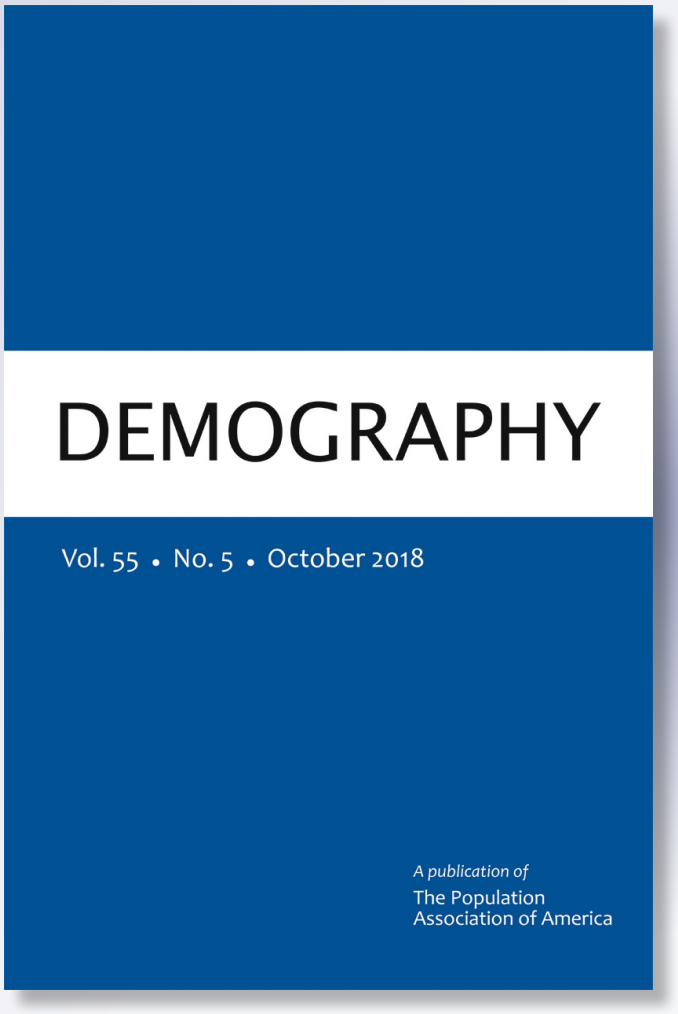
Gender Bias in Parental Attitude: An Experimental Approach

Lutfunnahar Begum, Philip J. Grossman & Asadul Islam

Demography

ISSN 0070-3370
Volume 55
Number 5

Demography (2018) 55:1641-1662
DOI 10.1007/s13524-018-0699-y



Springer

Demography (2018) 55:1641–1662
https://doi.org/10.1007/s13524-018-0699-y

Gender Bias in Parental Attitude: An Experimental Approach

Lutfunnahar Begum[1] · **Philip J. Grossman**[2] · **Asadul Islam**[3]

Published online: 3 August 2018

Abstract Parental bias toward children of a particular gender has been widely observed in many societies. Such bias could be due to pure gender preference or differences in earning opportunities and concern for old-age support. We conduct a high-stakes allocation task (subjects allocate the equivalent of one day's wages between male and female school-aged students) in rural Bangladesh to examine parental attitudes toward male and female children. Parents, either jointly or individually, allocated freely or restricted endowments for the benefit of anonymous girls or boys at a nearby school. We examine whether there is any *systematic* bias among fathers and mothers and, if so, whether such bias differs when they make the decision individually or jointly. The results suggest (1) bias both for and against boys or girls but no *systematic* bias by either parent; and (2) no significant differences in individual and joint decisions.

Keywords Parental bias · Gender · Allocation task · Field experiment

Introduction

Policymakers in developing countries constantly struggle to address discrimination against girls and women. Deep-rooted gender stratification and discriminatory beliefs

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s13524-018-0699-y) contains supplementary material, which is available to authorized users.

✉ Asadul Islam
asadul.islam@monash.edu

[1] National Board of Revenue, Dhaka, Bangladesh

[2] Department of Economics, Monash University, Melbourne, Australia

[3] Department of Economics, Monash University, PO Box 197, Melbourne, Caulfield Vic 3145, Australia

can be at play in the formation of gender preferences (Glaeser and Ma 2013; Pande and Astone 2007). Several studies have established that in many parts of the world, differentiating on the basis of gender has resulted in inequitable treatment of boys and girls (for a review, see Barcellos et al. 2014). However, these studies, which relied primarily on observational data, documented preferences of parents toward a boy or a girl that may not be the real preferences. For example, parents' expectations of sons and daughters could differ because sons bring benefits to their parents (e.g., old-age insurance or better labor market prospects), whereas daughters impose costs (e.g., dowry). Therefore, observed gender differences in terms of allocation of resources do not necessarily imply that parents have a preference for sons.

We differ from the existing literature on gender bias, which has relied on surveys that are confounded by a number of factors. We conduct a high-stakes allocation task (subjects allocate the equivalent of one day's wages between male and female students) in rural Bangladesh to control for a number of confounding factors, such as old-age insurance or better labor market prospects, which may confound the actual parental preferences revealed in survey data. We examine whether there is any *systematic* bias among fathers and mothers and, if so, whether such bias differs when they make the decision individually or jointly.

Gender bias can be a result of gender stereotyping or discriminatory beliefs about gender role, which result from socioeconomic factors, cultural norms, or religious teaching. Such taste or stereotyping may originate from persuasion or even from pre-adult influences (Fershtman and Gneezy 2001; Glaeser and Ma 2013) and may lead to discrimination (Becker 1957) if parental belief or prejudice toward gender affects parents' preferences. For example, a common belief in patriarchal societies is that women should concentrate on household activities but that market-oriented activities are suitable for men. "A home can be happy only by the virtue of women" is a common saying in many South Asian and other patriarchal societies. If we assume that parents are altruistic and want to make their children happy, then by adopting this belief of segregation in gender role-play, they will place a greater weight on educating a son than on educating a daughter. Religious teaching also often reinforces a belief that boys are more valuable than girls, with boys being essential for the salvation of the soul in many religions.[1]

A number of studies in the context of South Asia have attempted to identify parental preference toward boys and girls using survey questions on their attitudes (Bose and Bose 2009; Kingdon 2002). However, identifying parental preferences through this type of attitudinal question might be biased, with survey respondents reluctant to express their beliefs. To examine gender bias, we conduct a high-stakes allocation task, wherein the subjects are parents of school-aged children. The task is designed such that the outcome does not directly affect the subjects themselves or their own children. This unique feature of the allocation task, together with the anonymity of decision, minimizes any motivation for the subjects to hide their true preferences. The task was conducted between two mutually exclusive groups and involves individual and joint decisions. We also add a variation to our design to test whether subjects accurately reveal their preferences by restricting the choice set to splits that strongly preferred either the boys or the girls. We address the potential concern about whether our design

[1] These issues are discussed in more detail in the next section.

is able to identify the bias due to pure parental preferences. We believe our allocation task offers us a better understanding of the different aspects of gender bias than the conventional approach of relying on survey data.

Our findings can be summarized as follows. The results indicate that a large number of parents reveal bias. However, we do not find any *systematic* bias by either parent. When we consider only biased parents, neither fathers nor mothers are systematically biased. We also find that joint decisions elicit more biased choices than do individual decisions, but again we observe no systematic bias. Parental and household characteristics differ between unbiased and biased parents, suggesting that these characteristics do play a role in explaining bias. Finally, the outcome from the restricted allocation task suggests that the subjects revealed their actual preferences. Our results call for cautious interpretation of gender bias that exists in many developing countries. The results suggest that gender bias in these countries could be largely due to the social security system (e.g., reliance on sons) or labor market discrimination faced by women. Hence, gender bias in developing countries could be addressed primarily through affirmative action in the labor market or other policies, such as addressing the old-age security concern.

