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Detecting Mother-Father Differences in Spending on Children: A New Approach Using Willingness-to-Pay Elicitation†

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This paper tests whether mothers and fathers differ in their spending on daughters relative to sons by comparing their willingness to pay (WTP) for specific goods for their children. This method, which we apply in Uganda, offers more precision than the standard method of examining expenditure effects of mothers' versus fathers' income. We find that fathers have a lower WTP for their daughters' than their sons' human capital but mothers do not. Altruism plays a role: fathers' but not mothers' WTP for goods that simply bring joy to their daughters is lower than their WTP for such goods for sons. (*JEL* D64, G51, J12, J13, J16, O12)

Do fathers invest less in their daughters than their sons? Are mothers less discriminatory against their daughters? If so, these relationships would be important for policy, as they would imply that improvements in gender equality are self-reinforcing. As women gain more say in household decision-making, household spending on daughters may increase, producing more gender equality in the next generation. This virtuous cycle could help to close the gender gaps in schooling and health care that are pervasive in developing countries (Evans, Akmal, and Jakiela 2021).

In this paper, we examine if and why fathers underspend on their daughters' health and education relative to how mothers spend. We adopt a new approach to measure parents' spending preferences that has higher statistical power than the traditional approach used in the literature: we elicit and compare mothers' and fathers' willingness to pay (WTP) for various goods for their sons and daughters. We conduct the study in Uganda among a sample of 1,084 households with young children in which we interviewed one randomly selected parent or usually both (separately).

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We find that fathers have a significantly lower WTP for their daughters' human capital than their sons' human capital. In contrast, mothers, if anything, have a higher WTP for their daughters' human capital than their sons'. As a result, willingness to spend on daughters is higher among mothers than fathers. While previous papers have hinted that mothers might spend more on daughters while fathers spend more on sons (see Lundberg 2005 for a review), the previous literature's power to statistically reject equality between male and female caregivers has been limited (e.g., Duflo 2003).

We then investigate the underlying reason for the mother-father differences. In a review paper on possible mother-father differences in son-daughter preferences published two decades ago, Lundberg (2005, 341) noted that "one central unanswered question for economists is whether these differences emerge from parental preferences … [or from] real or perceived differences in the returns to parental inputs." Today, we still know remarkably little about this question.

The preference-based explanation is simple: fathers care more about their sons than their daughters, and mothers do not. Alternatively, the differences between mothers and fathers could be due to different returns to investment ("investment-based" explanation). Mothers might expect to be more dependent on support from their children in old age, as women have lower earnings and longer life expectancy than men, on average. This could cause mothers to spend more on daughters than fathers do if they believe, as the majority of our sample does, that daughters are more likely to help support their parents in old age than sons are. Fathers and mothers could also have different beliefs about the returns to human capital investment for boys and girls.

To test between these hypotheses, we examine whether there are similar mother-father son-daughter WTP differences for goods that bring joy to the children but do not add to their human capital: toys and candy (hereafter, "enjoyment goods"). Under an investment-based explanation, one would expect the gaps to be observed for human capital goods but not enjoyment goods. Conversely, the patterns being similar for both types of goods would point to a preference-based explanation.

The results support a preference-based explanation: we find that fathers also have a lower WTP for enjoyment goods for their girls than for their boys, suggesting that they have less altruism or love for their daughters than their sons. Mothers, in contrast, have no lower WTP for enjoyment goods for their girls than for their boys. A second piece of evidence consistent with altruism as the underlying explanation is that the mother-father differences in human capital spending are almost entirely driven by households that say the mother loves the children more than the father does.

