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Domestic Violence and Women's Autonomy: Evidence from India

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by

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ABSTRACT

This paper sets out a simple non-cooperative model of resource allocation within the household in developing countries that incorporates domestic violence as an instrument for enhancing bargaining power. We demonstrate that the extent of domestic violence faced by women is not necessarily declining in their reservation utilities, nor necessarily increasing in their spouses'. Using the National Family Health Survey data of India for 1998-99, we isolate the effect of domestic violence on female autonomy, taking into account the possible two-way causality through the choice of appropriate instruments. We provide some evidence for the evolutionary theory of domestic violence, which argues that such violence stems from the jealousy caused by paternity uncertainty in our evolutionary past. The findings have strong policy implications suggesting that it will take more than an improvement in women's employment options to address the problem of spousal violence.

Key Words: domestic violence, female autonomy, developing countries, patriarchy, evolution
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1 Introduction

Domestic violence is a universal phenomenon. Irrespective of whether a country is poor or rich, spousal violence is pervasive. However, it has not received as much research scrutiny in economics as it warrants.[2] This paper deals with the determinants of domestic violence in developing countries and how this violence impinges on women's autonomy (and the reverse). We present a simple theoretical framework and we provide empirical evidence drawn from India.

Both feminist and evolutionary theories are in agreement that a pivotal aspect of gender relations is the need for men to control the sexuality of women. Feminist theory identifies patriarchy as the root cause of domestic violence, whereby males do whatever is needed to exercise control over women and keep them subservient [e.g. Dobash and Dobash (1979), Martin (1976), Yllo and Strauss (1990)]; using violence is one possibility. Evolutionary theory has it that domestic violence ultimately stems from paternity uncertainty [e.g. Daly and Wilson (1993, 1996)]. Because the paternity of children was never certain in our evolutionary past, natural selection would have favoured proprietary behavior by males with regard to sexual access to their mates. Domestic violence, in this view, stems from the insecurity and jealousy that males feel when their partners are exposed to the possibility of sexual encounters with other males. Although feminist theory does not typically invoke evolutionary arguments, it is nevertheless true that the latter can augment feminist claims by providing some evolutionary underpinnings for patriarchy.

We pursue two goals in this paper. First, we seek to ascertain if domestic violence impinges on female autonomy. In feminist theory, domestic violence is an outcome that derives from the weak autonomy and bargaining power of women. This theory predicts that women who have more autonomy (perhaps because they earn independent incomes) would experience less mate violence than women with less autonomy. In a pioneering paper that brought out the importance of female autonomy in determining the demographics of India by region, Dyson and Moore (1982) showed a clear divide in the autonomy of women in north India and those in south India (with the latter exhibiting greater autonomy).[3] Therefore, one would expect less domestic violence in the south of India. As was shown by Menon and Johnson (2007) using the NFHS data for India, and as we confirm here, this is patently false: women from the south appear to be beaten more frequently. We are able to provide an explanation for this very puzzling fact that women with more autonomy experience more spousal abuse. We show that there is no necessary theoretical relationship between a woman's reservation utility (or outside option) and the extent of the physical abuse she faces at home. In our framework,

[2] Women who are abused—and it is largely women who suffer serious violence—are often not likely to report physical violence to the police because they may be too embarrassed to admit to having experienced such violence, too concerned with embarrassing their abusers, or too intimidated to expose them to public censure.

[3] But see Rahman and Rao(2004) for a contrary view.

greater domestic violence may also be a rational male response to the greater autonomy of women.

Second, we attempt to empirically assess the feminist and evolutionary theories of domestic violence. While both theories often make similar predictions, it is possible to separate them out in some scenarios. For example, the effect of domestic violence on earning by women would elicit similar predictions from them, but evolutionary theory would go further and predict that women whose earnings come from working *outside* the home would experience greater domestic violence. This is because, in the perception of their husbands, there is greater danger for these women may have sexual contact with other men; paternity uncertainty would trigger more spousal jealousy and violence as a response. This claim can be tested, and we do so in this paper.

The framework that suggests itself when we seek to understand domestic violence is that of household bargaining. Most bargaining models tend to assume that bargaining is a cooperative endeavor; that the outcome is Pareto efficient. But this is a difficult assumption to justify in the context of spousal violence.[4] We concur with the theoretical literature on domestic violence that this is best analyzed in a noncooperative framework, as is done in Tauchen, Witte, and Long (1991), Farmer and Tiefenthaler (1996), and Bloch and Rao (2002). Violence is a means to obtaining the upper hand in bargaining situations. In developing countries, there are hardly any legal recourses to domestic violence; even when the laws are on the books they will not be enforced if society finds such violence culturally acceptable. In the developed countries, where the laws are enforced with less reluctance, the enforcers are hampered by the fact that charges of domestic violence are often dropped by the victims.[5]

In their pioneering theoretical work on the economics of domestic violence, Tauchen, Witte, and Long (1991) assume that spousal violence is used to control behavior and is also a source of gratification for the abuser. They argue that an increase in the income of the abuser increases his violence and welfare, yielding no benefit to the victim if her reservation utility is binding. Increases in the victim's income generally increases her welfare. In high income families with women supplying most of the income, the authors argue that an increase in the victim's income may increase violence.[6]

Farmer and Tiefenthaler (1996) have argued that the laying of charges in domestic violence cases may be a signalling device. By communicating to their abusers that they have access to outside support and that they will leave should the violence continue, in effect they signal a higher reservation utility. The authors propose this as the reason why women often drop the

[4] It is possible to suggest a view that outcomes can still be ex ante Pareto efficient by invoking the assumption that information is asymmetric and incidents entailing spousal violence are much like strikes observed in union-management negotiations. But such an interpretation seems to us to be strained and untenable.

[5] But Farmer and Tiefenthaler (1996) emphasize the point that too much must not be read into this. In their view, the placing of charges is a signalling device that curtails abuse. See the discussion below.

[6] But the authors acknowledge that the conditions under which this may happen are odd.

charges they brought against their abusers; the use of services offered to battered wives offers a credible signalling mechanism as much as it offers a direct reprieve from battering.

Goode (1971) was an early proponent of the view that, in the absence of other factors such as education or income that may confer power within a relationship, men may resort to violence as a substitute to achieve their ends. Using data from three villages in a southern Indian state, Rao (1998) showed that women who faced greater domestic violence had less control over resource allocation within the household (as captured by children's nutrition levels). This, to our knowledge was the first paper to quantitatively establish a connection between domestic violence and decision-making power. Addressing the problem of dowry-related violence in India, Bloch and Rao (2002) propose a theoretical model of asymmetric information within a household bargaining framework. The husband uses violence to signal to his in-laws the degree of his satisfaction with his marriage and uses violence as a weapon of extortion. The authors show that women coming from wealthier families are more likely to be beaten in order to elicit greater transfers from their parents. They then provide some evidence for their theory using ethnographic data drawn from a southern Indian state.

In this paper, we provide a simple noncooperative model of spousal violence in general. In our view, which is complementary to those of the authors whose papers are summarized above, spousal violence is intended to increase the abuser's bargaining power. We advance the view, in particular, that spousal violence is a means to ensuring that the victim (taken to be a woman) allocates resources more in line with the preferences of the abuser (taken to be her husband). This is in accordance with the views of evolutionary psychologists, who argue that spousal violence is a means men utilize to ensure that women behave in their (the men's) reproductive interests; dominating women through violence facilitates the transmission of the genes of violent men.[7] This behavior gets entrenched in male human nature—and this is the essence of the argument—because it is rewarded by the process of natural selection. The genesis of domestic violence, in this view, may well lie in the advantages it conferred on such behavior in our evolutionary past, but in the contemporary context it is not just reproductive interest that is at stake. The important and more general point is that violence garners resources for its perpetrators.

In our model women's autonomy, as captured by the extent to which she can implement her preferences in household resource allocation, is determined among other things by the amount of spousal abuse she confronts. We demonstrate that an improvement in the wife's reservation utility would increase her autonomy in the noncooperative equilibrium but this may be accompanied by an increase, not decrease, of the spousal violence she experiences. Thus increases in women's education levels, outside options, and the support groups available to them may incite more spousal violence. We also show that an increase in the husband's reservation utility may, in fact, lower the amount of violence he inflicts on his wife. We provide

[7] See, for example, Wilson and Daly (1993, 1996) for an account of this line of argument.

strong empirical support for these claims using the extensive National Family Health Survey data of India for the years 1998-99. This data set contains detailed socioeconomic information on a nation-wide sample of women and whether they were beaten by their husbands or by any family members (hers or his) and, if so, how frequently. The data set also provides some detailed information at the individual and household level.

After controlling for a whole host of factors, working women are seen to face greater spousal violence and those working away from home even more so. There appears to be clear evidence in favor of the evolutionary theory of domestic violence. With regard to how the autonomy of married women depends on domestic violence, there is of course a clear endogeneity issue here: greater female autonomy may impinge on domestic violence, and domestic violence may in turn affect female autonomy—an issue that has been overlooked in the literature. Some of our empirical findings have been previously unearthed by Menon and Johnson (2007) in their interesting study of how personal and family characteristics affect domestic violence in India and how this varies by geographical region. However, they take autonomy as an explanatory variable when, in fact, it is likely to be highly endogenous.[8] In contrast, we purge the effect of autonomy on domestic violence by suitable choice of instruments and isolate how spousal violence impinges on married women's autonomy. Though there are some regional variations in the importance of certain factors in exacerbating domestic violence, the broad thrust of our results is unambiguous: domestic violence undermines women's autonomy. This offers persuasive evidence in favor of our model and that of Bloch and Rao (2002): domestic violence is a vehicle employed by males to enhance their bargaining power. It is not necessary to invoke additional assumptions on preferences (such as men obtain satisfaction from spousal abuse, etc.) to explain the prevalence of domestic violence.

This paper is organized as follows. The next section presents our model and we derive some testable implications from it. In Section 3, we describe the data and present our sample statistics. Our econometric results are presented in Section 4. We present our concluding thoughts in Section 5.

2 The Model

In this section, we propose a model that determines a married woman's autonomy endogenously when spousal violence is an option available to her husband.

We presume that the household consumes two goods, X and Y. For simplicity, we assume that these are household public goods so that we do not have to separately determine the private consumptions of individuals. Denote the utility function of the wife by $U_W(x, y, v)$, where x and y denote the respective amounts of X and Y consumed and v denotes the amount

[8] Menon and Johnson (2007) also use women's attitude towards domestic violence as a regressor, possibly further biasing the results due to the endogeneity of this variable, too.

of violence inflicted by the husband on her. We assume that $U_W(.,.,.)$ is increasing and strictly quasiconcave concave in its first two arguments and decreasing and strictly concave in the last. We denote the husband's utility function by $U_H(x, y, v)$, with monotonicity and curvature properties identical to those of the wife's utility function. In particular, we posit that the husband's utility also decreases with the amount of violence he inflicts on his wife because this leads to strained relations, loss of intimacy and trust, etc. This loss is the opportunity cost he perceives to engaging in spousal violence. In this view, domestic violence is a means to an end for the husband and not an end in itself.

We presume that the wife's preferences over goods X and Y are different from those of the husband, and this difference is the point of contention within the household that makes bargaining power relevant. In South Asian households the wife manages the running of the household and, since we use data from India in our empirical work, we presume that she oversees the allocation of household resources. It is to bring this allocation more in alignment with his own preferences that the husband potentially engages in domestic violence. Indeed, one may interpret the efforts of patriarchy in exercising control over women as attempts to bring women's behavior more in accord with the interests of males. Here we take household management (resource allocation) as the nexus of women's struggle for autonomy.