The Context

Bangladesh poses an interesting case to study parental attitudes toward gender because of its socioeconomic transformation in last few decades. In Bangladesh, Muslims constitute approximately 90 % of the population, followed by Hindus at 8 % to 9 %. Both Hindu and Muslim communities in Bangladesh are based on traditional patriarchal norms, including gender segregation (*purdah*)[2] and the seclusion of women, with local religious leaders and community elders exerting significant influence by nurturing these norms (Cain et al. 1979; Munshi and Myaux 2006). Anecdotal evidence strongly suggests a cultural preference for boys. Previous studies on Bangladesh found mixed evidence of gender bias in intrahousehold allocation (Chen et al. 1981; Pitt et al. 1990).

Bangladesh has made considerable improvements in female educational provision in recent years, particularly at the primary and secondary level (Begum et al. 2017; Hahn et al. 2018). The rapidly expanding nongovernmental organization (NGO) activities—including the Grameen Bank and BRAC, microcredit programs, and the garment sector in Bangladesh—have mostly targeted women for credit and employment and have been key driving forces in increasing the mobility and social interactions of rural women. Despite the progress, very few girls participate in vocational, technical, and higher education, and female participation in these areas tends to be highly sex-segregated and stereotyped. This limits women's upward mobility in the labor market. At present, women are playing a growing role in agriculture; however, social practices and cultural norms effectively exclude women from direct access to land. It is customary for a woman not to claim her share of the family property unless it is willingly given. Violence against adolescent girls and women is still common. A 2010 report from

[2] *Purdah* is a religious and social practice among Muslims (and Hindus, especially in Indian subcontinent) that involves the seclusion of women from public observation by means of concealing clothing, including the veil.

United Nations Development Programme (UNDP 2010) argued that an estimated 3.2 million women are missing in Bangladesh, where the sex ratio at birth is 1.04.

In rural areas, daughters are still commonly seen as an economic liability. Parents consider marrying them off as soon as possible so that the costs of feeding them can be shifted to husbands. Sons, on the other hand, are considered insurance against poverty in old age. Adult children, particularly sons, are considered to be the main source of security and economic support to their parents, particularly in times of disaster or sickness and in old age (Cain 1986). In the absence of old-age insurance, parents rely exclusively on the male child for support during their elder years. Old-age dependency ratio (65+ per 20–64) of Bangladesh was 9.1 in 2015 and has been growing at an average annual rate of 4.1 % over the last two decades.

Related Studies

A large body of literature suggests parental bias in favor of boys, particularly in South Asia and the Middle East (see Barcellos et al. 2014 for a review), but other studies have found no pro-male bias (see, e.g., Bhalotra and Attfield 1998). A bias in favor of boys can be partly explained by labor market discrimination toward females. If market returns are higher for males, investing more in boys represents an efficient allocation of intrahousehold resources (Becker 1991; Rosenzweig and Schultz 1982). Alternatively, parents with a strong aversion to inequality among children might invest more in girls in this situation (Behrman et al. 1982). Some researchers have argued that poverty or resource constraint is the source of parental bias and that parents may favor boys if they face bad times (Maccini and Yang 2009; Rose 2000). However, some studies have found evidence of stronger bias in households with greater socioeconomic status (Basu 1989).

The gender difference in mortality between the northern and southern part of India, which cannot be explained by differences in income, has received wide attention in the literature. Bardhan (1974) suggested that this regional difference between northern and southern India can potentially be explained by the differential participation of women in the production process. However, as Gupta (1987) pointed out, this low labor force participation explanation cannot explain the discrimination against females in Haryana and Punjab in India. Gupta (1987) suggested that discrimination against girls originates mainly from cultural factors: the widespread practice of dowry payments, kinship patterns, and the marriage system can lead to a preference for sons. Research shows that even in developed countries where the differential returns due to economic or social factors do not exist or are minimal, parental sex preference is evident. Andersson et al. (2006) suggested that culturally rooted preferences for sons may prevail despite the acknowledged social, political, and reproductive rights of women.

Several studies have documented religion or caste-based gender differences in mortality, sex ratio, and education (Bhalotra et al. 2010; Borooah and Iyer 2005). The greater observed gender bias among Hindus than Muslims can be partly explained by the differences in the marriage and kinship system (Bhalotra et al. 2010). Cultural or religious teachings may lead to a belief that men are more valuable than women, to gender stereotyping, or to a psychological distaste for women's role in market activities. Muslim kinship shares both Dravidian and Indo-Aryan characteristics. Consanguineous marriage is common in South Asian and other Muslim communities. Further, Islam

recognizes property rights for women, dowry is less important in Muslim society in general, and Hinduism is traditionally based on patrilineal inheritance and excludes women from inheritance rights. However, in traditional patriarchal Muslim societies, Quranic provisions concerning women's status and position are sometimes misinterpreted by fundamentalist Muslim leaders and used to exacerbate the subordination and oppression of women and suppress their values and rights (Howland 2001; Othman 2006). Delavande and Zafar (2013) found evidence of bias against females among *Madrassa* (religious institution) students in Pakistan.

Religious fundamentalist forces in other religions such as Buddhism, Christianity, or Judaism also interpret religious teachings in ways that sustain the patriarchal norms and have negative effects on women (Derichs and Fleschenberg 2010; Howland 2001). Hindus believe that a person's soul can achieve salvation and reach heaven if a son offers ancestral worship and lights the funeral pyre (Arnold et al. 1998), with this belief contributing directly toward a distinct preference for sons in Hindu society. Notwithstanding the many aforementioned differences among the religions, one common feature of these religions is that the patriarchal gender relations promulgated within these religions lead to the subordination of women to men.

Preferences may differ between the two parents. For example, mothers may favor daughters, and fathers may favor sons, or vice versa. The literature has provided only indirect evidence of different parental preferences. For instance, studies have found that a mother's education or income has a greater effect on a daughter's education or health, and a father's education or income has a greater effect on a son's education or health (Emerson and Souza 2007; Lillard and Willis 1994; Thomas 1990, 1994). Thomas (1994) argued that because a mother has a longer and closer relationship with a daughter than with a son, it is more beneficial to invest in a daughter.

The different preferences of fathers and mothers suggest that the ultimate resource allocation to boys and girls is an outcome achieved through intrafamily bargaining. Studies have rejected the income-pooling mechanism in the intrahousehold allocation process, implying that the differential preferences of spouses play an important role in the intrahousehold decision-making process (Bourguignon and Chiappori 1992; Thomas 1994). However, Ashraf (2009) found that the ultimate household decision also depends on the relative influence of household members. Our study sheds light on the intrahousehold bargaining process between spouses by comparing two groups of couples, with one group making individual decisions and one group making a joint decision.[3]

Design and Procedure of the Allocation Task

Study Sample

The allocation task was conducted in 2012 in 66 villages in two districts (Khulna and Satkhira) in southwestern Bangladesh.[4] Nine hundred couples were randomly selected from households that had school-aged children of both genders (6–18 years). The

[3] See Munro (2018) for a survey of the recent experimental work on intrahousehold decision-making.

[4] These two districts are typical of any Bangladesh's 64 districts. They were chosen because the research team has been working on other projects in those districts for a number of years.

sample includes *all* families with children regardless of whether they are in school. We chose families with school-aged children because they are making actual human capital investment decisions for both boys and girls.[5] Thirteen households, on average, were selected from each village, with a minimum of 4 and a maximum of 34 households from a village. The final sample consists of 882 couples (households), or 1,764 individuals.[6] Each participant received a participation fee of 120 *taka* (120 *taka* ≈ US$1.70 at the time of the study), the average daily wage of an adult.[7] Considering that most women are not wage-earners, the total payment per couple (240 *taka*) would have been attractive to these households.

