut and childbearing outside of unions than indigenous women in predominantly indigenous communities, lending support to the argument that Ladina women's sexuality and reproduction are more likely to be decoupled from union formation. The results further demonstrate that indigenous women in Ladino communities have a higher risk of experiencing these events than their counterparts in indigenous communities, suggesting that these indigenous women are subject to assimilation to Ladino gender systems rather than being able to maintain their autonomy in Ladino communities. Furthermore, the hazard of pre-union sexual initiation and un-partnered childbearing for indigenous women in Ladino communities that is even higher than that for Ladina women in both types of communities suggests that their sexual partners may have been Ladinos, and their sexual relations were characterized not only by gender inequality but also by the ethnic hierarchy.

Their relations may have taken a form of concubinage and even rape[9]. This pattern most closely parallels "downward assimilation," in which an indigenous minority not only loses protection and supervision of their native communities, but also becomes incorporated into the "prostitute" status in Ladino gender systems. Lastly, the effects of the proportion of indigenous people in communities on the risk of pre-union sexual initiation and childbearing are small and insignificant among Ladinas, pointing to the uni-directionality of the assimilation process in Guatemala.

Being indigenous has neither an interactive effect with the ethnic composition of communities, nor independent and negative effect on pre-union pregnancy. These results are not surprising because the risk of pregnancy among an already sexually experienced group of women is also a function of contraceptive use and its efficacy and frequency of sexual intercourse. The potentially positive effect of living in Ladino communities on pre-union pregnancy among indigenous women due to the increased frequency of sexual intercourse might be offset by their increased use of contraceptives, which are more common among Ladinos (Santiso-Galvez and Bertrand 2004), as a result of the same assimilation process (Lindstrom and Munoz-Franco 2005). Nonetheless, the evidence of indigenous women's risk of pregnancy that is comparable to that for Ladinas despite indigenous women's overall lower use of

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[9] The extremely high risk of pre-union sexuality and childbearing among indigenous women in Ladino communities might raise questions concerning the characteristics of these women, particularly whether or not they are sex workers. The auxiliary analysis showed that approximately 29% of indigenous women in communities where at least 95% of the residents were Ladinos were not working, 17% were students, other 17% were domestic servants, 14% were ambulatory vendors of comestibles, and 7% were cooks or waitresses. The last category includes waitresses who serve alcoholic beverages in a bar, and such an occupation often involves sexual relations based on monetary compensation in Guatemala. Thus, a small proportion of indigenous women who live in predominantly Ladino communities may indeed be sex workers.

[11] The auxiliary analysis indicates that 6% of indigenous women reported using modern contraceptives at the first sexual intercourse that occurred outside of unions while 28% of their Ladina counterparts did so (7% versus 34% for any contraceptives, which includes rhythms and coitus interruptus in addition to modern methods). This suggests that sexual activities outside of unions are likely to be directly related to the hazard of pregnancy particularly for indigenous women.

contraceptives[11] invites two explanations. First, their sexual initiation are more likely to take place with partners with whom they intend to form unions within a period of time that is short enough for pregnancy not to precede union entry. Alternatively, indigenous women may have casual sexual relations less frequently than Ladina women. On the other hand, Ladinas are more likely to be, or more frequently, involved in sexual activities without the prospect of entering into a union with their sexual partners.

Other findings are briefly summarized focusing on the variables included in the first through fourth models. Not surprisingly, education in terms of both achievement and current school enrollment consistently depresses the hazards of sexual debut, pregnancy, and childbearing before union entry while delaying union entry not preceded by childbearing for both ethnic groups.[12] Being Catholic delays union entry and consistently protects both indigenous and Ladina women against all pre-union sexual and reproductive events as expected, although a significantly negative effect is only found for union entry not preceded by childbearing and pre-union sexual debut. Being Protestant has weaker and inconsistent effects; however, similarly to the effect of Catholicism, it has a significantly negative effect on pre-union sexual initiation.

