

# Child Brides in Rural Rajasthan\*

Shirley Johnson-Lans  
*Vassar College, USA*  
Patricia Jones  
*Vassar College, USA*

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## Abstract

This paper investigates the determinants of child marriage using a new data set from rural India. Our model estimates the relative importance of economic factors and social norms in determining the prevalence of child marriage. We find that the probability of a girl becoming a child bride, defined as married before the age of ten, is highly correlated with the prevalence of child marriage within her own caste and village, even after controlling for household and village characteristics. Specifically, if the proportion of child brides within a caste and village were to be reduced by half, the likelihood of a girl being a child bride would be reduced by about 20 percent. Parental literacy, caste, and having electricity in the home are also found to be significant. However, economic factors, including household income and whether income is below the village mean, appear to be much less important determinants of child marriage.

*JEL Classification:* J12, D83, D13

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## Key words

Child Marriage, social influence, family economics, Asia, India

## Introduction

For millions of girls in the developing world, the onset of puberty marks the end of childhood and the beginning of adult responsibilities, including marriage and motherhood. Child marriage – that is, marriage

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before the age of 18—remains common in many traditional societies, even in countries where it is illegal. Rates of child marriage vary widely but are highest in South Asia and Sub-Saharan Africa. Although the marriage of children—particularly girls under the age of 15 or 16—is now widely viewed as a violation of basic human rights and is associated with a number of social and economic disadvantages (UNICEF, 2001; Jensen & Thornton, 2003), we focus not on the ills of early marriage but on the determinants of early marriage within traditional societies. Our study is based on data from a rural section of the Indian state of Rajasthan, where it is still a common practice. We do not, however, mean to treat this as a uniquely Indian phenomenon, since the practice is regarded as a world-wide human rights problem and is still common in traditional communities in a number of countries. For instance, the prize-winning film, “Child Brides: Stolen Lives” documents this practice in communities in Niger and Guatemala as well as in the village of Binnewas, one of the Rajasthani villages in our sample.<sup>1</sup>

In this study, we focus on an extreme form of child marriage, pre-adolescent marriage, which is defined as the marriage of girls under the age of 10. We investigate the importance of both economic and social factors in determining the relative prevalence of child marriage by caste and village within a cluster of fairly socio-economically homogeneous rural villages in Western Rajasthan. We offer the hypothesis that parents feel the need to conform to social norms and therefore adopt the behavior of other families in their caste who live in the same village. Social conformity is thus a dominant factor in determining the likelihood of a family entering into a marriage contract for a daughter before her tenth birthday.

To investigate the importance of social conformity on child marriage, we employ new data from a household survey designed by one of the authors and implemented in nine rural villages in western Rajasthan during 2004-2005, with re-interviews conducted in 2006. These data are unusual because they contain detailed information on the families of young girls who are eligible for marriage or already married. To date, much of

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<sup>1</sup> This film was first shown in the United States on the PBS (public broadcasting system) program “Now” on October 12, 2007. It is available at [www.pbs.org/now/shows/341/index.html](http://www.pbs.org/now/shows/341/index.html).

what is known about child marriage is based on information from household surveys—like the Demographic and Health Surveys (DHS)—which collect information on the bride’s current household (usually her husband’s household) but not on the household and village where she was raised. Such data are useful for understanding the *consequences* of child marriage but not for modeling the determinants of child marriage. To do this it is necessary to have information on the girl’s natal household as well as her parents’ background because it is her parents who typically decide the timing of her marriage. Our data contain such information for both married and single adolescent girls, aged 10-18. One weakness of these data, however, is that they do not contain the age of [potential] marriage for all girls in the sample. Some girls may marry after the family is interviewed but before they turn 18 while others may marry at later ages or not at all. Therefore, we focus on the determinants of marriage for girls who are married before the age of 10. We have chosen to do this not only because of the characteristics of the data but also because adolescence is defined in this part of the world as encompassing ages 10-18 for girls. No other study to our knowledge has specifically examined the factors underlying such young marriages.

Our empirical analysis reveals that social norms do play an important role in explaining the prevalence of child marriage. Specifically, we find that the probability of a girl being married before her 10th birthday is highly correlated with the prevalence of early marriage within her own caste and village—whereas the cross-caste effects at the village level are insignificant. Caste and parental education are also important, but economic status, including family income, relative income, and land ownership, are surprisingly unimportant. Several checks are carried out to verify our results, including a number of specifications which attempt to deal with the “reflection problem” identified by Manski (1993a).

The remainder of the paper is organized as follows. Section 2 provides background material about the institution of marriage in traditional Indian villages and relates this to the literature on social influence or conformity. Section 3 provides a brief explanation of the reduced form model that we estimate. Section 4 describes the data and empirical results. In Section 5, we offer some concluding remarks.