The allocation task and surveys were administered by locally recruited enumerators fluent in the local dialect. Given that many males work outside during rice cultivation and harvesting season, the study was conducted during a lean period when most people stay at home. We selected subjects randomly from a list of previous households surveyed for another project in the same villages. Enumerators went to each of the selected households and invited the parents to participate in the study.[8] The subjects were told that both husband and wife needed to be present to participate. They were informed only that we were running a general household survey and that they would be paid for participation in the survey if both of them were at home on the particular day.[9] Because we were concerned that the subjects' behavior might be influenced through the spread of gossip among neighboring households, all households in a village participated on the same day, and all within the same *para* (neighborhood) participated at the same time. Furthermore, the typical village in our sample averaged more than 2,000 households; at most, only 34 households in a village participated.

Allocation Task Design

In the allocation task, parents divided a sum of money between an anonymous girl student and an anonymous boy student. The task is designed such that the outcome does not directly affect the subjects themselves or their own children. Given that the task outcome does not affect the subjects directly, it is more likely to capture real bias. Parents individually (jointly), divided 120 (240) *taka* between anonymous male and female school children. The unique design of the exercise minimizes any motivation for the subjects to hide their real preferences. The parents were informed that all money allocated to the girl (boy) would be donated to local schools to fund education-related

[5] Our sample is representative of the rural households. We do *not* restrict the sample to only households with children at school. We include *all* households with school-aged children, including those families with no school-going child.

[6] We omitted 18 households because one or both parents were absent at the time. No household refused to participate in the study. The obvious reason for not refusing to participate is that the participation fee was high relative to the participants' opportunity cost. Also, the enumerators and the third author were local. Nonetheless, unanimous acceptance is not uncommon in other experimental studies of this type (Carlsson et al. 2012).

[7] The average daily wage in the locality at the time of the study was roughly 150 *taka* for males and 100 *taka* for females.

[8] Enumerators were supervised by trained research assistants with experience in conducting similar field experiments. The supervisor and all enumerators were trained by the authors and given guidelines for the study.

[9] We conduct the allocation task and surveys in subjects' homes because of the common concern that subjects might behave differently in an artificial experimental environment.

gifts for girl (boy) students. At the time the parents made their decisions, they did not know exactly which school would receive their contributions. Parents knew only the gender of the beneficiaries of their decisions.

The enumerators gave copies of the written instructions to each individual, read them aloud, explained the procedures and instructions of the task, and answered all questions (see the online appendix for instructions). After receiving and hearing the instructions, the parents could choose whether to participate, and they could withdraw from the study at any time. The study started after the parents understood the procedures of the allocation task. The task and surveys were typically completed within two hours. Subjects participated in one of four treatments: Unrestricted Individual (UI), Unrestricted Joint (UJ), Restricted Joint (RJ), and Restricted Individual (RI). We detail the procedures for the Unrestricted Individual treatment (UI), and the remaining three treatments followed the same basic procedures. Differences are discussed later herein.

Unrestricted Individual (UI). In the UI treatment, each parent was given 120 *taka* in units of four 5-*taka* notes and ten 10-*taka* notes, providing 25 alternative allocation possibilities. In private, each parent allocated the money between two envelopes—one marked "girl" with a stylized picture of a girl and the other marked "boy" with a stylized picture of a boy.[10] There was no restriction on how they allocated their endowments.

The participants were assured about the anonymity of their decisions at the beginning of the task (see instructions for the task in the online appendix). To maintain the anonymity of the decisions, each parent was randomly assigned an ID number, and the number was never associated with the individual's name. Parents were also separated into two rooms or separate closed areas so that they could not hear or communicate with each other.

The envelopes were marked with the parent's ID number. The parent went to a second room or separate closed area in the residence and allocated the money between the two envelopes. When the parent returned to the main room, the envelopes were handed to the enumerator, who placed them in a sealed box. Individual- and household-level survey data were collected immediately after the allocation task was completed. Survey forms were marked with the parent's ID number. Each parent separately and privately answered individual-level attitudinal questions. Either individually or jointly, parents provided the household-level general information.

After collecting all the envelopes from all the households participating in the village, the enumerator submitted the boxes, which were sealed and signed, to the study coordinator. We were aware that parents might have concerns that the money would not be allocated according to their preferences. To maintain trust, the envelopes were opened the same day or the following day in front of a representative from the school receiving the money and a local leader.[11] Participants in the study were informed about the time and venue of the ceremony and were invited to observe the whole process; most of the participants attended the ceremony. Before

[10] The envelopes were labeled with the drawings because some parents may be illiterate. Envelopes were marked with ID numbers to allow matching of allocation decisions and survey responses. None of the participants stole the money.

[11] The third author has a strong connection in these areas and has been conducting a multiyear intervention in the area with the same group of enumerators.

conducting the study in a village, we also informed the schoolteachers, village leaders, and elders about the procedure for donating money from the task to the boy and girl children in schools. Parents were also informed about such arrangements. All these directives helped ensure that schools would divide the money between boys and girls as instructed.

Unrestricted Joint (UJ). In this treatment, the parents jointly decided how to allocate a common endowment of 240 *taka* (in units of eight 5-*taka* notes and twenty 10-*taka* notes, providing them with 49 alternative allocation possibilities) between the two envelopes. The objective of this treatment is to observe whether the individual distribution decisions differ from the joint distribution decisions.

Restricted Individual (RI). This treatment replicates UI but with restrictions on the allocation of the endowment, forcing a parent to prefer either the boy or the girl. The 120-*taka* endowment was divided into one 80-*taka* bundle and one 40-*taka* bundle. Parents were required either to allocate 80 *taka* to the boy and 40 *taka* to the girl or to allocate 40 *taka* to the boy and 80 *taka* to the girl.

Restricted Joint (RJ). This treatment replicates UJ but with restrictions on the allocation of endowment, forcing parents to prefer either the boy or the girl. The 240-*taka* endowment was bundled into one 160-*taka* bundle and one 80-*taka* bundle. Parents were required either to allocate 160 *taka* to the boy and 80 *taka* to the girl or to allocate 80 *taka* to the boy and 160 *taka* to the girl.

The objective of incorporating treatments RI and RJ is to observe whether parents accurately reveal their preferences in treatments UI and UJ, which place no restriction on the allocation of money. For example, if a person (couple) is biased, that person (couple) may not wish to reveal this for any number of reasons, and to avoid doing so may select an even or close to even split in UI and UJ. Hence, these treatments may or may not reveal the parents' actual preferences. In RI and RJ, a biased person (couple) cannot hide the bias unless that person (couple) wants to act in a way that not only hides their bias but runs significantly counter to that bias. The parents have to either reveal their true bias or reveal the opposite preference.[12] It is reasonable in this case to assume that the person (couple) is more likely to choose the allocation consistent with the person's (couple's) real bias. The expectation then is that the percentage of choices biasing girls should be significantly different from 50 %.