Our paper's main contribution is to introduce a new way of testing whether mothers and fathers differ in their spending preferences. The standard approach in the literature is to examine the effects of exogenous changes in female versus male income, asking: does a change in income for mothers lead to larger spending on, say, girls' education or children's education in general, than the same change in income for fathers? However, children's health and education—and goods assignable to children more generally—typically constitute a modest share of household expenditures. Detecting mother-father differences off a small base is statistically challenging. Thus, while a few studies can reject that women's income and men's income have identical effects (e.g., Lundberg, Pollak, and Wales 1997) or can rule out modest differences between women's and men's spending (e.g., Almås, Somville,

and Vandewalle 2020), many studies in this literature are underpowered to compare mothers' and fathers' overall spending on children, let alone whether mother-father patterns differ for sons versus daughters. We are unaware of any prior paper that uses the standard approach and statistically rejects that mothers and fathers spend identically on their sons relative to daughters.[1,2]

Our method has considerably higher statistical power to test if mothers and fathers have the same spending patterns for their sons and daughters. To be concrete, Haushofer and Shapiro (2016) compare large cash grants given to men or women in Kenya and report that the minimum detectable effect (MDE) size gap between male and female recipients for their health and education outcomes is 0.24 to 0.25 standard deviations. The MDE for mother-father differences in child spending in our study, which uses a comparable number of households, is 0.08 standard deviations. The gains with our method come from zeroing in on the expenditure category of interest, namely children's human capital.

Another advantage of using WTP to study parental differences in spending is that it directly elicits parent-specific choices rather than inferring them from household-level choices. In the standard approach, if an increase in women's relative income does not change household spending on children, that might be because women's bargaining power did not increase, in which case one cannot conclude whether or not mothers and fathers have similar spending patterns.

Finally, the approach we use is practical. It could easily be incorporated into studies that are interested in measuring parental spending or son preference. The ability to compare WTP for goods with different attributes or that are relevant for different children offers valuable flexibility to test mechanisms. Indeed, this flexibility makes possible our second contribution to the literature, namely shedding light on *why* mothers and fathers spend differently on their children.

I. Data

The data for the study were collected in Iganga district in eastern Uganda. The sample comprises households with a child in primary school. In the first round of data collection (March–May 2013), we surveyed one randomly selected parent per household. The randomization means that household and child characteristics are balanced when we compare mothers and fathers. In the second round of data collection (September–October 2013), we returned to a subset of the households, specifically those that also had a child three to eight years old and surveyed the other parent. Figure 1 provides a visual summary of the sampling strategy.

[1] For example, Duflo (2003) analyzes the child health effects of pensions in South Africa, and one likely could not reject that there is no difference in the effect of grandmothers' versus grandfathers' income on boys relative to girls. (The paper does not report this test.) Other studies on male-female differences in investment in children include Thomas (1994); Qian (2008); Benhassine et al. (2015); and Akresh, de Walque, and Kazianga (2016).

[2] Two related papers use lab experiments to compare mothers' and fathers' allocation of money to their child or to themselves (Ringdal and Sjursen 2021; Cherchye et al. 2021). These studies were conducted after ours. Ringdal and Sjursen (2021) also find some evidence for gender-concordant patterns although acknowledge that there might be biased selection into their sample by the gender of the child, which contributes to their gender-concordant finding. Another related study is Nikiforidis et al. (2018), who asked a small sample of mothers and fathers visiting a zoo in the United States to choose between a boy's or girl's backpack and posed a similar question about a savings bond to an Amazon MTurk sample, with the main finding that choices were gender concordant.