## Background

Rural Rajasthan is an interesting region in which to examine child marriage for several reasons. India, even though a highly diverse society with respect to education, income, urban versus rural customs, caste and religion, has one of the highest rates of child marriage in the developing world. The 2001 Indian Census revealed that 1.5 million girls in India were married before the age of 15. According to the most recent National Family Health Survey, 44.5 percent of Indian women aged 20 to 24 were married before the age of 18 and, of these, 22.6 percent were married before the age of 16 (Rao, Saggurti, Balaiah, & Silverman, 2009). Moreover, Rajasthan is the Indian state which has the highest rate of child marriage. It is estimated that nearly 80 percent of the marriages in Rajasthan take place when the bride is under the age of fifteen (Gupta, 2005).

Child marriage is illegal in India and has been illegal since The Child Marriage Restraint Act (CMRA) of 1929. Updates to this law have established the minimum age of marriage at 18 years for girls and 21 years for boys. Under CMRA, child marriage is a crime which is punishable by either a fine or imprisonment of up to 3 months (Sagade, 2005). However, in practice, the law is rarely enforced.<sup>2</sup> There is no nationwide system for the registration of marriages, which makes it difficult to prove that marriages have taken place below the legal age.<sup>3</sup> In addition, once a marriage ceremony is performed, the marriage is legally valid even if the girl is underage. Given the illegality of child marriage, the marital status of minors is a highly sensitive subject which may lead to inaccurate responses in survey data. We are fairly confident, however, about the accuracy of our data since the enumerators for our survey live

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<sup>2</sup> According to UNICEF(2001), 18 percent of all girls who were married in India between 2000 and 2010 were below the age of 15 (see [http://www.unicef.org/infobycountry/india\\_statistics.html#94](http://www.unicef.org/infobycountry/india_statistics.html#94)). Unfortunately, estimates of child marriage are not yet available from the most recent Indian census.

<sup>3</sup> The government of Rajasthan passed a law in 2009 requiring the registration of all marriages, including child marriages. This has raised a number of issues and many activist groups are protesting that this gives tacit sanction to the illegal practice. According to government spokesmen, this will, on the contrary, make it easier to combat the practice of child marriage. (*The Times of India*, January 23, 2010).

in the same village as the respondent. Given the small size of these villages (and the celebratory nature of weddings even when they are performed in secret), the marital status of those within the village is usually common knowledge.

To better understand the nature of the marriage market in traditional Indian society, it is useful to outline the basic structure of such marriages. Indian (Hindu) marriages usually take place within endogenous groups – that is, young people tend to marry only those who belong to the same caste. This preference for within-caste marriage is strong, even among middle-class Indians.<sup>4</sup> Banerjee, Duflo, Ghatak, and Lafortune (2009), for example, measured the strength of discriminatory preferences using a new data set on individuals who placed matrimonial advertisements in a major Bengali paper. They found that “parents of a prospective bride would be willing to trade off the distance between no education and a master’s degree to avoid marrying outside their caste” (p. 3). Similarly, Dugar, Bhattacharya, and Reily (2008) revealed that “even a quadrupling of income is not enough to make up for a one-level caste difference between grooms” (p. 1).

Several other features of the Indian marriage market are important. First, marriages are generally arranged by parents and, when parents’ and children’s preferences are discordant, parental preferences dominate. A recent survey from Rajasthan reveals that most girls preferred to be married at an older age than their parents believed would be optimal for them (Santhya, Haberland, & Singh, 2006). It is the parents’ primary duty to get their daughter(s) married, and having an older unmarried daughter means a loss of social status as well as additional monetary costs to the family. Studies have shown the size of dowry payments, also illegal but still prevalent in India, to be positively correlated to the age of the bride, suggesting that it may be more expensive for parents to marry an older daughter (Chowdhury, 2010). Second, the Indian marriage market is patrilocal – that is, brides leave their parents’ home to live with their husbands. In our study villages, grooms are always selected from outside the bride’s own village. Therefore, the prevalence

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<sup>4</sup> Today hypergamy—attaining upward mobility through marriage—is more common than it was in the past. See, for example, Srinivasan (2005). Such marriages usually require a large dowry.

of girls marrying within a village and the age at which they are married do not imply anything about the supply of potential grooms.

Child marriage in rural India has not disappeared, despite its illegality and the country's recent growth boom and falling rates of poverty. According to Jensen and Thornton (2003), 57 per cent of Indian women (aged 20 to 24) were married before their 18th birthday in 1975. Thirty years later, the rate of child marriage among the same age group of women had fallen by only 12.5 percent, and in Rajasthan it remains much higher: 65.5 percent of 20-24 year old women surveyed in 2005-6 had been married before the age of 18<sup>5</sup> (NFHS, 2005-6). The persistence of child marriage in India has puzzled policy makers, since child marriage is usually thought to be associated with poverty. Indeed, the policy response by several regional governments has been to provide financial incentives to families who postpone their daughters' marriages.<sup>6</sup> However, the difficulty in eradicating long-standing social and cultural norms is illustrated by the 2011 report of the Comptroller and Auditor General (CAG) which censured the Rajasthan government for providing subsidies for weddings and other financial stipends to families marrying underage sons and daughters ("CAG slams," 2012, April 19).

