Paying for Violence? Spousal Abuse and Son Preference in India

Shatanjaya Dasgupta & Erin K. Fletcher

➕ View supplementary material ↗

📅 Published online: 18 Sep 2017.

✎ Submit your article to this journal ↗

🔍 View related articles ↗

⬚ View Crossmark data ↗
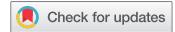
Paying for Violence? Spousal Abuse and Son Preference in India

SHATANJAYA DASGUPTA* & ERIN K. FLETCHER**

*Department of Economics, Beloit College, Beloit, WI, USA, **Kennedy School of Government, Harvard University, Cambridge, MA, USA

ABSTRACT *We find a puzzling correlation in the data on domestic violence and children's outcomes in India. Using the 2005–2006 National Family and Health Survey, we see that girls in families experiencing spousal violence are less worse off than boys when only fathers report a son preference while the gender bias reverses when only mothers report having a son preference. To shed light on the puzzle in the data, we present a non-cooperative theoretical framework based in economic theories of domestic violence, whereby differing parental son preference and bargaining over investments in girl and boy children potentially explains the observed relationship.*

1. Introduction

India suffers from a significant dual problem of violence against women (Brown, Flavin, & Kane, 1996). It is most widely known for an excess son preference resulting in skewed sex ratios and lower investments in girl children. As a result, many girls are 'missing' and the ones who do survive are more likely to have worse outcomes than boys (Clark, 2000; Das Gupta, 1987; Jayachandran & Pande, 2017; Pande, 2003). Simultaneously, adult survey respondents report both high levels of intimate partner violence and high acceptability of that violence (Jayachandran, 2015; Jensen & Oster, 2009). Such violence, in turn, is associated with poor later life outcomes for both victims and witnesses to the abuse – usually children or other family members (Aizer, 2011; International Center for Research on Women [ICRW], 2000). These two problems are likely linked, though the relationship driving this link has remained relatively obscured.

In this paper, we aim to fill this research gap and further explicate the relationship between intimate partner violence and nutritional investments in children. Our explanation is one that may not be immediately obvious and relies not on a directional causality, but rather seeks to show how a mismatch in preferences interacts with intimate partner violence to predict gaps in gender-specific investments. We present diagnostic evidence of a puzzle relating these twin phenomena, show that it is robust to inclusion of controls, and provide one explanation based in economic theory. The puzzle we uncover is based on three observations: 1) according to the literature, girls are often worse off than boys in India although the nature and extent of these differences vary by the outcome under consideration as well as factors such as socio-economic status and geographical location; 2) in our data as well as the literature, children in families where domestic violence is present are worse off on average than those

where it is not present; and 3) in our data, girls in families experiencing spousal violence are less worse off than boys when only fathers report a son preference while the gender bias reverses when only mothers report having a son preference.

We present correlative evidence for the third relationship using data from the 2005–2006 round of the National Family and Health Survey (NFHS), India. We find that it is robust to simple regression analysis and incremental inclusion of controls for various demographic characteristics that are otherwise predictive of domestic violence and children's outcomes. While we acknowledge that these controls are likely endogenous to children's health status and are not independent of domestic violence, the relative stability of the coefficient indicates a relationship that merits further study. We also present a theoretical framework for understanding the relationship based on pay-for-violence models from economics. Our framework is an extension of an existing model of intra-household bargaining problem in which mothers allocate household resources between boy and girl children according to their gender preferences and the probability of that allocation incites violence.

The rest of this paper is organised as follows: Section 2 provides some background on the son preference, domestic violence, and children's health literatures. In Section 3, we present a review of theoretical models of domestic violence in economics and our extension of one of these as it applies to investments in children. Section 4 describes our dataset and presents descriptive statistics. In Section 5, we present an empirical model, for which we discuss estimated parameters using ordinary least squares (OLS) in Section 6. Section 7 concludes.

2. Background

Indian children suffer from malnutrition, wasting, anaemia and stunting in large numbers, a phenomenon that ultimately hinders child development and cognitive ability (Berkman, Lescano, Gilman, Lopez, & Black, 2002). Although there has been some improvement in these trends (Tarozzi, 2012), more than 40 per cent of Indian children are stunted (Imai, Annim, Kulkarni, & Gaiha, 2014) and malnutrition is still prevalent despite the fact that average GDP growth exceeded 8 per cent per year between 1998 and 2008 (Kandpal & McNamara, 2009). Thus, economic growth is not necessarily translating to higher child health and nutritional investments.

While not widely believed to be a primary driver of malnutrition, studies have shown that, on average, children with mothers who experience domestic violence have worse health outcomes than their peers in households without domestic violence. Medical studies have linked domestic violence to significant and negative birth and later life outcomes. For example, domestic violence is found to be associated with lower rates of prenatal care, higher rates of chronic malnutrition and incidence of childhood asthma (Ackerson & Subramanian, 2008, 2009; Koski, Stephenson, & Koenig, 2011; Subramanian, Ackerson, Smith, & John, 2009; Subramanian, Ackerson, Subramanyam, & Wright, 2007). Aizer (2011) uses a unique dataset from California to show that domestic violence during pregnancy results in lower birth weight. In rural India, Imai et al. (2014) find that children at the tail ends of nutritional distributions are more likely to have been in a home where violence is perpetrated.

While some of these studies are only able to show correlation, it is also clear that malnutrition and domestic violence are intertwined even if there is no discernible causal relationship between the two. Women who report domestic violence in India have been shown to be poorer and less educated (Martin, Tsui, Maitra, & Marinshaw, 1999), characteristics that also predict child malnutrition.

Given that our focus is to identify whether there are differential effects on children's outcomes by gender in the face of domestic violence, India's overwhelming son preference is relevant. High rates of sex-selective abortion and differential investments by gender have resulted in a skewed sex ratio (Arnold, Kishor, & Roy, 2002; Jha et al., 2011; Retherford & Roy, 2003) and higher rates of female infant mortality and poor nutritional outcomes among girls (Das Gupta, 1987; Jayachandran & Pande, 2017; Mishra, Roy, & Retherford, 2004; Pande, 2003). Previous research provides explanations for such gender differences in investments, which include: (a) differences in parental preferences regarding a child's gender; (b) mothers and fathers getting different returns from investments in girls and

boys; (c) male-biased stopping behaviour whereby girls are born into larger families than boys; and (d) equity (directing resources to the child with a lower initial endowment) or efficiency (directing resources to the child who might, for example, derive a higher labour market return) concerns (Clark, 2000; Jayachandran, 2015; Rosenzweig & Shultz, 1982; Sahn & Stifel, 2002; Thomas, 1994).

