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PAA 2012 Submission: Marriage Choice and First Birth Interval in India

ABSTRACT

Concomitant with a fertility decline, Indian cultural institutions like marriage are experiencing a transition from traditional arranged to love marriage. This study examines the impact of increased female autonomy in partner choice on the length to first birth, using data from the nationally representative India Human Development Survey (2005). Results indicate that women in arranged marriages have longer birth intervals, with a mean of 41 months, while those in love marriages have a significantly shorter interval, at 33 months. These findings are explained by increasing female age at marriage, increasing female education, urban residence, spouse being from a different village, and longer length of familiarity with spouse prior to marriage. Analysis by birth cohort (1956-1980) reveals the overall decreasing trend in length to first birth intervals by marriage, as well as the sustained delay in age at marriage and the "catching-up" of births among women in recent birth cohorts.

Introduction to marriage in India

The study of marriage has tended to focus on individual determinants of the decision to marry and societal factors shaping this choice (Cherlin, 2004; Lesthaeghe, 2010; Oppenheimer, 1988). This framework is incomplete in the Indian setting, where the decision to marry is not a personal choice, but is influenced if not *dominated* by the family. The social world that influences an individual's decision to marry includes kinship ties and caste- where one's place in social hierarchy is tied to selection of a marriage partner, age at marriage, and manner in which marriages take place (Desai & Andrist, 2010; Uberoi, 1993). Marital hypergamy can raise a woman's social status if she marries someone of a higher caste (Bloom & Reddy, 1986). It is in these settings where theoretical frameworks that link gender with marital choice and timing are salient- keeping in mind the prevailing social context where marital decisions are made by the extended family.

Marriage in India has historically been a universal milestone, and remains so even though age at marriage is rising slowly albeit with a mean age at marriage remaining under age twenty (Das & Dey, 1998). Demographic research of marriage patterns in India during the period 1891-1951 found the female mean age at marriage in the northern states to be particularly low, while there was evidence of higher rates of nonmarriage and marital dissolution in the south and east (Dyson & Moore, 1983). The National Family Health Survey III (2005-2006) shows that nationally, about 47.4% of women were married by the age of 18 with significant regional variation. In the north Indian state of Bihar, this proportion was highest at 69%, with the lowest proportion found in the south Indian state of Tamil Nadu at 22.3%.

Proportions were lower in the west and eastern regions, with 39.4% in the western state of Maharashtra and 54% in the east Indian state of West Bengal (IIPS, 2007). Not surprisingly, much research has focused on gender relations in these above-mentioned states that typify distinct regions of India. There is a noticeable developmental, social, and cultural divide that characterizes and distinguishes each geographical area, particularly when it comes to marriage and gender roles. The principal difference between the states is the unique kinship structure of north India, which assigns relatively little autonomy to females (Stephenson, Koenig, Acharya, & Roy, 2008), while women in a more egalitarian south Indian society on the other hand have higher levels of education and autonomy (Rocca, Rathod, Falle, Pande, & Krishnan, 2009). The construction of female autonomy presumes economic models about the household that assume an internally consistent and unified decision-making structure. This construct leads to inattention to gender inequalities with regards to decisions ranging from financial matters to that of marital choice as well as financial decisions.

Dyson & Moore's (1983) seminal regional analysis typifies north Indian society as one where marriage is largely exogamous. The act of marriage is preceded by a search for inter-group alliances, and women usually have no choice in the matter. The "wife givers" are socially and ritually inferior to the "wife takers", and dowry is the main marriage transaction (Dyson & Moore, 1983). The behavior of a new wife must be closely watched, and she must be resocialized so that she comes to identify her own interests with those of her husband's kin. Parents can expect little help from their daughters after marriage, whereas their sons will remain at home and become the economic providers (Dyson & Moore, 1983). South Indian

society on the other hand is more endogamous, with the ideal marriage occurring between cross-cousins. Women are much more likely to be married to known persons from familiar households near their natal home. Dowry is not important, however bride wealth is- and contributions to the expenses of the marriage ceremony are likely to be more equally shared by the kin groups of the bride and groom compared to their counterparts in the north (Dyson & Moore, 1983).

Marriage has economic implications in India, with dowry or bride wealth transactions occurring despite its illegality. Dowry is associated with a transfer of wealth from the bride's to the groom's family, with the implicit understanding that after the marriage, it is the duty of the groom and his family to provide permanent financial support for the bride. These dowry sums vary with the educational attainment and employment possibilities of the groom as well as the social status of his family (Bloom & Reddy, 1986).

In a study in south India, women who marry early (less than 18) are less likely to have been involved in any decision-making surrounding partner choice (Bloom & Reddy, 1986). This could be related to the more traditional family backgrounds of women who marry early and to the difficulties these women encounter in asserting themselves when important decisions are being made, such as marriage (Santhya, et al., 2010). India is a religiously pluralistic society, and studies find that Muslim women tend to get married earlier than Hindu women, while caste differences are negligible (Caldwell, Reddy, & Caldwell, 1983).

Global determinants of first birth interval

Under southern and northern kinship structures in India, it is evident that women are subjected to relatively strong pronatalist pressures, and they are faced with particularly severe restrictions on their ability to control their fertility (Dyson & Moore, 1983). A married woman's primary task is to produce male heirs for the family she has married into, and raises her social status with the birth of her first born (preferably male) child. The first birth interval is defined as the length of time between marriage and the birth of the first child. In societies such as India where childbearing contributes significantly to a woman's social identity, a first birth proves her fertility and reduces the anxiety surrounding family continuance (Fricke & Teachman, 1993). Data from Taiwan shows a large increase in the probability of conceiving during the first three months of marriage among those women who were not pregnant at the time of marriage (Rindfuss & Morgan, 1983). Trends from Taiwan, Korea, and Malaysia also show a substantial increase in premarital conceptions (not premarital births) between the marriage cohorts of the 1950s to 1970s (Rindfuss & Morgan, 1983), which the authors attribute to increased coital frequency in the early part of marriage.