For tractability, we assume that the wife's utility function is of the form:

$$U_W(x, y, v) = \alpha_1 \ln x + \beta_1 \ln y - \delta_1 v, \quad \alpha_1 > 0, \beta_1 > 0, \alpha_1 + \beta_1 = 1;\ \delta_1 > 0, \tag{1}$$

and the husband's of the form:

$$U_H(x, y,\ v) = \alpha_2 \ln x + \beta_2 \ln y - \delta_2\, v, \quad \alpha_2 > 0, \beta_2 > 0, \alpha_2 + \beta_2 = 1;\ \delta_2 > 0. \tag{2}$$

To ensure that difference in preferences over goods is a point of contention for the couple, we assume that $\alpha_1 \neq \alpha_2$. The normalizations $\alpha_1 + \beta_1 = 1$ and $\alpha_2 + \beta_2 = 1$ are innocuous and are invoked for convenience.

Let $\overline{U}_W$ and $\overline{U}_H$, respectively, denote the wife's and husband's reservation utilities, that is, the utilities they need to be assured of for the marriage to be viable.[9] Suppose the family income, taken as exogenous here, is M and that the units of goods X and Y are chosen so that their prices are both normalized to unity. We assume that the husband and wife pool their incomes.

The wife is viewed here as the one who manages the household income and implements the allocation of resources. To what extent this allocation reflects her own preferences will depend, of course, on her bargaining power. In the allocation of resources, suppose the wife

[9] This sidesteps the issue of what is the relevant threat scenario in marriage. In the South Asian context, divorce is rare—especially in rural areas—it has been argued that non-cooperative behavior within marriage is the likely threat outcome [e.g. Woolley (1988), Chen and Woolley (2001), Lundberg and Pollak (1993)].

puts a weight γ $(0 \leq \gamma \leq 1)$ on her own preferences and $1-\gamma$ on her husband's. We can interpret γ as the wife's autonomy (or as her bargaining power) and is one of the principal endogenous variables of interest here.

To begin with, let us consider how female autonomy is determined in the absence of the reservation of domestic violence. Suppose in this case that γ_0 and $1-\gamma_0$, respectively, are the weights the wife would put on her own preferences and on her husband's. We would expect that $\gamma_0 < 1$ because an allocation of resources tilted too much in favor of her own preferences is likely to generate a utility for her husband that falls short of his reservation utility. The wife has to ensure that her husband's utility in the allocation she chooses is at least equal to his reservation utility, $\overline{U}_H$. In other words, γ_0 and the associated allocation $(x_0, y_0,)$ of the two goods must be the solution to the problem:

$$\max_{x,y,\gamma} \qquad \gamma U_W(x,y,0) + (1-\gamma)U_H(x,y,0) \quad s.t. \quad x+y \leq M, \quad U_H(x,y,0) \geq \overline{U}_H. \tag{3}$$

If the husband's reservation utility is very high, one might expect γ_0 to be close to 0. At the other extreme, if the husband's reservation utility is very low, the wife may well choose $\gamma_0 = 1$. It is possible that the husband reckons the allocation of household resources in this scenario is not sufficiently aligned with his preferences. In other words, he might deem that γ_0 is too high. To reduce his wife's exercise of independence and thereby bring the resource allocation more in line with his own preferences, he may choose the option of wife battering. As outlined in the Introduction, evolutionary psychologists argue that spousal violence is a means to force women to serve the *reproductive* interests of men [see, for example, Wilson and Daly (1993, 1996)]. But the use of spousal violence can be more general, and that is the view we adopt here. Our approach is consistent with Rao (1998), who found using data from three villages in the state of Karnataka, India, that domestic violence and intra-household allocation of resources were correlated, and also with that of Goode (1971).

The determination of female autonomy as we model it involves two stages. In the first stage, the husband sets down the rule by which he decides how much violence he will inflict on his wife. We explicitly allow for the possibility that the exercise of autonomy by the wife may incite violence by the husband. Suppose the husband commits to a frequency (or 'intensity') of battering, b, which inflicts violence on his wife in proportion to the autonomy she exercises, that is, the violence, v, that she suffers is given by $v = \gamma b$. In the second stage, the wife decides how much weight to put on her own preferences (that is, how much autonomy to exercise) in the household resource allocation. The choice of modeling the husband as the first mover in this setting is motivated by the fact that patriarchy is an entrenched institution in developing countries. The fact that most brides leave their natal family and move to their husband's home and frequently live with his parents' extended family implies that married women can hardly aspire to being first movers.

Since the choices outlined above are made sequentially, we need to work backwards to solve for the equilibrium. Given that the violence she confronts is $v = \gamma b$, in the second stage the wife chooses the degree of autonomy to exercise and the household resource allocation to effect by solving:

$$\max_{x,y,\gamma} \quad \gamma U_W(x, y, \gamma b) + (1-\gamma)U_H(x, y, \gamma b) \quad s.t. \quad x + y \leq M, \quad U_H(x, y, \gamma b) \geq \overline{U}_H. \quad (4)$$

In solving this problem, the wife makes her choices with full awareness of the battering this may subsequently entail. Denote the solution to this problem by $[x^*(b), y^*(b), \gamma^*(b)]$. (For brevity, we suppress the dependence of this solution on the husband's reservation utility.)

It can be verified that provided the following condition is satisfied

$$\delta_2 + 2(\delta_1 - \delta_2)\gamma^*(b) > 0, \quad (5)$$

the degree of autonomy, $\gamma^*(b)$, the wife chooses to exercise in the second stage is strictly declining in b:

$$\frac{d\gamma^*(b)}{db} < 0, \quad (6)$$

that is, the greater the frequency of battering (all else constant) the lower is the autonomy the wife exercises. We assume that condition (5) is satisfied, for its violation is only conceivable when δ_2 is large compared to δ_1, that is, when the (constant) marginal disutility of violence is much greater for the husband than for the wife—a scenario where domestic violence is likely to be irrelevant.[10]

The husband is cognizant of his wife's optimal response to the potential spousal violence she faces. Therefore, in the first stage, in choosing the frequency of battering, b, the husband solves

$$\max_{b} \quad U_H(x^*(b), y^*(b), \gamma^*(b)b) \quad s.t. \quad U_W(x^*(b), y^*(b), \gamma^*(b)b) \geq \overline{U}_W. \quad (7)$$

Denote the solution to this problem by $b^\dagger$. The wife's endogenously chosen autonomy in the presence of domestic violence, then, is given by $\gamma^*(b^\dagger)$. The amount of spousal violence, $v^\dagger$, she encounters in the (subgame perfect Nash) equilibrium is given by $v^\dagger = \gamma^*(b^\dagger)b^\dagger$. In general, the endogenous bargaining power of the wife and the equilibrium level of spousal violence will depend on the reservation utilities. Our theory claims that $b^\dagger$ would be the equilibrium frequency of battering and $v^\dagger$ would be the observed level of spousal violence the woman experiences.

It should be noted that wife-beating is not inevitable in this model. For one, if the wife's reservation utility is very high, naturally enough, the husband may not exercise the option of

[10] This presumes that the husband's reservation utility constraint in (4) is not binding. If it is, the comparative static derivative (6) is unconditionally true for, in that case, an increase in b raises the cost to the wife of asserting her autonomy and so she will economize on it in delivering the husband's reservation utility, $\overline{U}_H$.

spousal violence. Even if there was scope for him to inflict violence, he may choose not to do so, since violence has an opportunity cost to him: if the marginal utility cost to the husband of lowering his wife's autonomy exceeds the marginal benefit of further aligning the household resource allocation with his preferences, it may well be that $b^\dagger = 0$. This is a more likely event when the husband's reservation utility is quite high, as we shall see.

It is easy to see that, generally, the equilibrium frequency of wife battering $b^\dagger$ will be weakly declining in the wife's reservation utility. This can be seen from the upper and lower panels of Figure 1. On the horizontal axis of both panels is the frequency of wife battering, b. On the vertical axis of the upper panel is the husband's utility after the wife optimally chooses the autonomy she exercises, given b. The husband's utility (shown as $ABCD$) is U-shaped as a function of b; for low levels of b, his utility is increasing because increases in wife battering induce her to align the household's resource allocation more in accord with his preferences. But at higher levels of b, the opportunity cost to him of inflicting violence on his partner overwhelms the additional benefit. The wife's utility (shown as LM in the lower panel), on the other hand, monotonically declines in b. This is because the increasing violence she faces for exercising autonomy induces her to choose resource allocations that increasingly deviate from her preferences. Both the curves ABC and LM have been drawn without the consideration of the fact that the husband's utility can not be lower than its reservation value, $\overline{U}_H$, shown as OE on the vertical axis of the upper panel. So, even if $b = 0$, the wife will curtail her bargaining power so that her husband's utility achieves the level indicated by OE instead of OA; as a result, her own utility falls from OL to ON on the vertical axis of the lower panel.

For values of b in the range $0 < b \leq \underline{b}$, the husband has no use for wife battering and so he will either set $b = 0$ or set b at a level that exceeds $\underline{b}$. Thus wife battering is ruled out over the range $0 < b \leq \underline{b}$. From the lower panel of the Figure we see that the wife's utility jumps discontinuously from ON to OR when the husband starts battering just past $b = \underline{b}$. If the husband were to acquire a more liberal view of spousal violence and find wife beating more reprehensible, we can capture this effect by an increase in the parameter δ_2 in (2). As a result, the schedule $ABCD$ would shift down, and $\underline{b}$ would increase. In other words, such a husband would be less likely to engage in wife beating.

For future reference, we note that the distance ON on the lower panel of Figure 1 is the utility level the wife can assure herself of in the event domestic violence is not a possibility (that is, when $b = 0$). This utility will depend on the husband's reservation utility, since she has to ensure that she delivers him at least the utility, $\overline{U}_H$. If his reservation utility were higher, she would have to tilt resource allocation in his favor (that is, reduce γ) and so her own utility (ON) would be lower. So when the husband does not engage in spousal violence, a woman's utility within marriage declines with his reservation utility. This, as we shall see, is not so when he *does* engage in violence.

From the upper panel of Figure 1 we see that the battering frequency that is globally optimal from the husband's point of view is b^*. Whether this is feasible or not depends on the wife's reservation utility, $\overline{U}_W$. If this utility is equal to or lower than OS in the lower panel, the husband would choose to batter with a frequency b^*. This optimum is clearly independent of the husband's reservation utility, $\overline{U}_H$. If the wife's reservation utility rises to a level above OS in the lower panel her reservation utility will be binding, and the husband is constrained to set $b^\dagger < b^*$; he will set $b^\dagger$ as the largest value of b for which his wife will receive her reservation utility, $\overline{U}_W$. When $\overline{U}_W$ increases, $b^\dagger$ will have to decrease commensurately. Thus for reservation utilities of the wife within the range $OS < \overline{U}_W \leq OR$ on the vertical axis of the lower panel, the equilibrium battering frequency, $b^\dagger$, will be declining in $\overline{U}_W$. Over the range $OR < \overline{U}_W \leq ON$, wife battering is infeasible because even the minimal battering frequency the husband deems to be in his self-interest (that is, $\underline{b}$) pushes the wife below her reservation utility. For $\overline{U}_W > ON$, the marriage is infeasible even in the absence of wife battering because there is not enough surplus in the marital alliance to allow both partners to recover their reservation utilities.

The above reasoning, along with the comparative static derivative in (6), shows that the relationship between the wife's reservation utility and her autonomy in equilibrium, $\gamma(b^\dagger)$, is of the form shown in Figure 2. It is weakly increasing in her reservation utility and discontinuously increases when her reservation utility reaches OR, at which point wife battering becomes infeasible.

