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BIRTH CONTROL USE PRIOR TO FIRST CONCEPTION IN THE ISLAMIC REPUBLIC OF IRAN*

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Using data from the 2002 Iran Fertility Transition Survey (IFTS) collected in four Iranian provinces, the authors explore changes in elapsed time between marriage and first conception. Across marriage cohorts, a u-shaped pattern is observed. This pattern can be explained by: i) a monotonic decline in conception interval length possibly associated with a shift from arranged to romantic marriages overlaid by ii) a sharp increase in birth control use among those married after 1990. The authors focus on the post 1990 increase in contraceptive use and develop two possible explanations. The first posits that birth control use before the first conception reflects a new marriage form, the conjugal marriage that places a heightened value on the spousal relationship while de-emphasizing the centrality of parenthood. The competing explanation stresses the power of Iranian political/religious actors to encourage early marriage while allowing women access to higher education and birth control. Women respond to these constraints and opportunities by marrying relatively early but postponing fertility via birth control. Thus, birth control allows the maintenance of the status quo marriage regime. Evidence from IFTS strongly supports the later explanation.

Iranian fertility has fallen dramatically, and this decline has been well documented. Indexed by the total fertility rate, Iranian fertility declined from slightly above six in 1985 to slightly above two in 2000 (Abbasi-Shavazi 2000, 2001, 2002; Abbasi-Shavazi and McDonald 2005), perhaps the most rapid fertility transition ever recorded. Here we concentrate on a small segment of changing fertility, changes in the length of the interval between marriage and first conception. Our focus is not driven by the importance of this change in accounting for the dramatic fertility decline -- in this respect the lengthening of the interval between marriage and first conception is trivial. Rather we concentrate on the first conception interval because of its substantive importance as a possible marker of the changing nature of marriage. Alternatively, the changes we document may reflect not changing marriage but an attempt to maintain the status quo in

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relation to marriage in the face of exigencies encouraging fertility delay. In this paper we develop these competing explanations and assess the empirical evidence that supports each.

THE FIRST BIRTH INTERVAL AND THE MEANING OF MARRIAGE

An attractive feature of demographic work is the relative ease of some key measurements. For instance, substantial agreement can and has been reached on the measurement of births and deaths, events anchored in biology. Certainly compared with many other social science concepts, these events are well measured and have similar meanings across time and space (Morgan and Lynch 2001). The timing of first birth, for instance, usually corresponds with the transition to parenthood and is a major event biologically and socially. Its date is reliably reported in Iran as in many other contexts. Here we shall focus on the time of the first conception measured for most women as nine months preceding their first birth. For those whose first pregnancy ends in miscarriage or stillbirth, the event is also likely well remembered as a crisis early in married life.[1]

Marriage on the other hand has a less certain meaning. Across contexts it may or may not signal the beginning of intercourse, spousal co-residence, an attempt to establish a close emotional bond, an attempt to institutionalize a familial division of labor, etc. The distinction made here between the "fixed" meaning of first conception and marriage is a relative one. Our claim (building on Rindfuss and Morgan 1983 and Wang and Quanhe 1996) is that we can use the relation of first conception to marriage as a way of indexing marriage change, since the meaning of first conception is relatively invariant. For instance, Rindfuss and Morgan (1983) document shortening first birth intervals (i.e., shorter durations between marriage and first birth) in a number of Asian contexts. While they consider a range of possible explanations, they conclude that the shortening of the first birth interval was the result of increasing coital frequency early in marriage. The more frequent coitus, in turn, reflected a shift in marriage from arranged marriages to ones with substantial input from the partners. Rindfuss and Morgan argued that greater familiarity, initial closeness and comfortableness associated with "love matches" was conducive to more frequent coitus. This empirical finding has been replicated and its interpretation often adopted (see Wang and Quanhe 1996). In fact, we will document a similar phenomenon in Iran for those married after 1970 and before 1990 and for the full range of cohorts (1970-2000) when those using birth control are excluded.

But note that the shortening of the first birth interval as described by Rindfuss and Morgan is still within a view of marriage as primarily a context for parenthood. In short, marriage was postponed until the couple was ready to become parents. In the Asian contexts studied by Rindfuss and Morgan, there was no contraceptive use in the first birth interval despite its use at higher parities in all of these contexts.

Stimulated by the shift from arranged to romantic marriages, many would expect a set of changes in marriage, including greater gender equality and more emphasis on the quality

[1] Bongaarts and Potter (1983) estimate that approximately 20% of recognizable conceptions end in miscarriage or stillbirth. Pregnancies measured in our study are recognizable pregnancies.

of the conjugal relationship. These changes, in turn, legitimate marriage as distinct from parenthood and legitimate fertility postponement within marriage. One rationale for first birth postponement is to allow the couple to establish strong affective bonds. In the West, practicing birth control in new unions is highly normative. Early birth control use is also emerging in other contexts where the conjugal marriage is taking hold. (for Japan, see Ogawa 2003).

