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Wives' and Husbands' Nonfamily Experiences and First-Birth Timing

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Introduction

Demographic research on the pace of childbearing in Asian populations emphasizes the influence of changes in marital processes on changes in first birth interval, generally accelerating first birth timing resulting in a shorter interval between marriage and first birth. In arranged marriage societies, as social changes lead to more involvement of young people in spouse choice the nature of marital relationships are changing, resulting in shorter first birth intervals through mechanisms such as increased coital frequency (Feng and Quanche 1996; Hong 2006; Rindfuss and Morgan 1983; Zhenzhen 2000). However, recent evidence demonstrates that these same changes in marital processes are themselves closely linked to widespread changes in social organization outside the family (Axinn and Yabiku 2001; Ghimire, Axinn, Yabiku and Thornton 2006; Morgan and Niraula 1995; Yabiku 2005, 2004). There are strong theoretical reasons to expect that the changes occurring outside of the family will influence the first birth interval independently of marital experiences, sometimes delaying first births (Acharaya 1998; Aryal 1991; Caldwell 1982; Niraula 1994; Suwal 2001).

This paper leverages a unique body of individual-level measures to compare the effects of marital experiences and non-family experiences on hazard of first birth. Although demographic research on fertility processes has historically focused exclusively on women, recent research giving equal attention to men and women demonstrates important gender differences in these processes (Allendorf 2006, 2007; Malthotra 1991; Mason and Smith 2000; Mason and Malhotra 1987; Thompson, McDonald, and Bumpass 1990; Sorenson 1989). Following this line of research, this study investigates both wives' and husbands' non-family experiences, in comparison to their marital experiences, as potential influences on hazard of first birth.

This investigation provides three key advances important for theories addressing the pace of childbearing. First, by comparing non-family experiences to marital experiences, this study documents the independent influences of these two domains on hazard of first birth. Moreover, by investigating multiple dimensions of both marital and non-family experiences, the analyses reveal important effects on first birth timing within each domain. Second, by directly comparing the individual non-family and marital experiences of wives and

husbands, the investigation also shows that these influences vary by the gender of the spouse. Third, this investigation is guided by a theoretical framework that acknowledges the potential of role incompatibility, human capital and resource accumulation, and new ideas and young people's independence from their parents produced by changing social and economic opportunity, to simultaneously shape variation in first birth timing. The empirical analyses yield results consistent with key aspects of this framework, particularly the potential of multiple dimensions of marital and non-family experiences to affect the hazard of first birth in opposing directions, indicating that this framework is likely to prove useful in future studies investigating timing of first birth.

The empirical aspects of this investigation are possible through panel data from the Chitwan Valley Family Study (CVFS) in South Central Nepal. The data provide dynamic measures of timing and sequencing of individuals' non-family, marital and childbearing experiences. The rural Nepalese setting is ideal for this study because it is historically characterized by an arranged marriage population currently in the midst of dramatic changes in non-family experiences, marriage arrangement and timing of marriage. The data feature measures of multiple dimensions of non-family and marital experiences from identical, but separate, interviews with wives and husbands. These measures, along with Life History Calendar (LHC) measures on the timing of first births, can be combined to estimate hazard models that document the factors shaping variation in the first birth interval.

Theoretical framework

In Nepal, as elsewhere in South Asia, the issues of marriage and childbearing have historically been considered of too great importance to be left to the decision of young couples (Acharya and Bennett 1981; Ahearn 2001; Bennett 1983). However in recent years, South Asian countries, including Nepal, have been experiencing dramatic social changes leading to the rapid spread of western family ideals and behaviors (Axinn and Yabiku 2001; Axinn and Barber 2001; Caldwell 1983; Thornton 2005, 2001; Goode 1970). This shift from historical family ideals and behavior toward the western family ideals and behavior has weakened the influence of the collective family, changing the locus of *[fertility]* decision making from families to the young couples themselves (Caldwell 1983; Sastry and Ross 1998; Thornton 2005, 2001), making young couples' early life experiences crucial for later life outcomes, including the timing of first birth.

To link young couples' experiences with first birth timing, I draw on three theoretical arguments: role incompatibility, human capital and resource accumulation, and independence and new ideas.

Role incompatibility

The role incompatibility argument suggests that non-family activities, such as schooling and work, directly compete with childbearing for time and resources. Clearly childbearing and childrearing require much time, money, and energy—resources that are then less available for those who attend school or are employed full time. Fulfilling the demands of school and work may conflict with the demands of parenthood, causing role conflict (Hogan and Astone 1986; Rindfuss et al. 1988). Giving birth to a child is usually viewed as a transition from

youth to adulthood, and on a practical level requires a large commitment of time, resources and energy.

Thus, having a child at an age when young adults are expected to enroll in school produces tension between these two roles (Rindfuss et al. 1988). On the other hand, continuous enrollment in a school well into young adulthood may conflict with family formation activities (Thornton et al. 1995; Yabiku 2005, 2004). In addition, educational attainment may increase the chances of subsequent employment, leading the individual to make a transition from school to work instead of from school to parenthood.

Moreover, since the patriarchal nature of Nepalese society expects women to assume sole responsibility for childrearing, role incompatibility becomes more salient, particularly for women. Given the incompatibility of roles related to educational or professional attainment and roles related to childbearing, non-family experiences—particularly current enrollment in school—are likely to discourage early childbearing.