If instead, parents are not systematically biased, then if forced in RI and RJ to choose between a boy-biased and a girl-biased allocation, they should choose randomly. Now

[12] Figure A1 in the online appendix shows the 25 choices available to subjects assigned to UI and the two choices available to subjects assigned to RI. Let us take a parent whose actual preference is at point A. The parent might hide his/her preference by choosing an equal split at point C, which moves him/her from U_1 to U_3. Limiting the choice set to just two options forces the parent to move to U_4 (point D) if he/she wants to hide the real preference. Instead, the other option (point B) is closer to real preferences. As the graph illustrates, the manipulation forces the person to move to a much lower utility level if he/she wants to hide the actual preferences. Given the restricted choice set, parents supposedly choose the option that gives them the highest utility. This restriction also forces parents to show bias even when they are not biased to any gender. However, this might be explained by extreme cases where parents need to choose investing in either a boy or a girl—for example, due to resource constraint. Nonetheless, our main objective of incorporating this restriction is to compare the average bias shown by the parents between treatments without and with restriction.

the expectation is that the percentage of choices biasing girls should not differ significantly from 50 %. If results from UI (UJ) do not systematically differ from RI (RJ), this suggests that UI and UJ are reasonably accurate measures of bias. If these paired results are systematically dissimilar, this suggests that UI and UJ provide inaccurate measures of bias.

The important feature of the allocation task is that the parents' own children are not directly affected by their decisions. This feature minimizes the effect of other factors that might typically influence a parent's resource allocation decision for his or her own children of different genders, leaving only the parent's bias toward the gender of a child. We deliberately kept the sample size in UI larger than other treatment groups, considering both our limited budget and our primary focus on identifying the attitude of individual parents (UI).[13]

We did consider other alternative procedures. One would have required a parent to divide the money between her own son and daughter. We dismissed this procedure because the parent's decision might be driven by other factors. In addition, the parent would know how much each child received and, post-experiment, could demand that the child relinquish the money, thus rendering the allocation decision irrelevant. A second alternative was to have a parent allocate money to another couple's children. We dismissed this procedure because parents would have to provide consent for their children to participate. If both parents and children participated, parents (knowing the rules) might try to retrieve the money given to their children. Also, the parent might believe there was a high likelihood that the money would be confiscated by the child's parents and not directly benefit the child, which might make the parent reluctant to allocate the money according to his or her preferences. By having the money benefit an anonymous child, parents were freer to express their gender preferences.

Hypotheses

Based on the evidence discussed earlier, we test the following hypotheses:

> *Hypothesis 1* (H1): In all treatments, a disproportionate share of the endowments will be allocated to the boy.

As previously noted, Bangladeshi society is one in which culture, religion, and market forces all prefer boys relative to girls. We expect that our subjects' allocations will reflect this fact.

> *Hypothesis 2* (H2): More bias will be observed in the restricted treatments.

Assuming a parent is biased toward boys, he/she may wish to conceal this bias from the experimenters. Doing so, however, incurs a cost; his/her chosen allocation will differ from his/her preferred allocation. The unrestricted treatments enable a subject to

[13] The results reported later herein are not affected by the differences in the sample sizes or characteristics across treatment groups.

balance the marginal benefits from concealing his/her true preferences against the marginal costs from deviating from his/her preferred allocation by choosing a more equal allocation—or, if his/her desire to deceive is strong enough, he/she may choose an allocation benefiting girls. The restricted treatments require a subject who wishes to hide his/her preference to incur the greatest cost; he/she cannot just moderate his/her bias but must reverse his/her preferences.

Hypothesis 3 (H3): Less bias will be observed in our joint treatments than in our individual treatments.

The ultimate resource allocation to boys and girls is an outcome achieved through intrafamily bargaining. Observed bias in the joint treatments will reflect a compromise between fathers and mothers.

Hypothesis 4 (H4): Fathers will reveal more boy bias than mothers. Parents will be relatively more biased to same-gender children.

Existing evidence suggests that parents are biased toward same-gender children.

Empirical Approach

To identify parental bias toward male and female children, we examine bias from two perspectives. First, we identify whether the parents individually or jointly reveal any bias by deviating from an even split of their endowments.[14] Second, if bias is revealed, we test for any systematic girl bias using the subsample with unequal splits of the endowment.

We run the following regression to test whether parental bias differs systematically by parent gender:

$$bias_{ij} = \alpha_0 + \alpha_1 Mother_i + \alpha_2 \mathbf{X}_{ij} + \alpha_3 \mathbf{H}_j + \varepsilon_{ij}, \quad (1)$$

where $bias_{ij}$ is bias of parent i in household j, with $i = 1, 2$; $Mother_i$ is equal to 1 for the female parent; $\mathbf{X}_{ij}$ is a vector of variables representing individual characteristics of parent i inhousehold j; and $\mathbf{H}_j$ is a vector of characteristics for household j. $\mathbf{X}$ and $\mathbf{H}$ include age and education of parents, household income, number of sons, number of children, and religion.[15] We are mainly interested in the coefficient α_1—the differences in bias of father and mother.

We define *bias* in three ways: (1) $Girl_{ij}$ / $Total_{ij}$ is the proportion of the endowment allocated to a girl; (2) Unbiased is equal to 1 if parent i in household j chooses an equal

[14] We choose to be conservative in what we consider unbiased. Any deviation from an even split is defined as biased.

[15] We also include a number of control variables in our regression to examine whether household composition can affect our main results. Our results remain the same when we add controls, such as whether first child is girl, ratio of son to daughter, whether the family has only one son, or whether the family has only one daughter.

split; and (3) $Girl\text{-}biased_{ij}$ is equal to 1 if parent i in household j conditional on being biased, allocated to the girl more than 50 % of the endowment.

We estimate standard errors by clustering at the village level. We also cluster standard error at the household level to account for intrahousehold correlation, and the results remain robust.

The allocation of resources between male and female children is a household decision. The joint household decision may predominantly reflect the preferences of one parent or may be a compromise. As such, the individual preferences revealed in UI may not reflect the joint preferences by the couple in the household. We test whether household behavior differs systematically between individual and joint decisions by estimating the following regression:

$$bias_j = \beta_0 + \beta_1 C_j + \beta_2 \mathbf{X}_{ij} + \beta_3 \mathbf{H}_j + \xi_j, \tag{2}$$

where C_j is equal to 1 if it is a joint decision. We compare joint decisions in UJ with the individual decisions in UI by father, the mother, and their combined decisions.

We next test whether our subjects reveal their bias in the allocation task. In UI and UJ, bias can be disguised by evenly dividing the endowment. RI and RJ force subjects to express a gender preference. If, for example, a parent is boy-biased, disguising this bias in RI requires the parent to strongly prefer girls. We run the following regression with the sample consisting of participants in UI and RI in order to identify whether subjects reveal their true bias in UI.

$$bias_{ij} = \lambda_0 + \lambda_1\, mother_{ij} + \lambda_2 R_j + \lambda_3 \mathbf{X}_{ij} + \lambda_4 \mathbf{H}_j + \boldsymbol{\varphi}_j, \tag{3}$$

where, $bias_{ij}$, $mother_{ij}$, $\mathbf{X}_{ij}$, and $\mathbf{H}_j$ are defined as earlier, and R_j is equal to 1 for restricted decisions. Similarly, using participants in UJ and RJ, we identify whether subjects revealed their actual preferences when making the joint decision:

$$bias_j = \delta_0 + \delta_1 R_j + \delta_2 \mathbf{X}_{ij} + \delta_3 \mathbf{H}_j + \eta_j, \tag{4}$$

where, $bias_j$, $\mathbf{X}_{ij}$, R_j, and $\mathbf{H}_j$ are defined as earlier.

We use generalized linear model (GLM) estimation when the dependent variable is a proportion. For the dummy dependent variable, we use a linear probability model (LPM).[16] We also report results for UI using household-level fixed-effects regression. The fixed effects account for all household-level characteristics (observed and unobserved) and compare husbands and wives within the same household. The results are reported in Table A2 in the online appendix. Note that we cannot run household fixed-effects regression in other treatments because we have only one observation per household when the husband and wife make the joint decision. For consistency of our estimates, we report the results using household and individual controls as mentioned earlier, which cannot control for household fixed effects because these characteristics are the same within the household level.