In this study, we explore one possible channel through which domestic violence can have a direct effect on investments in children by gender. In doing so, we make use of a non-cooperative household bargaining, pay-for-violence framework. This is based on economic theories that model violence within this same framework, which we outline below and discuss in more detail in the theory section. Our contribution is to apply such a framework specifically to the problem of allocation of resources to children and to add gender preferences that may (but are not required to) differ by parent's sex. The first of such models by Tauchen, Witte, and Long (1991) (TWL) presents a model of violence for purchase. In this model, the perpetrator varies the level of violence with changes in his income or the victim's share of household income, but allows for some probability that the victim will leave the relationship if her utility falls below that of her outside option. Bloch and Rao (2002) extend TWL in the Indian context and model spousal violence as a means of extracting transfers from the victim's family, but do not address the outcomes for children. In an empirical paper examining gender roles and violence in Vietnam, Luke, Schuler, Mai, Thien, and Minh (2007) posit that women with more gender egalitarian attitudes may challenge their husbands more and be subject to reprisal in the form of violence. Eswaran and Malhotra (2011) propose an expanded model in which one partner may accept violence in return for exerting their autonomy in household decisions. We rely on Eswaran and Malhotra's model to guide the theoretical discussion in this paper, extending their model to predict the allocation of household resources among girl and boy children, by adding the element of son preference.

Our econometric analysis uses cross-sectional data to examine if the presence of domestic violence is associated with gender differences in children's nutrition outcomes. Since we are interested in the interplay of domestic violence and son preference, we estimate our regressions separately based on whether neither parent has son preference, only father has son preference, only mother has son preference, or both parents have son preference. We employ a measure of son preference derived from the parent's separate reports of their ideal number of girls and boys. The use of survey data on preferred fertility has precedent in the literature (Clark, 2000; Gaudin, 2011) and such measures of stated son preference have been shown to correlate well with the regional patterns of gender bias in the aggregate.

3. Theoretical framework

The growing theoretical literature on family behaviour suggests that we approach domestic violence within a non-cooperative framework, as an intrahousehold bargaining problem. These models are defined by agents maximising their individual utility functions subject to their own budget constraints (see Lundberg and Pollak [1996] for a review). We rely on those models which include an element of 'pay-for-violence' whereby the abuser transfers resources to the victim in exchange for perpetrating violence against her.

The first example of this application in economics was Tauchen et al. (1991). In the Tauchen, Witte and Long (TWL) model, each spouse chooses a level of capital to transfer to the other spouse, and the male spouse chooses the level of violence to impart on his partner. Husbands derive positive utility from both violence and income, and wives derive utility from income but disutility from violence. TWL examines comparative statics on the level of violence through changes in each partner's income. Assuming that the woman's reservation utility is binding, violence has no instrumental value, but an increase in the husband's income leads to him 'purchasing' more violence with increased transfers. An increase in her income leads to lower levels of violence as she essentially 'purchases' safety through transfers to him. If women are not constrained by their reservation utilities, violence may be increasing or decreasing in either spouse's income, depending on the marginal utility of consumption goods.

Eswaran and Malhotra (2011) present an updated version of the TWL model (call it the EM model) where spouses bargain over autonomy in household resource allocation, rather than transfer wealth. In the EM model, both husbands' and wives' utility is decreasing in violence (therefore even the perpetrator does not have a 'taste' for violence) and husbands use violence to turn the relative decision making power in their favour.

We propose an extension to these models to show how domestic violence may affect children's investments differentially by gender. We first assume that all violence is perpetrated by the male partner on the female partner, and that pairs are male-female. These assumptions are made without loss of generality. Next we consider a two-stage bargaining process. First, total household income will be allocated between all children and other generic household goods by intrahousehold bargaining or some other ex-ante process. This results in some fixed amount of household resources, $\bar{I}$, to be allocated to children and ultimately divided between girl and boy expenditures, g and b. Thus, $g + b = \bar{I}$, a constant. We do not explore the effects of shocks in changing the overall level of this allocation, rather we examine possible changes to the proportion allocated to boy and girl children. Some violence may also be a result of this ex-ante bargaining or assignment within the family, or exogenous stressors, which we do not consider here.

The second stage consists of bargaining over the specific allocation of resources to male and female children. Here, we consider the utility function of the mother, $U_1(g, b, v)$, and that of the father, $U_2(g, b, v)$. Both these functions depend upon g, b, and v, where g and b denote the resources allocated to girl and boy children as noted above, and v is the amount of violence inflicted on the mother by her husband. Both U_1 and U_2 are assumed to be increasing and strictly quasiconcave in g and b, and strictly decreasing and concave in v. Therefore, similar to Eswaran and Malhotra (2011), we present a framework where violence is not a source of gratification but a method of enforcing the husband's will in the household. This interpretation of violence is consistent with both models of domestic violence in India (Bloch & Rao, 2002), and survey data from India showing that violence is an accepted way to mete out punishment to wives for offenses such as burnt food or disobedience.

In a similar fashion to the EM framework, we use the following functional form for parental utility functions:

$$U_1(g, b, v) = \alpha_1 lng + \beta_1 lnb - \delta_1 v$$

$$U_2(g, b, v) = \alpha_2 lng + \beta_2 lnb - \delta_2 v$$

For each $i \in \{1, 2\}$, $0 < \alpha_i < 1$, $0 < \beta_i < 1$, and $\delta_i > 0$, such that parent's utility is increasing in investments in boy and girl consumption or investment goods, but decreasing in violence. For convenience, we normalise the weights and assume that $\alpha_i + \beta_i = 1$ for each i.[1]

Utility maximisation is subject to the constraint that each parent's individual utility must exceed some reservation utility, or the utility from the outside option. Thus, $U_i \geq \bar{U}_i$ for all i. For mothers, we assume this reservation utility is quite low due to the lack of options available to women in many areas throughout India to be financially independent or leave their partners. Bloch and Rao (2002), for instance, document that in many Indian communities, divorce is not possible and returning to one's parents would result in social isolation. However, it is dependent on her education, access to public health services, urban/rural setting, distance to her family, whether she is working and possibly more. Given that in many situations, leaving a marriage might require paying another dowry to a new husband, this outside utility is not constrained by zero and may even be negative. In determining how much violence to perpetrate, men must ensure that they do not provide enough disutility to force their spouse to exert her outside option. For fathers, reservation utility is determined by the availability of other partners and social norms around divorce. In determining how much autonomy to assert in determining allocations among children, mothers must ensure that father's reservation utility is at least met.