One possible reason for the slow decline in child marriage is that many aspects of individual behavior—including marriage and fertility—are tightly regulated by social custom. When strong social norms are present in a society, individuals may be slow to change their behavior. Indeed, many social customs—such as India's caste system—have persisted for generations despite the fact that a significant fraction of India's population would be better off if the custom disappeared. As Akerlof (1976, 1980) noted decades ago, many social customs that are costly to follow persist because individuals are unwilling to suffer the loss of reputation which would result from breaking with custom.

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<sup>5</sup> The National Family Health Survey, NFHS-3, 2005-6, conducted by the International Institute for Population Sciences for the Ministry of Health and Family Welfare, is the most recent source of national and regional statistics on marriage in India. Unfortunately, for budgetary reasons, NFHS, Round 4, planned for 2012-13, will not be conducted.

<sup>6</sup> According to UNICEF (2001, p. 15), "the governments of Rajasthan, Karnataka and Haryana have established an incentive programme for low-income families. In Haryana, for example, a small sum of money (Rs. 2,500 or approximately US\$78) is set aside in a savings account for a girl at birth. At the age of 18, if she is still unmarried, the girl is eligible to collect the accumulated sum of Rs. 25,000."

The term, ‘social influence’ has long been used in the sociological literature and more recently has become part of the economists’ lexicon (Manski, 1993a; Manski, 1993b; Grinblatt, Keloharju, & Ikaheimo, 2008; Young, 2009). For our empirical analysis, we define ‘social influence’ as the proportion of girls in a village who belong to the family’s caste and were married before the age of 10.<sup>7</sup> This variable reflects the prevalence of child marriage at the village and caste level. If a large proportion of a family’s caste marry their daughters at a young age, we assume that the family will feel some pressure to adhere to the social norm of the village. Following Manski (1993b), we consider ‘social influence’ to be an endogenous effect in that individual families have a propensity to behave in a way that corresponds to the behavior of others in their reference group. Behavior with respect to age of marriage of daughters is endogenous in the sense that any policy intervention that directly affects attitudes about child marriage in one or more families in the group would have a “social multiplier” effect throughout the reference group (Manski, 1993b, p. 533).

Our estimation strategy deals with the identification issue highlighted by Manski (1993a). That is, the prevalence of child marriage in the reference group (i.e., caste) could be a proxy for any unobserved determinant of early marriage at the household level, at least to the extent that it is correlated among households in a village. That is, ‘social influence’ could be picking up unobserved village effects. To address this potential problem, we employ an estimation strategy similar to that used by Munshi and Myaux (2006). Specifically, we assume that parents respond to the marriage norms of families within their own caste and village but not to the marriage norms of other castes within their village. For each household, we define the ‘other-caste’ effect as the proportion of girls within their village who are members of other castes and who were child brides (i.e. married before the age of 10). We expect this variable to be insignificant in all of our specifications. If the ‘other-caste’ effect is significant, there could be unobserved village-specific household effects influencing our results.

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<sup>7</sup> We do not include the girl herself when calculating the proportion of same-caste girls married before the age of 10.

## The Decision to Marry

To estimate the determinants of child marriage, we assume that parents decide the timing of their daughter's marriage. By making this assumption, we introduce the classic agency problem-- that is, parents make decisions for their daughter(s) about when and whom to marry but they do not fully internalize the costs of those decisions. If parents choose to arrange the marriage of a pre-adolescent girl without considering how such a marriage will affect her current or future well-being, they may select a lower age of marriage than would be chosen by the girl herself. We expect that the degree to which the girl's own utility is taken into consideration by her parents will vary depending on such things as the parents' (particularly the mother's) education level, which may also affect the balance of power between the parents in the decision process.

We assume that parental decisions are influenced by a number of factors which vary across both households and villages. These factors include the standard socio-economic variables as well as a 'social influence' variable. The 'social influence' variable captures the potential effect of within-caste village-specific norms about child marriage.<sup>8</sup> Parents observe the marriage decisions of same-caste families in their village and consider this information when making decisions about the timing of their own daughter's marriage. We therefore predict that the probability of a girl becoming married before age 10 is positively correlated with the prevalence of this practice among same caste families within her village.