Place of residence is also an important factor in determining length to first birth interval, with a study in China demonstrating rural women's first birth intervals being shorter with little influence of education and age at first marriage compared to urban women (Zheng, 2000). Age at marriage has been shown to be an important indicator as well, with women who marry early waiting longer to have their first child- a result that indicates "catch-up" effects associated with

late marriage (Hong, 2006). Spousal education and the length to first birth interval have been shown to have a negative relationship in the Chinese context (Hong, 2006).

Marriage choice and first birth interval

In the first few months of a traditionally arranged marriage, the level of coital frequency is likely to be low, leading to fewer births in the first months of marriage. As one moves away from the most traditional form of arranged marriages, the level of coital frequency early in marriage increases, thereby increasing the probability of an early marriage conception (Rindfuss & Morgan, 1983). The extended family's pressure for children within marriage is exerted only as the first birth interval lengthens, and not in the first few months of marriage. In the case of love marriages, there is a shorter 'honeymoon' period, characterized by frequent intercourse. Arranged marriages are likely to begin with an awkward, uncomfortable period, with a delay in the time to the 'honeymoon' period. Thus, the shift from arranged to love marriages have shortened the length to first birth intervals in East Asia (Rindfuss & Morgan, 1983). Hong (2006) finds that the decision of marriage can be regarded as a proxy for the intimacy of couples, at least in the early years of marriage. If couples in love marriages are likely to experience a greater degree of intimacy than do their counterparts in arranged marriages, it is likely that these wives are more likely to become pregnant in the early years of marriage (Hong, 2006).

To the author's knowledge, no such study has been initiated in the Indian setting. For a country undergoing changes in gender, marital structures, and fertility; it is an opportune time

to study the intersection of the three. This paper aims to determine how pervasive the shift from arranged to love marriage has been, and what impact it has had on length to first birth interval. This analysis is conducted under the backdrop of marriage indicators unique to India.

THEORETICAL FRAMEWORK

Goode (1963) suggests that in societies where wider kin interests dominate, arranged marriage and structural factors in the marital household work against the quick formation of intimate ties between young spouses. On the other hand, in societies characterized by individual interests, spouses' prior knowledge of each other and their entry into marriages based on mutual attraction are likely to result in more emotional attachment. The result would be that in societies with the latter types of marriage lack familial impediments to intercourse (living with extended family, disapproval of expression of affection between young couples) and lead to faster births post-marriage (Goode, 1963). Based on this theoretical framework, in this analysis it is hypothesized that arranged marriages would lead to longer birth intervals than those where the respondent had any decision-making power.

DATA AND METHODS

The India Human Development Survey (2005) is a nationally representative sample of 41,554 households spread over 33 states and union territories (Desai, et al., 2007) The survey is a result of a collaboration between the University of Maryland and National Council of Applied Economic Research (NCAER) in New Delhi. The survey includes a household module as well as a

separate module administered to 33,510 ever-married women aged 15-49. It is a unique survey with detailed modules on women's birth history, marriage practices, and gender relations in India. Prior work with the IHDS has restricted the sample of women to those between 25-49 in order to minimize an overrepresentation of women who marry at young ages (Desai & Andrist, 2010) since over 95% of women at that age have been married as indicated by the Indian Census of 2001. Thus, for this paper, analysis is restricted to 82,024 women aged 25-49- specifically, 23,754 of those who had a first birth.

Categorization of variables

Dependent variable

Birth interval: Imputed date of marriage and imputed date of first birth are used to construct a continuous variable for birth interval in months. A dichotomous variable is then created with births occurring within 24 months of marriage coded as 0 (44.69%), and those thereafter as 1 (55.31%). The total sample size of women with a first birth interval is thus 23,754.

Key independent variable

Marriage choice: In India, marital decisions are mainly within the purview of the family. However, this does not indicate that women have no say in one of the biggest decisions of their lives. Mothers and older sisters-in-law are often asked to ascertain the wishes of the young women (Desai & Andrist, 2010). In this analysis, respondents are asked, "Who chose your husband". Answers are coded as 1 (4.72%) if respondent chose for herself (love marriage), 2

(36.84%), if it was a joint decision with her parents (joint marriage) and 3 (58.44%) if she had no say in the decision (arranged marriage). The reference category used for analysis is the latter, arranged marriage. The author acknowledges the categories of marital choice may be more fluid than the question suggests. This is however, a first attempt at analyzing the relationship between marital choice and fertility in India.

Analysis

Survival analysis (Allison, 1995) is used to determine the hazard of first birth among all women in the sample. A total of 16,032 women did not have a first birth and were thus treated as not having had the event, while a total of 23,756 women had the event of a first birth. Kaplan-Meier estimates for hazard to first birth interval are produced by marriage type (love, joint, or arranged). Next, since the aim is to determine *when* after marriage birth occurs- and not *if* birth occurs, logistic regression models are fit for the outcome of birth interval (0=within 2 years of marriage, 1=after 2 years of marriage) using STATA 11 software. Model 1 describes the relationship between marriage choice and birth cohort with birth interval. Model 2 adds controls for demographic indicators: age at marriage, spousal age difference, female and male education, type of place of residence, and caste/religion of respondent. Model 3 adds controls for key marriage indicators: whether the respondent and her husband are from the same village and same caste, living arrangements after marriage, natal family's economic status relative to marital family, and respondent's length of familiarity with husband before marriage.