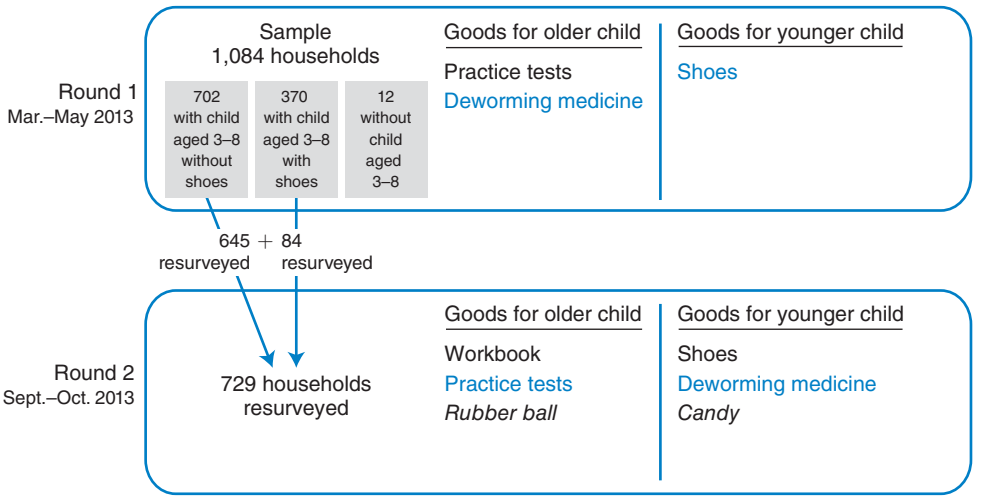

FIGURE 1. OVERVIEW OF SAMPLING AND CHILD GOODS FOR BOTH SURVEY ROUNDS

Notes: The market prices of each good in UGX are as follows: practice tests: 6,000; shoes: 2,000 or 2,500 (note that this varied by foot size; we used the child's age as a proxy when choosing the maximum price for the shoe elicitation); deworming medicine: 4,000; workbook: 4,500; rubber ball: 1,500; candy: 3,000. Blue text indicates a nonincentivized good. Italic text indicates an enjoyment good.

A. *Sampling*

We sampled households with children enrolled in grades 4–6 in 40 government primary schools with whom we partnered to offer one of our education goods (practice exams that schools administer for a fee). We began with a listing of eligible households in the participating schools. The first eligibility criterion was that the child lived with both biological parents (94 percent of children). The second was that for the current academic term, the child's parents had not paid for all of the practice exams the school offered (70 percent of children). The rationale was that we would be eliciting WTP at different prices up to but not exceeding the market price, so households already purchasing the good at the market price would generate no variation in WTP.

B. *First Survey*

For the first survey, we randomly selected whether to interview the mother or the father, stratified on school and whether the household was polygamous. A surveyor visited the home and administered a screening questionnaire to confirm eligibility. The final sample comprises 1,084 households that met the eligibility criteria and agreed to participate.

The survey elicited WTP for goods for the focal child enrolled in grades 4–6.[3] If a household also had a younger child aged three to eight, we gathered WTP for one

[3] In cases of more than one eligible older child in a household, we randomly selected one, and the same for the younger child.

good for that younger child. Hereafter, we refer to these two children as the older and younger child, respectively.

The randomly chosen parent was interviewed with no one else present, besides infants or toddlers. The survey first collected information on household composition, family background, and income and assets for each parent. We then elicited WTP for a set of goods. Finally, we asked questions related to mechanisms, such as expected old age support. The survey took approximately 75 minutes to complete. The participant received 8,000 or 10,000 Ugandan shillings (1 USD $\approx$ 2,600 UGX) as compensation for their time and to minimize cash constraints affecting WTP.[4]

C. *Second Survey*

In the second round of data collection, we revisited 729 of the original 1,084 households and surveyed the other parent, using a similar survey structure and content. The reason for revisiting a subsample was budgetary constraints. We focused on the subsample with a child aged three to eight. Because one of the goods would be shoes for the younger child, we oversampled households in which the child did not own shoes, according to the parent interviewed in the first survey. We attempted to interview all 702 of these households and completed interviews with 645. We also resurveyed a random subset (84 households) of the other households with a child aged three to eight. All respondents received 9,000 UGX for participating.

D. *Procedure for WTP Elicitation*

To elicit WTP, we used the Becker-DeGroot-Marschak (BDM) mechanism, asking the respondent if he or she was willing to purchase the good at a series of prices, in declining order from the market price to a price near zero (Becker, DeGroot, and Marschak 1964).[5] The decrement was chosen so that respondents were asked about roughly 12 price levels per good. The respondent was told that after the price questions, one price would be randomly chosen and she would purchase the good from us at that price if and only if her response had been that she wanted to. The surveyor explained the procedure in detail to ensure comprehension, and we also asked debrief questions (such as regret about one's choices) to confirm comprehension. The selection of the randomized price and exchange of money and goods, if applicable, were conducted just after the BDM questions were asked for a good. In the second wave, to increase sample size without increasing study costs, we grouped five of the goods and first randomly chose one good and then one price level for that good; respondents were informed in advance that a transaction could only occur for one of these five goods. This two-step randomization occurred after the BDM questions for all five goods.