The proportion of residents in the non-agricultural sector has large and significant interactive effects by ethnicity on union entry not preceded by childbearing, pre-union sexual initiation, and pre-union childbearing. The results demonstrate that modernization significantly delays indigenous women's entry into unions, nonetheless without increasing their risk of pre-union sexual and reproductive events, suggesting the robustness of their "responsible" patriarchy. On the other hand, modernization increases Ladina women's risk of pre-union sexual and

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[12] Consistently positive effects of interactions between the indigenous identity and educational attainment in the preliminary analyses (results not shown) suggested that the protective effects of educational attainment against pre-sexual and reproductive events are stronger for Ladinas than for indigenous women as expected; however, the lack of statistical significance resulted in the omission of these interactions from the final models.

reproductive events as expected, however without decreasing union entry not preceded by childbearing. This is partially consistent with the argument that rapid modernization and concomitant economic instability more negatively affect Ladino patriarchy and encourage the males' manifestation of machismo. The lack of the expected negative effect of living in modern communities on union entry among Ladinas might be explained by the way union entry is measured in this study, however. It is defined as the onset of cohabitation, and unions include both consensual and marital ones, which are different in stability. Ladino men and women in modern communities may enter into unions as early and frequently as their counterparts in agricultural communities; however, their unions may be much less stable and short-lived, or "fragile."

The proportion of women with elementary school completion does not seem to have additional negative effects, suggesting that the effect of education is solely operative at the individual level. A higher economic status of communities expectedly and significantly decreases both pre-union pregnancy and childbearing; however, the negative effect is not significant for pre-union sexual initiation. The argument that the mass media raises the expected standard of living, thereby elevating the economic hurdle to union entry is supported by the negative effect of access to television programs on union entry not preceded by childbearing. In addition, its positive effect on pre-union childbearing is also consistent with the claim that the exposure to the romanticized idea of Western "liberal" heterosexual relationships through the mass media increases pre-union fertility. Housing ownership at the community level has significantly negative effects on union entry not preceded by childbearing and pre-union sexuality and childbearing. This suggests that communities with a higher degree of residential

stability are more likely to maintain solidarity among their members, discouraging sexual and reproductive activities outside of unions, however, without encouraging their early union entry.

CONCLUSION

In addition to the several issues discussed in the data and method section, it is important to acknowledge another important limitation. Although this study identified a significantly positive association between living in a Ladino community and the hazard of experiencing sexual debut and childbearing prior to union entry among indigenous women, its ability to establish causality is limited due to a potential selection bias. A portion of this high association could be attributable to the selective and unobserved characteristics of these women, which prompted them to migrate to Ladino communities in the first place. Furthermore, whether or not the move to a Ladino community preceded pre-union sexual and reproductive events is unknown from the data. It can be argued that indigenous women who have already experienced these events outside unions might be more motivated to migrate from their native indigenous to Ladino communities for the potential stigma attached to un-partnered childbirth. However, ethnographic literature suggests that indigenous women's past sexual experiences or failure in previous partnerships neither results in a loss of the support from their communities nor undermines their chances of entry into a new union as long as their partners are also indigenous or, even if the males were Ladinos, their sexual relations were not voluntary (Smith 1995). This suggest that the pre-union sexual and reproductive events are unlikely to promote women's emigration to other, particularly, Ladino communities. Future work that incorporates the role of migration (Lindstrom 2003; Lindstrom and Munoz-Franco 2005; Lindstrom and Hernandez 2006) will be particularly promising in providing more insights into the interrelationship between ethnicity and fertility and addressing this selection bias.