[16] We also use logit and probit regressions for binary outcomes, and a 0–1 inflated beta distribution for when the outcome is a proportion. The results are similar and are available upon request.

Table A1 in the online appendix presents the descriptive statistics by two main treatment groups, UI and UJ. The mean ages of the fathers and mothers are 42–43 years and 34–35 years, respectively. Fathers and mothers have, on average, a primary school education in both treatments. Approximately 70 % to 80 % of the households across the groups are Muslim. The mean yearly income of the households among the groups is 92,000–100,000 *taka*. There are no significant differences in terms of parental age and household income across different groups. We control for all these characteristics in our regression to account for differences across treatment groups. Moreover, we also used a sample that balances all the characteristics; the results, available upon request, remained the same.

Results

Hypotheses

We first summarize our findings for Hypotheses H1–H4. Based on the evidence discussed in following sections, we report the following results:

Result 1: H1 is rejected. In all treatments, boys are not allocated a disproportionate share of the endowments. We observe no systematic bias toward boys or toward girls.

Result 2: H2 is rejected. Our restricted treatments do not exhibit more systematic bias than our unrestricted treatments.

Results 3: H3 is rejected. More bias is observed in our joint treatments than in our individual treatments. However, the observed bias does not systematically prefer boys.

Results 4: H4 is rejected. Fathers (mothers) are not systematically biased toward same-gender children.

Summary of the Outcomes of the Allocation Tasks

Table 1 summarizes the allocation decisions in the four treatments. Overall, the results suggest no systematic bias; on average, subjects in all treatments split the endowment equally between boys and girls. In the UI treatment, a majority of parents split the endowment equally (64 % of the fathers and 70 % of the mothers). Of the minority who reveal a bias, one-half are boy-biased, and one-half are girl-biased. In the UJ treatment, we observe more evidence of bias; only 40 % of the couples split the endowment equally. Again, however, among those couples revealing bias, only slightly less than one-half (46.6 %) prefer girls. Thus, there is slight preference for boys in UJ, although the difference is not significant. Figure 1 shows the distributions of the proportions allocated to girls by fathers, mothers, and couples in the UI and UJ treatments. The figure suggests that parents who decide independently and those who decide jointly overwhelmingly choose the equal split. Even among those who exhibit some bias, the split does not deviate dramatically from an equal split. Finally, the girl bias observed in both the RI and RJ treatments for fathers, mothers, and couples is not significantly different from an even split (p values > .43, in every case).

Table 1 Allocation decisions by treatment: Unrestricted individual (UI), unrestricted joint (UJ), restricted individual (RI), and restricted join (RJ)

Treatment	UI (1)	UJ (2)	RI (3)	RJ (4)
A. Mean % Allocated to Girl[a]				
Father	50.4	N/A	50.9	N/A
	(8.6)		(16.7)	
Mother	49.9	N/A	50.4	N/A
	(5.9)		(16.7)	
Joint		49.5		51.0
		(8.6)		(16.7)
Number of households	310	197	186	189
B. % Unbiased[b]				
Father	63.5		N/A	N/A
Mother	70.0		N/A	N/A
Joint		40.1		
Number of households	How many unbiased in UI			
C. % Girl Biased (if biased)				
Father	50.4	N/A	52.7	N/A
Mother	50.5	N/A	51.1	N/A
Joint		46.6		52.9
Number of households				

Notes: Standard deviations are shown in parentheses. N/A = not applicable for the group. UI refers to individual decision with no restriction on endowment allocation; UJ refers to joint/couple decision with no restriction on endowment allocation; RI refers to individual decision with restriction (two alternate choices) on endowment allocation; and RJ refers to joint/couple decision with restriction (two alternate choices) on endowment allocation.

[a] Indicates the percentage of the total endowment allocated to a girl by *all* mothers, fathers, or jointly.

[b] Applies only for UI and UJ because RI and RJ subjects are forced to make biased decisions.

UI and UJ

We test for evidence of systematic bias in the UI and UJ decisions by applying means tests. We cannot reject the null hypothesis that fathers, mothers, and couples allocate girls an equal share of the endowment (p values > .10 in each case; two-tailed test).[17] Furthermore, if we consider the subsample of parents and couples who exhibit bias, the mean percentage of the endowment allocated to boys does not differ significantly from that allocated to girls (p values > .10 in each case; two-tailed test).[18]

If no systematic bias exists, then the distributions of proportions allocated to girls should be symmetric. The distributions illustrated in Fig. 1 appear roughly symmetric

[17] We check whether parental allocation in the task is correlated with the gender of the firstborn child. The correlation coefficient is not significant in any of the treatments.

[18] Furthermore, Wilcoxon rank sum tests cannot reject the null hypothesis that the allocations to boys by boy-biased fathers, mothers, and couples are drawn from the same populations as the allocations to girls by girl-biased fathers, mothers, and couples (p value > .10 in both cases, two-tailed test).

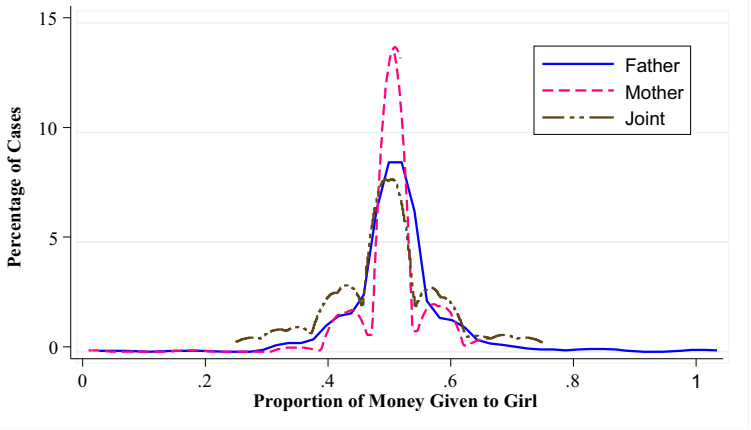


Fig. 1 Distribution of endowment, UI and UJ treatments

and normal. To get a clearer picture of how the actual distributions differ from a normal distribution, we graph the actual allocation distributions against the expected normal allocation distributions given the sample sizes, means, and standard deviations (see Fig. A2, online appendix). The actual distributions largely track the expected distributions, especially for couples, given that the actual distributions are discrete rather than continuous and that each distribution has a relatively large mass at 50 %. The father and mother distributions most differ from a normal distribution in the tails, where small numbers of outliers give abnormally large amounts to either the boy or the girl.

We next test whether fathers, mothers, and couples differ in bias. In the UI treatment, 64 % of the fathers and 70 % of the mothers individually choose an equal split. Table 2 reports for treatment UI the number of couples exhibiting the different possible patterns of bias. In 51 % of the couples, both parents are unbiased. Also evident in this table is the symmetry in parental bias: that is, if a father is boy-biased, the mother is equally likely to be boy-biased as girl-biased. A Wilcoxon matched-pairs signed-rank test cannot reject the null hypothesis that fathers and mothers distributed their endowments in the same way (p value > .10). Finally, Wilcoxon rank sum tests cannot reject the null hypothesis that the allocations of fathers and couples and mothers and couples are drawn from the same population (p value > .10 in both cases).[19]

In the UJ treatment, 40 % of the couples jointly choose an equal split; 51 % in the UI treatment choose an equal split (Table 2). Comparing these two proportions of unbiased couples, we find that joint decisions significantly reduce the number of even allocation splits (p value < .05; two-tailed test).