Human capital and resource accumulation

Demographers and economic theorists alike have argued that accumulation of knowledge, social networks and resources through schooling, media exposure, employment and contact with the outside world may make individuals *more* prepared to assume higher roles, including that of parenthood (Becker 1975; Becker, Murphy and Taura 1990; Blau, Ferber, and Winkler 1998; Blossfeld and Huinink, 1991; Caldwell 1982; Coleman 1988; Kasarda, Billy and West 1986; Sewell and Houser 1975; Thornton, Axinn, and Teachman 1995). In fact, in many societies having a stable job is considered an important qualification for marriage (Coleman 1990) or a prerequisite for childbearing. Indeed, accumulation of new knowledge and economic and non-economic resources may equip individuals with resources that greatly increase motivation to begin childbearing leading to early childbearing. Although family collectivism and joint family living used to be quite common in Nepal, the rapid social and economic changes currently underway have greatly weakened family ties, reduced joint family living and family support, making young couple human capital and resource accumulation more important.

Independence and new ideas

Exposure to school, work for pay outside the home, and the media all tend to provide information not commonly available within the family. Non-family experiences promote independence through the acquisition of new ideas including personal freedom, equality, and western family ideals of love and romance (Caldwell 1982; Ghimire et al. 2006; Rindfuss and Morgan 1983; Thornton 2001, 2005). Because the daily activities of recent Nepalese cohorts are increasingly organized outside the domestic sphere, relationships among family members—especially between children and parents—have changed significantly. Adolescents who once would have learned from and worked for their parents in domestic chores have become sources of new ideas to the parents (Barber and Axinn 2004; Beutel and Axinn 2002; Caldwell 1982; Caldwell et al. 1988; DeRose et al. 2002). Empirical studies linking non-family experiences to fertility behavior suggest that in arranged marriage societies exposure to non-family experiences lead to increased participation of young people

in spouse choice (Ghimire et al. 2006), which leads to shorter first birth intervals through mechanisms such as increased coital frequency (Feng and Quanche 1996; Hong 2006; Rindfuss and Morgan 1983; Zhenzhen 2000).

Until the later half of the twentieth century Nepal was kept in complete isolation from the rest of the world. However, after the overthrow of the Rana Family regime in the 1950s, Nepal made outstanding progress on several fronts including the extensive expansion of schools, health services, markets, transportation, communication technology and mass media (Axinn and Yabiku 2001). This has greatly increased the exposure to sources of new ideas, particularly related to achievement oriented ideals and youth independence including older age at marriage and choice marriages (Ghimire and Axinn 2006, Thornton, Ghimire and Mitchell 2012; Beutel and Axinn 2002; Barber and Axinn 2004; Yabiku and Schlabach 2009).

Gender differences in experiences and cost-benefits of childbearing

Several studies have documented important gender differences in various aspects of social life (Acharya and Bennett 1981; Beutel and Axinn 2002; Jamison and Lockheed 1987; Marini 1978, 1980; Smock 1981; Sorenson 1989; Thomson et al. 1990). The patriarchal nature of Nepali society has aggravated the gender difference even more, resulting in greater inequalities for women (Suwal 2001). Gender inequalities are deeply rooted in Nepalese society (Acharya 1998; Acharya and Bennett 1981; Bennett 1983; Jamison and Lockheed 1987; Morgan and Niraula 1995; Stash and Hunnam 2001; Stone 1978). Most Nepalese women, regardless of ethnic group or age, face barriers to participation in activities such as education, employment, and media exposure. The disadvantaged position of women has also substantially reduced their ability to freely voice their wishes. Moreover, because the costs and benefits of having a child may be considerably different for husbands and wives, their preferences for when to have a first child may also vary (Mason and Malhotra 1987; Mason and Smith 2000; Watkins and Danzi 1995). Because wives and husbands likely have substantially different experiences, they may each affect first birth timing in different and important ways. Given the disproportionate burden of childbearing on women, wives' experiences are most likely to influence the timing of first birth through role incompatibility (school enrollment) and human capital (educational attainment and employment). On the other hand, considering the patriarchal nature of Nepalese society, husbands' experiences are most likely to influence the timing of first birth through independence (participation in wife selection) and new ideas (media exposure).

Data and methods

Data for this study comes from the Chitwan Valley Family Study (CVFS) in South Central Nepal. The CVFS selected an equal probability, systematic sample of 171 neighborhoods in Western Chitwan (Barber et al. 1997). Once a neighborhood was selected a household survey of all the households residing in sample neighborhoods was carried out to collect information on relationships among the members of the household. After household surveys were conducted, all individuals aged 15 to 59 residing in the sampled households were personally interviewed using a standardized questionnaire and a Life History Calendar

(LHC). Also surveyed were respondents' spouses who lived elsewhere or who were outside the age range. A total of 5,271 individuals were interviewed, with a 97% response rate. In the standardized interviews, individuals were asked a variety of questions regarding their family background, personal characteristics, experiences and attitudes about various aspects of social life. In addition, the LHC collected information on residence, marital status, children, contraceptive use, living arrangements, schooling and work experience. Although the LHC uses a more flexible approach to gathering data than structured interview questions, it does collect standardized calendar time information for various defined domains in predetermined time periods. The LHC provides special advantages for accurate retrospective measurement and sequencing of personal life events (Axinn, Pearce, and Ghimire 1999; Belli 1998; Freedman et al. 1988). Thus, the CVFS provides rich measurements of the occurrence and timing of individual life events through the LHC, and linked measures of the characteristics of those events via a structured questionnaire—a data set uniquely designed for the purpose of examining the influence of individuals' experiences on behavior.