## Data Description and Empirical Results

This study employs an original data set to investigate the role of both economic and social factors in determining the probability of child marriage. The sample of adolescent girls was obtained from a stratified, random sample of approximately 1000 households with daughters sur-

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<sup>8</sup> We assume that pressure to conform to social norms varies across households. It is likely to affect families more when they have fewer information sources. In this case, parents are more likely to look to their neighbors' behavior for signals on optimal behavior.



veyed in nine rural villages in the Jodhpur district of Rajasthan during 2004 and 2005. Each household was re-interviewed in 2006 in order to obtain additional data and check accuracy of data obtained in the previous round of interviews. The survey obtained detailed information about an adolescent daughter of the family, including questions about her age, health, education, marital status, and age of marriage. In addition, information was collected about her parents and siblings and about the household's income and wealth. In households with more than one adolescent daughter, only one girl, the eldest, was included in the sample. Most households, though often intergenerational, did not consist of joint families, e.g. married siblings living together with their spouses and children, and thus it was rare to find cousins living together. However, in the event of such a joint household, data on only one nuclear family was collected, although the total number of members of the household was recorded.<sup>9</sup>

We found that early marriage is common in rural Rajasthan. More than one-third of the girls in our sample are classified as either 'effectively' or 'contractually' married. Of those (approximately 300) who are married, more than 70 percent were married before the age of 10. Girls are 'effectively married' if they have had a wedding ceremony whereas they are 'contractually married' if they are betrothed but have not yet had a wedding. It should be noted that marriage contracts, even among the very young, are considered irrevocable. Breaking a marriage contract can lead to a family's disgrace and may subject family members to violence. We therefore categorize girls as married if they are either 'contractually' or 'effectively' married. However, among our married adolescents, 89 percent were categorized as "effectively married". As many marriages in these villages take place during a girl's infancy or early childhood, it is customary for pre-pubescent married girls to remain with their families until they are deemed old enough to move into their husband's household.<sup>10</sup> The girls in our sample include single girls, mar-

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<sup>9</sup> If the family has daughters above the age of 18, they would not be interviewed. They would, however, be included in the calculation of the girl's number of sisters.

<sup>10</sup> Parents are often able to delay transferring a daughter to the husband's household as long as she remains in school. Moreover, many grooms were also young children at the time of their marriage.

ried girls who are still living full time with their parents, and married girls who maintain contact with their parents but who reside, at least part time, in their husbands' households.

As revealed in Table 1, most girls in our sample come from households with low levels of education and income. Only seven per cent of the girls' mothers, for example, are literate. This is much lower than the national literacy rate for women in India which is estimated at 48 per cent (World Bank, 2008). The literacy gap for fathers is not as large. Fifty-six percent of the girls' fathers are literate while the national average for men is estimated at 73 per cent (World Bank, 2008). The average monthly income for households in our sample is 3,020 rupees which was equivalent to about two dollars per day at the time of the survey. The rate of land-ownership, however, is very high (86% of households) and most families engage in some form of agricultural activities.

All households in the sample are either Hindu or Muslim, with Hindu being the dominant religious group (97% of the sample). There are four main Hindu caste groupings: three lower castes and one high caste. The three lower castes, scheduled castes (dalits), scheduled tribes, and other backward castes (OBC), are recipients of affirmative action by the Indian government. The girls in our sample who are defined as OBC are predominantly and almost exclusively members of the Vishnoi caste. High-caste (general caste) girls are virtually all members of the Rajput caste. The Muslim families are quite assimilated into the community and were categorized as general caste by the interviewers. However, to check that religion is not a confounding factor, empirical tests were conducted which excluded the one village in which Muslim households were a dominant group.<sup>11</sup> This exclusion entailed no significant changes to our empirical results.

To determine the factors that increase the likelihood of a girl becoming a child bride, we estimate several different probits. Covariates include caste, parental education, number of siblings, and household economic status. We define educational attainment in terms of literacy rather than years of schooling because many adults, particularly women, at-

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<sup>11</sup> There was a concern that Muslim households are outliers in that there is no pre-adolescent marriage of daughters but lower average income and lower female literacy rates than in Hindu households in the survey.

tain literacy through informal methods of schooling. In addition, we include the number of brothers and sisters as separate covariates because parental decisions about the timing of a daughter's marriage are likely to be affected by both the number and gender of siblings. We also include the girl's age (and its square) to capture any possible cohort effects.

Several variables are included which control for different aspects of economic status. These include household income (measured by the head of household's monthly income), relative income (measured by a dummy variable which takes a value of 1 if the household's monthly income is below the mean income in the village), land-ownership (measured by a dummy variable which takes the value of 1 if the family owns land), and electricity (measured by a dummy variable which takes the value of 1 if the home has electricity).