In Iran after 1990, the use of birth control in marriage before the first conception increased dramatically, from 3% to 20%. One explanation consistent with the arguments above is that this new behavior (birth control use immediately after marriage) signaled a new type of marriage, a marriage less focused on children and more focused on the conjugal relationship. First birth postponement was driven by the desire of the couple (and with the support of the community) to develop strong emotional bonds between husband and wife prior to parenthood. A range of theoretical perspectives has anticipated such a change (e.g., Goode 1963; Thornton 2001; 2005). Further, this shift in the meaning of marriage has far reaching implications including claims that conjugal centered marriage is conducive to very low fertility.

An alternative interpretation exists; it challenges the above as a common Western misinterpretation of change, that is, as a convergence toward Western-style conjugal unions driven by forces exogenous to the society. In opposition to these earlier arguments, a focus on local culture and agency views birth control use early in marriage as a strategy to manage new exigencies while limiting institutional/cultural change. Thus, use of birth control is not evidence of a new institutional form, but rather behavior necessary to maintain the existing marriage regime. McDonald (1994) offers a theoretical frame that captures key aspects of the Iranian situation. In general, McDonald posits an *idealized family morality* as a fundamental cultural component of all societies. Because family organization is at the core of all societies, this morality is key to societal identity. The extent to which societies will be open to change will vary according to the degree to which deviation from the idealized morality is tolerated. In particular, there will be little variation from the idealized family morality in countries where the family system is reinforced by a strong social morality, that is, where variation from the ideal is deemed to be illegal, antisocial, or contrary to the teachings of the prevailing religion. In these societies, conventionally, the ideal is policed by the strong formal institutions of the society, principally the institutions of religion and the state.

In the Iranian circumstance, family change must be interpreted within a framework that is political: how much and what type of change in family organization will be acceptable to the ruling authorities? Individuals can experiment with the boundaries of change and find that in some areas, these boundaries are relatively flexible while in others they are rigid. In contemporary Iran, the boundaries are defined and interpreted by religious authorities. Change may proceed in some aspects of family life because that change is not viewed as a threat to the idealized family morality. For example, birth control use and smaller family size may be acceptable while “dating”, premarital sex and cohabitation are anathema.

The lynchpins of Iranian idealized family morality are a sharp gendered division of labor and clear gender stratification. Early marriage is seen, probably correctly so, as the key mechanism for maintaining both. Domesticity and motherhood is the core of women's roles. Consistent with this ideal, only a small percentage of women work outside the home (approximately seven per cent of married women), roughly one-half the percentage employed prior to the revolution.

The state's willingness to tolerate change in some domains in order to maintain early marriage is illustrated by contemporary marriage incentives and rewards. Iranian girls and women remain in schools and universities for more years than in the past. Further, the sex ratio of university students has changed in favor of girls in recent years. In 1998, 52 per cent of new enrolments at government universities were girls. The figure increased to 57 per cent in 1999, to 60 percent in 2000, and to 62 percent in 2001 (Abdollahyan, 2001). These increases indicate the acceptance of female tertiary education in post-revolutionary Iran. In other Asian contexts, especially in East Asia, advanced education leads onto substantial delay of marriage through the incentive for young single women to engage in paid employment. In Iran, the increasing numbers of girls as against boys of marriageable age has been discussed in the media and in academic circles as a factor that may lead to rising age at marriage (Doroudi-Ahi 2001). In reaction to these trends, the government has acted to promote early marriage, or more exactly to prevent delayed marriage. Various government organizations (eg., the Youth Organization) have indicated the importance of providing incentives including financial support for young men and women to marry. At universities across Iran, the Office of Supreme Leader has initiated programs that encourage students (men and women) to marry. For instance, at Tehran University in recent years, the Office of Supreme Leader has organized public ceremonies on religious occasions to honor students who married other students in the university. The couples were presented with gold coins (worth approximately 100 US$) by the government and other community donors provided basic amenities to the couples, items such as a refrigerator, carpet etc. Many other universities have similar ceremonies. As another example, in 2003, the mayor of Tehran (and now the Iranian President, Dr. Mohmoud Ahmadinejad) proposed loans and housing allowances for newly married couples. Interestingly, the 2005 elected government in its first meeting held in the city of Mashhad in 26 August 2005, established a foundation to provide loans in the name of the eight Shiite Imam called: *Sandoogh-e Mehr-e Imam Reza* to support young adult employment and marriage. The Foundation will operate in all provinces.

In such a context, it is reasonable to interpret increasing birth control use after marriage as a response to existing exigencies and not as reflecting fundamental change in the nature of marriage.