Moreover, because the CVFS interviewed the wife and husband separately using the same survey instruments, it allows an examination of how the experiences of the wife, the husband, and as couple influence the hazard of first birth.

Outcome measures

Analyses focus on the timing of first birth. However, the decision of whether or not to become pregnant usually takes place at or before conception, or at least nine months prior to the birth. Therefore, instead of using the hazard of first birth as the dependent variable, I use the hazard of first pregnancy resulting in a live birth.¹ The LHC provides records by month and year of when a woman was married and had her first child. From this record I constructed a person year file by subtracting nine from the month a woman first gave birth, a practice used successfully in previous research (Axinn and Yabiku 2001; Barber 1997; Yabiku 2005).

This occurrence measure allows me to use person-year of exposure to pregnancy as the unit of analysis. I code the outcome “0” in all observation years before the respondent becomes pregnant, and code “1” in the year the respondent becomes pregnant. Once a pregnancy occurred, the respondent was censored from the analysis. Women who did not become pregnant during the observation period were censored at the end of this period. I consider women at risk of first pregnancy only when they are age 13 and older, are married, and have not had a child before.

Explanatory factors

The measures of both the explanatory factors come from individual interviews and the LHC. Because identical measures were collected using the same instruments separately for both

¹Although using only pregnancies ending in live births results in an underreporting of the total number of pregnancies to some extent (induced abortion in Nepal remains uncommon despite recent legalization), the measures of miscarriage and still birth are subject to misreporting. Estimates based on the 2001 Nepal DHS data indicate that induced abortions account for .006 of pregnancies in rural areas of Nepal (Ministry of Health [Nepal] 2002).) Pregnancies resulting in live births were accurately measured and since they are of greatest interest I limit outcome measures to pregnancies that resulted in live births.

wives and husbands, the description of measures below reflect the experiences of both wives and husbands. The measures of explanatory factors were measured on a yearly basis in the LHC. As some of the measures are time-varying, changing over the duration of hazard, I used the value in the last observed time unit (year) for the individuals who gave birth as the point at which to summarize these values and calculate the descriptive statistics. For those who did not give birth during the observation period, I used the value at the end of the entire period.

Non-family experiences

I used measures for three non-family experiences that compete with childbearing: schooling, nonfamily work and media exposure.

i) Education—The CVFS collected a complete history of respondents' educational experiences, including adult education (literacy programs), via the LHC. This source provides data on both school enrollment in any particular year and the total length of time spent in school. Based on my theoretical framework, I separate the total effects of education into the effects of school enrollment and the effects of educational attainment (Thornton, Axinn and Teachman 1995; Yabiku 2004, 2005). Enrollment is coded “1” if the respondent is enrolled during a particular year of observation and “0” otherwise. Educational attainment is measured as the total number of the years spent in school or adult education up to one year before the respondent was at risk of first birth. As shown in the top panel of Table 1, men and women in Nepal have significantly different life experiences. Although almost an equal proportion—eight percent of wives and ten percent husbands—were enrolled in school the year prior to giving birth to their first child, the average years of schooling is 3.45 years for wives while it is almost doubled for husbands (6.74 years).

ii) Non-family work—All years that a respondent was employed outside the family were recorded in the LHC, from which I created a time-varying measure of cumulative years of non-family work up to one year before the risk of first birth began. Given the highly gendered context, dramatic differences in non-family work experiences exist for wives and husbands. Table 1 shows the average years of non-family work are 1.57 for wives and 4.72 for husbands.

iii) Exposure to media—The measure of media exposure is an index constructed from responses to three sets of questions in the individual interview about listening to a radio, watching television, and seeing movies. Each type of mass media is coded “1” if the respondent has been exposed and “0” otherwise. Because responses to these questions are correlated, to avoid problems of multicollinearity, I sum these three variables to produce a time-varying measure with values ranging from 0 to 3. I code media exposure as “0” for all the years before the respondent was exposed to any of the media sources, “1” in the year of exposure to any one source of media for the first time, “2” at exposure to any second media source, and “3” at exposure to a third media source. Table 1 reveals that wives were exposed to fewer media sources than their husbands: mean media exposure is 1.69 for wives and 2.11 husbands.