3.1. Allocation over boy and girl children

If $\alpha_1 = \alpha_2$, there is a stable equilibrium, but there is no room for bargaining over the allocation using violence. For such bargaining to happen, we would require room for disagreement and for parent's preferences for spending on girls' goods to not be equal, that is, $\alpha_1 \neq \alpha_2$. In our theoretical framework, mothers first decide how to allocate resources between boy and girl children, and then fathers decide how to impart violence in response to the mother's choice of allocation. Thus, mothers face the decision of how much to assert their preferences and face some probability of violence in exchange. An alternative version of this framework would allow for fathers to be responsible for the allocation among children. However, given that the outcomes of interest – weight- and height-based anthropometric scores – are directly related to nutritional decisions and women are more likely to be primary caregivers for young children, we believe this is the more realistic version of the framework.

Below we detail the possible regimes and outcomes that may arise:

Case 1: Parents' preferences for sons are identical. We assume that parents' preferences for allocation of resources over g and b are determined by son preference. If their preferences are identical, we have $\alpha_1 = \alpha_2$. In this case, ex-ante characteristics of the household members and stage 1 allocations determine the level of violence and no additional violence is perpetrated in exchange for the mother allocating to her preferred sex. Within this category emerge two possibilities:

Case 1a): Strong son preference by mother and father. The framework predicts higher investments in boy children than girl children.

Case 1b): No son preference by mother or father. The framework predicts higher investments in girl children or equal investments in boy and girl children.

Case 2: Son preferences differ by parent. Where son preferences diverge, there exists the necessary tension in allocation preferences to solve the framework. An initial level of domestic violence is determined by ex-ante characteristics, and via bargaining, mothers might accept some additional level of violence in exchange for implementing their preferred allocation among boy and girl children.[2]

There are two possibilities in this case, resulting in different allocations.

Case 2a): Mother has son preference while father does not. Mothers may be willing to accept violence in return for investing more in boy children, so the framework predicts additional violence in families where only the mother has son preference and more investments in boy children.

Case 2b): Father has son preference while mother does not. Mothers may be willing to accept violence in return for investing equally between her children or more in girl children, so the framework predicts additional violence in families where only fathers have son preference and gender equal investments or higher investments in girl children.

4. Data and descriptive statistics

Data come from the 2005–2006 round of the National Family and Health Survey (NFHS) of India. This household survey is a cross-sectional, nationally representative dataset and the information is gathered from interviews with approximately 124,000 women aged 15–49 and 74,000 men aged 15–54. Relevant to our study, the NFHS asked detailed questions about the presence of domestic violence and actual and preferred fertility. Weight and height information of men, women, and children under the age of five was collected. A rich array of information on demographic and household characteristics is also available.

The men's survey was administered to a sub-sample of households which means that not all women have a corresponding match. Again, the domestic violence module was administered to a sub-sample

of women, which further narrows our sample. We also limit our sample to children under five years since height and weight information for them is only available for these ages. Our final sample consists of observations where there is complete information about the children and their parents on the variables used in this analysis and includes 4953 children from 3806 urban households and 6859 children from 5022 rural households.

The primary explanatory variable is an indicator for whether the respondent (mother) was physically attacked (slapped, pushed, kicked, twisted arm, tried to strangle, punched or physically forced sex) by her spouse at any time in the past 12 months.[3] Yes is coded as 1 and No is coded as 0. While theoretically we do have information on whether the woman experienced such violence ever in her lifetime, we do not know when those incidents have occurred. We also restrict the response to the last 12 months to avoid measurement error arising from recall bias. From Table 1 we can see that, in our sample, 21 per cent of women in urban households and 26 per cent of women in rural households report having experienced spousal violence in the past year.[4] The urban-rural difference in incidence of violence is statistically significant.

We focus on child anthropometric indicators because they provide an important window into child health and nutritional investments. Specifically, the outcome variables of interest are the weight-for-height and height-for-age z scores of a child. These measures are based on the 2006 World Health Organization (WHO) Child Growth standards. A z score gives the standard deviations below or above the median value of zero in the corresponding age and sex group in the reference population. Weight-for-height is a short-term measure, variations in which are brought on by periodic changes in food intake and disease prevalence. In contrast, height-for-age provides a more long-term measure, which reflects accumulated effects of infections and nutritional investments since birth (WHO Working Group, 1986). Although our predictor variable is an indicator for domestic violence in the past 12 months, it is highly likely that this type of violence is repeated (ICRW, 2000; Koenig, Stephenson, Ahmed, Jejeebhoy, & Campbell, 2006), and thus we might expect effects on both short- and long-term measures.

Table 2 presents the summary statistics of children's z scores. These are disaggregated by urban and rural households and whether or not the child's mother has experienced domestic violence. The first thing to note is that, in all three panels, the average scores are negative, meaning that children in this sample fare worse compared to the median well-nourished child. It is clear from Panel A that the scores are lower among children whose mothers experienced domestic violence compared to those whose mothers did not, and columns (3) and (6) confirm that these differences are statistically significant. These patterns are also observed in Panels B and C, which present the z scores for female and male children respectively. The unconditional gender gap in z scores by household type in our study sample, however, is mostly statistically insignificant.[5]

Table 3 illustrates the sample parental and household characteristics. Again, statistics are presented separately by urban/rural location of household. Women are less likely to face domestic violence if they are taller and closer in height to their husbands. The incidence of domestic violence strictly decreases with increases in the educational attainment of the couple. There is substantial variation in

Table 1. Prevalence of domestic violence

	Urban			Rural			
	Mean (1)	SD (2)	N (3)	Mean (4)	SD (5)	N (6)	t-stat (7)
Mother experienced DV in last 12 months (=1)	0.21	0.41	3,806	0.26	0.44	5,022	5.26

Notes: DV = Domestic Violence. Column 7 reports the t-statistic from the urban-rural mean comparison test.