RESULTS

The national mean age at marriage for females in the IHDS sample is 16.58 years, which is consistent with figures from Bloom and Reddy's study nearly twenty years earlier where mean age of marriage for females was below 18 (Bloom & Reddy, 1986). The mean age at marriage varies, with expected regional distinctions based on regional characteristics discussed above (Table 1). The lowest mean age at marriage for women is concentrated in north India, with Bihar reporting the lowest at 14.79 years, followed by Madhya Pradesh and Rajasthan at 15.2 years. Interestingly, the highest mean age at marriage is found in the northeastern part of India, in Manipur (21.84 years) and Mizoram (20.53) years- a region that is notoriously underdeveloped and plagued with communal violence. Notably, this is also the region that corresponds with highest years of education attained for women, with the states of Manipur and Mizoram at 6.73 years and 6.89 years respectively. Not surprisingly, the highest mean years of female education is found in the southern state of Kerala (7.95 years)- a region known for gender egalitarianism, high literacy rate, and high proportion of female labor force participation. Low education levels for males are also concentrated in the north of India, with Chhattisgarh (4.42 years) and Madhya Pradesh (4.32 years) indicating particularly low levels.

For ease of comparison henceforth, marriages where respondents choose their partners will be referred to as "love marriages", marriages where respondents have joint decision-making power are called "joint marriages" and marriages where respondents have no say in spousal choice are characterized as "arranged marriages".

Once decomposed by marriage choice, the indicators above show distinct patterns (Table 2). In instances of love marriages, marriage is delayed with mean age at marriage for those women at 18.05 years. This is almost a year later than joint marriages (17.01 years), and almost two years later for arranged marriages (16.24 years). The mean age at marriage at the national level is close to that of arranged marriages (16.58 years), signaling the proportional impact of arranged marriages on mean age at marriage.

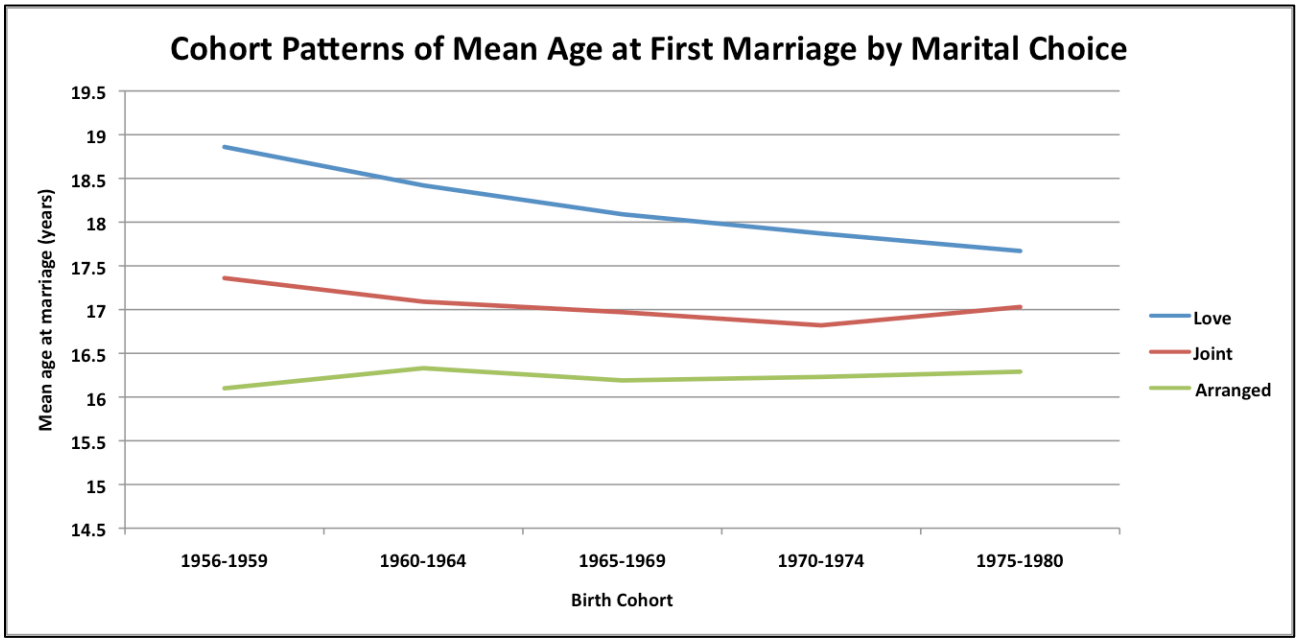
The same gradient is observed for years of education. Women who have love marriages are also those with more mean years of education (4.17 years), followed by those that have joint marriages (3.41 years). Women who have arranged marriages have the fewest mean years of education (2.62 years), perhaps signaling higher dropout rates once a marriage has been arranged. Surprisingly, there is not much difference in the spousal age gap regardless of marital choice. Love marriages (5.67 years), joint marriages (5.57 years), and arranged marriages (5.31 years) are clustered around the national average of 5.49 years. In terms of length to first birth interval, women in love marriages have the shortest birth interval at 33.28 months. This interval gradually gets longer with lower autonomy- with women in joint marriages at 38.37 months, and women in arranged marriages at 41.6 months.

Birth cohort trends

Analysis by birth cohorts reveals a different pattern than observed looking at period patterns of marital choice and birth intervals. Graph 1 shows that over the years from 1956 to 1980, mean age of marriage has been highest for women who choose love marriages, and

lowest for those in arranged marriages. This pattern is consistent with period analysis, however, cohort analysis shows a steady decline in mean age at first marriage for women in love marriages, and slight increases for women in the other two marriage choices from 1970 onwards.