It is very interesting to inquire how the equilibrium level of spousal violence the wife suffers changes with her reservation utility, $\overline{U}_W$. Recall that this equilibrium level of violence is given by $v^\dagger = \gamma^*(b^\dagger)b^\dagger$. When $\overline{U}_W$ increases, we have seen above that, when the wife's reservation utility binds in the equilibrium, $b^\dagger$ decreases and so, in view of the comparative static derivative in (6), $\gamma^*(b^\dagger)$ will increase. What happens to the equilibrium level of violence depends on how sensitive the wife's exercise of autonomy is to battering frequency. If the absolute value of the elasticity of $\gamma^*(b)$ with respect to b is greater than unity, an increase in the wife's reservation utility may result in *greater*, not less, violence in equilibrium.[11]

In Figure 3, we plot the amount of domestic violence, $v = \gamma^*(b)b$, as a function of battering frequency, b, for the assumed functional form (1) for the wife's utility function. We see that the relationship is an inverted-U curve, displayed as EFG in Figure 3. Suppose the wife's reservation utility is binding in equilibrium. The husband implements the equilibrium value $b^\dagger = OH$ and the associated level of spousal violence the wife suffers is GH. We have seen that, when her reservation utility increases, $b^\dagger$ decreases. Over the range $OI < b^\dagger < OH$, where the elasticity condition referred to above is satisfied, we see from the Figure that the equilibrium

[11] If this elasticity is denoted by $\epsilon(b)$, we readily see that $dv^\dagger/d\overline{U}_W = [1 + \epsilon(b^\dagger)]\gamma^*(b^\dagger)\, db^\dagger/d\overline{U}_W$. Since the derivative on the right hand side is non-positive (from the negative slope of the schedule in the lower panel of Figure 1), the result follows.

level of violence increases when the wife's reservation utility rises. Further increases in her reservation utility, which push $b^\dagger$ below OI, result in decreases in the equilibrium violence. At a sufficiently high $\overline{U}_W$ we shall observe $b^\dagger = OJ$, the minimal battering frequency ($= \underline{b}$) the husband would ever find worthwhile to engage in wife-battering. At higher levels of $\overline{U}_W$, $b^\dagger$ discontinuously falls to zero; the equilibrium level of violence, therefore, discontinuously falls from EJ in the Figure to zero.

The reasoning above demonstrates that, contrary to intuitive ideas one may entertain, an increase in the attractiveness of the outside options available to women need not be accompanied by an endogenous monotonic decline in wife beating. When the wife's reservation utility is very low, the mere reservation of violence may be sufficient to undermine her autonomy. When the battering frequency declines in response to higher reservation utilities, however, she may find it worthwhile to indulge her preferences so much that the incidence of domestic violence actually increases in equilibrium. Thus, for example, if higher earnings of the wife indicate higher reservation utility (as is reasonable), our model predicts that there may be *positive correlation* between women's earnings and the extent of spousal violence they endure in equilibrium. We record this insight for subsequent reference as the following proposition:

Proposition 1 *: The equilibrium level of spousal violence a woman endures may be non-monotonic in her reservation utility.*

We now inquire how the wife's bargaining power depends on her husband's reservation utility, $\overline{U}_H$. Suppose the wife's reservation utility is fixed at a level in the range $OS < \overline{U}_W \leq OR$ shown in the lower panel of Figure 1. We have seen that the equilibrium battering frequency is then given by $b^\dagger < b^*$. When the husband's reservation utility is very low, the husband has a great deal to gain by engaging in spousal violence. As his reservation utility increases, all else constant, his wife's utility will decline even in the absence of wife battering because she has to ensure that her husband receives his reservation utility. As long as her utility in the absence of wife battering (that is, ON in the lower panel of the Figure) is sufficiently high that $OR > \overline{U}_W$, when his reservation utility increases the husband will find it optimal to continue enforcing the same level of battering frequency as before. When his reservation utility continues to increase, the distance OR will decrease and a point will be reached when $OR = \overline{U}_W$. At that point, wife battering ceases to be feasible and, as we have seen, the husband discontinuously sets $b^\dagger = 0$.

The wife's bargaining power in equilibrium as a function of her husband's reservation utility will be as shown in Figure 4. Suppose that her reservation utility lies within the range $OS < \overline{U}_W < OR$, that is, her reservation utility is binding in equilibrium. When the husband's reservation utility is low (below OW in Figure 4), he will maximize his utility by opting to enforce a battering frequency $b^\dagger < b^*$. As his reservation utility increases over the range O to OW, he will continue to implement the same frequency of wife battering.

The wife's bargaining power and utility within marriage, as a result, are independent of her husband's reservation utility. Violence is a means the husband uses to make his reservation utility irrelevant. When his reservation utility reaches OW, however, the minimal amount of battering he would find worthwhile would reduce his wife's utility below its reservation level. In terms of Figure 1, OR coincides with $\overline{U}_W$. At this point battering is unviable and the wife's bargaining power discretely increases, as shown in Figure 4. For the husband's reservation utilities in the range $OW < \overline{U}_H \leq OV$ in the Figure, wife battering is entirely out of the question and her bargaining power stays constant. For $\overline{U}_H > OV$, there is not enough surplus in the marriage to ensure that both partners receive their reservation utilities. For $\overline{U}_H$ in the range 0 to OW, the wife is held at her reservation utility. When $\overline{U}_H$ is between OW and OV, the wife achieves a utility level *above* $\overline{U}_W$, since the minimal level of wife battering the husband would find profitable would push her below her reservation utility and is therefore not feasible.

In our model, we see that women who experience domestic violence in equilibrium are held at their reservation utilities within marriage; women who experience no domestic violence are above their reservation utilities. Spousal violence in our framework is a vehicle that husbands employ for appropriating the entire surplus within marriage. It is only when it gets too expensive for husbands to employ this means that wives receive part of the surplus. From the point of view of the husband, violence is a substitute for low reservation utility.

We see from Figure 4 that the wife's bargaining power is weakly *increasing* in the husband's reservation utility. Contrary to what we would expect from standard bargaining models without domestic violence, the wife's equilibrium utility here can increase when her husband's reservation utility increases. When $\overline{U}_H$ is sufficiently high, the resource allocation within the household is already strongly aligned with his preferences even in the absence of spousal violence. Since he perceives an opportunity cost to wife battering, he reckons it is not worth incurring the cost of further narrowing the gap between his preferences and the outcome his wife voluntarily implements. We record these points for subsequent reference:

Proposition 2 *: (a) The wife's autonomy in equilibrium is non-decreasing in her husband's reservation utility. (b) The extent of spousal violence the husband perpetrates in equilibrium may decline in his reservation utility.*

In our model, as $\overline{U}_H$ increases the husband suddenly relinquishes spousal violence and the wife's utility discretely jumps up from her reservation utility. One could conceive of other models that would deliver this outcome more gradually. The important point, however, is that when the husband's reservation utility is low he maintains his wife at her reservation utility through spousal violence. It is when the *husband's* reservation utility is sufficiently high that the wife's well-being strictly exceeds her reservation utility. This model also predicts that, all else held constant, domestic violence can be expected to *decline* when the husband's

reservation utility increases. It is only husbands with poor outside options who will resort to spousal violence.

The analysis above enables us to predict the effects on domestic violence of various exogenous determinants. Naturally, the higher is the wife's education, dowry, earnings, and land ownership the higher would her reservation utility be and, therefore, the higher her autonomy. Equilibrium spousal violence, however, is not necessarily monotonic in these factors, as we have seen. Furthermore, increases in the husband's reservation utility due to analogous factors may well decrease the spousal violence (when this becomes too costly).

We need to make a special point about the effects of husband's education. An increase in his education can naturally be expected to increase his reservation utility. But this is not the only effect relevant here. Typically, educated men have more enlightened views on the appropriateness of spousal violence: they find it less acceptable. This would be tantamount to an increase in the parameter δ_2 in (2). As we have seen, this will make domestic violence less likely. So how would we expect an increase in the husband's education to impinge on his wife's autonomy? We have seen that, in the absence of domestic violence, the wife's bargaining power and utility in marriage are both decreasing in her husband's reservation utility (because she has to allocate resources more in line with his preferences). Thus our model predicts that an increase in the husband's education will reduce wife beating as well as reduce her autonomy.

One exogenous component of the environment that would be expected to substantially impinge on a woman's autonomy is the sort of family she lives in after marriage. If she lives in a nuclear family, her autonomy would be greater than when she lives with the husband's extended family, which usually includes his parents, his brothers and their sisters and wives [see Dyson and Moore (1983)]. In the latter scenario, one would expect the husband's reservation utility to be higher than when the family is nuclear because he has the support of his parents and siblings. This increase in his reservation utility in going from a nuclear to an extended family may result in a *decline* in spousal violence, as argued above.

We would expect to observe less domestic violence when the couple resides with the wife's natal family.[12] This is because her parents and siblings are likely to be protective of her and curtail her husband's violence. We would expect a woman's autonomy, too, to be lower when the couple resides with her natal family because it would be hard for her to break free from parental influence and exercise her independence.

[12] Matrilocal residence is a frequent occurrence in the southern Indian state of Kerala, where a significant fraction of the population is organized along matriarchal lines—in sharp contrast to the rest of India, which is highly patriarchal and where, consequently, residence is patrilocal.

3 Data and Estimation Strategy

We use the National Family Health Surveys (NFHS-2) data collected in 1998-99.[13] The cross-sectional data was collected on the basis of a multi-stage sample design. The survey information is nationally representative and gathered from 91,196 households in 25 states through interviews with over 90,000 eligible women, ever-married women between the ages of 15-49 in these households. The survey had an excellent response rate, ranging from 89% to 100%, and in 24 out of the 26 states it was above 94%.[14] The survey provides state-level estimates of demographic and health parameters as well as data on various socioeconomic and programmatic information at the village, household, and individual level. We narrow down our study to currently married women living in rural areas. This sub-sample comprises over 50,000 eligible women.

The NFHS-2 survey covered a number of topics on gender issues relevant to this study, such as information on women's autonomy, domestic violence, and nutrition. The survey also collected anthropometric measures like woman's height and weight (these were carried out on site at the time of the interview).

3.1 Outcome Variables

We use five dichotomous outcome variables in our econometric study. Of these, one is a domestic violence variable: violence perpetuated by a woman's husband in the past one year. The remaining four are our principal autonomy outcome variables, which reflect the woman's participation in household decision-making.

- Domestic violence: whether the husband physically assaulted a woman during the year preceding the survey. Women are grouped as those not beaten by husbands in the 12 months preceding the survey and those who were beaten. ('Yes' is coded as 1 and 'No' as 0.)

- Answers to the following questions yield the autonomy variables we employ: Is the woman involved, by herself or jointly with her husband or other members of the family, in deciding to (i) obtain health care for herself, (iii) purchase jewelry, (iv) go and stay with her natal family and siblings, and (v) set money aside for herself? ('Yes' is coded as 1 and 'No' as 0.)

[13] The NFHS-2 survey was funded by the United States Agency for International Development (USAID) and UNICEF. The survey is the outcome of the collaborative efforts of many organizations: The International Institute for Population Sciences (IIPS), Government of India, New Delhi, Thirteen reputed state field organizations ,ORC Macro, Calverton, Maryland, USA, and the East-West Center, Honolulu, Hawaii, USA.

[14] International Institute for Population Sciences (IIPS) and ORC Macro. 2000. National Family Health Survey (NFHS-2), 1998-99: India. Mumbai: IIPS.

As Table 1 shows, a large proportion of the sample reports some form of subservience, as indicated by incidence of domestic violence and exclusion from family decisions. Roughly 18% of women in our sample of 58,500 have been beaten by their husbands at some time, and at least 10% experienced such violence in the 12 months preceding the survey. There are substantial variations across women' autonomy variables. Overall, in rural India 95% of women are involved in decision-making (or don't need permission) on at least one of the selected topics.[15] Around 50% are involved in the decision to access health care for themselves, 52% are involved in decisions to purchase jewelry and 47% can participate in the decision to stay with her natal family. Also, 55% of the women were allowed to set aside money for themselves.