DATA: THE 2002 IRAN FERTILITY TRANSITION SURVEY

The main data source for this paper is the 2002 Iran Fertility Transition Survey (IFTS). The aim of the IFTS was to assess recent trends and differences in fertility and associated social changes in order to understand the phenomenal fertility decline in Iran. The IFTS re-interviewed 50 per cent of women in four selected provinces that had been interviewed in the 2000 Iran Demographic and Health Survey (IDHS). Thus, the IFTS sample

includes approximately 1000 households in both urban and rural areas in each of the provinces.

The IFTS was conducted during April and May 2002, 18 months after the IDHS, and a total of 5190 questionnaires were completed for eligible women aged 15-49. The questionnaire included around 100 questions on various demographic and socio-economic characteristics as well as attitudes of women regarding childbearing, marriage, women's employment and gender equity within and outside the family.

The interviewers were selected from among Health Officers (*behvarz*) who have been working in Health Houses (*khanah-e Behdasht)* for several years. Most of these interviewers had participated in the IDHS data collection, and thus were familiar with the field, and had accurate knowledge of the households and respondents (particularly in rural areas). The interviewers were trained by the first and second authors at workshops held in each province. Field supervisors from the Iran Ministry of Health were present in the field at the time of data collection to supervise the interviewer teams and to check the accuracy of the data. A thorough analysis of the data has indicated a high quality of data collection and accuracy of the various demographic measures.

The IFTS covered the four provinces of Sistan & Baluchistan, West Azarbaijan, Gilan, and Yazd. Several reasons justify the selection of these provinces. First, these provinces have displayed very different fertility levels during the period, 1972–1996. A comparison of fertility levels of all provinces with the national average revealed that Sistan & Baluchistan and West Azarbaijan had higher fertility as compared to the total population, while Gilan and Yazd displayed considerably lower fertility than the national level (Abbasi-Shavazi 2000). Second, socio-economic characteristics such as literacy, employment, and access to electricity and safe drinking water vary markedly across these provinces. Sistan & Baluchistan province (located in the south-eastern part of Iran and sharing borders with Afghanistan and Pakistan) stands out with the lowest level of socio-economic development, while Gilan and Yazd approach the highest levels of socio-economic development in the country (Abbasi-Shavazi, McDonald & Hossein-Chavoshi 2003: 3-4. See Appendix 2 for more discussion of the characteristics of the selected provinces).

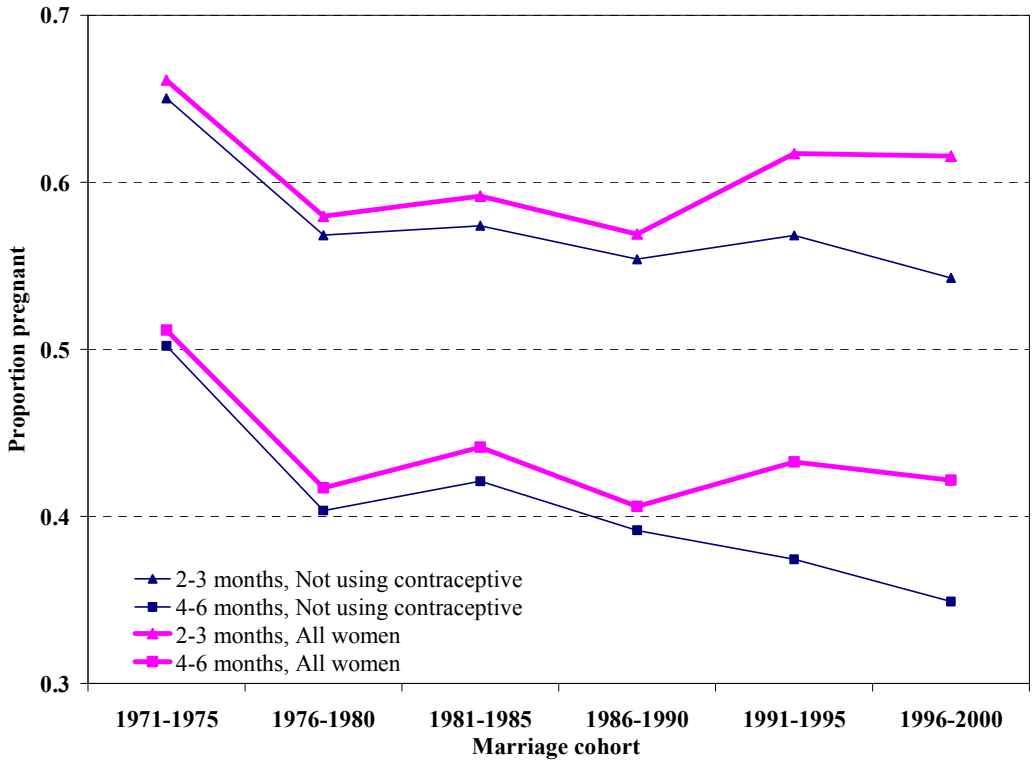
PREGNANCY RATES AND CONTRACEPTIVE USE IN THE FIRST PREGNANCY INTERVAL

We begin with an examination of change in the length of the interval between first marriage and first pregnancy, the first pregnancy interval. Much prior research focuses on the first birth interval; we focus on the first pregnancy because it provides a more sensitive indicator of the effects of coital frequency and birth control use.