Graph 1. Cohort Patterns of Mean Age at First Marriage by Marital Choice



Perhaps the most surprising pattern emergent in cohort analysis is evident in birth intervals (Graph 2; See Appendix for details). Women in love marriages have consistently had longer (albeit declining) length to first birth intervals from the birth cohorts of 1956 to 1980 compared with women in joint or arranged marriages. Women in arranged marriages show a similar declining pattern initially, with mean lengths to first birth interval closing in on the means observed in love marriages. Women in joint marriages have an irregular pattern for birth intervals, although it is declining as well. While these results are converse to period patterns, it is important to note that sample sizes for love marriages among the earlier cohorts (1956-1969)

are very small (n=8 to 18), which would lend themselves to unreliable patterns and thus unremarkable conclusions, given the rarity of these marital choices in earlier cohorts.

Graph 2. Cohort Patterns of Mean Length to First Birth by Marital Choice

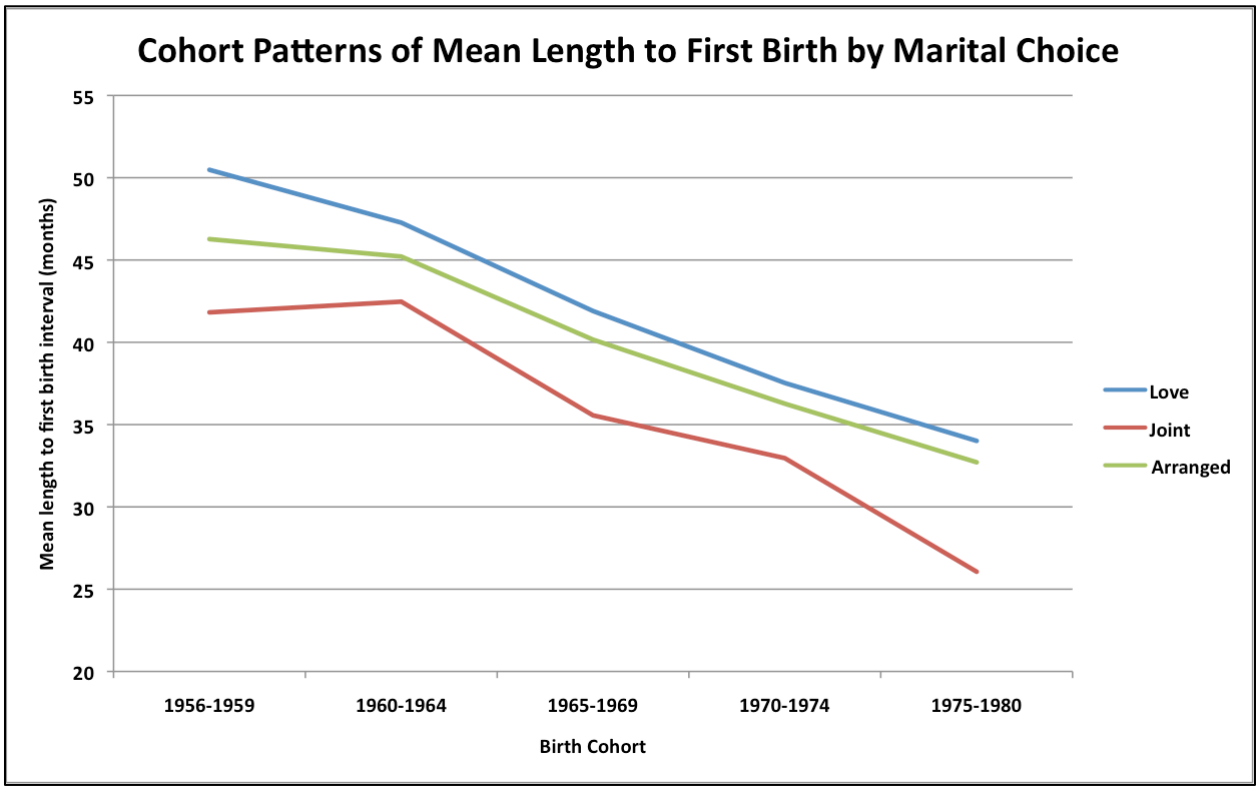
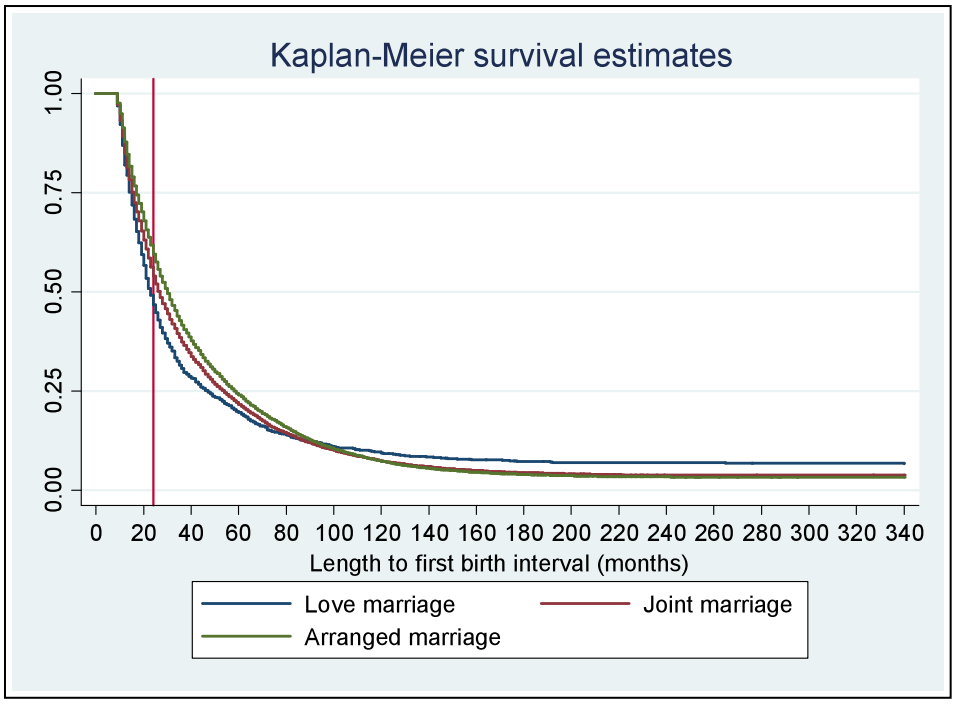