However, substantially lower hazard of pre-union sexual initiation and un-partnered childbearing for indigenous women in indigenous communities compared to that for Ladina women lends solid support to the argument that ethnicity plays an important role in women's reproductive careers. Furthermore, the significant difference in the risk by the ethnic composition of communities among indigenous women is contrasted to the lack of the effects of being an ethnic minority among Ladina women, clearly demonstrating the uni-directionality of the assimilation process that extends to the ways in which women experience their sexuality, reproduction, and union formation in Guatemala. The evidence that the risk of pre-union sexual initiation and un-partnered childbearing among indigenous women in Ladino communities is higher than that of Ladina women in both types of communities is most consistent with "downward assimilation," in which an indigenous minority is likely to be assigned the "prostitute" status in Ladino gender systems, whose prospect of entry into stable unions is low. In addition to the inferior ethnic status, un-partnered childbearing among these indigenous women is likely to further hamper their future socioeconomic achievement, while transmitting such disadvantages to these fatherless children. This study constitutes an important step toward our better understanding of the interrelationships between ethnicity and women's reproduction as implicated by the two distinct gender relations between indigenous and Ladino communities. Further studies should test the generalizability of the results to other Latin American nations.

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Table 1. Summary Statistics for Explanatory Variables by Ethnicity (N=9,035)

	Indigenous	Ladina	Full Sample
Explanatory variables			
Individual characteristics			
Current age**	28.0 (0.228)	28.9 (0.177)	28.6 (0.143)
Educational attainment***			
No school	0.492	0.161	0.262
Some elementary school	0.333	0.282	0.297
Elementary school graduates and above	0.175	0.557	0.441
Currently enrolled in school***	0.072	0.182	0.149
Religion			
Catholic	0.522	0.486	0.497
Protestant	0.356	0.348	0.351
Community characteristics			
Proportion indigenous***	0.810 (0.018)	0.084 (0.006)	0.306 (0.020)
Proportion in non-agricultural sector***	0.467 (0.023)	0.702 (0.025)	0.630 (0.022)
Proportion with education 6+***	0.218 (0.018)	0.530 (0.023)	0.435 (0.022)
Average economic status***	0.264 (0.012)	0.514 (0.018)	0.438 (0.017)
Proportion household with TV sets***	0.445 (0.024)	0.767 (0.019)	0.669 (0.019)
Proportion household owned by residents***	0.884 (0.009)	0.747 (0.015)	0.789 (0.013)
Number of respondents (proportion)	3,767 (0.305)	5,268 (0.695)	9,035 (1.000)

Note: Standard errors are in parentheses, unless otherwise noted. Means, proportions, and standard errors are weighted. The numbers of respondents are not weighted.
The difference between Indigenous and Ladina samples is statistically significant, respectively, at *p<.05; **p<.01; ***p<.001.

Table 2. Proportion Not in Union at Sexual Initiation, First Pregnancy and First Childbirth by Ethnicity

	Indigenous	Ladina	Full Sample
Sexual initiation***	0.173	0.294	0.260
Any first pregnancy***	0.220	0.316	0.286
Any first childbirth***	0.086	0.132	0.118
First pregnancy, conditional on sexual initiation outside of a union	0.598	0.600	0.599
First childbirth, conditional on first pregnancy outside of a union	0.445	0.447	0.447

Note: Proportions are weighted.
The difference between Indigenous and Ladina samples is statistically significant at ***p<.001.

Table 3. Two-Level Discrete-Time Logit Models of First Union Entry Not Preceded by Childbirth, Pre-Union Sexual Initiation, Pre-Union First Pregnancy, Pre-Union First Childbirth, and First Union Entry After Childbirth