Table 2 presents the results of the probit analysis. In column (1) we include only the 'social influence' and 'other-caste' effect as covariates. As predicted, the 'social influence' coefficient (marginal effect) is positive and significant but the 'other-caste' coefficient is not significant. The positive coefficient of the social influence variable indicates that the probability of a girl becoming married before age 10 increases as the proportion of child brides from her own caste and village rises. In column (2), we add covariates which control for income, parental education, number of brothers and sisters, land-ownership, electricity, and the age and age squared of the girl. The addition of these variables only slightly raises the explanatory power of the equation (the pseudo R<sup>2</sup> increases from 0.09 to 0.12). However, the magnitude and level of significance of the 'social influence' effect remains virtually unchanged. In this specification, the marginal effect of having a literate mother is highly significant and associated with a reduction of about 13 per cent in the probability of her daughter being married before age 10. Perhaps most surprising, neither of the income variables are statistically significant.

Only 'electricity' and 'owns land' are significant and the latter is only marginally significant. Having electricity in the home reduces the probability of a girl being a child bride by eight per cent whereas being in a land-owning family increases the probability by about the same amount. These two variables are likely to have social as well as econom-

ic dimensions. Land-ownership may be a proxy for higher social status which may facilitate earlier marriage if it is correlated with membership in a group with socially conservative attitudes. Having electricity may be associated with access to media sources (e.g., radio and TV) which provide information about attitudes outside the local village. Recently, Jensen & Oster (2009) have highlighted the importance of cable television in exposing rural households in India to new information. They find that the introduction of cable television is associated with a significant decrease in domestic violence toward women, as well as lower fertility and increased school enrollment.

In column (3) we add caste fixed effects to the model. Once we control for caste, the effect of 'social influence' is still significant but the (marginal) coefficient is reduced from 0.72 to 0.43. This is not surprising; it reflects the fact that social norms which operate via the caste system have an independent effect on child marriage. The 'social influence' effect is, however, still large enough to be of practical import. For instance, if the proportion of child brides within her caste and village were to be cut in half, the probability of a girl becoming married before age 10 would decline by about 20 percent. Column (3) also reveals that high-caste girls are less likely to be child brides than girls who are members of OBC, which is the omitted category. Girls in the other low castes are not significantly different from members of OBC in this respect. The addition of caste fixed effects also reduces the significance of mother's literacy, indicating that mother's literacy is probably correlated with higher caste status.

One cause for concern is that the lack of statistical significance of the income variables may be due to insufficient variation. In Table 3, we report average household income and its standard deviation by village which indicates substantial variation both across and within villages. Average monthly household income for the whole sample is about 3000 rupees with a standard deviation of about 1940 rupees. It is possible, of course, that the insignificance of the income variables is due to an ambiguous effect of income on age of marriage. Higher income may reduce the age of marriage if households with higher incomes are better able to finance a dowry or wedding when their daughters are young. On the other hand, higher income may increase the age of marriage if the costs associated with a daughter remaining at home are more easily

borne by more affluent families.

Another potential cause for concern is that 'social influence' may be correlated with income. To address this issue, we first estimate a model in which we omit all covariates except the income variables. We then add sequentially, family characteristics, caste fixed effects, and village fixed effects. In all specifications, the 'social influence' variable and the 'other-caste' variable are omitted. These results, reported in Table 4, show income to be insignificant in all specifications.

Finally, we examine whether the insignificance of the 'other-caste' variable arises because of insufficient variation of the caste variables at the village level. Inspection of the data suggests that this is not the case. Table 5 shows the distribution of castes within each village, and it appears that no caste is dominant in any single village. A more formal test consists of partitioning the sample by caste and then re-estimating the model for each caste separately. Unfortunately, we are limited by the small sample size of two of the castes.<sup>12</sup> Therefore, we estimate separate probits for girls belonging to the two largest castes which we refer to as 'low caste' and 'high caste'. The low-caste (OBC) sample comprises 42 percent of the girls whereas the high-caste (general-caste) sample comprises 26 percent. As noted above, our analysis of the whole sample revealed no significant differences in probability of child marriage between OBC and the other lower castes.

Some important differences emerge when we subdivide the sample into low- and high-caste households. Referring back to Table 1, the rate of child marriage is much higher among low-caste girls than it is among high-caste girls. Thirty-seven per cent of girls in the low-caste sample were married before the age of 10 whereas the rate was only about six per cent for high-caste girls.<sup>13</sup> Similarly, fewer low-caste mothers are

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<sup>12</sup> There are 55 girls in the scheduled tribe sample and 145 girls in the scheduled caste sample.

<sup>13</sup> In 2012, 100 girls from these villages attend secondary school and live in a residence in the city of Jodhpur maintained by the local NGO. Twenty of these students, aged 11-17, are married. All are members of the scheduled caste. Their age at marriage reflects the continuing prevalence of very early child marriage, even for daughters of more enlightened low-caste families, e.g. those permitting their daughters to receive secondary education: Of the 20, ten were married at age 3, four were married at age 2, and two each were married at ages 4,5, and 8 respectively. (Information received in communication from Veerni Institute, August 15, 2012.)

literate. Only five per cent of low-caste mothers are literate compared with more than 15 per cent of high-caste mothers. However, the difference in economic status is less pronounced. Average monthly income of high-caste households is 3,431 rupees as compared to 3,208 for OBC households. Both groups have high rates of land-ownership, although electricity is more common in high-caste households (68%) than it is in OBC households (56%).