Marital experiences

Three aspects of marital experiences are examined in the analyses. These measures include age at first marriage, participation in spouse selection, and marriage duration.

i) Age at first marriage—Age at marriage is measured in years. As shown in Table 1, the average age of first marriage for women (16.35 years) is more than 4 years younger than for men (20.58).

ii) Participation in spouse selection—Participation in spouse selection is measured using responses to a question providing an ordinal scale of 1 to 5. In this scale “1” means respondent did not participate in the choice of her or his spouse (arranged marriage), “2” means respondent had some say but parents and relatives had more influence in the decision, “3” means both respondents and parents had equal influence, “4” means respondent had more influence than parents and “5” means respondent solely chose her or his spouse (individual choice marriage). Table 1 shows that only one in four unmarried women participated in the selection of their husbands, whereas more than half of all men participated in the selection of their wives.

iii) Marriage duration—Marriage duration (time from first marriage to first pregnancy) is a time-varying interval-level variable coded in number of years. Because only a few individuals (less than 1 percent) were married for more than 10 years, I coded them as 10 years. On average, both women and men were married slightly more than 2 years before they had their first child. (See Table 1.)

Controls

Controls in these analyses focus on personal characteristics (ethnicity and birth cohort) and family background (parents' experiences). These measures control for two types of issues: potential differences by subpopulations and potential confounders. Ethnic group and birth cohort are two important attributes of subpopulations likely to have varying levels of influence on the baseline hazard of first birth. Family background, on the other hand, likely influences both the hazard of first birth and other experiences (such as education, work, media exposure, etc.) that may confound the effects of explanatory variables.

Personal background

Nepali society consists of many ethnic groups (Bista 1972; Dahal 1993, 2006; Niraula 1994, Thapa 1989, 1997) that scholars often categorize into five major groups for analytical purposes: Brahmin/Chhetri, Dalit, Newar, Hill Janajati, and Terai Janajati (Axinn and Yabiku 2001; Blaikie et al. 1980). I adopted the same categories, coding individuals “1” if they are members of a specific category and “0” if not; Brahmin/Chhetri was the reference group for comparison. I construct birth cohort as a series of dummy variables representing 10-year birth cohorts: 15–24, 25–34, 35–44, and 45–54.

Parents' Experiences

The parental characteristics include mother's number of children and parents' education. Information on parents is derived from interviews of both the wives and husbands. Total number of children is determined from the response to the question: "How many children did your mother have?" The measure of the parents' education comes from the response to a series of questions beginning: "Did your mother/father ever go to school?" If either one of the parents ever attended school I coded "1" and "0" otherwise.

Analytical Strategy

Because childlessness and premarital childbearing have strong, negative repercussions on young couples, particularly on women (Bennett 1983; Stone 1978; Weiss 1996), and are also quite rare in Nepal (Retherford and Thapa 1998), analyses focus on timing of the beginning of childbearing among married women within their first marriage. More specifically, the hazard of first birth measures how soon after marriage a woman experienced the birth of her first child. Life Table Methods are widely used and are the simplest methods to model transition from one state to another (i.e., from not pregnant to pregnant) when there are very few or no censored observations. These methods, however, are not that useful when a large number of observations are censored (Allison 1995). Because analyses reported here rely on retrospective event history data, many of the married women in this study had not experience a first birth by the time of the survey. This creates significant censoring of first birth intervals in the data. This censoring level is particularly large at short marital durations (recent marriages). I use the hazard of first birth approach in order to avoid the potential bias from systematically omitting (through censoring) cases of short marital duration. In addition, an important advantage of the hazard approach is the inclusion of time-varying covariates for experiences such as schooling, which allows one to separate the consequences of enrollment and educational attainment (Thornton, Axinn and Teachman 1995; Yabiku 2005). Therefore, I use district-time hazard models to estimate the effect of wives' and husbands' experiences on the hazard of first birth.

The analytical strategy involved estimating the effects of wives' and husbands' experiences on the hazard of first birth separately and then jointly in a single model. With regard to temporal ordering, all measures of wives' and husbands' experiences are lagged. This modeling strategy is guided by my theoretical framework, in which—last year's experiences predict outcomes for this year. I estimate multi-level discrete-time hazard models using a standard logistic regression procedure. Logistic regression is an appropriate statistical technique for analyzing multivariate models of dichotomous dependent variables (Kmenta 1986).

The hazard of getting pregnant is a function of both the biological ability to conceive and exposure to sexual intercourse with a man. Therefore, there are two basic concerns using the discrete-time event history models: when to start the hazard and what functional form to use for duration of the hazard. In principle, the hazard should begin when respondents become at risk of the event—a woman is at risk of giving birth to a baby when she is biologically fecund and exposed to sex with a man. Because the lowest age at first birth in general population was 13 years, I treat this age as the approximate point at which a woman

becomes fecund. Next, as sexual activity prior to marriage is very much discouraged socially in Nepal and, in fact, almost no premarital births occur in Nepal (Retherford and Thapa 1998), I use marriage date as the start of exposure to sex. Therefore, the hazard of first birth begins when a woman is both married and has reached age 13.

The second issue related to hazard modeling is the functional form of the baseline hazard. Because the shape of the hazard function is likely to vary by several explanatory variables, it is very difficult to be exact. However, because the main variable of interest is how soon a woman becomes pregnant after she marries, I rely on duration: the time since marriage that a woman has been at risk of pregnancy. To determine the appropriate functional form, I modeled hazard of first birth using alternative functional forms for marriage duration. These forms include linear term, quadratic and linear term, log, and unrestricted (dummy variables). Based on the -2 Log Likelihood ratio, a model fit statistic (not shown in the table), compared to the models with other functional forms, the model with the unrestricted specification for duration has the lowest value for the -2 Log Likelihood ratio. These investigations suggest that the unrestricted specification for duration yields a better model fit. Thus, I used the unrestricted specification for duration represented by ten dummy variables, one for each year, and treated ten years as the reference group.