Table 3 shows Kaplan-Meier survivor estimates of the proportion of respondents who survive, i.e. do not have the event of a first birth by duration of marriage at month *t*. At exactly 9 months after marriage, about 97% of all women had not have a first birth. The 3% that do have a birth before 9 months can be attributed to premature births and perhaps premarital conceptions- although this is impossible to determine given the data and Indian context (as described previously). By the end of the first year of marriage, 18% of women in love marriages have had a first birth, compared to 15% of women in joint and 12% of women in arranged marriages. By the end of the second year of marriage, women in arranged marriages have

significantly higher proportions of births: 53% have had a first birth compared to 46% of women in joint and a lower 40% in arranged marriage (Graph 3 for a graphical representation of the data). By the end of the observation period (340 months), about 7% of women in love marriages have not had children, while the proportions are lower for the other types of marriage- about 3%. Given that the natural sterility in a population is estimated to be about 3% (Bongaarts, 1987), it is likely that the higher proportion of women without children in love marriages at the end of the observation period of 340 months are delaying children or choosing not to have any. The Wilcoxon (Breslow) test for equality of these survivor functions confirms that survival functions are statistically significantly different by type of marriage (chi-square p=0).

Table 4 shows distributions of key variables by marital choice. Women who have love marriages have higher proportions of spouses from different villages (31.51%) compared to women in joint (13.1%) or arranged (12.38%) marriages. These women also have proportionately more exogamous marriages, with 14.71% of women in love marriages marrying outside their caste compared to lower proportions of women- 4.15% in joint and 5.04% in arranged marriages. Living arrangements post-marriage also varies by marital choice, with most women in joint (87.14%) and arranged marriages (93.99%) living with their husband's family. More couples in a love marriage live separately from the marital home (18.85%), which could potentially explain intimacy and length to first birth interval (discussed in next section).

Graph 3: Survival estimates for hazard of birth in months by type of marriage



In terms of economic differences between natal and marital families, women in love and joint marriage have higher proportions of "marrying-up" (25.43% and 23.05% respectively), while those in arranged marriages have lower proportions of the same (17.31%). Familiarity with a spouse also varies by marital choice; proportionally higher women in love marriages knew their spouse for greater than a year (23.34%), while most women in joint (60.64%) and arranged (77.09%) marriages met their husband on their wedding day. Interestingly, 34.5% of women in love marriages also met their husband on their wedding day- which indicates that this type of marriage need not demonstrate length of familiarity, but the depth of decision-making power the woman had in choosing her spouse once the arranged marriage process was set in motion. There are no particular caste differences when it comes to marital decision-making. All castes have proportionally high levels of arranged marriages, with lower caste

Hindus (OBC) having the highest proportion of love marriages (28.46%) and Muslim women having the lowest (11.13%). Table 4 shows that among women who have love marriages, 57.14% have a first birth within the first 2 years of marriage, compared to lower proportions of 47.78% in joint and 41.78% in arranged marriages.

Logistic regression results

The outcome of length to first birth interval is modeled as a categorical variable, with 0 corresponding with a birth within 2 years of marriage, and 1 referring to a birth after 2 years of marriage (Table 5). Women who have love marriages are 46% significantly less likely to have a birth interval longer than 2 years, while women with joint decision making are 22% significantly less likely to have the same. In other words, women with more autonomy in choosing their spouses are significantly more likely to have shorter birth intervals than those women who have arranged marriages. A cohort comparison shows a similar decelerating gradient, with younger cohorts having significantly shorter birth intervals than the cohort born between 1956 and 1959.

Model 2 adds controls for demographic indicators. Women who marry at older ages are significantly and incrementally more likely to have shorter birth intervals. For instance, women who marry before age 14 are three times more likely (OR=3.27), and women who marry above age 25 are 84% less likely- to have longer birth intervals than women who marry between ages 15 and 19. There is no significant effect of spousal age difference on duration to first birth. Women with education between 1-12 years are significantly less likely to have longer birth

intervals, an effect that disappears with more education. Place of residence is also important, with urban women having significantly shorter birth intervals than their rural counterparts (OR=0.82). Religion does seem to matter, with Muslim women being 25% less likely to have a shorter birth interval compared to upper caste Hindu women (OR=0.74).

Model 3 adds controls for marriage indicators. The effect of marital choice is slightly attenuated with the addition of demographic and marriage indicators in the full model. Women who have love marriages are about 29% less likely to have longer birth intervals while those in joint marriages are 7% less likely to have longer birth intervals, compared to women in arranged marriages. Women whose husbands are from the same village as theirs are 12% significantly less likely to have longer birth intervals (OR=0.88). Length of familiarity is highly indicative of length to first birth interval, with women who knew their husbands longer prior to marriage having significantly shorter intervals. No significant effects are found for caste differences, living arrangements after marriage, or relative economic status.

DISCUSSION AND CONCLUSIONS

This analysis provides empirical evidence in favor of the Goode framework by showing that women in arranged marriages have longer birth intervals. Shorter intervals for women in love marriages are explained by: increasing age at marriage, increasing female (and to a certain extent, male) education, urban residence, spouse being from a different village, and longer length of familiarity with spouse. Goode's framework does include length of familiarity between spouses as indicative of shorter birth intervals, which is confirmed in the present

analysis. Longer familiarity with one's spouse prior to marriage may increase intimacy and understanding between spouses, leading to earlier physical intimacy once married.