In Table 6, we present the results of the analysis on the partitioned sample. The results from the 'low-caste' sample are as expected. As seen in column (4), the 'social influence' effect is positive and significant while the 'other-caste' effect is insignificant. 'Electricity' has a significant negative effect as it does in the full sample. Less supportive results are found, however, when we estimate the probit equation using the 'high-caste' sample. Results shown in column (5) indicate that neither the 'social influence' nor the 'other-caste' effects are significant for 'high-caste' girls. In addition, none of the variables which are significant in the other specifications are significant in this specification. A likely explanation for the lack of significance of the 'social influence' variable is that it does not have the same effect among high caste families where the incidence of child marriage is low and therefore not the norm. We therefore interpret this result as consistent with our hypothesis that decisions about the appropriate age of arranged marriages of daughters is affected by local social norms.

To better understand how parental education affects the decision making process, we examine the sub-sample of girls with literate fathers. Ideally we would also like to examine the behavior of families with literate mothers but the sample is too small. The results for the sample with literate fathers are presented in Table 7. The 'social influence' effect remains significant, indicating that even families with literate fathers use informal information networks based on local norms when making marriage decisions. For this sub-sample, the effect of 'literate mother' is negative, highly significant, and of greater magnitude than in the whole sample, even when caste fixed effects are included. Having a literate mother is associated with about a 16 percent reduction in the probability of a girl being a child bride. This result suggests that mother's literacy plays an important role in reducing child marriage in households where the father is literate as well. In addition, the effect of 'high-caste'

is again negative, highly significant and of approximately the same magnitude as having a literate mother. Unique to this sub-sample, the coefficients of both 'age' and 'age squared' are significant, with younger girls being less likely to be child brides. One possible explanation for this apparent cohort effect might be that literate parents have responded to the Indian government's campaign in recent years against child marriage by changing their behavior.

### Conclusion

In this paper, we examine the relative importance of economic and social factors in determining the probability of a girl in rural Rajasthan becoming a child bride. Our empirical results reveal that social conformity plays an important role in explaining the prevalence of child marriage in this part of India. Surprisingly, the data reveal that economic variables--such as household income, relative poverty status, and land ownership-- do not significantly affect the probability of a girl becoming married before her 10th birthday. This result is unexpected since child marriage is usually viewed as a by-product of extreme poverty.

Our findings suggest that the observed behavior of other families in their local social group acts as an important informational signal to parents in making marriage decisions for their own daughters.

However, having electricity in the home also appears to be important in determining (reducing) the incidence of child marriage, particularly in lower-caste families where parents are illiterate. This suggests that access to information about norms outside the local village through radio or TV may act to counterbalance local norms that favor child marriage. Having a literate mother also lowers the probability of a girl becoming a child bride in families where the father is also literate. Future research is needed, however, to fully understand the relationship between parental education, economic incentives, and parental decisions regarding child marriage. Our results do, however, suggest that some combination of educational programs and economic incentives aimed at whole villages may be a more effective public policy strategy than merely providing monetary incentives to individual families to postpone the marriage of their daughters.

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## Appendix

**Table 1**  
*Descriptive Statistics of Full and Partitioned Samples*

Variables	Full Sample (N = 811)		High Caste (N = 210)		OBC (N = 389)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Married < 10 years old	0.264	0.441	0.057	0.232	0.365	0.482
Effectively Married	0.335	0.472	0.133	0.341	0.400	0.491
Contractually Married	0.040	0.198	0.014	0.119	0.005	0.218
Unmarried	0.625	0.484	0.857	0.351	0.546	0.498
Father Literate	0.557	0.497	0.590	0.493	0.553	0.498
Mother Literate	0.069	0.025	0.148	0.356	0.046	0.210
Age of Girl	13.15	2.28	13.6	2.31	13.0	2.24
Number of Brothers	2.19	1.12	2.15	1.17	2.11	1.06
Number of Sisters	2.55	1.50	2.56	1.51	2.52	1.48
Monthly HH Income <sup>1</sup>	3,020	1,942	3,431	2,290	3,208	1,851
Owens Land	0.856	0.352	0.814	0.390	0.870	0.336
Income < Village Mean	0.692	0.460	0.619	0.487	0.900	0.301
Electricity	0.567	0.496	0.681	0.467	0.558	0.497
Scheduled Caste	0.186	0.390	0	0	0	0
Scheduled Tribe	0.075	0.264	0	0	0	0
Other Backward Castes	0.482	0.500	0	0	1	1
High Caste	0.259	0.438	1	1	0	0
Own-caste-own village	0.265	0.184	0.055	0.047	0.365	0.157
Other-caste-own-village	0.244	0.123	0.319	0.135	0.200	0.081

*Note:* Based on data collected by the authors.