We calculated life tables for first pregnancy based on monthly units of time for a set of five-year marriage cohorts. In Figure 1, we plot the cumulative proportion pregnant by 3 months (upper bold lines) and 6 months marriage duration (lower bold lines). We focus on short marital durations because the coital frequency arguments apply to the early

months of the marriage (Rindfuss and Morgan 1983) and because the effects of birth control should be most visible here as well.

Figure 1. Proportion pregnant at selected durations of marriage by marriage cohort: All women versus women not using birth control



These bold lines show a shallow u-shape with the middle cohorts most likely to be pregnant early in marriage compared to earlier and later ones. The reason for this pattern is illustrated by the thinner lines in Figure 1. These lines reflect the cumulative proportion pregnant for the sub-sample that did not use birth control. Note that for this sub-sample the line is monotonically downward. This is consistent with findings of shorter birth intervals all over Asia that Rindfuss and Morgan attribute to shifts from arranged to romantic marriages. However, overlaid on this trend is a trend toward greater contraceptive use. Table 1 shows the proportion in each marriage cohort using birth control prior to the first pregnancy. This proportion increases from 3-5% for early cohorts to over 20% for the most recent cohort. As expected and implied by the distance between each pair of bold and thin lines, those using birth control were much less likely to become pregnant by three and six months of marriage (data not shown).

Table 1. Report of contraceptive use in first pregnancy interval by cohort

Marriage cohort	2002 IFTS	
	Number	%
1971-75	553	3.44
1976-80	789	4.31
1981-85	762	5.25
1986-90	742	8.22
1991-95	755	14.70
1996-00	780	20.26
Total	4907	8.8

TESTING EXPLANATIONS FOR BIRTH CONTROL USE IN THE FIRST PREGNANCY INTERVAL

Earlier we developed two competing explanations for birth control use in the first pregnancy interval. The first stressed a goal of postponing motherhood to allow the couple time to develop a close emotional attachment. Such an interpretation suggests a new marriage form in the Iranian context, the *conjugal marriage*. The second explanation posits that contraceptive use might emerge because it helps maintain the status quo marriage system, *early marriage*.

We use variation in birth control use to compare the usefulness of these explanations. Bivariate associations are shown in Table 2. We focus on variation in use among recent marriage cohorts, the post 1990 cohorts, but we present data for all marriage cohorts as well. The four regions show substantial variation that reflects very different levels of economic development as discussed earlier.

There are striking differences in birth control use by level of woman's education; the most educated are much more likely to be first pregnancy interval users (34% compared to only 4% for illiterate women). However, this bivariate association is indeterminate with respect to the competing explanations above. To explain, it is plausible that education signals exposure to new ideas including those supportive of conjugal marriage. In fact, increased education is associated with egalitarian attitudes in the West (refs?). Further, education is associated with more liberal attitudes as indicated by questions available in the IFTS data (items discussed below). Thus, education effects could reflect an emerging feminist ideology supportive of conjugal marriage; these ideas could then be the more proximate cause of birth control use.

Table 2. Birth control use in first pregnancy by selected factors

Factors	All marriage cohorts			Marriage cohorts 1990+		
	%	No.	Missing	%	No.	Missing
Province						
Sistan & Baluchistan	5.0	1232		7.5	347	
West Azarbaijan	6.9	1326	0	14.5	421	0
Yazd	14.5	1197		29.6	354	
Gilan	10.8	1222		20.8	413	
Live in extended family during first two years after marriage						
Yes	7.8	3578	10	15.5	1070	3
No	11.5	1389		22.1	462	
Married to relative						
Relative	7.4	2239	6	14.6	632	1
Non-relative	9.7	2732		18.7	902	
Education level						
Illiterate	2.9	1958		4.3	279	
Primary	5.5	1584	0	9.1	504	0
Secondary	14.7	782		19.8	391	
Diploma or Higher	25.2	653		34.4	361	
By age at marriage						
<18	6.6	2197		11.3	547	
18-19	10.3	922	342	22.9	327	0
20-22	10.4	880		19.4	338	
23+	14.0	636		18.7	323	
Attitudes towards women's employment						
A woman should not work outside home, her duty is housekeeping						
Conservative	6.5	1913	10	13.6	517	1
Liberal	10.2	3054		19.1	1017	
Employed women cannot rear their children very well						
Conservative	7.1	1847	11	14.6	509	2
Liberal	9.7	3119		18.4	1024	
Freedom of movement						
Going to relatives' home						
No freedom	7.6	1888	24	14.3	640	3
Has freedom	9.5	3065		19.2	892	
Going to neighboring towns or villages						
No freedom	7.6	3723	30	14.8	1209	4
Has freedom	11.8	1224		24.7	322	
Total	**8.8**	**4907**	**0**	**17.2**	**1535**	**0**