3.2 Predictor Variables

The survey also collected detailed economic and demographic data at the individual and household level. For our analysis we consider the following variables at the individual level: woman's and husband's educational attainment, length of their marriage, woman's age at her first marriage, woman's employment status, and aspects of woman's work (employed by family, someone else, or self). From the question about woman's ideal number of sons and information on total number of sons, we constructed the variable dubbed 'unmet desire for sons'. In India, where a woman is (erroneously) considered responsible for the gender of the child and where families prefer sons over daughters, a woman might face more domestic violence and possess less autonomy if there is an unmet desire for sons.

In the social network module, the survey asked the woman if she discussed family planning with her mother and whether she went to her mother's house for delivery, as is the custom in most Indian households. We used this information to generate a variable for mother's support.[16] We expect that a woman might demand more autonomy and be less tolerant of physical abuse if she has support from her family. This variable might suffer from endogeneity issues, however, since a woman might contact her mother more frequently in case she needs to vent her anger or frustration with abuse or lack of autonomy. There can also be another reason for the association between domestic violence and mother's support, namely, the husband might inflict more violence on his wife if he believes she is influenced by outsiders, in this case her mother.

The survey also collected anthropometric measures like woman's height and weight; these were measured on site at the time of the interview by the surveyors. Since the average height of a woman varies significantly across different states in India, as an appropriate height index we use the deviation of her height from the mean for the state that she belongs to. (We

[15] We created a variable which takes the value of 1 if woman participates in any of the decisions and 0 otherwise. This variable has mean 0.95 and standard deviation 0.214.

[16] These questions were asked only for the last two children.

subsequently use this as an instrumental variable for domestic violence perpetrated by her husband.) The ideal variables would be the difference in heights of husband and wife, but the survey did not collect this data for the husband. We will discuss this variable in more detail later in the paper.[17] We also have information about whether the woman is currently pregnant, pregnant last year or currently breast-feeding. We expect a woman to be more time-constrained when she has a small child to take care of, especially if she breast-feeds the child. (We subsequently use this breast-feeding variable, too, as an instrument for domestic violence.)

At the household level we consider the following variables: caste, religion, an asset-based standard of living index, and structure of the household (explained below). For the caste variable, we consider four groups: scheduled caste (a group that is socially segregated), scheduled tribe (a group identified on the basis of physical isolation), and other backward classes (officially identified as socially and educationally backward), and the upper caste (comprising Brahmins and other higher castes that are privileged). We consider 4 major religious groups, Hindus, Muslims, Sikhs and Christians. The survey asked a multitude of questions about the ownership of assets like a car, television, property etc. The NFHS has used ownership of assets to create a standard of living index (SLI) with three categories: low, middle and high. For the variable 'structure of the household', we created 3 groups: nuclear family (defined as a couple with/without children), joint family living with woman's in-laws, and joint family living with woman's natal family.[18] We created these using information about woman's relationship with the household head and other members in the household.

In Table 2 we provide the summary statistics of these individual and household predictor variables. We consider five educational categories: illiterate, literate but less than primary school, primary school completed, middle school completed, high school completed or higher. The sub-sample of rural population has extremely low levels of education and literacy rates, with women far less educated than the husbands; a hefty 59% of the women are illiterate where as only 31% of the husbands are illiterate in our sub-sample; 25% of men have completed high school or more as compared to 9% of women. The mean age at first marriage is 16.9 years for the woman, and the average length of marriage is 14 years. Only 7% of women in the sample have some support from their mother, and 40% of women still have an unmet desire for sons. On the work front, 41 % of women are currently working or have worked in the last 12 months, 19% work for family members, 4.5% are self employed and roughly 18% are employed by someone else.

In the sample approximately 80% of women belong to Hindu households, 11% to Muslim households, 5% to Christian households, and 2.4% to Sikh households.[19] Around 18% of the

[17] The woman's weight would also be correlated with the amount of domestic violence she faces, but we did not use this variable as an IV because it more likely to be endogenous than height.

[18] Menon and Johnson (2007) consider the first two but not the last.

[19] The survey asked the following question: "What is the religion of the head of the household?".

women belong to the scheduled caste, 15% to scheduled tribes, 31% belong to other backward classes, and the rest to upper castes. For the standard of living index, around 35% of women belong to the group with the lowest standard of living index, 50% belong to the middle group, and 15% to the highest group. A large proportion (59%) of the women live with their husbands in a nuclear family and 40% of women (couples) live in a joint family, 38% with wife's in-laws and only 2% with wife's parents.

3.3 Estimation Strategy

To assess the impact of domestic violence on the autonomy outcomes, we need to deal with the endogeneity of violence. We would expect that women with greater autonomy might face different degree of domestic violence than women with less autonomy. On the other hand, our theory suggests domestic violence would impinge on autonomy. As expected, both Wu-Hausman F and Durbin-Wu-Hausman tests reject exogeneity of domestic violence.[20] We use two sets of instruments for domestic violence: woman's current breast-feeding status (BF), and an index of the woman's height (H). In our sample, 29 percent of women reported that they were currently breast-feeding. This activity takes away from the time that a women might have spent attending to her husband's demands. Also, most of the women were reported to breast-feed on demand (they do not have a set time schedule when they feed the child—it completely depends on when the child wants to be fed). Thus, compared to other women, breast-feeding women are more likely to ignore their husbands' demands and the latter are more likely to engage in spousal violence. We do not expect a woman's autonomy to be effected directly by her breast-feeding activity, however. There is no reason for us to believe that a woman who did not require permission to leave home before the birth of her child would lose that right once she has had a child.[21]

Our reason for using wife's height also as an instrument variable for domestic violence is that a husband is more likely to engage in spousal violence if he feels he can physically overpower his wife. Also, the height of a woman is determined prior to marriage and is not directly correlated with the socioeconomic status of her husband. Of course, there are a lot of other factors that might make even a physically strong woman acquiesce to spousal violence—like absence of other options or a belief system that makes her accept wife-beating as legitimate. We still maintain that woman's physical stature does play an important role in determining domestic violence, and find empirical support for this claim in our sample. In order to identify the following model, the instrumental variables and domestic violence should be highly correlated.[22] Table 3 reports the pairwise correlation coefficients between

[20] Wu-Hausman F test: 9.05381 F(1,49067) P-value = 0.00262; Durbin-Wu-Hausman chi-sq test: 9.06155 Chi-sq(1) P-value = 0.00261

[21] It is possible that the sex of the child might play a role, though we do not find that to be true.

[22] Identification also requires the variance in WH to be independent of other factors determining women's autonomy, controlling for observable measures.

the variables, and the significance level of each correlation coefficient. The currently breast-feeding and height variables are both significantly correlated (at 5%) with the domestic violence variable. Charts 1 and 2 visually reveal these pairwise correlations.

There are two major issues that we can think of with the use of height as an instrument for domestic violence. The first is the potential existence of third factors influencing both wife's height as well as autonomy outcomes. The exclusion restriction requires that the relationship between height and autonomy outcomes be completely mediated by physical violence. We believe that a woman's natal family income would be the only other avenue of influence. It is possible that a low income family is more likely to marry their daughter into a family with a similar income level. We control for income level by including a standard of living index (SLI). Since we think physical violence is a major route through which height of a woman influences autonomy outcomes, our other concern is that of selection bias. A man who intends to intimidate his wife through physical violence may be more likely to marry a woman with a smaller physical stature. However, in rural India most of the marriages are arranged by the either the parents or other family elders or village elders. In most of these cases the man and woman do not see each other before (and sometimes even during) marriage.[23] It may be thought that taller women may be more self-confident (autonomous) and so would face less domestic violence. If anything, however, in the Indian context a tall women would do poorly in the marriage market [Deolalikar and Rao (1996), Dalmia (2004)]. Hence, she might might possess lower self confidence and thus exhibit a lower level of autonomy. A significant negative correlation in the data between domestic violence and women's height would further support our claim on how physical stature directly impinges on spousal violence.

We use the two stage least square regression in our analysis. Given that the national health survey used a multi-stage sample design, we incorporate the complex design factors (stratification, clustering, and post-survey weighting) in our analysis.[24] We estimate the following two-stage least square model:

$$V = \alpha_1 X + \alpha_2 Z + \epsilon_1 \tag{8}$$

$$D = \beta_1 X + \beta_2 \widehat{V} + \epsilon_2, \tag{9}$$

where V is domestic violence as reported by the respondent, D is her decision-making autonomy, Z is an instrumental variable for domestic violence, and X denotes a vector of exogenous regressors. As mentioned, we use two variables for Z to identify the first stage regression. One is BF, which captures the breast-feeding status of the woman. It is binary variable that

[23] There is the possibility, though, that the groom's family members might choose a woman of a smaller frame, so that she will be easily intimidated by the groom.

[24] The survey design was uniform for all the states, with a 2 stage selection procedure in the rural areas and a 3 stage selection procedure in the urban areas. In both cases, households were randomly selected in the last stage. (See the survey's final report for details of sample design, including sampling frame and sample implementation [IIPS (2000)]).

takes the value of one if the woman is currently breast-feeding and zero otherwise. The other is the woman's height, H, which we define more precisely as the deviation of the woman's height from the average of the relevant state. In the first stage, we regress domestic violence on all the predictor variables on the right hand side of equation (8). We then use the predicted values of this regression, $\widehat{V}$, as the instrumental variable in the second stage ordinary least squares regression equation (9) of the autonomy variables. We run separate sets of regressions for the two instruments (BF and H). We then also run a third set of regressions where we include both the instruments in the first stage regression.

The vector X contains regressors that determine the reservation utilities of the woman and her husband, and we include the variables listed in Table 2. We expect education (both for man and woman) to have a negative impact on domestic violence and a positive impact on women's autonomy outcomes. Higher socioeconomic status, and consequently less financial stress, should reduce the likelihood of domestic violence. Woman's age at first marriage should decrease domestic violence and increase autonomy; a young girl is easier to intimidate and, as the saying goes, easier to mold into a family's norm and tradition. We expect a woman to have less autonomy in a joint family than in a nuclear family. Working should increase a woman's bargaining power and thus we expect a positive correlation between working and autonomy outcomes. However, working might or might not reduce the physical abuse she faces—our theory suggested that better outside options for the woman may increase wife beating. The husband might use violence to undermine a woman's bargaining power or her higher status as a working member. As mentioned earlier, a woman may face more domestic violence and have less autonomy if there is an unmet desire for sons. We also include dummy indicators for the 26 states to control for state fixed effects.

4 Results

4.1 Domestic Violence

In Table 4 we list the results from the regressions for domestic violence. Here we include all the variables of interest that have been reported earlier.[25] Columns 2 and 4 report the results for a linear probability model (ordinary least square regression) and columns 3 and 5 report the odds ratio from a logit estimation.[26]

Education (both for men and women) significantly decreases the incidence of domestic violence. This is consistent with what we might expect. We find this relation to be non-linear,

[25] Note that these are *not* the first stage regressions of the 2SLS estimation. In the first stage regression of the 2SLS model we do not include the work variables, for they are likely to be endogenously determined by the woman's autonomy. The first stage regression for the 2SLS is reported in the Appendix.

[26] The main difference between the two regressions is that the linear probability model assumes marginal effects to be constant, where as the logit model allows marginal effects to change. Close to the average values of the regressors, the linear probability model is a good estimator.

however, and it is significant only if the woman and her husband have at least completed primary school or more. A literate woman with less than primary schooling is as likely to be beaten by her husband as an illiterate woman. Similarly, a literate husband who has only some primary schooling is as likely to indulge in domestic violence as an illiterate husband. The odds of violence decreases with the length of woman's marriage and her age at first marriage. We find no evidence of a relation between domestic violence and unmet desire for sons or pregnancy status. We find a significant positive correlation between support from mother and domestic violence. Either men are more likely to be violent with wives who are close to their mothers or wives who are abused tend to seek greater support from their mothers—we cannot say which.