Table 2. Summary statistics: children's outcomes

	Urban			Rural		
	DV (1)	No DV (2)	t-stat (3)	DV (4)	No DV (5)	t-stat (6)
Panel A: All Children						
Weight-for-height z score	−0.84	−0.75	1.90	−1.01	−0.93	2.06
	(1.29)	(1.36)	(0.06)	(1.23)	(1.32)	(0.04)
Height-for-age z score	−1.80	−1.41	7.13	−2.01	−1.85	3.50
	(1.59)	(1.60)	(0.00)	(1.60)	(1.67)	(0.00)
Observations	1,088	3,865		1,769	5,090	
Panel B: Female Children						
Weight-for-height z score	−0.80	−0.74	0.92	−1.05	−0.92	2.66
	(1.31)	(1.35)	(0.36)	(1.22)	(1.30)	(0.01)
Height-for-age z score	−1.69	−1.42	3.42	−1.98	−1.85	1.86
	(1.60)	(1.61)	(0.00)	(1.56)	(1.67)	(0.06)
Observations	510	1,852		824	2,449	
Panel C: Male Children						
Weight-for-height z score	−0.86	−0.75	1.74	−0.97	−0.95	0.36
	(1.27)	(1.37)	(0.08)	(1.23)	(1.34)	(0.72)
Height-for-age z score	−1.89	−1.40	6.60	−2.04	−1.85	3.04
	(1.59)	(1.59)	(0.00)	(1.63)	(1.67)	(0.00)
Observations	578	2,013		945	2,641	

Notes: DV = Domestic Violence. The means and standard deviations (in parenthesis below) are reported in Columns 1, 2, 4, and 5. Columns 3 and 6 report the t-statistic (from the DV- no DV mean comparison test) and the p-value of the t-test in parenthesis below.

the incidence of domestic violence by women's employment. Women who are working for someone else (non-family member) are more likely to face domestic violence than if they are unemployed or not working. Fertility (total number of sons and daughters) is higher among women who face spousal violence. Women are more vulnerable to violence in nuclear families than in joint families (residing either with her natal family or her in-laws). Domestic violence also varies by household religion and caste. Women belonging to Muslim households report more violence than those in Hindu or Christian households. Similarly, the incidence of violence is higher among scheduled castes and other backward classes. While income data is not available, the NFHS provides a wealth index, constructed from survey information on ownership of household assets. The wealth index categorises households into five quintiles, quintile 1 denoting the poorest households and quintile 5 denoting the richest households. Using this asset-based index, we observe that the prevalence of violence decreases with an increase in the household living standard. The above statistics essentially highlight the predictors of domestic violence and are consistent with previous theoretical and empirical work (for example, Eswaran & Malhotra, 2011; Martin et al., 1999).

5. Estimation strategy

Our objective is to observe whether and how the presence of domestic violence, after controlling for other characteristics that predict violence, influences investments in children and if differences arise by the child's gender. The fixed effects model we use is specified as follows:

$$y_{i,m,h,s} = \alpha + \beta_1 DV_{m,h,s} + \beta_2 female_{i,m,h,s} + \beta_3 (DV_{m,h,s} * female_{i,m,h,s}) + X\delta + \gamma_s + \varepsilon_{i,m,h,s} \quad (1)$$

where $y_{i,m,h,s}$ is either the weight-for-height or height-for-age z score of child, i, with mother, m in household, h in state, s. DV is an indicator for whether the mother experienced spousal violence in the

Table 3. Parental and household characteristics

	Urban			Rural		
	DV (1)	No DV (2)	t-stat (3)	DV (4)	No DV (5)	t-stat (6)
Age of mother	26.64	27.41	3.94	27.04	27.11	0.40
	(5.00)	(4.94)	(0.00)	(5.36)	(5.53)	(0.69)
Age of father	32.50	32.95	1.99	32.08	32.30	1.11
	(5.75)	(5.70)	(0.05)	(6.21)	(6.29)	(0.27)
Difference in age of parents	5.86	5.54	−2.05	5.04	5.19	1.12
	(4.13)	(3.94)	(0.04)	(4.12)	(4.28)	(0.26)
Height of mother (cms)	151.18	152.69	6.70	151.14	151.76	3.34
	(5.74)	(5.63)	(0.00)	(5.76)	(5.79)	(0.00)
Height of father (cms)	164.42	165.15	2.83	163.39	163.76	1.76
	(6.27)	(6.53)	(0.05)	(6.36)	(6.55)	(0.08)
Difference in height of parents (cms)	13.24	12.46	−2.64	12.25	11.99	−1.02
	(7.58)	(7.38)	(0.01)	(7.68)	(7.69)	(0.31)
Education of mother (years)	5.45	8.36	14.06	2.98	4.30	9.18
	(4.76)	(5.29)	(0.00)	(3.91)	(4.65)	(0.00)
Education of father (years)	6.63	9.34	13.80	5.19	6.39	7.77
	(4.70)	(4.98)	(0.00)	(4.56)	(4.84)	(0.00)
Mother not working (=1)	0.71	0.77	3.63	0.47	0.52	3.19
			(0.00)			(0.00)
Mother working for family member (=1)	0.07	0.06	−1.08	0.26	0.26	−0.02
			(0.28)			(0.98)
Mother working for someone else (=1)	0.16	0.12	−3.37	0.19	0.15	−3.84
			(0.00)			(0.00)
Mother self-employed (=1)	0.06	0.05	−0.78	0.07	0.07	−0.70
			(0.43)			(0.48)
Total no. of sons alive	1.29	1.10	−5.06	1.48	1.36	−3.45
	(1.08)	(0.93)	(0.00)	(1.18)	(1.09)	(0.00)
Total no. of daughters alive	1.28	1.11	−3.98	1.45	1.41	−1.03
	(1.11)	(1.01)	(0.00)	(1.23)	(1.21)	(0.30)
Female HH head (=1)	0.04	0.06	1.39	0.03	0.04	1.80
			(0.16)			(0.07)
Nuclear HH (=1)	0.68	0.57	−5.53	0.64	0.56	−4.56
			(0.00)			(0.00)
Hindu	0.68	0.73	2.48	0.80	0.75	−3.45
			(0.01)			(0.00)
Muslim	0.24	0.15	−5.51	0.09	0.06	−2.72
			(0.00)			(0.01)
Christian	0.06	0.09	2.76	0.09	0.16	5.57
			(0.01)			(0.00)
Other	0.02	0.03	1.15	0.02	0.03	1.36
			(0.25)			(0.17)
Scheduled Caste (SC)	0.26	0.15	−7.10	0.24	0.19	−4.38
			(0.00)			(0.00)
Scheduled Tribe (ST)	0.05	0.09	3.73	0.21	0.23	1.74
			(0.00)			(0.08)
Other Backward Class (OBC)	0.40	0.37	−1.76	0.35	0.37	1.26
			(0.08)			(0.21)
Not SC/ST/OBC	0.28	0.38	5.24	0.19	0.21	1.04
			(0.00)			(0.30)
Wealth Quintile 1 (poorest)	0.05	0.03	−2.97	0.34	0.23	−8.17
			(0.00)			(0.00)
Wealth Quintile 2 (poorer)	0.12	0.05	−7.82	0.29	0.26	−2.09
			(0.00)			(0.04)