From the competing (idealized family morality) perspective, the more educated may use birth control to delay births while still being in accord with social norms relating to early marriage or more precisely, from the societal perspective, to keep age at marriage from rising more dramatically. The costs of early marriage are reduced if marriage does not imply immediate parenthood. Postponement of parenthood allows the couple and their families more time to establish an economic basis for marriage, including the completion

of schooling, obtaining a job, and establishing a residence. Each of these goals is more demanding and time consuming for higher status, more educated couples. Further, delayed parenthood allows the couple to mature so that they will be more ready to become good parents. Note that none of these arguments imply greater gender equality or a conjugal marriage ideology.

Next are two variables reflecting circumstances of marriage that should be linked to the conjugal/early marriage distinction: post-nuptial residence and whether the husband is a relative of the wife.[2] In the cultural tradition, both post nuptial residence with husband's parents and marriages to a relative were preferred arrangements. Thus those that live with parents post-nuptially /marry a relative are adopting features of the conservative early marriage pattern. If birth control is a feature of a new marriage form (conjugal marriage), then it should be less prevalent among those living with parents post-nuptially and among those marrying a relative. The bivariate associations show modest differences in the directions predicted by the conjugal marriage explanation.

Table 2 also shows contraceptive use by age at marriage, a variable clearly related to the conjugal versus idealized morality explanations. First, later marriage is not the socially-sanctioned pattern and thus could signal a conjugal marriage orientation. Further, later marriage allows more time for persons to become more assertive and to influence partner choice more strongly. These arguments suggest greater contraceptive use with later age at marriage. In contrast, the absence of such an association or even a negative association would signal that contraceptive use is "substituting" for later marriage in an innovative strategy to maintain early marriage while postponing motherhood. The bivariate association offers some support for both explanations. Those married very early, before age 18, are least likely to report use in first pregnancy interval, but among the other categories there is no such pattern; in fact the association is weakly negative for those not marrying very early.

The attitudinal items in Table 2 are both interesting and problematic. They are problematic because they refer to attitudes in the current period and not at the time of marriage. Thus we cannot be assured that those giving more liberal answers at the survey were also more liberal at marriage. Focusing on recent (post 1990) marriages reduces this concern but does not eliminate it. We also note that associations (and subsequent multivariate results) remain substantively the same if we limit the sample to those married in 1995 or later. But again this minimizes the issue without fully resolving it.

[2] The prevalence of marrying a relative and living with parents post-nuptially varies sharply by province, but this variation reflects cultural/traditional differences associated with ethnicity and religion and not primarily socioeconomic differences. There is no discernible trend in these variables by marriage cohort for any province. So variation in these distributions does not suggest shifts away from normatively preferred patterns linked to the early marriage regime.

Table 3: Effect of selected factors on contraceptive use: Post 1990 cohorts

	Model 1		Model 2		Model 3		Model 4	
Variable name	Odds ratio	Sig.	Odds ratio	Sig.	Odds ratio	Sig.	Odds ratio	Sig.
Province								
Gilan (ref.)								
Yazd	1.51	0.029	1.51	0.028	1.70	0.007	1.71	0.007
West Azarbaijan	0.87	0.474	0.87	0.469	0.99	0.965	0.99	0.962
Sistan & Baluchistan	0.47	0.004	0.47	0.004	0.48	0.007	0.48	0.007
Education level								
Illiterate (ref.)								
Primary	1.89	0.059	1.91	0.056	1.77	0.093	1.79	0.088
Secondary	3.89	0.000	3.97	0.000	3.62	0.000	3.70	0.000
Diploma or Higher	7.39	0.000	7.65	0.000	6.70	0.000	6.91	0.000
Age at marriage								
<18 (ref.)								
18-19	1.64	0.013	1.64	0.013	1.67	0.010	1.67	0.010
20-22	1.13	0.564	1.13	0.561	1.10	0.644	1.10	0.644
23+	1.18	0.429	1.19	0.422	1.09	0.680	1.10	0.672
Married to relative								
Relative (ref.)								
Non-relative	0.90	0.503	0.89	0.483	0.90	0.524	0.90	0.509
Post nuptial residence								
Co-residence (ref.)								
Not co-residence	1.08	0.650	1.08	0.640	1.07	0.674	1.07	0.669
Attitude towards *"A woman should not work outside home, her duty is housekeeping"*								
Conservative (ref.)								
Liberal			0.92	0.614			0.93	0.674
Going to neighboring towns or villages								
No freedom (ref.)								
Freedom of movement					1.52	0.017	1.52	0.016
Constant	0.06	0.000	0.06	0.000	0.05	0.000	0.05	0.000
Number included	1531		1530		1527		1527	
-2 Log likelihood	1266.6		1266.2		1256.9		1256.8	