Consistent with our theory, domestic violence is positively related to work status of a woman. The coefficients on all the categories of work status are significant in our two estimated equations although they vary across her work status. However, women who work for someone else are more likely to face domestic violence (OR 1.43) than those that work for a family member (OR 1.3). The difference is statistically significant, as can be seen from Table 5. This result is strong confirmation of the evolutionary basis of domestic violence espoused by Wilson and Daly (1993, 1996). We also find that the incidence of domestic violence is significantly lower in couples that reside in joint families (OR 0.71). When the couple resides with the husband's family, his reservation utility increases. As a result, there is less need for the husband to resort to violence to boost his own wellbeing. This finding, which Menon and Johnson (2007) also find using NFHS data, is consistent with our theory. Gonzalez-Bernes (2004) uses data from East Africa to conclude that 'female labor force participation is not associated with lower levels of violence'.

Women belonging to Sikh and Muslim households have significantly higher odds of domestic violence (1.35 and 1.18, respectively) as compared to Hindu households. In contrast, women belonging to groups with medium and higher standard of living index (SLI) have significantly lower odds of domestic violence, as compared to the group with the lowest SLI. Using a similar measure of wealth index Gonzalez-Bernes (2004), in contrast, does not find a significant relation between wealth and domestic violence for East Africa.

In order to better understand the incidence of domestic violence by women's work conditions, in Chart 2 we report the proportion of women who face domestic violence in the different sub-groups defined by employer. Of woman who work for someone other than family member, 16% report incidence of wife beating in the past one year, as compared to 9% of women who either are self employed or working for family members. Of course, these proportions do not account for other covariates. In Table 5 we control for other socio-demographic determinants (use the regression results from Table 4) and we still find evidence of a significantly greater incidence of domestic violence for women employed by non-family members than for those working for family members.

4.2 Women's Autonomy

4.2.1 Effect of Domestic Violence

In Tables 6, 7 and 8 we report the results from the second stage (the estimation of women's autonomy) of the two stage least squares procedure. The first stage regressions from the two stage least squares are reported in the Appendix (Table 10). We separately report results for the two instrumental variables, 'currently breast-feeding' and 'height', in Table 6 and Table 7, respectively. In Table 8, we report the results for the second stage regression where we include both instruments in the first stage to predict domestic violence. The two instrumental variables are very different in nature, and even if they are slightly correlated with any of the autonomy indicators they would affect the latter very differently. Nevertheless, the Tables reveal that our results are quite robust to the choice of the instrument.

In Table 9, we report the effect of domestic violence on autonomy variables for all regression specification, and find domestic violence to significantly reduce autonomy. We see that the coefficients are much larger in magnitude once we account for the endogeneity of domestic violence (using IVs) as compared to the ordinary least square estimate. The results indicate that domestic violence inflicted by a husband leads to lower autonomy for the woman: she is more subservient as a result of her husband having beaten her in the past one year. Domestic violence is mostly significant at least at the 5 % level in its effect on autonomy. It impinges negatively on women's autonomy in almost all aspects of their lives as captured by the autonomy indicators. A woman whose husband does not indulge in violence has significantly more control over the decisions in her life like accessing health care for herself, buying jewelry and staying with her family. Also, she is able to set money aside for herself.

4.2.2 Other Determinants

Higher education would be expected to increase reservation utilities. That higher levels of education increase a woman's autonomy is not surprising. An increase in her husband's educational attainment (which also likely makes him more averse to wife beating) is seen from Tables 6, 7, and 8 to reduce her bargaining power, consistent with our theory. The coefficients on woman's educational attainment achieve significance only for the 'high school and above' category, especially for 'allowed to own money' autonomy measure. On the other hand husband's educational attainments significantly reduces woman's autonomy; if a husband has at least completed middle school, it reduces woman's autonomy with respect to decisions about staying with her family, buying jewelry and accessing health care. If a husband's educational attainment is low, it has no effect on women's autonomy after controlling for domestic violence. As our theory predicts, these men with low reservation utilities would try to assert control through domestic violence. That this is so can be seen in Table 10 of the Appendix.

The regressions in Tables 6, 7, and 8 show that, if the couple lives in a joint family (stays with the husband's family), the woman's autonomy is lower.[27] This is consistent with our theory. Patrilocal residence reduces the woman's freedom in all forms of autonomy, from her decision about buying jewelry to her right to stay with her natal family. In essence, a woman is more restrained if she is living with her husband's parents and siblings rather than just with her husband in a nuclear family. The joint family structure in India usually clearly delineates a wife's role and, in addition, other family members are able to monitor and control her life more closely. Furthermore, a joint family also raises her husband's reservation utility. Our results also revealthat if the couple stays with the wife's natal family, then too her autonomy is reduced. As argued earlier, this is to be expected because it is difficult for a woman to exercise autonomy in the presence of her parents.

Unmet desire for sons is seen from Tables 6, 7, and 8 to significantly decrease women's autonomy, and it is significant for three autonomy indicators: decision to access health care, decision to buy jewelry, and decision to stay with her family. It must be that women's desire for more sons reflects and captures the husband's or his family's desire for more sons. In our data we have a large proportion of women who, despite having more than 3 sons, still express the need for more sons. It might be that these families are still not content with the woman's 'capacity' to bear sons and penalize her.[28] It is also possible, however, that women who voluntarily endorse highly patriarchal values (such as the importance of sons) are those who automatically assume a less autonomous stance.

Despite our expectations about a positive influence woman's age at first marriage, we find no significant relation between this and women's autonomy other than through its influence on domestic violence. We also do not find mother's support and the woman being currently pregnant to be significant determinants of women's autonomy. We find that the longer the woman has been married the more autonomy she has in accessing health care for herself; however, length of marriage does not significantly increase other autonomy measures.

We do not find much difference in women's autonomy across different religious households, except for the decision to stay with one's natal family. (The left out category in Tables 6, 7, and 8 is Hindu.) Women in Sikh and Christian household have more autonomy in deciding to stay with their natal families than women belonging to Hindu, Muslim or other religious groups. Turning to caste, where the left out category in the Tables is upper castes, we see that women belonging to the Scheduled Caste and Schedule Tribe castes have more control over decisions in their lives than those in the other castes. They are less likely to need permission to stay with their natal family, to buy jewelry, and to set money aside for themselves.

We observe a negative correlation between women's autonomy and the standard of living

[27] Menon and Johnson (2007) also find this.

[28] When we estimate these regressions for different regions of India, the effect of this variable on female autonomy is seen to be significantly positive and much higher in magnitude for the northern region of the country (the region with the lowest girls to boys ratios) than elsewhere.

index (SLI). Women belonging to more affluent families have less bargaining power than those belonging to poorer families (as measured be SLI). It is possible that more affluent families are more particular about their so-called 'family honor', which is invariably tied to controlling women's actions and mobility. So, paradoxically, the autonomy of women in well-off families may be lower than that of women in poorer families.

5 Conclusions

In this paper, we have provided a noncooperative model of the household in the South Asian context, in which husbands use domestic violence as a means to undermining their wives' autonomy and ensuring an allocation of household resources that is more aligned with their own preferences. We showed that, although the autonomy of married women is (weakly) increasing in their reservation utility, it is not necessarily (weakly) declining in their husbands'. Furthermore, the amount of spousal violence women experience can be non-monotonic in their own reservation utility. Better outside options for women may, we showed, may invite more spousal violence— especially since violence is the last resort of husbands with low reservation utilities. The framework we offered here also suggested a way to investigate whether it is patriarchy or jealousy hardwired in our evolutionary past by concerns of paternity uncertainty that is responsible for spousal violence against women. In the latter case, women who earn income by working away from home should face greater domestic violence.

We tested the theory with data on married women from the NFHS (1998-99) from India. Our analysis takes care to account for the possible two-way causality between autonomy and domestic violence. With the choice of suitable instruments, we find compelling evidence to suggest that domestic violence reduces women's autonomy. Women who work away from home are seen to confront more spousal violence, after controlling for a host of explanatory variables. This provides some tentative evidence in favor of the evolutionary psychology view on the ultimate cause of spousal violence. Furthermore, we find that the extent of the violence can be increasing in the outside options of women.

This last finding has important policy implications. It suggests that empowering women through better employment opportunities—which can be very helpful in terms of improving their wellbeing on balance—may be accompanied by more wife battering. More shelters for battered women and better enforcement of the law may be necessary accompaniments of better employment opportunities if spousal violence is to be controlled. Such responses are all the more essential if, as our data suggests provisionally, spousal violence may have evolutionary origins and so would need to be countered with greater vigilance via an appropriate design of institutions.

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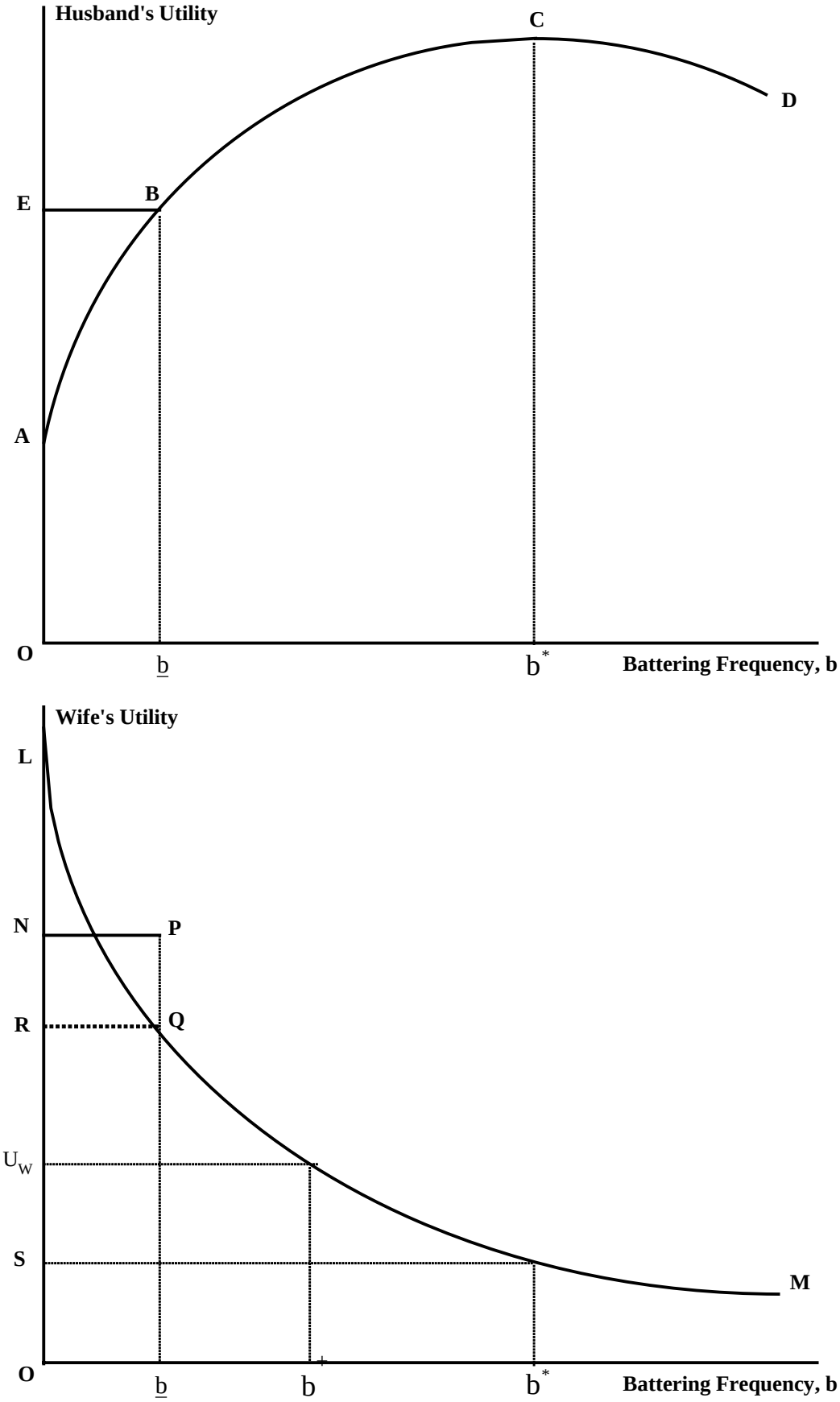