Table 3. (*Continued*)

	Urban			Rural		
	DV (1)	No DV (2)	t-stat (3)	DV (4)	No DV (5)	t-stat (6)
Wealth Quintile 3 (middle)	0.22	0.14	−5.79 (0.00)	0.22	0.26	2.44 (0.01)
Wealth Quintile 4 (richer)	0.39	0.31	−4.49 (0.00)	0.11	0.18	5.62 (0.00)
Wealth Quintile 5 (richest)	0.21	0.48	13.69 (0.00)	0.03	0.08	5.47 (0.00)
Observations	796	3,010		1,291	3,731	

Notes: DV = Domestic Violence, HH = Household. Standard deviations of non-binary variables are reported in parenthesis below in columns 1, 2, 4 and 5. Columns 3 and 6 report the t-statistic (from the DV- no DV mean comparison test) and the p-value of the t-test in parenthesis below.

past 12 months. *Female* is an indicator for the child's gender. Our coefficient of interest is β_3, which indicates gender differentials in the effect of domestic violence on children's outcomes. X is a vector of controls at the child-, parent- and household-level and includes dummies for the birth order of child (birth order 1 is the omitted category), difference in age of parents, difference in height of parents, total number of girls and boys borne by mother and are alive, mother's and father's education, dummies for mother's type of employment (unemployed/not working is the omitted category), whether the household head is female, whether the household is a nuclear family unit, and dummy variables for religion, caste/tribe, and wealth quintiles. γ_s is the set of state fixed effects, which are included to control for any state-level heterogeneity. To account for differences in the factors that may predict incidence of domestic violence, extent of son preference and child anthropometric measures, we disaggregate our sample by household location and estimate regressions separately for urban and rural households.

Our empirical model predictions on child outcomes are crucially dependent upon the agreement/disagreement of parental preferences. Therefore, in addition to separating out regressions by location of household, we also divide our sample by parental son preference. We use information on a parent's report of their ideal sex composition of children to construct our measure of son preference. Although deriving measures from survey data on preferred fertility have been common in the literature (Clark, 2000; Eswaran & Malhotra, 2011; Gaudin, 2011), there are reasonable objections to using it as a proxy for son preference. The first objection is that it is subject to rationalisation bias which implies that a respondent is likely to state as her ideal number the number she already has. We attempt to address rationalisation bias by controlling for actual sex composition of children, the primary source of this bias, along the lines of Bhat and Zavier (2003) and Gaudin (2011). Second, it is possible that stated preferences or the desire for more sons may not translate into purposely investing more in male children (revealed gender bias). However, Bhat and Zavier (2003) have shown that in the aggregate, measures of stated son preference correlate well with the regional patterns of gender bias in India. Finally, it could be the case that parents understate or overstate their preference for sons. We assume that the measurement error arising from this self-reported data is random.

Our measure of son preference is a binary variable which takes on a value of one only if the parent reports that their ideal number of sons is strictly greater than their ideal number of daughters. It has a value of zero if either they prefer an equal number of sons and daughters or if they strictly prefer a greater number of daughters. The indicators for whether the mother or the father has son preference ultimately gives rise to four cases: neither parent has son preference, only father has son preference, only mother has son preference, and both parents have son preference. In our sample, 15.5 per cent of mothers and 18 per cent of fathers in urban areas report a son preference. The corresponding figures for rural areas are 29.5 per cent and 27.5 per cent respectively. Thus, 84.5 per cent of women and 82

per cent of men in urban areas along with 70.5 per cent of women and 72.5 per cent of men in rural areas either have a neutral or strict daughter preference. The full distribution of parental son preference is presented in Table 4. The primary takeaway is the presence of a strong positive correlation between son preference and the incidence of domestic violence; the reported incidence of domestic violence is higher in households with stated son preference. This is true for urban and rural households.

Before analysing the results, it would be useful to consider certain limitations of the current estimation strategy. First, our ideal test of the theoretical framework would involve longitudinal analysis of the relevant variables. However, the 2005–2006 cross-section of the NFHS provides only a point-in-time observation of children's wellbeing and limits our ability to observe frequency of violence. Thus, we are unable to conduct a formal test of the multi-stage predictions of our framework. Particularly, our theoretical framework predicts that an additional amount of violence is accepted by the mother in the second stage to allocate investments in line with her preferences when they are different from her spouse, which we are unable to appropriately test. Instead we analyse whether or not children's outcomes differ by sex in the presence of domestic violence and different parental son preference regimes. Again, because we have anthropometric information only for children under five years of age, we are unable to conduct any household fixed-effects analysis since information for any older (greater than five years) siblings is unavailable. Finally, empirical models such as the one we implement face a big challenge in identifying the effects of domestic violence on observed outcomes. Domestic violence is necessarily endogenous to many of the factors included in any regression specification attempting to explain children's health status, and lack of appropriate instruments for son preference and domestic violence make determining the direction of causality difficult. For instance, it may be that mothers who are experiencing violence rebel by allocating more to girl children or it may be that allocating more to girl children prompts violent events. Unobserved factors such as cultural or normative elements may affect behaviours as well. In addition, there is no plausible or ethical way to randomly assign participants to situations of domestic violence, so our ability to discern a causal effect is limited by methodological constraints. For these reasons, we leave questions of statistical causality to future research and estimate our empirical model using ordinary least squares

Table 4. Distribution of parental son preference

	DV	No DV	Total
Panel A: Urban Households			
Neither parent has SP	527	2,204	2,731
	(19.30)	(80.70)	(100.00)
Only father has SP	107	377	484
	(22.11)	(77.89)	(100.00)
Only mother has SP	114	280	394
	(28.93)	(71.07)	(100.00)
Both parents have SP	48	149	197
	(24.37)	(75.63)	(100.00)
Total	796	3,010	3,806
	(20.91)	(79.09)	(100.00)
Panel B: Rural Households			
Neither parent has SP	613	2,143	2,756
	(22.24)	(77.76)	(100.00)
Only father has SP	234	548	782
	(29.92)	(70.08)	(100.00)
Only mother has SP	267	619	886
	(30.14)	(69.86)	(100.00)
Both parents have SP	177	421	598
	(29.60)	(70.40)	(100.00)
Total	1,291	3,731	5,022
	(25.71)	(74.29)	(100.00)

Notes: DV = Domestic Violence, SP = Son Preference. The row percentages are given in parenthesis below.