We consider these response items, despite the problem above, because they provide measurements central to our arguments. These items measure key characteristics associated with conjugal marriage – egalitarian gender attitudes and autonomy (as measured by freedom of movement). As such these items should be strongly associated with contraceptive use in the first pregnancy interval if the conjugal marriage argument is most relevant. Note that the items display this association but certainly not as strongly as proponents of the conjugal marriage argument might expect. For example, on the item "a woman should not work outside the home", those who agree and disagree have percentages reporting contraceptive use of 13.6 and 19.1, respectively. We also note that these items were selected from a larger battery of items that we show in the Appendix 1.

We have selected the attitudinal items shown in Table 2 on the basis of face validity, but they reflect associations between contraceptive use and the items in Appendix 1 more generally.

Proponents of the conjugal marriage and idealized morality arguments can find some support in the bivaritae associations in Table 2. We now turn to a set of multivariate results that provide clues of possible causal relationships and thus which explanation is more useful. Of course, reality is not as simple as our conceptual distinctions nor does reality require that only one explanation be operative. We return to these broader issues in the discussion and conclusion.

Odds ratios in Table 3 are estimated using logistic regression. Birth control use in the first pregnancy interval (yes vs. no) is the dependent variable. Model 1 provides key results. Controlling on Province and a number of other factors, education effects remain very strong; those with at least a high school diploma are over seven times more likely to use birth control than those not literate.

Note that the effects of postnuptial residence and marrying a relative are not statistically significant and are substantively trivial (only the coresidence variable is even in the predicted direction). These associations suggest that education does not operate by reducing post-nuptial residence and the likelihood of marrying a relative. Rather the education effects are direct and, consistent with the idealized morality argument. That is, these education effects reflect pragmatic decisions within the context of an early marriage regime. Fertility is postponed to provide an opportunity for the couple to establish a residence, complete schooling and secure a job for the husband.

The net age at marriage effects in Table 3 show the same pattern as in the bivariate results (see Table 2): those marrying very early (prior to 18) are least likely to use birth control (evidenced by all odds ratios greater than 1.0), but the association among those marrying older is negligible and slightly negative. Specifically the odds ratios for the three older categories do not continue to increase; rather they decline moderately suggesting a "substitution" of birth control use for later marriage. Thus, the pattern for those married after age 18, the majority of those in the post 1990 marriage cohorts, supports the idealized morality argument.

In the subsequent models, we cautiously explore the role of egalitarian attitudes and reports of freedom of movement (measures of female autonomy). In model 2, we include the item: "a woman should not work outside the home, her duty is housekeeping and childrearing", an item with high face validity regarding support/opposition toward a sharp gendered division of labor. Interestingly and importantly, this item is not associated with birth control use. We obtain the same result if we substitute the other item on egalitarian gender relations from Table 2. As noted above, there is a larger set of items available in this data set. We have tried all seven items in turn and only one, an item we judge as a problematic measure (See Appendix 1, Table A1-2, item 4), provides any support for the conjugal marriage explanation. In short, egalitarian gender views are not associated with greater contraceptive use and thus, we infer, no evidence that birth control use is part of a new, conjugal marriage form.

The third model in Table 3 includes a measure of freedom of movement, a key component of women's autonomy. As for egalitarian attitudes, we select the item with the greatest face validity, "can the woman go to a neighboring village alone". Here we do find a positive association, net of other variables; a liberal response to this item increases the likelihood of contraceptive use by a factor of 1.51 (an effect not likely attributable to sampling variability, P=.017). While this evidence supports the conjugal marriage explanation, additional evidence regarding related items weakens it. Specifically, if we substitute the second freedom of movement item from Table 2, we do not find a significant effect. Further, if we substitute, one by one, the set of other freedom of movement items (shown in Appendix 1), then we do not find another item that is significantly associated with contraceptive use. In fact, no other item even approaches statistical significance (see Appendix 1, Table A1-2). Thus, we do not confidently interpret the effect for the item used in Table 3 as strong evidence for the conjugal marriage explanation. We do not yet understand why this single item, apparently similar to others in the battery of items, shows a statistically significant positive effect.