<sup>1</sup> Household monthly income in 1000s of rupees.

**Table 2**  
**Probit Results on Child Marriage for Full Sample**

Independent Variables	(1) All Girls		(2) All Girls		(3) All Girls	
	$\frac{\delta M}{\delta X}$	Std. Error	$\frac{\delta M}{\delta X}$	Std. Error	$\frac{\delta M}{\delta X}$	Std. Error
Social influence effect	0.753**	(0.088)	0.720**	(0.090)	0.429**	(0.112)
Other-caste effect	-0.056	(0.135)	-0.047	(0.136)	0.177	(0.430)
Father literate			-0.175	(0.101)	-0.050	(0.029)
Mother literate			-0.507**	(0.229)	-0.098	(0.055)
No. of Brothers			0.013	(0.014)	0.015	(0.014)
No. of Sisters			-0.009	(0.011)	-0.009	(0.010)
Monthly income <sup>1</sup>			0.009	(0.012)	0.010	(0.012)
Income < mean <sup>2</sup>			-0.025	(0.164)	-0.008	(0.167)
Owens land			0.287	(0.161)	0.070	(0.041)
Electricity			-0.300**	(0.109)	-0.070*	(0.032)
Age			0.114	(0.081)	0.117	(0.075)
Age Squared			-0.00	(0.003)	-0.004	(0.003)
High caste					-0.208**	0.043)
Scheduled Caste					-0.045	(0.037)
Scheduled Tribe					-0.042	(0.053)
No. of observations		811		811		811
Pseudo $R^2$		0.089		0.117		0.135

*Note:* The dependent variable is one = girl is married at age < 10. The social influence effect is the proportion of same-caste girls in own village (minus oneself) married at age < 10. The omitted caste is OBC.

<sup>1</sup> Income is monthly household income in 1000 rupees.

<sup>2</sup> Household income less than the village mean. All probits include a constant. Robust standard errors are in parentheses. Significance at 1% and 5% are indicated by \*\* and \*, respectively.

**Table 3**  
*Avg. Monthly Household Income and Proportion of Land-Owning Households by Village*

Village #	Avg. Monthly Income in Rupees	Std. Dev.	Prop. Land Owners	Std. Dev.
1	4510	2511	0.892	0.325
2	3695	1868	0.938	0.244
3	2882	1878	0.873	0.334
4	2385	936	0.548	0.500
5	3308	2423	0.896	0.307
6	2207	1160	0.545	0.504
7	2924	1788	0.974	0.159
8	3038	1899	0.973	0.164
9	1854	1255	0.708	0.464

**Table 4**  
**Alternative Specifications: Determinants of Child Marriage**

Independent Variables	(1)		(2)		(3)		(4)	
	$\frac{\delta M}{\delta X}$	Std. Error	$\frac{\delta M}{\delta X}$	Std. Error	$\frac{\delta M}{\delta X}$	Std. Error	$\frac{\delta M}{\delta X}$	Std. Error
Monthly income <sup>1</sup>	-0.004	(0.013)	0.008	(0.013)	0.009	(0.013)	0.008	(0.012)
Income < Mean	-0.002	(0.054)	0.007	(0.053)	0.009	(0.051)	-0.015	(0.051)
Father literate			-0.066*	(0.032)	-0.056	(0.030)	-0.050	(0.031)
Mother literate			-0.157**	(0.046)	-0.094	(0.058)	-0.098	(0.057)
No. of Brothers			0.005	(0.014)	0.012	(0.013)	0.014	(0.013)
No. of Sisters			-0.010	(0.010)	-0.009	(0.010)	-0.010	(0.010)
Owens land			0.122**	(0.037)	0.087*	(0.039)	0.076	(0.043)
Electricity			-0.100**	(0.033)	-0.071*	(0.032)	-0.088**	(0.032)
Age			0.140	(0.078)	0.148	(0.076)	0.106	(0.076)
Age Squared			-0.005	(0.003)	-0.005	(0.003)	-0.003	(0.003)
High caste					-0.282**	(0.026)	-0.268**	(0.028)
Scheduled caste					-0.062	(0.035)	-0.057	(0.035)
Scheduled tribe					-0.082	(0.047)	-0.055	(0.050)
Village 1							-0.014**	(0.049)
Village 2							-0.202**	(0.037)
Village 4							-0.079	(0.050)
Village 5							0.042	(0.055)
Village 6							-0.173**	(0.056)
Village 7							-0.066	(0.043)
Village 8							-0.061	(0.048)
Village 9							-0.235**	(0.040)
Observations		811		811		811		811
Pseudo R2		0.000		0.039		0.116		0.157

*Note:* The dependent variable is one = girl was married at age < 10. All probits include a constant term. Robust standard error in parentheses. Significance at 1% and 5% are indicated by \*\* and \*, respectively.