Explanatory variables	(1) First union entry not preceded by childbirth	(2) Pre-union sexual initiation	(3) Pre-union first pregnancy	(4) Pre-union first childbirth	(5) First union entry after childbirth
Individual characteristics					
Indigenous (Ladina omitted)	-1.471 (0.770)	0.647*** (0.216)	-0.108 (0.131)	0.978* (0.416)	0.027 (0.200)
Risk age [1]	1.216*** (0.044)	3.272*** (0.160)	0.916*** (0.061)	0.982*** (0.071)	0.033 (0.063)
Interaction with indigenous	0.225* (0.088)				
Risk age^2	-0.028*** (0.001)	-0.136*** (0.008)	-0.019*** (0.002)	-0.021*** (0.002)	-0.005 (0.005)
Interaction with indigenous	-0.007** (0.002)				
Risk age^3		0.002*** (0.000)			
Age (time-varying)					-0.103*** (0.016)
Educational attainment (0 years omitted)					
1-5	-0.852*** (0.063)	-0.375*** (0.088)	-0.386** (0.132)	-0.468*** (0.126)	-0.000 (0.135)
6+	-1.295*** (0.062)	-0.726*** (0.090)	-0.426*** (0.122)	-1.445*** (0.156)	0.270 (0.164)
Currently enrolled in school	-0.822*** (0.051)	-0.394*** (0.068)	-0.416*** (0.094)		
Catholic	-0.144* (0.057)	-0.263*** (0.075)	-0.047 (0.103)	-0.111 (0.128)	-0.168 (0.149)
Protestant	0.013 (0.055)	-0.191* (0.078)	0.107 (0.114)	0.110 (0.128)	0.103 (0.148)
Community characteristics					
Proportion indigenous	-0.086 (0.092)	-0.106 (0.172)	-0.067 (0.173)	-0.077 (0.289)	-0.279 (0.259)
Interaction with indigenous		-0.673** (0.252)		-1.154* (0.441)	
Proportion in non-agricultural sector	0.130 (0.121)	0.769*** (0.207)	0.357 (0.223)	0.584* (0.297)	-0.051 (0.289)

Interaction with indigenous	-0.516***	-1.015***		-1.323***	
	(0.139)	(0.206)		(0.377)	
Proportion with education 6+	-0.170*	0.045	0.007	0.703	-0.717
	(0.172)	(0.290)	(0.335)	(0.487)	(0.474)
Average economic status	-0.424	-0.420	-1.067*	-2.392***	0.784
	(0.234)	(0.407)	(0.476)	(0.630)	(0.679)
Proportion household with TV sets	-0.282	-0.174	-0.229	0.722*	-0.592
	(0.130)	(0.193)	(0.238)	(0.295)	(0.365)
Proportion housing owned by residents	-0.379*	-0.745***	-0.071	-0.710*	0.387
	(0.142)	(0.202)	0.214	(0.304)	(0.371)
σ (residual variance)	0.065***	0.171***	0.122***	0.093	-0.011
	(0.013)	(0.032)	(0.040)	(0.059)	(0.093)
ρ (intra-community correlation)[2]	0.030	0.075	0.055	0.043	0.005
Person-Year	82,310	83,768	20,744	37,079	3,011

Note: Standard errors are in parentheses.
*p<.05; **p<.01; ***p<.001
[1]For the model that predicts union entry after childbirth, it is the time in years that elapsed since first child birth, instead of age.
[2]Intra-community correlation was calculated, using the following formula: $\rho=\sigma/(\sigma+\pi2/3)$. This represents the degree to which women in the same community are similar in the outcome due to the shared unobserved characteristics.