A study of birth cohorts is included as an indicator of social change in India. Previous analyses of birth cohorts and participation in mate choice show that compared to older cohorts, younger cohorts have significantly higher participation in choice of their spouses (Ghimire, Axinn, Yabiku, & Thornton, 2006). Birth cohort trends in the present study echo past studies- a declining mean age at marriage is seen for women who have love marriages- however in the present study a slight increase is observed for women in joint and arranged marriages. It is curious that mean age at marriage is declining for women choosing love marriages in the cohort analysis- this could be Mean lengths to first birth interval are also decreasing by birth cohorts, which shows women are delaying marriage and then "catching-up" on births by having them sooner than previous cohorts. A similar study in China finds that first birth intervals shortened significantly over the decades under study, and attributed this shortening with the transition from traditional arranged marriages to free-choice (love) marriages (Hong, 2006). While a similar shortening is seen in the present study, shorter birth intervals are not directly caused by marital choice, as causation is difficult to determine. Also, India has not undergone a significant change in martial structure- enough to call a transition. Over time, perhaps the traditional institution of arranged marriage will give way to a wave of love marriages with consequences for length to first birth interval and larger societal implications as well.

Hong (2006) finds a negative relationship between male education and length to first birth interval. The present study finds a similar association for men with up to 8 years of

education compared to men with no education. The effect of female education is unique to the present study, which finds that women with up to 12 years of education have shorter birth intervals than women with no education. It can be argued that women with more education are more likely to delay marriage as a result of increased labor force participation and college attainment. Previous studies have found conflicting effects of schooling on marital spouse choice (Ghimire, et al., 2006; Hong, 2006) while controlling for labor force participation. One limitation of this study is the inability to isolate female labor force participation pre-marriage and examine the consequences on marriage and birth intervals. Another limitation of the present study is the inability to isolate contraceptive use and the impact on delayed births. Women in love marriages seem to be delaying (or foregoing) births, which could be related to higher levels of education and possible labor force participation- yet our knowledge regarding past contraceptive use is limited. In the present sample, about 62% of women report using no contraception at time of interview- with most users opting for female sterilization (67.95%). A possible conclusion given these figures is that contraceptive use is very low- particularly in the early years of marriage due to an emphasis on early births. This is a likely explanation, given the importance placed on a woman 'proving' her fertility by giving birth soon after marriage- which also cements her role as a mother in the extended family network (Uberoi, 1993).

A study in Nepal shows that living arrangements where the married couple lives apart form the marital family leads to shortened birth intervals (Fricke & Teachman, 1993)- a result that the Goode framework hypothesizes as well, but not observed in the present study. Perhaps living apart from the marital family is not socially sanctioned in certain parts of India- at

least in the initial stages of marriage, which would explain these results. It is notable that the social transformation of greater spousal choice actually accelerates time to first birth and occurs within the purview of traditional living arrangements- an indicator of the complexity of the process of transition. Future directions would be to decompose this analysis based on ideologically and geographically distinct regions of India to determine variations within the country.

This study provides empirical evidence of the influence of autonomy in partner choice over birth cohorts, as well as the importance of analyzing type of marriage as it relates to fertility decisions. Cultural context is a salient yet underutilized perspective in explaining variations in the determinants and timing of fertility- with implications for projecting population estimates in a changing gender and ideational setting.

TABLES

Table 1. Mean Distributions of Demographic Indicators Across Indian States

State	Mean age at marriage	Std dev	Mean years of education (f)	Std dev	Mean years of education (m)	Std dev
All India	16.58	3.41	2.99	4.19	5.41	4.80
Andhra Pradesh	15.25	3.06	2.60	3.94	4.54	4.80
Arunachal Pradesh	17.21	4.08	3.71	4.95	6.82	5.49
Assam	18.62	3.32	4.22	4.13	5.88	4.50
Bihar	14.79	2.75	2.17	3.81	5.10	5.21
Chandigarh	19.15	3.59	7.95	5.59	10.11	4.42
Chhattisgarh	15.59	3.38	1.92	3.56	4.42	4.68
Dadra & Nagar Haveli	15.37	1.40	3.08	4.47	4.44	5.27
Daman & Diu	16.79	1.53	2.12	3.97	4.73	4.85
Delhi	18.23	3.14	5.15	5.01	8.55	4.66
Goa	22.07	3.52	5.68	4.48	7.18	3.90
Gujarat	17.66	2.80	3.63	4.46	6.13	4.69
Haryana	16.52	2.68	2.11	3.83	5.53	4.91
Himachal Pradesh	17.68	3.18	3.55	4.12	6.34	4.48
Jammu & Kashmir	17.95	3.43	2.54	4.22	5.50	4.89
Jharkhand	16.35	2.86	2.96	4.33	6.43	4.95
Karnataka	16.57	3.46	3.15	4.22	5.10	4.81
Kerala	19.78	3.60	7.50	3.74	7.78	3.55
Madhya Pradesh	15.18	2.91	1.55	3.19	4.32	4.42
Maharashtra	16.82	3.09	3.75	4.08	5.91	4.45
Manipur	21.84	5.38	6.73	5.71	10.35	4.39
Meghalaya	19.81	3.29	5.49	5.01	6.19	5.37
Mizoram	20.53	3.58	6.89	3.21	8.53	3.97
Nagaland	19.09	3.24	6.73	3.32	8.36	3.50
Orissa	17.25	2.96	2.76	3.90	4.77	4.45
Pondicherry	18.75	3.15	5.54	4.64	6.97	4.56
Punjab	18.80	3.07	3.67	4.42	5.68	4.77
Rajasthan	15.19	2.98	1.51	3.31	4.70	4.86
Sikkim	16.99	2.90	5.09	4.55	6.94	4.06
Tamil Nadu	18.34	3.29	4.23	4.48	5.79	4.67
Tripura	17.63	2.45	3.95	4.03	5.58	4.58
Uttar Pradesh	15.54	3.08	1.79	3.60	4.98	4.93
Uttaranchal	16.60	2.86	2.69	3.94	5.11	4.60
West Bengal	16.18	3.41	3.47	4.27	5.11	4.84