UI Versus UJ Decisions

One would *a priori* expect joint decisions to reduce (or at least not increase) biases if there is heterogeneity in preferences (and not perfect assortative matching according to this preference) and some form of joint decision-making. One possibility for our result

[19] We also find that the combined father and mother allocations from UI do not differ significantly from the couple distribution from UJ.

is that individuals who are more gender-biased are also more likely to have a larger weight in the joint decision-making process (e.g., fathers who discriminate against girls essentially make decisions alone or dominate the decision-making process).

In our questionnaire, we ask parents, separately and privately, who makes the decision on the education of their children. The options are (1) father only, (2) mother only, (3) father and mother jointly, or (4) others (all family members jointly). In roughly one-half the households, fathers and mothers choose different options, generally giving themselves more importance.[20] For example, in the survey response by the participants of the UI sample, 59 % of fathers mention that the mother has some control in the decision-making (options 2, 3, or 4), but 94 % of mothers believe that they have some control in the decision-making. The corresponding figures for UJ are 52 % and 97 %, respectively. In terms of father's control (options 1, 3, or 4), the corresponding figures are 76 % mothers and 93 % fathers in UI, and 78 % mothers and 98 % fathers in UJ. These survey responses indicate that both the father and mother each believes that he/she individually has more control over the decision-making process than what the spouse believes. This gap is larger for mother's control than for father's control, which might reflect noncooperative bargaining between fathers and mothers in their decision-making.

We test whether parental decisions are different between these two types of households. The chi-square test suggests that in UJ (but not UI), households with different responses[21] by parents make significantly more biased choices compared with households with the same response by both parents ($p = .05$). This result suggests that the more biased split in joint decisions than in individual decisions can be explained, at least partly, by the noncooperative bargaining behavior between the parents in the household decision-making process.

Our results indicate that both the father and mother deviate from their individual preferences and that the deviation is greater in the case of the mother.[22] Our finding again suggests that the aggregate behavior of a couple is not a simple extrapolation of any one individual's preferences. The result that none of the households choose an extreme choice in the joint decision also indicates that joint decisions are made more balanced by softening extreme individual preferences.

Regression Analysis

Table 3 reports the marginal effects from GLM and the LPM estimations based on Eq. (1) for the UI sample. The regressions control for individual- and household-level

[20] A number of related questions in the survey relate to who makes the following decisions: (1) overall household matters, (2) education, (3) health care, (4) shopping, and (5) time allocation (going outside the home or work). For overall household matters, fathers' and mothers' answers differ in only a few households; for other specific decisions, though, fathers' and mothers' answers differ significantly. We focus here on the decisions related to children's education, given that the parents in the task are deciding on allocating money that goes to school children.

[21] Households with "different responses" refer to those in which husband and wife report differently in the survey about the decision-making within households.

[22] This is consistent with Carlsson et al.'s (2012) finding from an experiment on intertemporal choice that both parents influence the joint decision, with the father exerting a stronger influence.

Table 2 Unrestricted individual treatment (UI), bias by couple: Number of observations

	Father		
Mother	Boy-Biased	Unbiased	Girl-Biased
Boy-Biased	14	18	15
Unbiased	29	159	29
Girl-Biased	14	20	12

characteristics. The results in panel A suggest that the proportion allocated to girls does not differ significantly by parents' gender. The results in panel B indicate that mothers are not significantly more likely to be unbiased than fathers. The results in panel C offer no evidence that either parent is more inclined to be girl-biased. These results are consistent with the results from nonparametric tests reported earlier.

In Table 4, we compare individual and joint allocation decisions. The regressions control for individual- and household-level characteristics. We report marginal effects from GLM and the LPM estimates based on Eq. (2). Column 1 compares combined allocations of couples from UI with that of UJ. Columns 2 and 3 compare the individual decisions of fathers and mothers, respectively, in UI with the joint decisions of couples in UJ.

Panel A of Table 4 reports marginal effects from GLM estimation in which the dependent variable is the proportion of the endowment allocated to girl. The estimates suggest that parents making joint decisions (UJ) are less generous to girls relative to fathers and mothers combined as well as fathers alone. However, the preference shown to boys is economically minimal. Panel B presents the LPM regression estimates for parental bias. The dependent variable is equal to 1 if the parent(s) are unbiased: that is, if the endowment is split evenly between boy and girl. The results suggest that parents are significantly more likely to be unbiased in individual decisions than in joint decisions. The probability of the father and mother being unbiased is, respectively, 22 and 27 percentage points higher in individual decisions than in joint decisions by both parents. These results again confirm that parents exhibit more gender bias when they make the decision jointly than individually. Panel C presents the LPM regression estimates for the subsample of parents who reveal bias. The results reveal that even among those who exhibit bias, there is no systematic bias toward any particular gender. These results are consistent with the results from nonparametric tests reported earlier.

UI and UJ Versus RI and RJ

Previously, we noted that biased subjects in the UI and UJ who are unwilling to reveal their biases could disguise their preferences by selecting a more equal distribution. To test for this, we include two treatments (RI for individual decisions and RJ for joint decisions) that restrict subjects' choices to either heavily bias boys or heavily bias girls. Biased parents must either reveal their true bias or reveal the opposite preference. It is reasonable to assume that if parents are systematically biased one way or the other, the allocation decision will reflect this; that is, the percentage of choices biasing girls should be significantly different from 50 %. If instead parents are not systematically

Table 3 Unrestricted individual treatment (UI): Marginal effect of parent gender on allocation, generalized linear model (GLM) and linear probability model (LPM) estimates[a]

Variable	(1)	(2)
A. GLM: Dependent Variable Is Proportion Allocated to Girl		
Mother	–0.009	–0.010
	(0.007)	(0.007)
N	620	
B. LPM: Dependent Variable Is Parent Is Unbiased (= 1)		
Mother	0.061	0.073
	(0.048)	(0.047)
N	620	
C. LPM: Dependent Variable Is Parent Is Girl-Biased (= 1)[b]		
Mother	–0.015	–0.026
	(0.088)	(0.085)
N	206	
Individual Control	Yes	Yes
Household Control	No	Yes

Notes: GLM is used when we consider proportion (panel A); LPM is used for binary dependent variables (panels B and C). Standard errors, shown in parentheses, are corrected for clustering at village level. Individual controls include age and indicator for education level; household controls include yearly income, number of sons, number of children (set of dummy variables), and religion (Muslim = 1). Panels A and B include all participants of treatment UI; panel C includes only treatment UI panels who are biased.

[a] Complete regression results are available on request.

[b] If biased.

biased, then when forced to choose between a boy-biased and a girl-biased allocation, parents will choose randomly: the percentage of choices biasing girls will not differ significantly from 50 %.

Table 1 (columns 3 and 4) reports the mean proportion allocated to a girl and the percentage of girl-biased allocations. On average, fathers, mothers, and couples are as likely to be biased toward girls as boys; the mean proportion allocated to a girl is insignificantly different from 50 % (p values > .10 in each case; two-tailed test). Binomial proportions tests fail to reject the null hypotheses that fathers, mothers, and couples chose the girl-biased allocation at random (p values > .10 in each case; two-tailed test).

Table 5 reports results from LPM regressions based on Eqs. (3) and (4), with a sample consisting of individual decisions from UI and RI (column 1) and a second sample consisting of joint decisions from UJ and RJ (column 2), respectively. To maintain comparability, we include only biased parents from UI and UJ: parents in RI and RJ are forced to be biased.[23] We do not find any significant difference between fathers' and mothers' behavior. The results for both the restricted or unrestricted treatments suggest that individuals who have revealed bias do not reveal a systematic

[23] We also run regressions including all parents in the unrestricted treatment groups rather than only biased parents. The results remain robust and are available upon request.