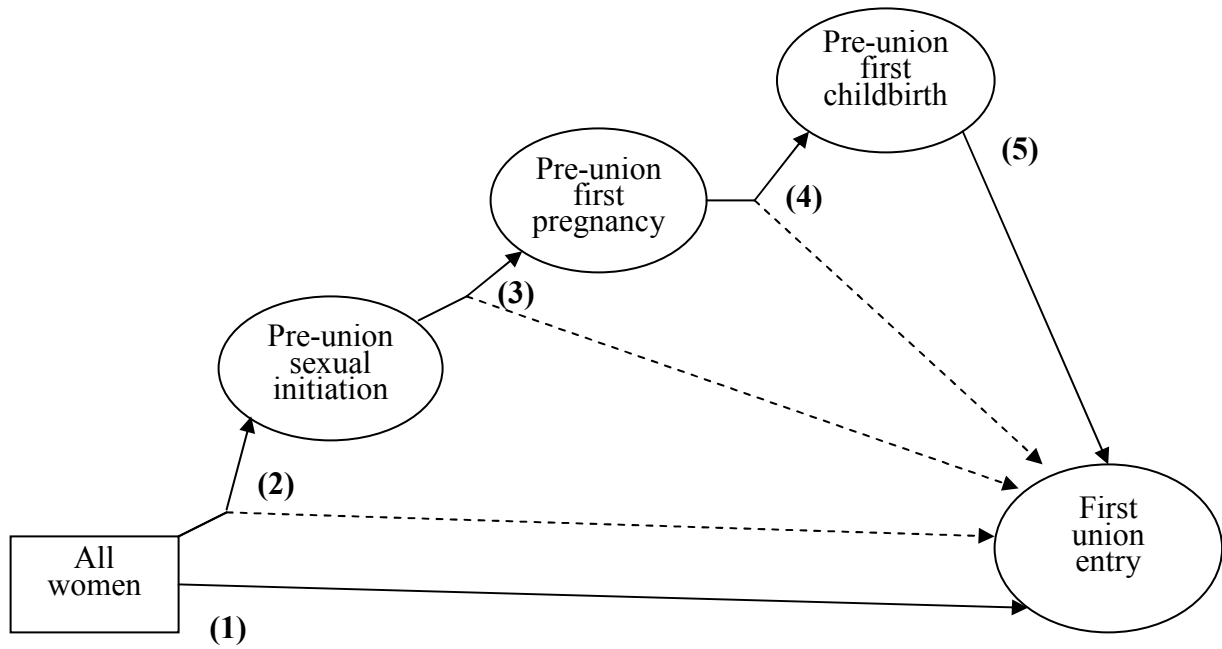**Figure 1. Sequence of First Sexual and Reproductive Events and First Union Entry**
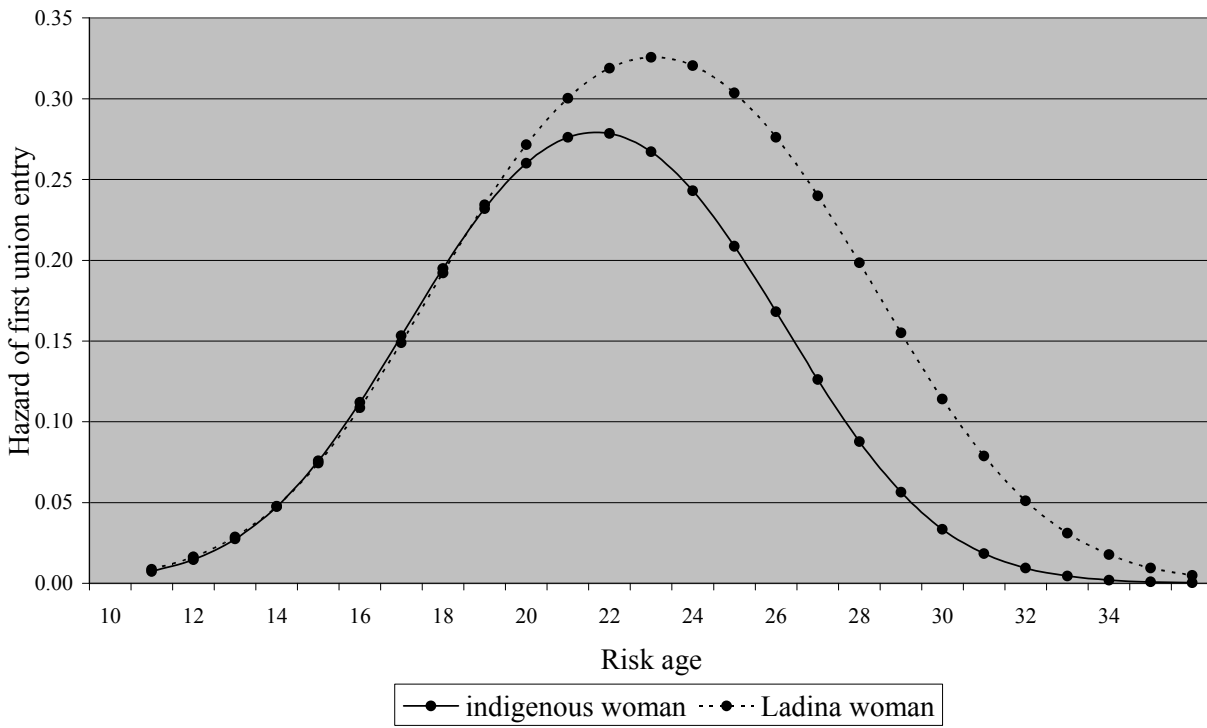
Figure 2. First Union Entry Not Preceded by Childbirth