Table 2. Means for Demographic Indicators by Marriage Choice Included in Analysis

Variable	Overall	Love	Joint	Arranged
Age at marriage	16.58 (3.41)	18.05 (4.03)	17.01 (3.38)	16.24 (3.32)
Years of education (female)	2.99 (4.19)	4.17 (4.71)	3.41 (4.38)	2.62 (3.93)
Years of education (male)	5.41 (4.80)	6.06 (4.97)	5.77 (4.85)	5.18 (4.72)
Spousal age difference	(5.49) 3.62	5.67 (4.11)	5.57 (3.62)	5.31 (3.49)
Birth interval	40.03 (34.82)	33.28 (32.82)	38.37 (34.12)	41.60 (35.29)

Table 3. Summary Kaplan-Meier proportions of first birth intervals by type of marriage

	Type of marriage		
Length to birth interval	**Love**	**Joint**	**Arranged**
9	0.97	0.97	0.98
12	0.82	0.85	0.88
15	0.72	0.75	0.79
18	0.62	0.68	0.72
21	0.53	0.61	0.66
24	0.47	0.54	0.60
27	0.41	0.49	0.54
30	0.37	0.44	0.50
33	0.33	0.41	0.45
36	0.31	0.37	0.42
39	0.29	0.35	0.39
42	0.27	0.32	0.36
45	0.26	0.30	0.33
48	0.24	0.28	0.31
51	0.23	0.26	0.29
54	0.22	0.25	0.27
57	0.21	0.23	0.26
60	0.20	0.22	0.24
72	0.15	0.17	0.19
84	0.13	0.13	0.14
96	0.12	0.11	0.11
112	0.10	0.09	0.09
120	0.09	0.08	0.08
340	0.07	0.04	0.03

Table 4. Distributions of Key Demographic and Marital Variables by Marriage Choice

Variable		Love	Joint	Arranged	Total
Is your husband from the same village as you?	No	2,302 (68.49)	24,648 (86.9)	43,884 (87.62)	70,834 (86.58)
	Yes	1,059 (31.51)	3,715 (13.1)	6,202 (12.38)	10,976 (13.42)
	Total	3,361	28,363	50,086	81,810
Is your husband from the same caste as you?	No	495 (14.71)	1,179 (4.15)	2,526 (5.04)	4,200 (5.13)
	Yes	2,870 (85.29)	27,241 (95.85)	47,554 (94.96)	77,665 (94.87)
	Total	3,365	28,420	50,080	81,865
After marriage, who did you both live with?	His parents	2,432 (72.77)	24,753 (87.14)	47,013 (93.99)	74,198 (90.74)
	Her parents	280 (8.38)	1,096 (3.86)	800 (1.60)	21,76 (2.66)
	Alone	630 (18.85)	2,556 (9.00)	2,207 (4.41)	5,393 (6.60)
	Total	3,342	28,405	50,020	81,767
What is the economic status of your natal family compared to marital family?	Same	2,239 (66.44)	19,461 (68.34)	37,570 (74.87)	59,270 (72.26)
	Better off	857 (25.43)	6,563 (23.05)	8,684 (17.31)	16,104 (19.63)
	Worse off	274 (8.13)	2,452 (8.61)	3,924 (7.82)	6,650 (8.11)
	Total	3,370	28,476	50,178	82,024
How long did you know your husband before marriage?	Wedding day	1,162 (34.5)	17,232 (60.64)	38,597 (77.09)	56,991 (69.63)
	<1 month	235 (6.98)	3,757 (13.22)	2,695 (5.38)	6,687 (8.17)
	<1 year	635 (18.85)	3,938 (13.86)	4,220 (8.43)	8,793 (10.74)
	>1 year	786 (23.34)	1,186 (4.17)	1,235 (2.47)	3,207 (3.92)
	Since childhood	550 (16.33)	2,303 (8.1)	3,319 (6.63)	6,172 (7.54)
	Total	3,368	28,416	50,066	81,850
Education level (female)	None	1,451 (43.06)	14,555 (51.11)	29,581 (58.95)	45,587 (55.58)
	Primary (1-8)	1,025 (30.42)	8,269 (29.04)	13,505 (26.91)	22,799 (27.80)
	Secondary (9-12)	664 (19.70)	4,507 (15.83)	5,782 (11.52)	10,953 (13.35)
	Higher (13+)	230 (6.82)	1,145 (4.02)	1,310 (2.61)	2,685 (3.27)
	Total	3,370	28,476	50,178	82,024
Education level (male)	None	1,881 (55.82)	16,820 (59.07)	32,429 (64.63)	51,130 (62.34)
	Primary (1-8)	1,033 (30.65)	8,693 (30.53)	12,579 (25.07)	22,305 (27.19)
	Secondary (9-12)	302 (8.96)	1,947 (6.84)	3,439 (6.85)	5,688 (6.93)
	Higher (13+)	154 (4.57)	1,016 (3.57)	1,731 (3.45)	2,901 (3.54)
	Total	3,370	28,476	50,178	82,024
Type of place of residence	Rural	2,205 (65.43)	19,058 (66.93)	34,337 (68.43)	55,600 (67.79)
	Urban	1,165 (34.57)	9,418 (33.07)	15,841 (31.57)	26,424 (32.21)
	Total	3,370	28,476	50,178	82,024
Caste/Religion	Upper Caste Hindu	602 (17.86)	5,505 (19.33)	9,884 (19.70)	15,991 (19.50)