Finally, because of the sampling design, individuals are clustered in neighborhoods and the simple person-level discrete-time models give a biased estimate of individual-level effects, which often result in underestimation of the baseline hazard (Barber, Murphy, Axinn, and Maples 2000; Goldstein 1995; Goldstein et al. 1998; Ma and Willms 1999). To address the clustering problem, I also model the effects of the wife's and husband's experiences using the GLIMMIX macro in the SAS procedure, an estimation technique particularly designed for multilevel data. This technique has been successfully implemented in other empirical analyses (Axinn and Barber 2001; Axinn and Yabiku 2001; Yabiku 2005). To model the multi-level discrete-time hazard, I use logistic regression with a random coefficient for the intercept (also known as a random intercept or a variance component model). This model allows the intercept to vary by neighborhood.

Results

To estimate the multivariate models of wives' and husbands' experiences on first birth timing, I first begin with models of wives' experience, followed by models of husbands' experiences and finally a combined model of couples' experiences. Table 2 presents the results from the multivariate models of wives', husbands', and their joint experiences as couples.

I. Effects of wives' experiences

Column 1 in Table 2 shows the effects of wives' experiences on the hazard of first birth. Coefficients are presented as odds ratios, which is the anti-log of the coefficient. These odds ratios can be interpreted as the amount by which the odds are multiplied for each unit change in the respective independent variable.

Education—The estimates of the impact of wives' education schooling on the hazard of first birth indicate that schooling has strong, statistically significant effects on the hazard of first birth in two opposite directions. Specifically, enrollment in school dramatically reduces the hazard of first birth. The odds multipliers of .59 in Column 1 In Table 2 for school enrollment indicates that wives who are enrolled in school have a hazard of first birth that is 41 percent lower than wives who are not enrolled in school. Given the observed effect is net of wives' marital experiences, other non-family experiences and controls, this effect is quite large and statistically significant ($p < .01$). In contrast, wives' educational attainment has a strong positive effect on the hazard of first birth. The odds multiplier of 1.07 suggests that each additional year of schooling increases the hazard of first birth by seven percent. Again, this effect—net of wives' marital experiences, other non-family experiences and controls—is quite large and statistically significant ($p < .01$). Although wives' non-family employment has a positive effect on the hazard of first birth, as predicted, it is not statistically significant.

Media exposure—Wives' media exposure also has a strong, positive statistically significant effect on the hazard of first birth. The odds multiplier of 1.15 suggests that every one-unit increase in the media exposure index (exposure to radio, television, or movies) increases the rate of first birth by 15 percent.

Marital experiences—Several dimensions of marital experiences have strong, statistically significant effects on the hazard first birth. Wives' age at first marriage dramatically increases the hazard of first birth. The odds multiplier of 1.10 for age at first marriage indicates that a one-year increase in the age at first marriage increases the hazard of first birth by ten percent. Because neither the age at first marriage nor the participation in spouse choice can be observed without the occurrence of the other, it is impossible to estimate the independent effect of one on the other. This makes the separation of the independent effect of age at first marriage very difficult (see Ghimire et al. 2006 for details). I added both age at marriage and participation in the same model. Although wives' participation in the selection of their husband has a positive effect on the hazard of first birth, as predicated, it is not statistically significant.

Marriage duration, which is also the duration of hazard, also has a strong, statistically significant effect on the hazard first birth. Note that I used unrestricted specification for duration represented by ten dummies, one for each year, and treated ten years as the reference group. This specification allows the hazard to vary by year; the odds multipliers presented here relate to the reference group. The odds multiplier of 1.85 for one year of marriage duration suggests that compared to those couples who were married for ten or more years, those who were married for one year have an 85 percent higher hazard of first birth. Next, the odds multipliers of 3.08 for married for two years suggests that compared to women married for ten or more years, those women married for 2 years have a 208 percent higher hazard of first birth. As indicated in the analytical strategy the hazard of first birth varies by year. In general, except for the first year, women in Nepal tend to experience the birth of their first child soon after marriage.

II. Effects of husbands' experiences

Following the same strategy outlined above, Column 2 of Table 2 shows estimates of the effects of husbands' experiences on the couple's hazard of first birth. Several dimensions of husbands' experiences also have strong, statistically significant effects on the hazard of first birth.

Education—Similar to wives' education effects, husbands' education also affects the couple's hazard of first birth in two directions. First, enrollment in school has a strong, negative statistically significant effect on the couple's hazard of first birth. The odds multiplier of .75 for enrollment in school suggests that those husbands who were enrolled in school have a 2 percent lower hazard of first birth than husbands who were not enrolled in school. On the other hand, husbands' educational attainment has a strong, positive statistically significant effect on the hazard of first birth. The odds multiplier of 1.04 for years of schooling suggests that each additional year of husbands' schooling increasing the hazard of first birth by four percent.

Media exposure—Husbands' media exposure also has a strong, positive statistically significant effect on the hazard of first birth. The odds multiplier of 1.24 suggests that every one-unit increase in the media exposure index increases the rate of first birth by 24 percent. Indeed, this effect is stronger than the effect of wives' media exposure.