Also to increase sample size, in each wave we asked WTP in a similar but nonincentivized way for additional goods. The surveyor followed the same protocol

[4] We randomized the payment level to test for cash on hand and gift exchange effects on WTP. Online Appendix Table A.1 shows that receiving the higher compensation level does not affect WTP for the goods we offered.

[5] Recent studies validating the BDM method in developing countries include Berry, Fischer, and Guiteras (2020) and Burchardi et al. (2021).

of showing the actual good to the respondent so that it was concrete, but respondents knew in advance that for these goods no transaction would take place. Online Appendix B presents evidence that the nonincentivized WTP elicitation appears to have worked quite similarly to the incentivized WTP elicitation. As a result, we pool incentivized and nonincentivized WTP in our main specifications for statistical power.

E. *Children's Goods*

We used several criteria when choosing which goods to offer parents. First, we wanted parents to be familiar with the good and its market price; otherwise, based on piloting, variation in the perceived quality and market price would add noise and potentially bias the results. Second, the good should be something that most households value at less than the market price but place some value on so that there is variation in WTP. Third, the good should not be particularly appealing to one gender, *within* the categories of human capital or enjoyment (nonhuman capital) *goods*; the goods are intended to represent the broad categories of human capital or enjoyment goods, so while each whole category might be favored more by one gender, we would not want a good that, say, fathers idiosyncratically like more than mothers do or that is more appropriate for girls than boys. In addition to doing extensive preliminary fieldwork to choose goods that met these criteria, we asked questions on the survey to verify our assumptions.

Figure 1 lists each child good, which survey it was collected in, which focal child it was for, and whether its WTP elicitation was incentivized. The market prices of the goods ranged from 1,500 to 6,000 UGX.

Human Capital Goods.—In the first survey, we elicited WTP for three human capital goods. The first, measured in an incentivized way, was practice exams for the older child, administered by the child's school. Schools offer practice exams during and at the end of each of the three terms of the school year but charge students to participate. Our survey was conducted during Term 1 of 2013, and we sold a bundle of all of the exams for Terms 2 and 3.

The other human capital goods in the first survey were deworming medicine for the older child and, if the household had a child aged three to eight, rubber-soled shoes for them.[6] Many young children do not wear shoes, and being barefoot is a risk factor for intestinal worms as well as cuts and injuries. WTP for these two goods was measured in a nonincentivized way.

In the second survey, we elicited WTP for four human capital goods: rubber-soled shoes for the younger child (incentivized); a grade-appropriate math workbook for the older child (incentivized); deworming medicine for the younger child (nonincentivized), and practice exams for the older child for the first two terms of the 2014 school year (nonincentivized).

[6] In the first survey, we asked about deworming only for those randomized to receive the higher payment for participating in the study. The reason was to justify the higher compensation for some people by their survey being longer.

Enjoyment Goods.—In the second survey, we also elicited WTP for fun goods for children that are not human capital enhancing. Both goods were offered for the younger child: a rubber ball (incentivized) and a packet of candy (incentivized).[7]

Each child good was intended for a specific child, and we use the gender of that child to compare how parents spend on sons versus daughters. However, some goods, such as the math workbook, rubber ball, and candy, might be transferable between siblings or shared among them, which would bias us against finding WTP differences by child gender.

F. *Benchmark Goods*

We elicited WTP for goods used by adults as a benchmark of each respondent's general WTP for goods. We control for the adult good WTP in our regressions to increase precision, as factors such as cash on hand or gift exchange motives should affect adult good WTP similarly to how they affect child good WTP (Dizon-Ross and Jayachandran 2022). In principle, controlling for the adult good WTP could also help address any systematic differences in such factors between male and female respondents. In practice, controlling for the adult good WTP does not change our point estimates much, only the standard errors, and we show robustness to excluding the control. We attempted to identify goods that were not gendered. In our preparatory fieldwork, we asked our field team and pilot respondents if they thought potential goods were preferred more by one gender or the other, and we chose goods that did not have that characteristic. In the first survey, the adult good was a metal cup for drinking (3,600 UGX), and in the second survey, the two adult goods were a poster (2,000 UGX) and a pair of jerry cans (4,000 UGX).