	OBC	959 (28.46)	9,873 (34.67)	16,372 (32.63)	27,204 (33.17)
	Dalit	614 (18.22)	5,791 (20.34)	11,331 (22.58)	17,736 (21.62)
	Adivasi	724 (21.48)	2,271 (7.98)	3,699 (7.37)	6,694 (8.16)
	Muslim	375 (11.13)	4,050 (14.22)	7,672 (15.29)	12,097 (14.75)
	Other	96 (2.85)	986 (3.46)	1,220 (2.43)	2,302 (2.81)
	Total	3,370	28,476	50,178	82,024
Spousal age difference	Same	88 (2.61)	238 (0.84)	438 (0.87)	764 (0.93)
	1-5 years	1,759 (52.2)	15,701 (55.14)	29,117 (58.03)	46,577 (56.78)
	6+ years	1,523 (45.19)	12,537 (44.03)	20,623 (41.10)	34,683 (42.28)
	Total	3,370	28,476	50,178	82,024
Age at marriage	<14	575 (17.06)	5,902 (20.73)	14,171 (28.24)	20,648 (25.17)
	15-19	1,786 (53.00)	16,895 (59.33)	28,871 (57.54)	47,552 (57.97)
	20-24	781 (23.18)	4,938 (17.34)	6,291 (12.54)	12,010 (14.64)
	25+	228 (6.77)	741 (2.60)	845 (1.68)	1,814 (2.21)
Birth interval	Less than 2 years	620 (57.14)	4,174 (47.78)	5,821 (41.78)	10,615 (44.69)
	2 years +	465 (42.86)	4,562 (52.22)	8,112 (58.22)	13,139 (55.31)
	Total	1,085	8,736	13,933	23,754
Birth cohort	1956-1959	280 (8.31)	2,545 (8.94)	4,615 (9.20)	7,440 (9.07)
	1960-1964	600 (17.80)	5,520 (19.38)	9,249 (18.44)	15,369 (18.74)
	1965-1969	877 (26.02)	7,187 (25.24)	13,011 (25.94)	21,075 (25.70)
	1970-1974	678 (20.12)	6,695 (23.51)	11,430 (22.79)	18,803 (22.93)
	1975-1980	935 (27.74)	6,529 (22.93)	11,850 (23.63)	19,314 (23.55)
	Total	3,370	28,476	50,155	82,001

Table 5. Logistic Regression on Birth Interval (0 = less than 2 years, 1 = 2+years)

Variable	Model 1	Model 2	Model 3
Marriage choice (ref: Arranged)			
Love	0.54***	0.66***	0.71***
Joint	0.78***	0.88***	0.93*
Birth Cohort (ref: 1956-1959)			
1960-1964	0.90	0.90	0.88*
1965-1969	0.78***	0.75***	0.74***
1970-1974	0.62***	0.58***	0.57***
1975-1980	0.55***	0.53***	0.52***
DEMOGRAPHIC INDICATORS			
Age at marriage (ref: 15-19)			
<14		3.27***	3.27***
20-24		0.69***	0.67***
25+		0.55***	0.55***
Spousal age difference (Same)			
1-5 years		1.06	1.03
6+ years		0.83	0.83
Education female (ref: none)			
1-8 years		0.76***	0.78***
9-12 years		0.72***	0.77***
13+ years		0.91	0.96
Education male (ref: none)			
1-8 years		0.92*	0.93*
9-12 years		1.03	1.02
13+ years		1.00	0.99
Type of place of residence (ref: Rural)			
Urban		0.82***	0.83***
Caste/Religion (ref: Upper caste Hindu)			
OBC		0.97	1.00
Dalit		0.93	0.95
Adivasi		0.86*	0.92
Muslim		0.74***	0.79***
Other		0.55***	0.58***

MARRIAGE INDICATORS	
Husband from same village (ref: No)	
Yes	0.88***
Husband from same caste (ref: No)	
Yes	1.06
Living arrangements after marriage (ref: With his parents)	
Her parents	0.95
Alone	1.10
Natal family's economic status relative to marital family (ref: Same)	
Better off	1.00
Worse off	1.09
Length of familiarity with husband before wedding (ref: met on wedding day)	
<1 month	0.64***
<1 year	0.69***
>1 year	0.83***
Since childhood	0.80***

APPENDIX

(Table not included in main discussion, but graphs correspond to this data)

Table 6. Birth cohort patterns of mean age at marriage and mean length to first birth interval by marriage choice

	Birth cohort	Love	Joint	Arranged
Birth Interval				
	1956-1959	50.48 (44.40)	41.82 (52.03)	46.27 (41.92
	1960-1964	47.27 (40.83)	42.47 (43.99)	45.21 (40.26)
	1965-1969	41.90 (36.10)	35.56 (31.96)	40.16 (34.59)
	1970-1974	37.53 (31.77)	32.96 (29.13)	36.27 (31.44)
	1975-1980	34.01 (27.70)	26.06 (20.93)	32.71 (28.13)
Age at marriage				
	1956-1959	18.86 (3.56)	17.36 (3.52)	16.10 (3.62)
	1960-1964	18.42 (4.51)	17.09 (3.56)	16.33 (3.50)
	1965-1969	18.09 (4.24)	16.97 (3.24)	16.19 (3.30)
	1970-1974	17.87 (4.23)	16.82 (3.43)	16.23 (3.34)
	1975-1980	17.67 (3.39)	17.03 (3.24)	16.29 (3.05)

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