Table 4 Unrestricted individual (UI) versus unrestricted joint (UJ) decisions: Marginal effects, generalized linear model (GLM) and linear probability model (LPM) estimates[a]

Variable	UI vs. UJ		
	Combined (father and mother)	Father	Mother
A. GLM: Dependent Variable Is Proportion Allocated to Girl			
Joint decision	–0.01*	–0.01*	–0.01
	(0.01)	(0.01)	(0.01)
N	507	507	507
B. LPM: Dependent Variable Is Parent Is Unbiased (= 1)			
Joint decision	–0.13*	–0.22*	–0.27*
	(0.05)	(0.05)	(0.05)
N	507	507	507
C. LPM: Dependent Variable Is Parent Is Girl-Biased (= 1)[b]			
Joint decision	–0.06	–0.07	–0.09
	(0.06)	(0.07)	(0.07)
N	254	231	211

Notes: UI refers to individual decision with no restriction on endowment allocation; UJ refers to joint/couple decisions with no restriction on endowment allocation. GLM is used when we consider proportion (panel A); LPM is used for binary dependent variables (panels B and C). Standard errors, shown in parentheses, are corrected for clustering at village level. Panels A and B include all participants in the UI and UJ treatments; panel C includes only participants from the UI and UJ treatments who were biased. The table reports the results with full controls, including individual and household characteristics mentioned in the notes to Table 3.

[a] Complete regression results are available on request.

[b] If biased.

*$p < .05$

preference toward girls or toward boys. Note that because we use between-subject treatments, we do not observe individuals in both treatment conditions. However, subjects across treatments were randomly assigned. Hence, our results suggest that subjects in UI and UJ behave the same way as those in RI and RJ.

Role of Individual and Household Characteristics

Here we try to understand the correlates of the parental bias. When we explore whether basic individual or household characteristics explain the differences in parental bias within subjects of each treatment, a few interesting patterns emerge (see Table A3, online appendix). First, parental education is positively correlated with an unbiased joint attitude. In the joint decision in UJ, mothers in the unbiased group are more educated than those in the biased group. This difference mainly arises from the difference between unbiased and boy-biased groups. Fathers are also more educated in the unbiased group compared with the boy-biased group. This set of findings seems to suggest that in joint household decisions, low parental education is associated with a bias toward boys, whereas higher parental education is associated with a more egalitarian attitude.

Second, household income is associated with only the father's individual decision in UI. Household income is significantly higher in households with girl bias compared with households with an unbiased father, and also when compared with households with a boy-biased father.

Third, the number and gender composition of children is correlated with parental bias. The number of children is higher in households with a girl-biased mother compared with households with an unbiased mother as well as households with a boy-biased mother. In UJ, the ratio of sons to daughters is lower in unbiased households than in biased households. The ratio of sons to daughters is higher in girl-biased households than in unbiased households. In UI, the ratio of sons to daughters is higher in households with a biased mother compared with households with an unbiased mother. The literature suggests that parents with a preference for a particular gender—more likely, a preference for sons in developing countries—tend to have more children (e.g., Chowdhury and Bairagi 1990, for Bangladesh). The result that girl-biased mothers have more children than boy-biased mothers might suggest that the decision to have more children might have been driven by other forces rather than bias. It might also be that the mother's attitude changed over time. One could argue that the advance of microcredit helped Bangladeshi households to be less biased against girls. We consider a subsample of households who are the members of the microcredit organization or involved in NGO activity. Roughly 18 % of 882 households in our sample have membership in either an NGO or a microcredit organization. The results are similar when we consider the samples with membership in NGO or microcredit organizations. Given that we have only a few households in each treatment with membership in microcredit or an NGO, we cannot rule out whether microcredit or membership in an NGO has any role in shaping the parental bias toward a gender.

Discussion and Conclusion

It is a widely documented empirical regularity that female children receive fewer resources than do male children in much of the developing world, particularly in South Asia. In our study, we attempt to capture the extent to which parental biases for male children are driven by taste-based bias compared with market-based bias in Bangladesh. In a modified allocation task, we ask parents to make either individual or joint decisions to divide an endowment between anonymous boys and anonymous girls. We remove any direct benefit to the parents by having the allocated sums distributed to schools that their children may or may not attend in order to fund education-related gifts for students.

Our results indicate that despite bias both for and against boys or girls, on average, we find no systematic bias by either parent. Furthermore, among biased parents, neither fathers nor mothers are systematically biased toward either gender. We also find that joint decisions exhibit more bias than individual decisions, but the bias does not systematically favor a particular gender. Comparing biased and unbiased parents, we observe some significant differences in individual and household characteristics that may explain this bias. The results suggest that, on average, the subjects do not tend to misreport their preferences in an artificial experimental framework.

Table 5 Restricted versus unrestricted decisions[a]

	Individual Decisions	Joint Decisions
Restricted, All	0.01	0.08
	(0.05)	(0.06)
Mother	–0.02	
	(0.05)	
N	578	307

Notes: Table reports marginal effects from LPM estimation. Standard errors, shown in parentheses, are corrected for clustering at village level. The table reports the results with full controls, including individual and household characteristics mentioned in the notes for Table 3.

[a] Complete regression results are available on request.

One potential concern regarding our results is whether the allocation task design is able to identify bias. For example, if parents (and their offspring) do not benefit from their allocation choices, then when making those choices, they may take into account the (perceived) return of investing in an anonymous boy versus investing in an anonymous girl. In a society such as Bangladesh, where favoritism toward boys is a common phenomenon, one would then expect to find that the participants would bias their allocations toward boys.

A second concern is that in our setting, if awareness-building makes people realize that women have been disadvantaged over a long period and that they need to be supported, aversion to inequality might bring about a women-friendly attitude (see, e.g., Fehr and Schmidt 1999). On the other hand, a belief that preferential treatment for girls is antithetical to long-held sociocultural or religious norms and traditions in a patriarchal society might strengthen bias (Goldin 2002; Rudman and Fairchild 2004). For example, Beaman et al. (2009) provided experimental and survey evidence indicating that although exposure to female leaders (through quotas) improves perceptions about female leaders and weakens gender role stereotyping, it does not alter preferences for male leaders by both genders. The overall effect of these counteracting forces is likely to be ambiguous.

Our finding of no systematic bias is consistent with the inequality-aversion of households suggested by earlier studies in Bangladesh (e.g., Pitt et al. 1990) and other developing countries (e.g., Deaton 1989). However, the important distinction of our study is that our results show the inequality aversion in parents' attitude, not in the actual allocation of household resources. Bangladesh differs from other developing countries in several aspects, given its own religious and sociocultural setting as well as the overwhelming progress in sociocultural development and women's empowerment in recent decades (Sen 2013). Because this is a predominantly Muslim population, religion might matter here: the literature suggests Muslims have less aversion to daughters or lower son preference (see Bhalotra et al. 2010), which may explain why we are not seeing any systematic bias. Moreover, in recent decades, the government has also undertaken several initiatives to foster female education and employment. In addition to their economic impact, the presence of a large number of NGOs and their various flagship programs might also exert a sociocultural effect through changing behavioral

norms and attitude in Bangladeshi society in terms of women's roles and participation in socioeconomic activities. Therefore, caution should be made in generalizing the results from this study toward other developing countries.

Acknowledgments We thank Lisa Cameron, Tim Cason, Gaurav Datt, Catherine Eckel, Lata Gangadharan, Glenn Harrison, John List, Yasuyuki Sawada, Russell Smyth, and Steven Stillman. We also thank the participants at the Australian Development Economics Workshop in Canberra, the Econometric Society Australasian Meeting in Sydney, the Asia Pacific Meeting of the Economic Science Association in Auckland, Monash University seminars, and Economic Research Group in Dhaka for their valuable comments and suggestions on earlier versions of this article.