DISCUSSION AND CONCLUSION

We have contrasted two explanations for the dramatic increase in birth control use immediately following marriage. The first, the conjugal marriage explanation, posits that this innovative behavior signals the emergence of a new marriage form, the conjugal marriage. This new marriage form is characterized by a focus on strong emotional bonds between husband and wife, egalitarian values and a weakened gender division of labor. The force driving marriage change in this direction is globalization and westernization, including western ideas supportive of individualism and self actualization (see Goode 1963; Thornton 2005). The alternative explanation stressed that an idealized family morality supported by powerful institutions, and personified in Iran by the state/religion nexus, can constrain family behavior. The state is focused on maintaining early marriage. As a result individuals turn to birth control early in marriage to conform to early marriage expectations while postponing parenthood. This explanation sees the new behavior as conservative, maintaining relatively early marriage.

Of course, the answer need not be "either or". Both explanations could be valid and operating simultaneously, but we have sought to assess the dominant process by examining differentials in contraceptive use. Bivariate results offered some support for both explanations, but the multivariate results clearly suggest the idealized morality model is dominant. Most importantly, birth control was not more likely to be adopted by those not living with parents, those not marrying relatives and those holding egalitarian attitudes. All of these findings fail to support hypotheses derived from the conjugal marriage explanation. Further, the direct effect of education (net of egalitarian attitudes) and the age at marriage effect provide support for hypotheses emanating from an idealized morality argument stressing the role of birth control in maintaining the status quo.

Our results encourage attention to local institutions, local culture and local constraints in interpreting trends that are found elsewhere, such as in the West or in Asia. Similar

behavior does not imply similar causes or understandings. Increasing birth control use does not seem to reflect the emergence of the conjugal family, at least, not yet. Westernization is sometimes characterized as an unstoppable march. The march, at least partly, advances on the wings of the West's economic power, but some also claim its ideology (stressing individualism and self-actualization) is inherently attractive (see Goode 1963: Thornton 2001; 2005). Indigenous cultures are sometimes characterized as defenseless in the face of a Western onslaught of ideas, institutions and products. But increasingly researchers, motivated by results such as ours, recognize the active role played by societies that interact with the West. Societies with long and rich cultural traditions, like Iran, can adopt and resist selectively. Consider just a few of the changes and initiatives that followed the Islamic Revolution. The veil became compulsory, schools were segregated for boys and girls, and women were discouraged from working outside the home. But there were strong initiatives for universal education and access to health care, and by 1990 strong support for access to birth control for married women. All of these initiatives are interpreted locally as Islamic.

Our interpretation of these results, our use of the concept of idealized family morality and the importance we attach to Iranian religion/state support of the early marriage regime, all beg the question: can this early marriage regime be maintained over the coming decades? The answer hinges on the same issue raised here for the short run: are contemporary changes best interpreted as movement towards a Western conjugal model? Or are they better understood as an Islamic Iranian use of new ideas and technology? Here we find evidence in favor of the later. But the question we pose about the future suggests that we do not think this explanation will hold up over the long run. Clearly demographic change creates "space" or an opportunity for new institutional forms. Davis and van den Oever (1982) argued that demographic change set the stage for the Western feminist movement of the 1960s and 1970s. Likewise, the fundamental changes in fertility behavior in Iran will reduce the number of years women spend in childbearing and childrearing. If it shrinks the importance of childbearing in women's lives as well, what will fill this space? Denied access to non-familial employment, what will women do with these years? Change will certainly take place, but a distinctly Islamic response, as opposed to movement toward a Western model, must be considered as a legitimate template for future Iranian social change.

Appendix 1. Additional description and analysis of gender attitudes and freedom of movement indicators included in IFTS

This appendix provides additional detail on gender attitudes and freedom of movement items discussed in the text. Table A1-1 shows the descriptive information in text Table 2 for the full battery of items in IFTS. The purpose is to allow readers to verify our characterization of the full set of items.