Marital experience—Unlike wives' age at first marriage, husbands' age at first marriage is not statistically significant. The effect of husbands' participation in wife selection, on the other hand, is much stronger than wives' participation in the selection of their husband. The odds multiplier of 1.07 suggests that a one-unit increase in husbands' participation in wife selection increases the hazard of first birth by seven percent. Marriage duration, which is a couple-level experience, has effects that are similar to the effects found in models for the wives.

In sum, the results from Table 2 are in the expected direction. The models for both wives and husbands provide compelling theoretical and empirical evidence of the important influence of wives' and husbands' life experiences on the hazard of first birth. Although these findings provide strong evidence that both spouses' experiences influence the hazard of first birth when measured separately, as posited in the theoretical framework section, it is likely that the impact of wives' and husbands' experiences are confounded through each other.

III. Effects of couple's experiences

Column 3 of Table 2 presents estimates of the impact of couples' experiences on the hazard of first birth by combining the measures of both spouses. In combining spouse measures, I sum the dummy variables, such as school enrollment, but average other categorical or interval level measures. For the sake of comparability, I estimate the effects of couples' experiences following the same strategy outlined above. As one might expect, the effects of couple-level measures are very close to the average of the effects as those in the wives' and husbands' models.

Education—In Table 2, the odds multipliers for wives' and husbands' school enrollment are .59 and .75, respectively (in the wives and husbands only models) compared to .72 in the couple model. There is little difference between estimated effects of wives', husbands' and couple's educational attainment and non-family employment.

Media exposure—The effect of couple's media exposure, however, got slightly stronger compared to models of both the husbands' and wives' media exposure. This suggests that media exposure is more effective if both wives and husbands are exposed to it.

Marital experience—Notice that in separate models wives' age at marriage has a strong statistically significant effect on the hazard of first birth (odds multiplier of 1.10), but is not significant for husbands' (odds multiplier of 1.01). On the other hand, husbands' participation in wife selection has a strong, statistically significant effect on the hazard of first birth (odds multiplier of 1.07) but is not significant for wives' participation in husband selection (odds multiplier of 1.01). However, in the couple model, age at marriage and participation in spouse choice each have a strong, positive statistically significant effect on the hazard of first birth (odds multipliers 1.06 and 1.07 respectively). Although several scholars have expected such relations may exist between spousal experiences, previous studies have not tested these relationships at this level of detail.

These results provide strong evidence that both spouses' experiences influence the hazard of first birth both separately and combined together. However, it is also likely that the effects of these experiences may vary with duration and time. By duration, I mean the length of time since a woman was at risk of first pregnancy. By time, I mean in what time period an individual has had an experience. Thus, in order to test whether or not the effects of wives' and husbands' experiences change across time and duration I test for interaction between the experiences and duration—represented by time since first marriage. I find several statistically significant effects of interaction term between marriage duration (measured in linear terms as number of years) and both wives' and husbands' school enrollment, non-family work and media exposure. A significant test statistic for the interaction term indicates that the effects of the wives' and husbands' experience vary by the duration of marriage (Allison 1977). The positive and statistically significant odds multiplier (not shown in table) for interaction term between marriage duration and school enrollment suggests that the strong negative effects of school enrollment decreases over duration. Likewise, the negative statistically significant odds multiplier (not shown in table) for interaction term between non-family work and media exposure each suggest that the positive effects of non-family work and media exposure decreases with duration.

The aim of this study is to examine the influence of wives' and husbands' non-family and marital experiences on the hazard of first birth in a historically arranged marriage society currently in the midst of dramatic social, economic and institutional changes. This changing context has had an enormous influence during the lifetimes of the respondents, on the organization of individuals' social lives and on Nepali marriage and childbearing practices. In particular, decisions concerning marriage and childbearing, which were historically considered too important to be left to young individuals, are now increasingly controlled by children rather than by parents and other family members. Arranged and young-age

marriages, early and prolific childbearing, and infrequent contraceptive use have given way to greater participation in spouse choice, relatively older ages at marriage and childbearing, and widespread use of contraceptives to delay or end childbearing (Axinn and Yabiku 2001; Barber and Axinn 2004; Choe, Thapa and Mishra 2004; Ghimire et al. 2006; Satavayada and Admachak 2000; Yabiku 2005). This setting provides a unique opportunity to examine influences of various dimensions of the wives', husbands' and couples' non-family experiences and marital experiences on couples' hazard of first birth.

Overall, the results of this study indicate that the experiences of wives', husbands', and couples' have important effects on the couple's hazard of first birth in Chitwan. For wives, an older age at marriage, educational attainment, and media exposure each substantially increase their hazard of first birth. On the other hand, wives' school enrollment lowers the hazard of first birth. With the exception of participation in wife selection and age at first marriage, effects of husbands' experiences mimic the effects of wives' experiences. Husbands' participation in wife selection, educational attainment, and media exposure each substantially increases the hazard of first birth, while school enrollment reduces the hazard. More importantly, even when combined into couple-level measures, several of the couples' experiences continue to exert an important influence.