Figure 1: Determination of husband's battering frequency in equilibrium

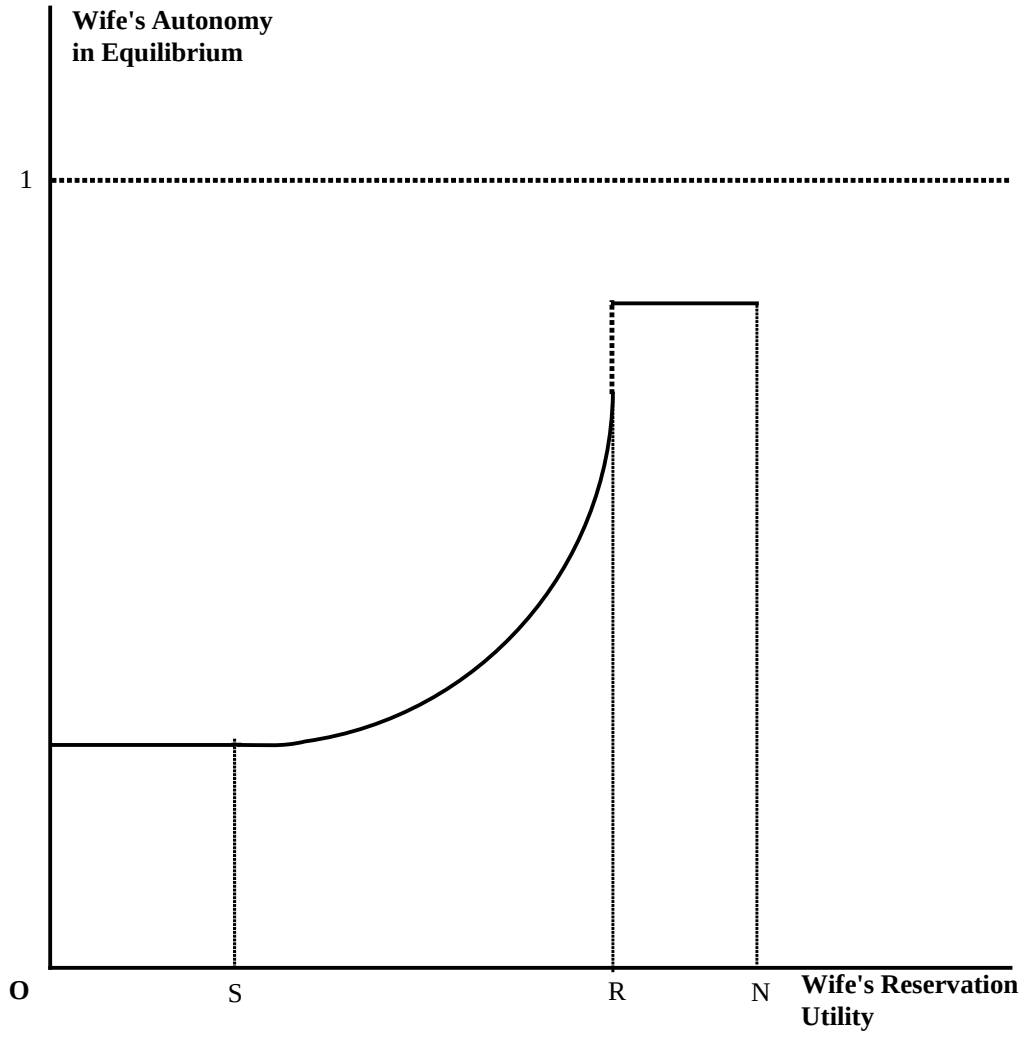


Figure 2: Wife's autonomy in equilibrium as a function of her reservation utility (for a given value of her husband's).

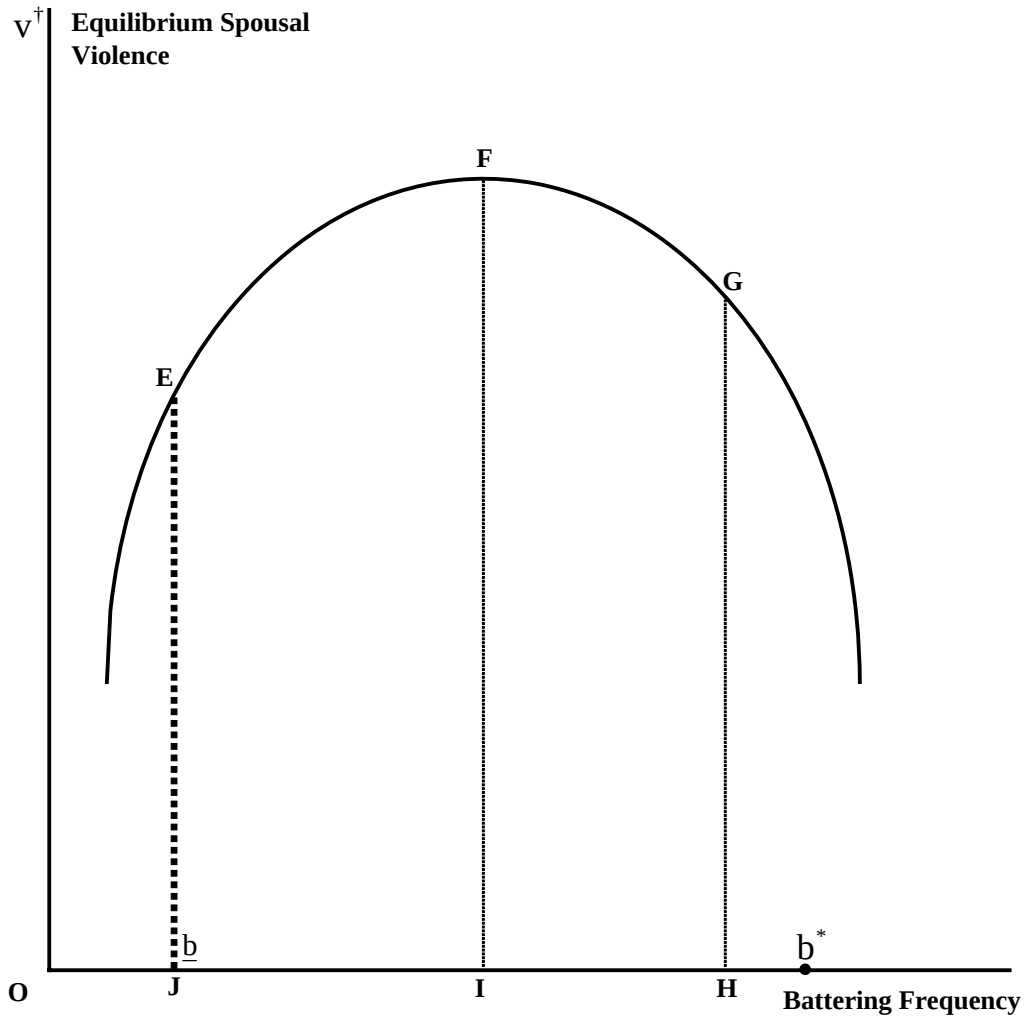


Figure 3: The equilibrium level of spousal violence as a function of the battering frequency.

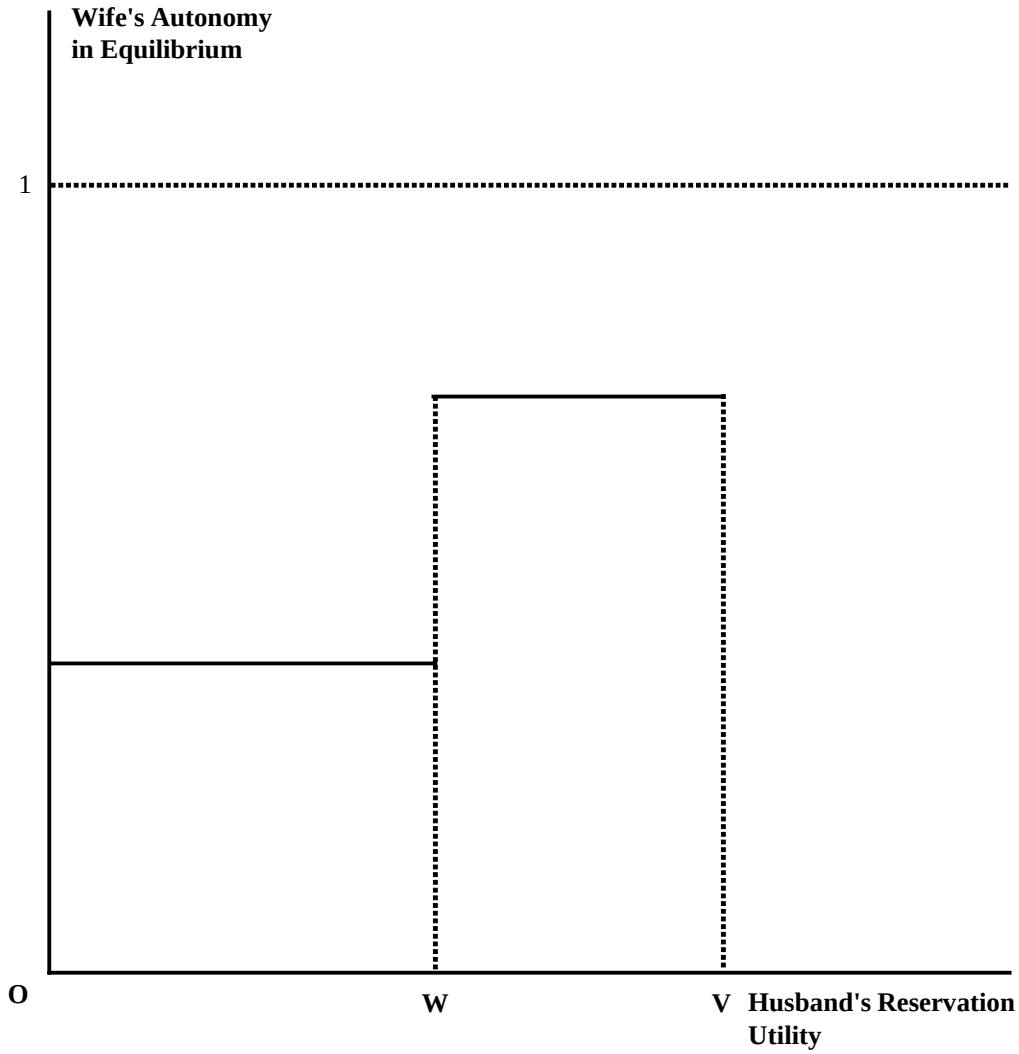


Figure 4: Wife's autonomy in equilibrium as a function of her husband's reservation utility (for a given value of her's).