Table A1-1. FPI contraceptive use by attitude items and freedom of movement

Factors	All marriage cohorts			Marriage cohorts 1990+		
	%	No.	Missing	%	No.	Missing
Attitudes towards women's employment						
1. A woman should not work outside home, her duty is housekeeping						
Conservative	6.5	1913	10	13.6	517	1
Liberal	10.2	3054		19.1	1017	
2. Employed women cannot rear their children very well						
Conservative	7.1	1847	11	14.6	509	2
Liberal	9.7	3119		18.4	1024	
3. Employed women have less children						
Conservative	11.2	1445	11	18.8	540	
Liberal	7.8	3521		16.4	994	
4. Women must be employed for financial autonomy						
Conservative	10.5	1388	10	17.2	509	
Liberal	8.1	3579		19.2	1025	
5. Women should not work outside home like men						
Conservative	7.1	2030	10	13.7	572	1
Liberal	9.9	2937		19.3	962	
6. Women should work outside home to support family financially						
Conservative	9.0	3563	10	17.9	1082	1
Liberal	8.3	1404		15.5	452	
7. Women should work outside home for social participation						
Conservative	9.0	2151	19	16.1	692	3
Liberal	8.6	2807		18.1	840	
Freedom of movement						
1. Going to a health centre or doctor's office						
No freedom	6.8	1937	25	13.2	649	3
Has freedom	9.9	3015		19.8	883	
2. Going to religious ceremonies						
No freedom	7.6	1778	72	14.0	641	20
Has freedom	9.4	3127		19.6	874	
3. Going to relatives' home						
No freedom	7.6	1888	24	14.3	640	3
Has freedom	9.5	3065		19.2	892	
4. Going to wedding ceremonies						
No freedom	7.9	2466	26	14.6	846	3
Has freedom	9.5	2485		20.1	686	
5. Going to neighboring towns or villages						
No freedom	7.6	3723	30	14.8	1209	4
Has freedom	11.8	1224		24.7	322	
Total	**8.8**	**4907**	**0**	**17.2**	**1535**	**0**

Table A1-2 shows results like those in text table 3 for the full set of gender and freedom of movement items. Effects estimated below come from separate regressions where the specific item replaces the one used in Table 2 (i.e., gender item 1 and freedom of movement item 5).

Table A1-2: Effect of attitude items and freedom of movement items on birth control use estimates in model 2 or 3 and model 4 of table 3 in the paper.

Attitudes towards women's employment	**Model 2**		**Model 4**	
	Odds ratio	Sig.	Odds ratio	Sig.
1. A woman should not work outside home, her duty is housekeeping	0.92	0.614	0.93	0.674
2. Employed women cannot rear their children very well	0.84	0.280	0.85	0.312
3. Employed women have less children	1.04	0.815	1.04	0.789
4. Women must be employed for financial autonomy	1.07	0.041	0.75	0.050
5. Women should not work outside home like men	1.07	0.656	1.10	0.534
6. Women should work outside home to support family financially	1.01	0.964	0.99	0.940
7. Women should work outside home for social participation	1.11	0.478	1.12	0.461
Freedom of movement	**Model 3**		**Model 4**	
	Odds ratio	Sig.	Odds ratio	Sig.
1. Going to a health centre or doctor's office	1.06	0.712	1.07	0.676
2. Going to religious ceremonies	1.00	0.997	1.01	0.975
3. Going to relatives' home	1.02	0.920	1.03	0.882
4. Going to wedding ceremonies	1.30	0.084	1.31	0.074
5. Going to neighboring towns or villages	1.52	0.017	1.52	0.016

Appendix 2 Description of provinces included in IFTS.

Table A2-1 shows socioeconomic characteristics of the provinces included in IFTS.

Table A2-1. Characteristics of the women interviewed in the four provinces included in IFTS 2002

Province	% Female literacy (15–49)	% FP use (2002)	TFR 1998–2000	N Interviewed[1]
Gilan	73.9	79.3	1.67	1274
Sistan & Baluchistan	41.9	47.5	4.64	1300
West Azarbaijan	49.8	79.0	2.52	1368
Yazd	81.0	79.7	2.27	1239

There is substantial ethnic variation among the selected provinces. For example, Sistan & Baluchistan province is populated mainly by *Baluchi*, while West Azarbaijan (located in the northwest of Iran and sharing borders with Turkey and Iraq) contains two large ethnic groups, *Turks* and *Kurds*. The people living in the two other provinces are mainly *Persians*. Furthermore, a considerable proportion of the population in both Sistan & Baluchistan and West Azarbaijan are Sunni Muslims, while the population in Yazd and Gilan are predominantly Shiites. Thus, comparisons between the fertility behavior of different ethnic groups and Shiite-Sunni Muslims would be possible, although the close overlap of ethnicity and religion causes difficulties in identifying their separate effects. The other reason for this selection is that the selected provinces are geographically located in different parts of Iran; Gilan located in the north, West Azarbaijan in the northwest, Yazd in the centre and Sistan & Baluchistan in the southeast of the country. It should also be noted that the two provinces of Gilan and Yazd, despite their relatively similar socio-economic characteristics, experience different social values and attitudes. People in Yazd are known for being 'religious' while people in Gilan are more 'liberal' in terms of values and attitudes. A study of Iranian Values and Attitudes (Ministry of Culture and Islamic Guidance 2002) showed that people in Yazd placed more emphasis on religion in their daily life than Iranians as a whole, as well as people in the developed provinces of Isfahan and Tehran. Selection of a diverse set of provinces also allows testing of the hypothesis of the importance of social inclusion and allows for consideration of varying institutional settings.

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