These findings provide empirical evidence consistent with theoretical mechanisms, demonstrating the important influence of *role incompatibility, human capital and resource accumulation, and independence and new ideas*, in gender specific ways. The strong, negative effects of both wives' and husbands' school enrollment are consistent with the role incompatibility argument which suggests that non-family activities directly compete with family formation behaviors for resources and time and are likely to discourage it. These findings show that fulfilling the demands of school attendance seem to conflict with the demands of parenthood, causing role conflict. As hypothesized, this effect is stronger for wives than for husbands.

The positive effects of educational attainment and media exposure are supportive of the idea that accumulation of knowledge and resources through schooling and media exposure make individuals *more* prepared to assume a higher role, including that of parenthood (Becker 1975; Becker, Murphy and Taura 1990; Blossfeld and Huinink 1991; Coleman 1988; Sewell and Houser 1975; Thornton, Axinn, and Teachman 1995). Thus, these findings provide strong empirical evidence for the rigorously argued but not frequently tested *human capital and resource accumulation* hypothesis.

The positive effects of schooling and media exposure also support what Caldwell called Westernization of non-Western societies through the spread of Western ideas. Chitwan historically had very low or no educational attainment and almost no media exposure. However, with the recent expansion of schools and media outlets throughout Chitwan, young women and men are increasingly exposed to educational systems and media sources that promulgate Western ideals (Beutel and Axinn 2002). Western ideals concerning romantic love, marriage, sex and modern family life may encourage a desire for sex and sexual activities among the women who would otherwise depend solely on their husband's desire for sex. Thus, access to Western ideas through education and media exposure may act

as a source of new ideas, encouraging independence that may actually lead to the initiation of sexual activities for women, and thus their hazard of first birth. This finding is consistent with the fertility literature suggesting that in societies in the early stages of fertility transition, *new ideas and independence* acquired through education and media may in fact temporarily enhance fertility (Caldwell 1982). On the other hand, education and media exposure may also encourage continuing school and contraceptive use, which reduces the hazard of first birth.

The strong effect of wives' and husbands' marital experiences—age at first marriage and participation in spouse selection—reveal the crucial role of both *human capital and independence* on the timing of childbearing. The strong, positive effect of wives' age at first marriage but not the husbands' reveals the important role of wives' human capital, perhaps including biological maturity. This finding is consistent with the fertility literature that suggests transitional societies in which age at first marriage is historically very young, an increase in women's age at first marriage speeds the pace of childbearing (Rindfuss and Moragn 1983; Wu 1996). In contrast, husbands' participation in wife selection has a much stronger effect than that of wives' participation in husband selection. This finding is supported by the idea that in historically arranged marriage societies, such as Nepal, young men's independence in selection of a wife may also mean more independence in deciding when to have a child. This might mean that if childrearing is still considered the responsibility of the family, young men may prefer to achieve fatherhood as soon as possible once married (Malhotra 1991; Mason and Smith 2000; Mason and Malhotra 1987; Morgan and Niraula 1995).

However, in the couple-level models, the age at marriage and participation in spouse selection each have strong, statistically significant effects on the hazard of first birth. This result indicates that although both the wives' and husbands' life experiences have important influences on the hazard of first birth, perhaps the hazard is also jointly influenced by both as a couple. But as mentioned above, because neither the age at first marriage nor participation in spouse choice can be observed without the occurrence of the other, the separation of independent effects of age at first marriage and participation in spouse choice is very difficult and should be interpreted accordingly.

The results also show the relative influence of marital experiences and non-family experiences and indicate the importance of distinguishing between the two. Thus, while studying couple-level influences, researchers should also pay attention to factors that encourage or compete with the focal behavior. Social scientists and policy makers alike increasingly emphasize *both* spouses' roles in fertility decisions (Bankole and Singh 1998; Lasee and Becker 1997; Ryder 1973; Sorenson 1989; Stash 1996). The evidence provided here demonstrates that both the individual experiences of the wives and husbands and their joint experiences as couples have important influences on the hazard of first birth.

Finally, although evidence from this study provides important information about the influence of life experiences—both non-family and marital experiences on first birth timing, and both wives' and husbands' experiences separately and as couple—this study also inherits some of the common weaknesses of cross sectional, non-experimental studies.

Therefore, the findings of this study should be interpreted with caution specific to the study context and its limitations. First, because analyses in this study rely on retrospective measures of experiences only, the findings of this investigation could not ascertain the role of ideational factors that many scholars consider important. The lack of measures on ideational factors also confines the analyses to non-family experiences, hindering comparison of the relative influence of individuals' experiences with their aspirations and performances. Second, although the data were collected using the most innovative data collection technique—the life history calendar method—these data may suffer from recall biases because some of the oldest respondents were asked to recall the timing of experiences that happened very early in their life course. Finally, to understand the causal inferences reported here, supplementing the quantitative survey data with in-depth qualitative information could be a useful next step for future research.