References

Andersson, G., Hank, K., Rønsen, M., & Vikat, A. (2006). Gendering family composition: Sex preferences for children and childbearing behavior in the Nordic countries. *Demography, 43,* 255–267.

Arnold, F., Choe, M., & Roy, T. (1998). Son preference, the family-building process and child mortality in India. *Population Studies, 52,* 301–315.

Ashraf, N. (2009). Spousal control and intra-household decision making: An experimental study in the Philippines. *American Economic Review, 99,* 1245–1277.

Barcellos, S. H., Carvalho, L. S., & Lleras-Muney, A. (2014). Child gender and parental investments in India: Are boys and girls treated differently? *American Economic Journal: Applied Economics, 6*(1), 157–189.

Bardhan, P. K. (1974). On life and death questions. *Economic & Political Weekly, 9*, 1293–1304.

Basu, A. M. (1989). Is discrimination in food really necessary for explaining sex differentials in childhood mortality? *Population Studies, 43,* 193–210.

Beaman, L., Raghabendra, C., Esther, D., Rohini, P., & Petia, T. (2009). Powerful women: Does exposure reduce bias? *Quarterly Journal of Economics, 124,* 1497–1540.

Becker, G. S. (1957). *The economics of discrimination*. Chicago, IL: University of Chicago Press.

Becker, G. S. (1991). *A treatise on the family*. Cambridge, MA: Harvard University Press.

Begum, L., Islam, A., & Smyth, R. (2017). Girl power: Stipend programs and their effects on the education of younger siblings. *Journal of Development Studies, 53,* 1882–1898.

Behrman, J. R., Pollak, R. A., & Taubman, P. (1982). Parental preferences and provisions for progeny. *Journal of Political Economy, 90,* 52–73.

Bhalotra, S., & Attfield, C. (1998). Intrahousehold resource allocation in rural Pakistan: A semiparametric analysis. *Journal of Applied Econometrics, 13,* 463–480.

Bhalotra, S., Valente, C., & van Soest, A. (2010). The puzzle of Muslim advantage in child survival in India. *Journal of Health Economics, 29,* 191–204.

Borooah, V. K., & Iyer, S. (2005). Vidya, Veda, and Varna: The influence of religion and caste on education in rural India. *Journal of Development Studies, 41,* 1369–1404.

Bose, S., & Bose, S. (2009, April). *The role of parental perceptions in the gender bias in education in West Bengal, India: Results from a micro survey*. Paper presented at the annual meeting of the Population Association of America, Detroit, MI.

Bourguignon, F., & Chiappori, P. (1992). Collective models of household behavior: An introduction. *European Economic Review, 36,* 355–364.

Cain, M. (1986). The consequences of reproductive failure: Dependence, mobility and mortality among the elderly of rural South Asia. *Population Studies, 40,* 375–388.

Cain, M., Khanam, S. R., & Nahar, S. (1979). Class, patriarchy and women's work in Bangladesh. *Population and Development Review, 5,* 405–438.

Carlsson, F., He, H., Martinsson, P., Qin, P., & Sutter, M. (2012). Household decision making in rural China: Using experiments to estimate the influences of spouses. *Journal of Economic Behavior and Organization, 84,* 525–536.

Chen, L. C., Huq, E., & D'Souza, S. (1981). Sex bias in the family allocation of food and health care in rural Bangladesh. *Population and Development Review, 7,* 55–70.

Chowdhury, M. K., & Bairagi, R. (1990). Son preference and fertility in Bangladesh. *Population and Development Review, 16,* 749–757.

Deaton, A. (1989). Looking for boy-girl discrimination in household expenditure data. *World Bank Economic Review, 3,* 1–15.

Delavande, A., & Zafar, B. (2013). *Gender discrimination and social identity: Experimental evidence from urban Pakistan* (Federal Reserve Bank of New York Staff Report No. 593). New York, NY: Federal Reserve Bank of New York.

Derichs, C., & Fleschenberg, A. (Eds.) (2010). *Religious fundamentalisms and their gendered impacts in Asia*. Berlin, Germany: Friedrich-Ebert-Stiftung.

Emerson, P. M., & Souza, A. P. (2007). Child labor, school attendance, and intrahousehold gender bias in Brazil. *World Bank Economic Review, 21,* 301–316.

Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics, 114,* 817–868.

Fershtman, C., & Gneezy, U. (2001). Discrimination in a segmented society: An experimental approach. *Quarterly Journal of Economics, 116,* 351–377.

Glaeser, E. L., & Ma, Y. (2013). *The supply of gender stereotypes and discriminatory beliefs* (NBER Working Paper No. 19109). Cambridge, MA: National Bureau of Economic Research.

Goldin, C. (2002). *A pollution theory of discrimination: Male and female occupations and earnings* (NBER Working Paper No. 8985). Cambridge, MA: National Bureau of Economic Research.

Gupta, M. D. (1987). Selective discrimination against female children in rural Punjab, India. *Population and Development Review, 13,* 77–100.

Hahn, Y., Islam, A., Nuzhat, K., Smyth, R., & Yang, H. (2018). Education, marriage, and fertility: Long-term evidence from a female stipend program in Bangladesh. *Economic Development and Cultural Change, 66,* 383–415.

Howland, C. W. (Ed.). (2001). *Religious fundamentalisms and the human rights of women*. New York, NY: Palgrave.

Kingdon, G. G. (2002). The gender gap in educational attainment in India: How much can be explained? *Journal of Development Studies, 39*(2), 25–53.

Lillard, L. A., & Willis, R. J. (1994). Intergenerational educational mobility: Effects of family and state in Malaysia. *Journal of Human Resources, 29,* 1126–1166.

Maccini, S., & Yang, D. (2009). Under the weather: Health, schooling, and economic consequences of early-life rainfall. *American Economic Review, 99,* 1006–1026.

Munro, A. (2018). Intra-household experiments: A survey. *Journal of Economic Surveys, 32,* 134–175.

Munshi, K., & Myaux, J. (2006). Social norms and the fertility transition. *Journal of Development Economics, 80,* 1–38.

Othman, N. (2006). Muslim women and the challenge of Islamic fundamentalism/extremism: An overview of southeast Asian Muslim women's struggle for human rights and gender equality. *Women's Studies International Forum, 29,* 339–353.

Pande, R. P., & Astone, N. M. (2007). Explaining son preference in rural India: The independent role of structural versus individual factors. *Population Research and Policy Review, 26,* 1–29.

Pitt, M. M., Rosenzweig, M. R., & Hassan, M. N. (1990). Productivity, health, and inequality in the intrahousehold distribution of food in low-income countries. *American Economic Review, 80,* 1139–1156.

Rose, E. (2000). Gender bias, credit constraints and time allocation in rural India. *Economic Journal, 110,* 738–758.

Rosenzweig, M. R., & Schultz, T. P. (1982). Market opportunities, genetic endowments, and intrafamily resource distribution: Child survival in rural India. *American Economic Review, 72,* 803–815.

Rudman, L. A., & Fairchild, K. (2004). Reactions to counterstereotypic behavior: The role of backlash in cultural stereotype maintenance. *Journal of Personality and Social Psychology, 87,* 157–176.

Sen, A. (2013). What's happening in Bangladesh? *Lancet, 382,* 1966–1968.

Thomas, D. (1990). Intra-household resource allocation: An inferential approach. *Journal of Human Resources, 25,* 635–664.

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

United Nations Development Programme. (2010). *Power, voice and rights: A turning point for gender equality in Asia and the Pacific* (Asia-Pacific Human Development Report). New Delhi, India: Macmillan.