(OLS) to test the simplified theoretical framework based on pay-for-violence models as outlined in Section 3.

6. Results

The OLS results from estimating Equation (1) with the full set of controls are presented in Tables 5 and 6, for urban and rural households, respectively. We present the results separated out by whether neither parent, only father, only mother or both parents have a son preference. As mentioned before, son preference is calculated as a binary variable that takes a value of one if the parent's ideal number of sons is strictly greater than the ideal number of daughters and zero if they are equal or if the inequality is reversed.

Columns (1)–(4) show the results for weight-for-height and columns (5)–(8) show the corresponding results for height-for-age. Additional bargaining over child investments in a pay-for-violence model as mentioned above is to be expected when the parental preferences do not match and only one parent has a son preference. To check if gender differences arise, we examine the coefficient on the interaction term, *Child is female × Mother experienced DV in last 12 months*. If our theory prediction holds true, we would expect this coefficient to be positive or zero when only fathers have a son preference and negative when only mothers have a son preference. This would imply that mothers invest more in girl children or equally among boy and girl children in exchange for violence when they do not have a son preference but their husbands do and invest more in boy children when they have a son preference but their husbands do not. Given our interest in examining gender differentials in child outcomes, it would be problematic if the sex of the child itself were endogenous. A number of studies have documented the widespread use of sex selection in India (for example, Jha et al., 2011; Retherford & Roy, 2003); these are used by parents to ensure male births. If the presence of girls and incidence of domestic violence were correlated, it would lead to a sample selection problem. However, when we compared the sex ratio of children in our sample born to mothers in households with and without domestic violence, the differences were not found to be statistically significant (data not shown).

Table 5. OLS results from urban households: sample separated by parental son preference

	Weight-for-height				Height-for-age			
	No parent has SP (1)	Only father has SP (2)	Only mother has SP (3)	Both parents have SP (4)	No parent has SP (5)	Only father has SP (6)	Only mother has SP (7)	Both parents have SP (8)
Mother experienced DV in last 12 months (=1)	0.065	−0.16	0.24	0.0042	−0.23**	−0.47**	−0.12	0.15
	(0.074)	(0.18)	(0.19)	(0.32)	(0.099)	(0.20)	(0.24)	(0.28)
Child is female (=1)	0.017	−0.10	0.30**	0.24	−0.013	−0.001	0.13	0.079
	(0.062)	(0.14)	(0.14)	(0.22)	(0.067)	(0.17)	(0.17)	(0.28)
Child is female × Mother experienced DV in last 12 months	0.064	0.46*	−0.63**	0.13	0.18	0.45*	−0.10	−0.34
	(0.11)	(0.26)	(0.28)	(0.47)	(0.12)	(0.27)	(0.32)	(0.39)
Observations	3,473	654	536	290	3,473	654	536	290

Notes: DV = Domestic Violence, SP = Son Preference. All controls are included but not reported. State fixed effects are included. Reference categories include birth order 1, unemployed mother, general caste (not SC/ST/OBC) and Hindu household. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 6. OLS results from rural households: sample separated by parental son preference

	Weight-for-height				Height-for-age			
	No parent has SP (1)	Only father has SP (2)	Only mother has SP (3)	Both parents have SP (4)	No parent has SP (5)	Only father has SP (6)	Only mother has SP (7)	Both parents have SP (8)
Mother experienced DV in last 12 months (=1)	0.050	0.016	0.12	0.19	−0.073	0.086	−0.042	0.053
	(0.069)	(0.14)	(0.11)	(0.13)	(0.092)	(0.17)	(0.14)	(0.17)
Child is female (=1)	0.0075	0.17*	−0.035	−0.052	−0.002	0.055	0.0074	0.15
	(0.054)	(0.10)	(0.091)	(0.13)	(0.067)	(0.13)	(0.12)	(0.18)
Child is female × Mother experienced DV in last 12 months	−0.12	−0.14	0.14	−0.33	0.090	−0.01	−0.100	−0.077
	(0.095)	(0.16)	(0.16)	(0.21)	(0.12)	(0.22)	(0.20)	(0.29)
Observations	3,683	1,109	1,243	824	3,683	1,109	1,243	824

Notes: DV = Domestic Violence, SP = Son Preference. All controls are included but not reported. State fixed effects are included. Reference categories include birth order 1, unemployed mother, general caste (not SC/ST/OBC) and Hindu household. Robust standard errors clustered at the primary sampling unit level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

We first consider the results for urban households, presented in Table 5. In columns (2) and (6), where the father has a son preference but the mother does not, the interaction term reveals that girls experience better outcomes on both weight-for-height (0.46 standard deviations), the short-term measure, and height-for-age (0.45 standard deviations), the long-term measure. On weight-for-height, column (3) shows that girls have z-scores which are 0.63 standard deviations lower compared to boys when only mothers have a son preference. The corresponding coefficient on height-for-age in column (7) also carries a negative sign but is statistically insignificant. The coefficient on the interaction terms when parental preferences match (columns (1), (4), (5) and (8)) are all statistically insignificant. Thus, the results imply that, in the presence of domestic violence, girls are relatively less worse when only fathers have a son preference while boys are relatively less worse off when only mothers have a son preference.[6] These findings are consistent with Case 2 predictions outlined in the theory section above.

Overall, we observe results for both the nutrition outcomes in urban areas. Weight-for-height is a short-term measure of health and tends to fluctuate. On the other hand, we may see changes in height-for-age (a long-term measure of health) as a reflection of sustained investments or in our case repeated bargaining, to fit with our framework. While we cannot directly test this with our data, other work supports that single instances of violence are uncommon, but rather that violence – and thus, potentially, bargaining over investments – is repeated (ICRW, 2000; Martin et al., 1999).