(Graph: x-axis labeled "Risk age" ranging from 10 to 34; y-axis labeled "Hazard of first union entry" ranging from 0.00 to 0.35. Legend: indigenous woman (solid line), Ladina woman (dotted line).)
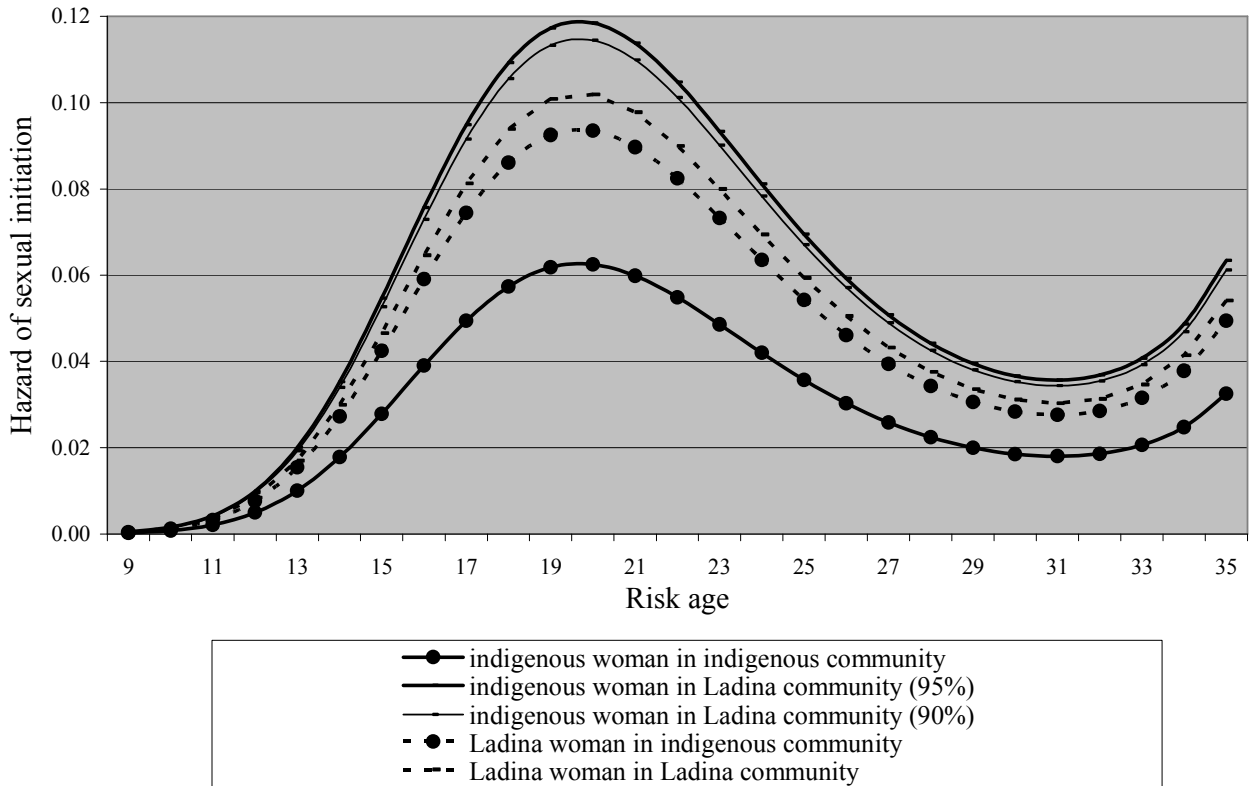
Figure 3. Pre-Union Sexual Initiation