Table 1: Summary Statistics of Outcome Variable

VARIABLE	MEAN	STD. DEV.
Husband Has Beaten Wife (Ever)	0.18	0.38
Husband Has Beaten Wife (Past Year)	0.10	0.31
Decision _Health	0.50	0.50
Decision –Jewelry	0.52	0.50
Decision_Stay With Family	0.47	0.50
Allowed_Own Money	0.55	0.50

Number of observations: 58,502

Table 2 Summary statistics for the sample of ever married women

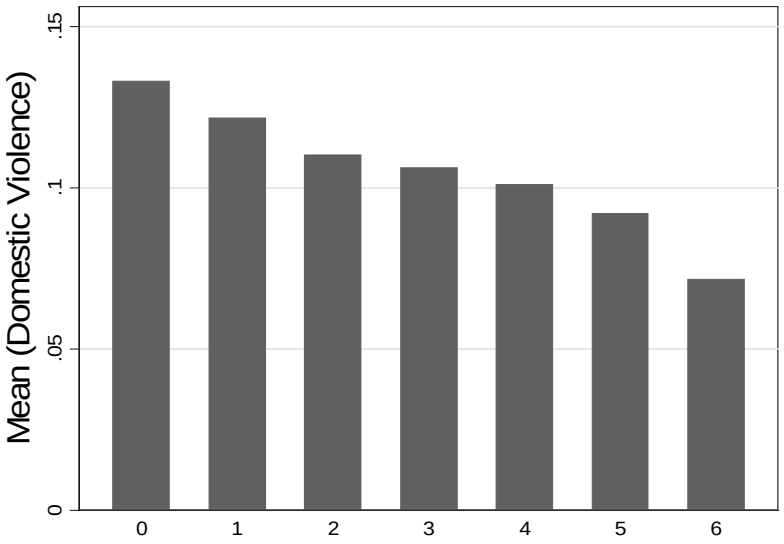
VARIABLE	MEAN	STD. DEV.
Wife Height-Deviation from Mean	0.00	5.75
Currently Breast-feeding	0.29	0.45
Woman-Illiterate	0.59	0.49
Woman-Less Than Primary	0.10	0.30
Woman-Primary School	0.08	0.26
Woman-Middle School	0.15	0.35
Woman-High School and above	0.09	0.28
Husband-Illiterate	0.31	0.46
Husband-Less Than Primary	0.12	0.32
Husband-Primary School	0.09	0.28
Husband-Middle School	0.24	0.42
Husband-High School and above	0.25	0.43
Length of Marriage	13.62	8.99
Woman's age at First Marriage	16.91	3.07
Unmet Desire for Sons	0.40	0.49
Pregnant-Currently or Past Year	0.23	0.42
Support from Mother	0.07	0.26
Self-employed	0.05	0.21
Work for family member	0.19	0.39
Work for someone else	0.18	0.38
Nuclear Family	0.59	0.49
Living in Natal Joint Family	0.02	0.14
Living in (Husband's) Joint Family	0.38	0.49
Hindu	0.80	0.40
Muslim	0.10	0.31
Christian	0.05	0.22
Sikh	0.02	0.16
Low Social Economic Status	0.35	0.48
Medium Social Economic Status	0.50	0.50
High Social Economic Status	0.15	0.36
Schedule Caste	0.18	0.39
Schedule Tribe	0.15	0.35
Other Backward Classes	0.31	0.46

Table 3: Pair-wise correlation coefficients

	Husband Has Beaten Wife (Past Year)	Wife Height-Deviation from Mean	Wife Height (meters)
Husband Has Beaten Wife (Past Year)	1		
Wife's Height (Deviation from Mean)	-0.0581*	1	
Wife's Height (meters)	-0.0561*	0.9966*	1
Currently Breast-feeding	0.0307*	0.0238*	0.0245*

Chart 1: Domestic Violence and Height Index*

Domestic Violence: Husband has beaten wife in last one year



*Height index is divided into seven categories of equal frequency.

Table 4: Determinants of Domestic Violence

DV: Husband Has Beaten Wife (Past Year)	*OLS*	*Logit Odds ratio*	*OLS*	*Logit: Odds Ratio*
Wife height-Deviation from Mean	-0.001**	0.983**		
	(0.000)	(0.002)		
Currently Breast-feeding			0.012*	1.107*
			(0.005)	(0.054)
Woman-Less Than Primary	0.005	1.071	0.005	1.061
	(0.006)	(0.066)	(0.006)	(0.065)
Woman-Primary School	-0.019**	0.814**	-0.020**	0.809**
	(0.006)	(0.060)	(0.006)	(0.059)
Woman-Middle School	-0.019**	0.785**	-0.020**	0.776**
	(0.006)	(0.055)	(0.006)	(0.054)
Woman-High School and above	-0.022**	0.678**	-0.024**	0.663**
	(0.007)	(0.076)	(0.007)	(0.074)
Husband-Less Than Primary	-0.002	1.017	-0.002	1.018
	(0.007)	(0.060)	(0.007)	(0.060)
Husband-Primary School	-0.019**	0.861*	-0.019**	0.859*
	(0.007)	(0.057)	(0.007)	(0.057)
Husband-Middle School	-0.014**	0.912+	-0.014**	0.907*
	(0.005)	(0.043)	(0.005)	(0.042)
Husband-High School and above	-0.030**	0.743**	-0.032**	0.729**
	(0.005)	(0.043)	(0.005)	(0.042)
Length of Marriage	-0.002**	0.979**	-0.002**	0.980**
	(0.000)	(0.003)	(0.000)	(0.003)
Woman's age at First Marriage	-0.003**	0.966**	-0.003**	0.964**
	(0.001)	(0.008)	(0.001)	(0.008)
Unmet Desire for Sons	0.002	1.015	0.002	1.015
	(0.004)	(0.040)	(0.004)	(0.040)
Pregnant Currently or in Past Year	-0.001	0.983	-0.007	0.938
	(0.005)	(0.043)	(0.005)	(0.042)
Total Children ever born	0.004**	1.039**	0.003**	1.035**
	(0.001)	(0.011)	(0.001)	(0.012)
Support from Mother	0.019**	1.202**	0.017*	1.181**
	(0.007)	(0.073)	(0.007)	(0.071)
Working: self-employed	0.034**	1.370**	0.035**	1.380**
	(0.010)	(0.118)	(0.010)	(0.119)
Working for family member	0.026**	1.297**	0.028**	1.310**
	(0.006)	(0.073)	(0.005)	(0.073)
Working for someone else	0.042**	1.429**	0.044**	1.453**
	(0.006)	(0.078)	(0.006)	(0.079)
Living in Natal Joint	-0.045**	0.647**	-0.044**	0.652**
	(0.011)	(0.085)	(0.011)	(0.086)
Living in Joint	-0.034**	0.718**	-0.033**	0.722**
	(0.004)	(0.028)	(0.004)	(0.028)
Muslim	0.013	1.152+	0.012	1.137
	(0.008)	(0.094)	(0.009)	(0.093)
Christian	0.011	1.106	0.010	1.090
	(0.015)	(0.172)	(0.015)	(0.170)
Sikh	0.021*	1.362*	0.019*	1.317+
	(0.009)	(0.193)	(0.009)	(0.184)
Medium Social Economic Status	-0.024**	0.834**	-0.025**	0.821**
	(0.004)	(0.033)	(0.004)	(0.033)
High Social Economic Status	-0.036**	0.546**	-0.042**	0.510**
	(0.006)	(0.048)	(0.006)	(0.045)
Schedule Caste	0.020**	1.185**	0.021**	1.206**
	(0.006)	(0.067)	(0.006)	(0.067)
Schedule Tribe	0.002	1.054	0.003	1.064
	(0.008)	(0.079)	(0.007)	(0.078)
Other Backward Classes	-0.004	0.991	-0.003	1.000
	(0.005)	(0.055)	(0.005)	(0.056)
Constant			0.165**	
			(0.018)	
Observations	49118	49118	49118	49118
R-squared	0.05		0.05	

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Coefficients for state dummy variables not shown

Chart 2: Work Status and Domestic Violence

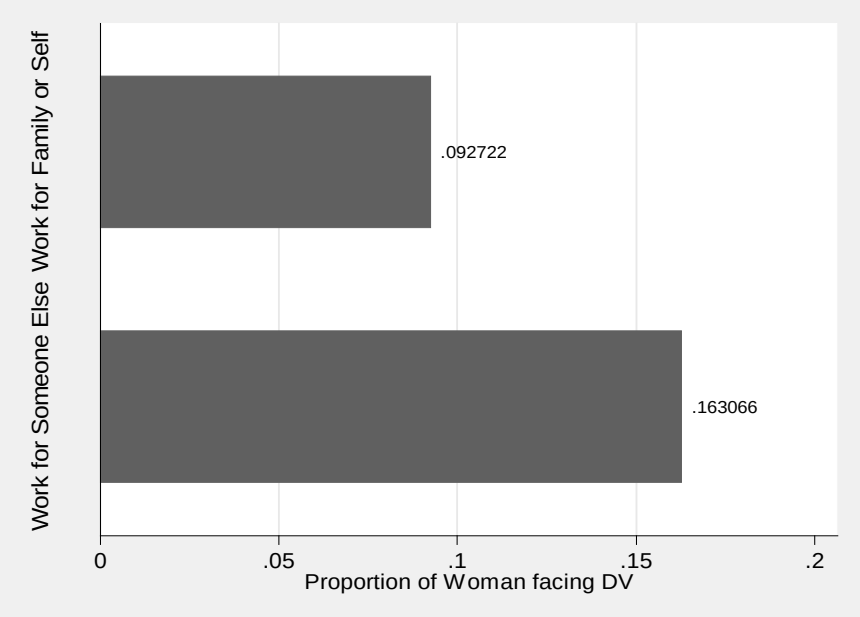


Table 5: Domestic Violence and woman's work status

Adjusted Wald Test	*Work_else – Work_family=0*		
	Coefficient	F test	Prob>F
OLS (Height – Deviation from Mean)	(.042) – (.026)	5.56	0.019
OLS (Currently Breast-feeding)	(.044) – (.028)	5.09	0.025

Table 6: Women's Autonomy- Involved in decision making (Instrument: Currently Breast-feeding)

	Decision_Stay With Family	*Decision Jewelry*	*Decision _Health*	*Allowed_ Own Money*
Husband Has Beaten Wife Last yr	-1.244*	-1.930*	-0.871	-1.455+
	(0.618)	(0.845)	(0.564)	(0.752)
Woman-Less Than Primary	0.006	0.017	0.022+	0.022
	(0.011)	(0.014)	(0.012)	(0.014)
Woman-Primary School	-0.007	-0.020	-0.018	0.022
	(0.020)	(0.024)	(0.020)	(0.025)
Woman-Middle School	-0.004	-0.022	0.000	0.042+
	(0.021)	(0.027)	(0.020)	(0.025)
Woman-High School and above	0.039+	0.035	0.038	0.130**
	(0.023)	(0.031)	(0.024)	(0.026)
Husband-Less Than Primary	-0.012	-0.011	0.002	0.002
	(0.014)	(0.016)	(0.012)	(0.015)
Husband-Primary School	-0.013	-0.024	-0.009	-0.019
	(0.018)	(0.024)	(0.015)	(0.021)
Husband-Middle School	-0.035*	-0.047*	-0.025*	-0.007
	(0.016)	(0.019)	(0.012)	(0.015)
Husband-High School and above	-0.054*	-0.079*	-0.038+	-0.008
	(0.026)	(0.035)	(0.023)	(0.030)
Length of Marriage	-0.000	-0.000	0.002*	0.002+
	(0.001)	(0.001)	(0.001)	(0.001)
Woman's age at First Marriage	-0.001	-0.005	0.003	-0.000
	(0.003)	(0.004)	(0.003)	(0.003)
Unmet Desire for Sons	-0.019*	-0.025*	-0.023**	-0.011
	(0.008)	(0.010)	(0.006)	(0.008)
Pregnant-Currently or Past Year	-0.013	-0.018	-0.013	-0.013
	(0.009)	(0.011)	(0.008)	(0.010)
Support from Mother	-0.001	0.010	0.007	0.024
	(0.021)	(0.026)	(0.019)	(0.025)
Living in Natal Joint	-0.010	-0.096+	-0.058+	-0.082+
	(0.039)	(0.054)	(0.030)	(0.046)
Living in Joint	-0.045+	-0.091**	-0.036	-0.109**
	(0.024)	(0.033)	(0.023)	(0.028)
Muslim	-0.023	-0.017	0.001	-0.003
	(0.017)	(0.021)	(0.015)	(0.020)
Christian	0.047+	0.053	0.003	0.037
	(0.026)	(0.038)	(0.025)	(0.029)
Sikh	0.068+	0.066	0.013	0.008
	(0.037)	(0.044)	(0.035)	(0.026)
Medium Social Economic Status	-0.023	-0.056*	-0.028	-0.012
	(0.020)	(0.026)	(0.018)	(0.023)
High Social Economic Status	-0.040	-0.084*	-0.049+	0.017
	(0.032)	(0.042)	(0.029)	(0.038)
Schedule Caste	0.044*	0.056*	0.013	0.044+
	(0.021)	(0.028)	(0.018)	(0.023)
Schedule Tribe	0.047**	0.041*	0.031*	0.032+
	(0.017)	(0.019)	(0.014)	(0.018)
Other Backward Classes	0.000	-0.002	-0.005	0.026*
	(0.010)	(0.012)	(0.008)	(0.011)
Observations	49118	49118	49118	48999