Due to the relatively small sample size arising from inclusion of both mother's and father's son preference (as compared to the full universe of interviewed women), we estimate a series of regression specifications adding child-level, parent-level and household-level controls incrementally as a robustness check. Beginning with a no-controls specification, the estimated coefficients of interest we observe are similar in spirit to Table 5 (available from the authors). Thus the included controls do not explain away all of the gender differentials, and in fact increases the magnitude of our coefficients, leaving room for our bargaining mechanism to potentially explain the effects. While this cannot be taken as definitive evidence of causality, it alludes to the possibility that the effect might be independent of socio-economic and demographic observable factors.

When we turn to results from rural households, in Table 6, we find that the coefficients are largely statistically insignificant and therefore we do not find any support for our theoretical model. We have several theories to explain the urban/rural differences, though we cannot definitively say which one holds. As total fertility is higher in rural areas (authors' calculations using NFHS data), perhaps the

constraint requiring a fixed proportion of resources going to children binds in rural areas, but not in urban areas. Another possibility is that there are fewer overall resources to allocate in rural areas, and so bargaining over small amounts is not enough to move the needle. Finally, returns to investing in girls may be higher in urban areas, where overall female labour force participation is low, but wages are higher among working women (Chowdhury, 2011). This would lead to bargaining over gender-specific child investments using domestic violence to be less salient in rural areas where returns to girl-specific investments are relatively marginal.

7. Conclusion

In this paper, we test the hypothesis that women are willing to accept domestic violence from their husbands in order to allocate resources among her children in a way that aligns with her preferences. This is examined by comparing the nutritional status of boy and girl children. Where the preferences for this allocation do not match up between parents – measured in practice via parents disagreeing on the ideal sex-ratio of their children – children of the mother's preferred gender are better off compared to the other gender in anthropometric measures. Notably, we highlight two important correlations that are present in the data from urban households and provide prima facie evidence for our hypothesis: 1) girls in households where the mother faces violence and in which only the father has a son preference perform better in terms of weight-for-height and height-for-age; and 2) girls' weight-for-height is significantly lower in households where mothers report spousal violence and that she prefers sons. These correlations are robust to the inclusion of controls in a regression model using data from the 2005–2006 round of the NFHS. While we cannot provide rigorous causal identification for these results due to endogeneity problems or explain root causes of domestic violence, we provide a theoretical framework consistent with previous research on intrahousehold allocation and violence for purchase to provide an explanation for the empirical results we see. The framework suggests one way in which domestic violence may affect children's health outcomes differentially by gender, that mothers may be able to mitigate the adverse effects associated with living in a house where spousal abuse is present.

These results are notable because they highlight the heterogeneity of women's preferences and provide some insight into how the interaction of preferences and adverse circumstances may affect children's health and wellbeing. They also suggest that when women have strong preferences regarding allocation of resources, they may find ways to enact them, even when these women suffer from domestic violence and thus do not meet notional or statistical standards of appearing 'empowered'. We do not advocate the acceptance or promotion of instrumental violence in exchange for improving the situation of girls. However, when designing programmes and policies to mitigate violence, policy-makers would do well to consider heterogeneity in women's incentives and preferences, particularly with regard to caregiving for children. Further research would be necessary to determine whether power derived from bargaining over violence explains why women stay in violent relationships.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. The model does not require that any parent have gender-differentiated preferences over children's goods. Parents may display no gender preference in which case $\alpha_i = \beta_i$, for any i.
2. We discuss the process as one of bargaining, but our empirical strategy does not allow us to rule out retaliation for enacting preferences instead of a formal or informal bargaining process.
3. Although information on violence perpetrated by other family members (such as parents and in-laws) as well as non-family members (such as employer or police) is available from the NFHS, we focus on spousal violence for three reasons. First, abuse by spouses is the most common and it is here that bargaining is most salient. Second, there exists a large literature on the presence of intimate partner violence from which to draw. Finally, the heterogeneity introduced by the various relationships between perpetrators and victims makes the model intractable.
4. It is also important to note that reports of domestic violence may not always match actual domestic violence; underreporting is a strong possibility especially since the NFHS data also reveal high rates of acceptability of violence. In the context of our analysis, it would be problematic if domestic violence was systematically misreported depending on the sex of the child. In fact, when we examined the incidence of domestic violence by child's gender, we found no statistically significant difference (data not shown).
5. Since we are interested in the interplay of domestic violence and son preference, we also provide a more detailed illustration of the descriptive statistics of children's outcomes by household type. These are presented in Supplementary Materials Table A1. The t-statistics confirm whether the gender gaps are statistically significant or not.
6. As an alternate to our model which is estimated on samples split by different parental son preference regimes, we also estimate a regression model wherein parental son preference enters the equation multiplicatively. These results are presented in Supplementary Materials Table A2. For the urban sample (columns 1 and 2), the result that female children fare worse when only the mother has a son preference and experiences violence continues to hold in this specification. The results for the rural sample (columns 3 and 4) are all statistically insignificant, similar to those in our original model. We contend that while such a specification is more efficient, it also compels us to compare across very different households. In addition, the interpretation of these coefficients is more complicated compared to our original specification.

References

Ackerson, L. K., & Subramanian, S. V. (2008). Domestic violence and chronic malnutrition among women and children in India. *American Journal of Epidemiology*, *167*, 1188–1196. doi:10.1093/aje/kwn049

Ackerson, L. K., & Subramanian, S. V. (2009). Intimate partner violence and death among infants and children in India. *Pediatrics*, *124*, e878–e889. doi:10.1542/peds.2009-0524

Aizer, A. (2011). Poverty, violence, and health: The impact of domestic violence during pregnancy on newborn health. *Journal of Human Resources*, *46*, 518–538. doi:10.1353/jhr.2011.0024

Arnold, F., Kishor, S., & Roy, T. K. (2002). Sex-selective abortions in India. *Population and Development Review*, *28*, 759–785. doi:10.1111/j.1728-4457.2002.00759.x

Berkman, D. S., Lescano, A. G., Gilman, R. H., Lopez, S. L., & Black, M. M. (2002). Effects of stunting, diarrhoeal disease, and parasitic infection during infancy on cognition in late childhood: A follow-up study. *Lancet*, *359*, 564–571. doi:10.1016/S0140-6736(02)07744-9

Bhat, P. N. M., & Zavier, A. J. F. (2003). Fertility decline and gender bias in Northern India. *Demography*, *40*, 637–657. doi:10.1353/dem.2003.0032

Bloch, F., & Rao, V. (2002). Terror as a bargaining instrument: A case study of dowry violence in rural India. *American Economic Review*, *92*, 1029–1043. doi:10.1257/00028280260344588

Brown, L. R., Flavin, C., & Kane, H. (1996). *Vital signs 1996: The trends that are shaping our future*. New York, NY: W. W. Norton.