<sup>1</sup> in 1000 Rupees.

**Table 5**  
**Proportion of Child Brides and Caste Membership by Village**

Village #	Sample Size	% Married < age 10	Std. Dev.	Scheduled Caste #	Scheduled Tribe #	OBC #	High Caste #
1	51	0.176	0.315	6	1	26	18
2	80	0.113	0.318	7	11	39	23
3	158	0.278	0.450	25	13	49	71
4	93	0.226	0.420	37	6	34	16
5	96	0.479	0.502	19	7	62	8
6	44	0.068	0.255	9	2	4	29
7	155	0.316	0.466	27	3	106	19
8	110	0.291	0.456	17	14	63	16
9	24	0.042	0.304	4	4	6	10
Total	811	0.254	0.441	151	61	389	210

**Table 6**  
**Probit Results For Sample Partitioned into Low and High Caste**

Independent Variables	(1) Low Caste(OBC)		(2) High Caste(General Caste)	
	$\frac{\delta M}{\delta X}$	Std. Error	$\frac{\delta M}{\delta X}$	Std. Error
Social influence effect	0.792**	(0.170)	-0.326	(0.246)
Other-caste effect	0.234	(0.332)	0.069	(0.068)
Father literate	-0.060	(0.047)	-0.013	(0.028)
Mother literate	-0.100	(0.099)	-0.009	(0.035)
Number of Brothers	0.035	(0.024)	0.019*	(0.009)
Number of Sisters	0.009	(0.018)	-0.022**	(0.008)
Income/month (1000 Rs)	0.007	(0.020)	-0.001	(0.005)
Income < village mean	-0.018	(0.072)	0.014	(0.037)
Owens land	0.124	(0.072)	0.050	(0.029)
Electricity	-0.110*	(0.049)	-0.017	(0.028)
Age	0.098	(0.129)	0.294	(0.735)
Age Squared	-0.003	(0.005)	-0.009	(0.025)
No. of observations		389		210
Pseudo $R^2$		0.089		0.229

*Note:* The dependent variable is one = girl was married at age < 10. The social influence effect is the proportion of same-caste girls in own village (minus oneself) married at age < 10. All probits include a constant. Robust standard errors are in parentheses. Significance at 1% and 5% are indicated by \*\* and \*, respectively.

**Table 7**  
**Probit Results For Subsample with Literate Fathers**

Independent Variables	(1)	
	$\frac{\delta M}{\delta X}$	Std. Error
Social influence effect	0.347*	(0.141)
Other-caste effect	-0.157	(0.200)
Mother literate	-0.162**	(0.054)
Number of Brothers	0.107	(0.068)
Number of Sisters	0.004	(0.040)
Income/month (1000 Rs)	0.015	(0.015)
Income < village mean	-0.032	(0.063)
Owens land	-0.002	(0.059)
Electricity	-0.041	(0.042)
Age	0.260*	(0.107)
Age Squared	-0.009*	(0.004)
High caste	-0.159*	(0.059)
Scheduled caste	-0.047	(0.047)
Scheduled tribe	-0.059	(0.064)
No. of observations		452
Pseudo $R^2$		0.112

*Note:* The dependent variable is one = girl was married at age < 10. The social influence effect is the proportion of same-caste girls in own village (minus oneself) married at age < 10. The omitted caste is OBC. All probits include a constant. Robust standard errors are in parentheses. Significance at 1% and 5% are indicated by \*\* and \*, respectively.

*Biographical Note:* **Shirley Johnson-Lans** is a labor economist specializing in health economics and gender issues. Recent publications include: *A Health Economics Primer* (Boston, Addison Wesley/Pearson, 2006) and a chapter, "Health Economics" in *Twenty-First Century Economics: A Reference Handbook* (New York, Sage, 2010). Recent working papers include, "When NGOs Make a Difference," *Vassar College Economics Department Working Papers 2009*, "Effects of Female Literacy in Villages in Rural Rajasthan," *Vassar College Economics Department Working Papers 2007*, and co-authored with Dr. Patricia Jones, "Foreign Direct Investment and Racial Inequality: Evidence from South Africa," Mimeo, Vassar College, May, 2012. E-mail: sjlans@vassar.edu

*Biographical Note:* **Patricia Jones** is a development economist whose research examines the determinants of productivity in developing countries. Her recent research includes: "History Matters: New Evidence on the Long-run Impact of Colonial Rule on Institutions", *Journal of Comparative Economics*, forthcoming, and "Identifying the Effects of Female Ownership on Firm Performance: Evidence from Ghana." Mimeo, Vassar College, March 2012. E-mail: patjones@vassar.edu