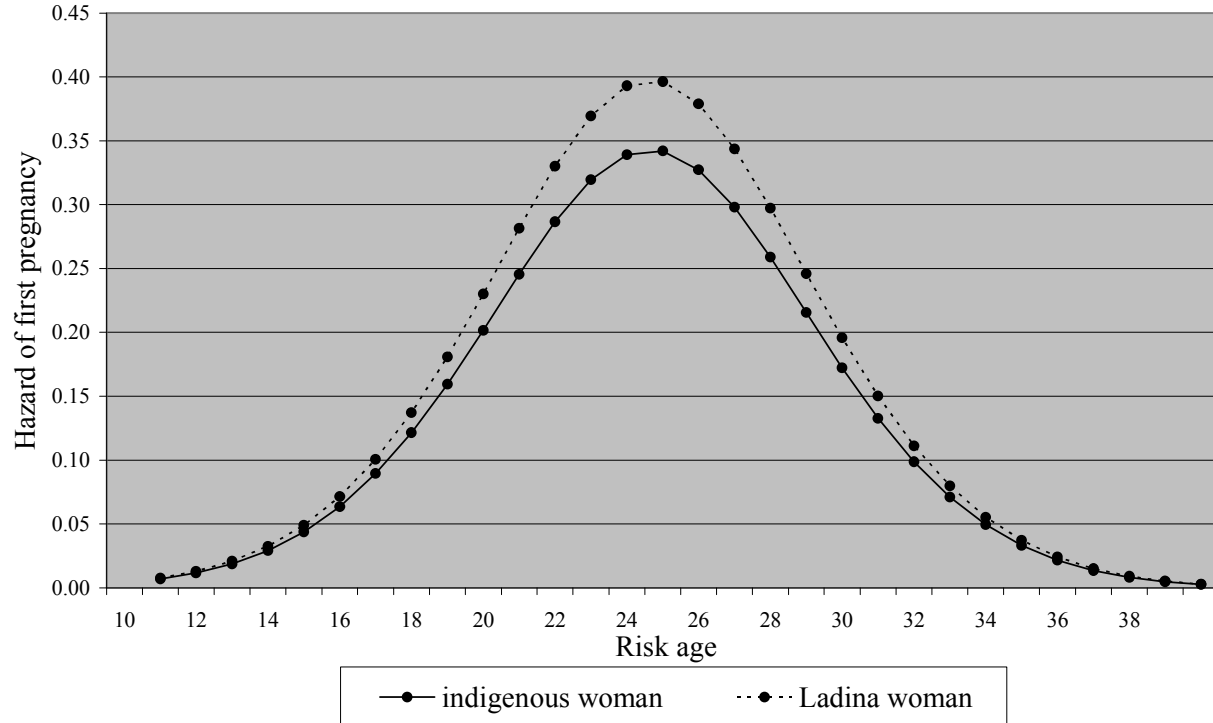**Figure 4. Pre-Union First Pregnancy, Conditional on Sexual Initiation**

Figure 5. Pre-Union First Childbirth, Conditional on Pregnancy

Legend:
- indigenous woman in indigenous community
- indigenous woman in Ladina community (95%)
- indigenous woman in Ladino community (90%)
- Ladina woman in indigenous community
- Ladina woman in Ladina community

X-axis: Risk age
Y-axis: Hazard of first childbirth