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Table 7: Women's Autonomy- Involved in decision making (Instrument: Height)

	Decision_Stay With Family	*Decision_ Jewelry*	*Decision Health*	*Allowed_ Own Money*
Husband Has Beaten Wife (Last Year)	-1.187+	-1.861*	-1.412*	-2.880*
	(0.637)	(0.802)	(0.714)	(1.193)
Woman-Less Than Primary	0.006	0.017	0.023+	0.024
	(0.011)	(0.014)	(0.013)	(0.021)
Woman-Primary School	-0.005	-0.018	-0.031	-0.014
	(0.020)	(0.024)	(0.023)	(0.038)
Woman-Middle School	-0.002	-0.020	-0.014	0.004
	(0.020)	(0.025)	(0.023)	(0.038)
Woman-High School and above	0.041+	0.037	0.023	0.091*
	(0.023)	(0.030)	(0.029)	(0.043)
Husband-Less Than Primary	-0.011	-0.011	0.000	-0.002
	(0.014)	(0.015)	(0.015)	(0.022)
Husband-Primary School	-0.011	-0.022	-0.021	-0.050
	(0.019)	(0.024)	(0.022)	(0.034)
Husband-Middle School	-0.034*	-0.045*	-0.035*	-0.033
	(0.016)	(0.020)	(0.016)	(0.027)
Husband-High School and above	-0.052*	-0.076*	-0.059*	-0.061
	(0.026)	(0.032)	(0.029)	(0.047)
Length of Marriage	0.000	-0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.002)
Woman's age at First Marriage	-0.001	-0.004	0.001	-0.006
	(0.003)	(0.004)	(0.003)	(0.005)
Unmet Desire for Sons	-0.019*	-0.025*	-0.023**	-0.011
	(0.007)	(0.010)	(0.008)	(0.013)
Pregnant-Currently or Past Year	-0.013	-0.017	-0.014	-0.017
	(0.009)	(0.011)	(0.009)	(0.017)
Support from Mother	-0.002	0.008	0.018	0.055+
	(0.018)	(0.024)	(0.022)	(0.032)
Living in Natal Joint	-0.007	-0.092+	-0.084*	-0.151*
	(0.038)	(0.048)	(0.042)	(0.072)
Living in Joint	-0.043+	-0.088**	-0.056*	-0.160**
	(0.024)	(0.031)	(0.027)	(0.046)
Muslim	-0.024	-0.017	0.006	0.011
	(0.018)	(0.021)	(0.017)	(0.029)
Christian	0.046+	0.053	0.010	0.053
	(0.027)	(0.038)	(0.030)	(0.049)
Sikh	0.067+	0.065	0.022	0.027
	(0.037)	(0.044)	(0.039)	(0.033)
Medium Social Economic Status	-0.022	-0.054*	-0.044+	-0.055
	(0.022)	(0.027)	(0.023)	(0.039)
High Social Economic Status	-0.037	-0.081+	-0.076*	-0.053
	(0.034)	(0.042)	(0.038)	(0.061)
Schedule Caste	0.043*	0.054*	0.027	0.081*
	(0.021)	(0.027)	(0.023)	(0.040)
Schedule Tribe	0.047**	0.040*	0.036*	0.044
	(0.017)	(0.019)	(0.018)	(0.030)
Other Backward Classes	0.000	-0.002	-0.006	0.023
	(0.010)	(0.012)	(0.010)	(0.017)
Observations	49118	49118	49118	48999

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Table 8: Women's Autonomy- Involved in decision making (Instruments: Currently Breast-feeding and Height)

	Decision_Stay With Family	*Decision_ Jewelry*	*Decision_ Health*	*Allowed_Own Money*
Husband Has Beaten Wife (Last Year)	-1.218**	-1.899**	-1.119*	-2.095**
	(0.443)	(0.606)	(0.458)	(0.635)
Woman-Less Than Primary	0.006	0.017	0.022+	0.023
	(0.011)	(0.014)	(0.012)	(0.017)
Woman-Primary School	-0.006	-0.019	-0.024	0.005
	(0.017)	(0.020)	(0.019)	(0.025)
Woman-Middle School	-0.003	-0.021	-0.006	0.025
	(0.017)	(0.022)	(0.018)	(0.024)
Woman-High School and above	0.040*	0.036	0.031	0.113**
	(0.019)	(0.026)	(0.023)	(0.027)
Husband-Less Than Primary	-0.011	-0.011	0.001	0.000
	(0.014)	(0.016)	(0.013)	(0.018)
Husband-Primary School	-0.012	-0.023	-0.015	-0.033
	(0.016)	(0.021)	(0.015)	(0.022)
Husband-Middle School	-0.035*	-0.046**	-0.030**	-0.019
	(0.014)	(0.016)	(0.011)	(0.015)
Husband-High School and above	-0.053**	-0.077**	-0.048*	-0.032
	(0.020)	(0.026)	(0.020)	(0.027)
Length of Marriage	0.000	-0.000	0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Woman's age at First Marriage	-0.001	-0.004	0.002	-0.003
	(0.002)	(0.003)	(0.002)	(0.003)
Unmet Desire for Sons	-0.019*	-0.025*	-0.023**	-0.011
	(0.008)	(0.010)	(0.007)	(0.011)
Pregnant-Currently or Past Year	-0.013	-0.018	-0.013	-0.014
	(0.009)	(0.011)	(0.008)	(0.013)
Support from Mother	-0.002	0.009	0.012	0.038
	(0.018)	(0.022)	(0.018)	(0.024)
Living in Natal Joint	-0.009	-0.094*	-0.070*	-0.113*
	(0.032)	(0.043)	(0.029)	(0.046)
Living in Joint	-0.044*	-0.090**	-0.045*	-0.132**
	(0.018)	(0.025)	(0.019)	(0.025)
Muslim	-0.024	-0.017	0.003	0.003
	(0.017)	(0.020)	(0.015)	(0.023)
Christian	0.046+	0.053	0.006	0.044
	(0.026)	(0.038)	(0.027)	(0.037)
Sikh	0.067+	0.066	0.017	0.016
	(0.036)	(0.043)	(0.036)	(0.027)
Medium Social Economic Status	-0.023	-0.055**	-0.035*	-0.031
	(0.016)	(0.021)	(0.016)	(0.021)
High Social Economic Status	-0.039	-0.083*	-0.061*	-0.014
	(0.025)	(0.032)	(0.025)	(0.033)
Schedule Caste	0.044*	0.055*	0.020	0.060*
	(0.017)	(0.024)	(0.016)	(0.024)
Schedule Tribe	0.047**	0.041*	0.033*	0.038+
	(0.016)	(0.019)	(0.015)	(0.022)
Other Backward Classes	0.000	-0.002	-0.006	0.025+
	(0.010)	(0.012)	(0.009)	(0.014)
Observations	49118	49118	49118	48999

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Table 9: Effect of Domestic Violence on Women's Autonomy

	Decision_Stay With Family	*Decision-Jewelry*	*Decision_ Health*	*Allowed_Own Money*
OLS	**-0.042****	**-0.048****	**-0.036****	**-0.028****
	-0.008	-0.009	-0.009	-0.008
IV (Height)	**-1.187+**	**-1.861***	**-1.412***	**-2.880***
	-0.637	-0.802	-0.714	-1.193
IV (Currently Breast-feeding)	**-1.244***	**-1.930***	**-0.871**	**-1.455+**
	-0.618	-0.845	-0.564	-0.752
IV (Both Instruments)	**-1.218****	**-1.899****	**-1.119***	**-2.095****
	-0.443	-0.606	-0.458	-0.635

+ significant at 10%; * significant at 5%; ** significant at 1%

APPENDIX

Table 10: First Stage Regression of the 2SLS (Ordinary Least Squares)

DV: Husband Has Beaten Wife (Last Year)			
	(1)	(2)	(3)
Currently Breast-feeding	0.014**	0.014**	
	(0.005)	(0.005)	
Wife Height-Deviation from Mean	-0.001**		-0.001**
	(0.000)		(0.000)
Woman-Less Than Primary	0.001	0.001	0.001
	(0.006)	(0.006)	(0.006)
Woman-Primary School	-0.025**	-0.025**	-0.025**
	(0.006)	(0.006)	(0.006)
Woman-Middle School	-0.025**	-0.026**	-0.026**
	(0.005)	(0.005)	(0.005)
Woman-High School and above	-0.027**	-0.027**	-0.027**
	(0.007)	(0.007)	(0.007)
Husband-Less Than Primary	-0.003	-0.003	-0.003
	(0.007)	(0.007)	(0.007)
Husband-Primary School	-0.022**	-0.022**	-0.022**
	(0.007)	(0.007)	(0.007)
Husband-Middle School	-0.018**	-0.018**	-0.018**
	(0.005)	(0.005)	(0.005)
Husband-High School and above	-0.037**	-0.037**	-0.037**
	(0.005)	(0.005)	(0.005)
Length of Marriage	-0.001**	-0.001**	-0.002**
	(0.000)	(0.000)	(0.000)
Woman's age at First Marriage	-0.004**	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)
Unmet Desire for Sons	0.000	0.000	-0.000
	(0.004)	(0.004)	(0.004)
Pregnant-Currently or Past Year	-0.008	-0.008	-0.003
	(0.005)	(0.005)	(0.005)
Support from Mother	0.018**	0.018**	0.021**
	(0.007)	(0.007)	(0.007)
Living in Natal Joint	-0.048**	-0.048**	-0.048**
	(0.011)	(0.011)	(0.011)
Living in Joint	-0.036**	-0.036**	-0.036**
	(0.004)	(0.004)	(0.004)
Muslim	0.010	0.009	0.010
	(0.009)	(0.009)	(0.009)
Christian	0.012	0.012	0.013
	(0.015)	(0.015)	(0.015)
Sikh	0.018*	0.018+	0.018*
	(0.009)	(0.009)	(0.009)
Medium Social Economic Status	-0.029**	-0.030**	-0.029**
	(0.004)	(0.004)	(0.004)
High Social Economic Status	-0.047**	-0.049**	-0.048**
	(0.006)	(0.006)	(0.006)
Schedule Caste	0.025**	0.026**	0.025**
	(0.006)	(0.006)	(0.006)
Schedule Tribe	0.008	0.009	0.008
	(0.007)	(0.007)	(0.007)
Other Backward Classes	-0.002	-0.002	-0.002
	(0.005)	(0.005)	(0.005)

Observations	49118	49118	49118
R-squared	0.04	0.04	0.04

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%