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Table 1

Descriptive statistics of measures used in the analyses (N=1592)

Experiences	Coding	Wives				Husbands			
		Mean	S. Dev.	Min.	Max.	Mean	S. Dev.	Min.	Max.
Education									
School enrollment (time varying)	0=no, 1=yes	0.078	0.25	0	1	0.10	0.30	0	1
Educational attainment (# years of schooling time varying)	years	3.45	4.72	0	20	6.74	5.67	0	23
Work for pay									
Non-family employment (# years employed time varying)	years	1.57	2.92	0	23	4.72	5.29	0	37
Media exposure									
Media exposure (index time varying)	index (0–3)	1.69	1.09	0	3	2.11	0.94	0	3
Marital experience									
Age at first marriage	years	16.35	3.01	5	33	20.58	4.16	7	45
Participation in spouse selection	0=no, 1=yes	1.81	1.53	1	5	2.67	1.80	1	5
Controls									
Ethnicity									
Brahmin/Chhetri	0=no, 1=yes	0.46	0.50	0	1	0.46	0.50	0	1
Dalit	0=no, 1=yes	0.12	0.32	0	1	0.12	0.32	0	1
Hill Janajati	0=no, 1=yes	0.17	0.37	0	1	0.17	0.37	0	1
Newar	0=no, 1=yes	0.06	0.24	0	1	0.06	0.24	0	1
Terai Janajati	0=no, 1=yes	0.19	0.39	0	1	0.19	0.39	0	1
Birth cohort									
Age in years	year	32.23	9.58	16	54	37.29	10.31	17	59
Birth Cohort									
Born between 1972 – 81 (age 15 – 24 Cohort0)	0=no, 1=yes	0.27	0.44	0	1	0.10	0.29	0	1
Born between 1962 – 71 (age 25 – 34 Cohort1)	0=no, 1=yes	0.33	0.47	0	1	0.35	0.48	0	1
Born between 1952 – 61 (age 35 – 44 Cohort2)	0=no, 1=yes	0.27	0.44	0	1	0.28	0.44	0	1
Born between 1942 – 51 (age 45 – 54 Cohort3)	0=no, 1=yes	0.13	0.34	0	1	0.27	0.44	0	1
Parents' experiences									
Mother's number of children	number	6.13	2.70	1	18	5.82	2.57	1	18
Parents' education (any parents ever went to school)	0=no, 1=yes	0.28	0.45	0	1	0.19	0.38	0	1
Couple: Hazard duration (time varying)									
	years	2.95	2.42	1	10				

	Wives			Husbands		
	Coding	Mean	S. Dev.	Min.	Max.	Mean
Experiences						
Married for 1 year	0=no, 1=yes	0.32	0.46	0	1	
Married for 2 years	0=no, 1=yes	0.27	0.44	0	1	
Married for 3 years	0=no, 1=yes	0.13	0.33	0	1	
Married for 4 years	0=no, 1=yes	0.09	0.28	0	1	
Married for 5 years	0=no, 1=yes	0.05	0.23	0	1	
Married for 6 years	0=no, 1=yes	0.03	0.18	0	1	
Married for 7 years	0=no, 1=yes	0.02	0.15	0	1	
Married for 8 years	0=no, 1=yes	0.02	0.15	0	1	
Married for 9 years	0=no, 1=yes	0.02	0.12	0	1	
Married for 10 years or more	0=no, 1=yes	0.05	0.20	0	1	
Outcome						
Ever had first birth	0=no, 1=yes	0.92	0.27	0	1	
Wife age at first birth	years	19.24	2.98	12	39	

Table 2

Odds ratios and significance levels for multi-level discrete-time hazard model estimates of the effects of wives', husbands' and couples' experiences on couple's hazard of first birth.

Models	Wives' experiences	Husbands' experiences	Couples' experiences
Education			
School enrollment (<i>Role incompatibility</i>)	0.59**	0.75**	0.72**
Educational attainment (<i>Human capital & resource accumulation</i>)	1.07**	1.04**	1.07**
Work for pay			
Non-family employment (<i>Human capital & resource accumulation</i>)	1.02	1.01	1.01
Media exposure			
Media exposure index (<i>Independence & new ideas</i>)	1.15**	1.24**	1.25**
Marital experiences			
Age at first marriage (<i>Human capital & resource accumulation</i>)	1.10**	1.01	1.06**
Participation in spouse selection (<i>Independence</i>)	1.01	1.07**	1.07**
Controls			
Ethnicity[†]			
Dalit	1.11	1.23*	1.23*
Hill Janajati	0.96	1.01	1.04
Newar	1.02	1.18	1.04
Terai Janajati e	1.65**	1.83**	1.89**
Parents' experiences			
Mother's number of children	0.99	1.01	0.99
Parents' education	0.87	1.06	0.93
Couple duration of marriage^{††}			
Married for 1 year	1.85**	2.38**	2.08**
Married for 2 years	3.08**	3.91**	2.45**
Married for 3 years	2.39**	2.84**	2.59**
Married for 4 years	2.72**	3.07**	2.90**
Married for 5 years	2.75**	2.98**	2.87**
Married for 6 years	2.00**	2.05**	2.06**
Married for 7 years	1.85**	1.86**	1.86**
Married for 8 years	3.27**	3.26**	3.30**
Married for 9 years	2.68**	2.70**	2.71**
Deviance	5,527	5,622	5,566
Person-years or couple-years	5,035	5,035	5,035

Note:

* $P < .05$,

** $P < .01$;

all probabilities are one-tailed. Reported coefficients are Odds ratios. All models are estimated using multi-level multivariate logistic regression.

[†] Brahmin/Chhetri as reference group.

^{††} Married for 10 years as reference group.

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