Chowdhury, S. (2011). Employment in India: What does the latest data show? *Economic and Political Weekly*, *46*(32), 23–26.

Clark, S. (2000). Son preference and sex composition of children: Evidence from India. *Demography*, *37*, 95–108. doi:10.2307/2648099

Das Gupta, M. (1987). Selective discrimination against female children in rural Punjab, India. *Population and Development Review*, *13*, 77–100. doi:10.2307/1972121

Eswaran, M., & Malhotra, N. (2011). Domestic violence and women's autonomy in developing countries: Theory and evidence. *Canadian Journal of Economics*, *44*, 1222–1263. doi:10.1111/j.1540-5982.2011.01673.x

Gaudin, S. (2011). Son preference in Indian families: Absolute versus relative wealth effects. *Demography*, *48*, 343–370. doi:10.1007/s13524-010-0006-z

Imai, K. S., Annim, S. K., Kulkarni, V. S., & Gaiha, R. (2014). Women's empowerment and prevalence of stunted and underweight children in rural India. *World Development*, 62, 88–105. doi:10.1016/j.worlddev.2014.05.001

International Center for Research on Women. (2000). Domestic violence in India: A summary report of a multi-site household survey. Retrieved from https://www.icrw.org/wp-content/uploads/2016/10/Domestic-Violence-in-India-3-A-Summary-Report-of-a-Multi-Site-Household-Survey.pdf

Jayachandran, S. (2015). The roots of gender inequality in developing countries. *Annual Review of Economics*, 7, 63–88. doi:10.1146/annurev-economics-080614-115404

Jayachandran, S., & Pande, R. (2017). Why are Indian children so short? The role of birth order and son preference. *American Economic Review*, 107, 2600–2629. doi:10.1257/aer.20151282

Jensen, R., & Oster, E. (2009). The power of TV: Cable television and women's status in India. *Quarterly Journal of Economics*, 124, 1057–1094. doi:10.1162/qjec.2009.124.3.1057

Jha, P., Kesler, M. A., Kumar, R., Ram, F., Ram, U., Aleksandrowicz, L., … Banthia, J. K. (2011). Trends in selective abortions of girls in India: Analysis of nationally representative birth histories from 1990 to 2005 and census data from 1991 to 2011. *Lancet*, 377, 1921–1928. doi:10.1016/S0140-6736(11)60649-1

Kandpal, E., & McNamara, P. E. (2009). *Determinants of nutritional outcomes of children in India: A quantile regression approach*. Paper presented at the Agricultural and Applied Economics Association 2009 AAEA & ACCI Annual Meeting, Milwaukee, WI.

Koenig, M. A., Stephenson, R., Ahmed, S., Jejeebhoy, S. J., & Campbell, J. (2006). Individual and contextual determinants of domestic violence in North India. *American Journal of Public Health*, 96(1), 132–138. doi:10.2105/AJPH.2004.050872

Koski, A. D., Stephenson, R., & Koenig, M. R. (2011). Physical violence by partner during pregnancy and use of prenatal care in Rural India. *Journal of Health, Population, and Nutrition*, 29, 245–254. doi:10.3329/jhpn.v29i3.7872

Luke, N., Schuler, S. R., Mai, B., Thien, P., & Minh, T. (2007). Exploring couple attributes and attitudes and marital violence in Vietnam. *Violence Against Women*, 13, 5–27. doi:10.1177/1077801206295112

Lundberg, S., & Pollak, R. A. (1996). Bargaining and distribution in marriage. *Journal of Economic Perspectives*, 10(4), 139–158. doi:10.1257/jep.10.4.139

Martin, S. L., Tsui, A. O., Maitra, K., & Marinshaw, R. (1999). Domestic violence in Northern India. *American Journal of Epidemiology*, 150, 417–426. doi:10.1093/oxfordjournals.aje.a010021

Mishra, V., Roy, T. K., & Retherford, R. D. (2004). Sex differentials in childhood feeding, health care, and nutritional status in India. *Population and Development Review*, 30, 269–295. doi:10.1111/j.1728-4457.2004.013_1.x

Pande, R. (2003). Selective gender differences in childhood nutrition and immunization in rural India: The role of siblings. *Demography*, 40, 395–418. doi:10.1353/dem.2003.0029

Retherford, R. D., & Roy, T. K. (2003). *Factors affecting sex-selective abortion in India and 17 major states, national family and health survey subject reports* (Technical Report 21). Hawaii: International Institute for Population Sciences, Mumbai and East-West Center Program on Population.

Rosenzweig, M. R., & Shultz, T. P. (1982). Market opportunities, genetic endowments, and intrafamily resource distribution: Child survival in rural India. *American Economic Review. 72*, 803–815. Retrieved from http://www.jstor.org/stable/1810018

Sahn, D. E., & Stifel, D. C. (2002). Parental preferences for nutrition of boys and girls: Evidence from Africa. *Journal of Development Studies*, 39, 21–45. doi:10.1080/00220380412331322651

Subramanian, S. V., Ackerson, L. K., Smith, G. D., & John, N. A. (2009). Association of maternal height with child mortality, anthropometric failure, and anemia in India. *Journal of the American Medical Association*, 301, 1691–1701. doi:10.1001/jama.2009.548

Subramanian, S. V., Ackerson, L. K., Subramanyam, M. A., & Wright, R. J. (2007). Domestic violence is associated with adult and childhood asthma prevalence in India. *International Journal of Epidemiology*, 36, 569–579. doi:10.1093/ije/dym007

Tarozzi, A. (2012). Some facts about boy versus girl health indicators in India: 1992–2005. *CESifo Economic Studies*, 58, 296–321. doi:10.1093/cesifo/ifs013

Tauchen, H. V., Witte, A. D., & Long, S. K. (1991). Domestic violence: A nonrandom affair. *International Economic Review*, 32, 491–511. doi:10.2307/2526888

Thomas, D. (1994). Like father, like son; like mother, like daughter: Parental resources and child height. *Journal of Human Resources*, 29, 950–988. doi:10.2307/146131

WHO Working Group. (1986). Use and interpretation of anthropometric indicators of nutritional status. *Bulletin of the World Health Organization*, 64, 929–941.