G. *Survey Questions to Test Mechanisms*

Our strongest test of whether mothers and fathers simply differ in how much they care about their children's well-being is to examine WTP for enjoyment goods, but we also asked direct questions about which parent cared more about the children. We similarly asked direct questions about other potential mechanisms such as perceived returns to investing in human capital.

H. *Summary Statistics and Balance*

Online Appendix Table A.2 presents summary statistics for household and focal child characteristics in the full sample and shows that these characteristics are balanced between the mother and father subsamples. Almost all households in our sample own land, and 25 percent are polygamous. Older focal children are 12 years old, on average, and younger focal children, almost 6. Online Appendix C presents additional summary statistics and balance tests.

[7] We also asked about a separate toy for girls (teddy bear) and boys (toy truck) in both surveys (nonincentivized). To make comparisons across boys and girls, it is important to use the same gender-neutral enjoyment good, so we exclude these toys from our analysis.

Table 1—Fathers Spend Less on Girls but Mothers Do Not

	WTP normalized by …					
	SD	SD	Market price	SD	SD	SD
	(1)	(2)	(3)	(4)	(5)	(6)
Daughter	−0.037	−0.102	−0.029	−0.094	−0.065	−0.159
	(0.024)	(0.032)	(0.009)	(0.037)	(0.036)	(0.052)
Mother × *Daughter*		0.131	0.036	0.142	0.069	0.209
		(0.046)	(0.013)	(0.053)	(0.053)	(0.076)
Mother	−0.029	−0.095	−0.028	−0.066	−0.091	−0.090
	(0.028)	(0.036)	(0.010)	(0.043)	(0.040)	(0.059)
p-val: *Mother* + *Mother* × *Daughter* = 0		0.318	0.420	0.070	0.589	0.032
p-val: *Daughter* + *Mother* × *Daughter* = 0		0.399	0.454	0.204	0.931	0.349
Dependent varible mean father-son	1.943	1.943	0.537	1.943	1.793	2.164
Fixed effects	Stratum	Stratum	Stratum	Household	Stratum	Stratum
Goods included	All	All	All	All	Incentivized	Nonincentivized
Number of observations	6,673	6,673	6,673	6,673	4,000	2,673

Notes: All columns control for survey round, adult WTP, and adult WTP interacted with survey round. Columns 1–3 control for strata and good fixed effects. Column 4 controls for household and good fixed effects. Standard errors are clustered by household.

II. Empirical Strategy and Results

A. *Spending on Children's Goods*

We begin by testing whether parents collectively spend more on their daughters or sons and whether mothers or fathers spend more on average on their children. To do so, we estimate the following equation:

$$(1) \qquad WTP_{ihgc} = \alpha + \beta Daughter_{ihc} + \gamma Mother_{ihc} + \delta \mathbf{X}_{ihgc} + \epsilon_{ihgc},$$

where each observation is for parent i in household h asked about a good g for child c. The independent variables of interest are *Daughter*, an indicator for the child being female, and *Mother*, an indicator for the respondent being female. In principle, we could estimate the difference using a single good, but for statistical power and so that the results are less specific to a particular good, we pool several goods. To make WTP comparable across goods, we normalize the WTP for each good by its within-sample standard deviation, with the results robust to other normalizations. The vector of control variables $\mathbf{X}$ includes good-by-survey-wave fixed effects and stratum fixed effects. To increase precision, $\mathbf{X}$ also includes WTP for the adult goods. The standard errors allow for clustering within a household.

Column 1 of Table 1 presents the results. There is no statistically significant difference between parents' WTP for goods for their daughters versus their sons and also no statistical difference between mothers' and fathers' WTP overall.

Next, to understand whether daughter-son spending preferences differ across mothers and fathers, we add the interaction term and estimate the following equation:

$$(2) \qquad WTP_{ihgc} = \alpha + \beta Daughter_{ihc} + \delta Mother_{ih} \times Daughter_{ihc} + \lambda Mother_{ih} + \gamma \mathbf{X}_{ihgc} + \epsilon_{ihgc}.$$

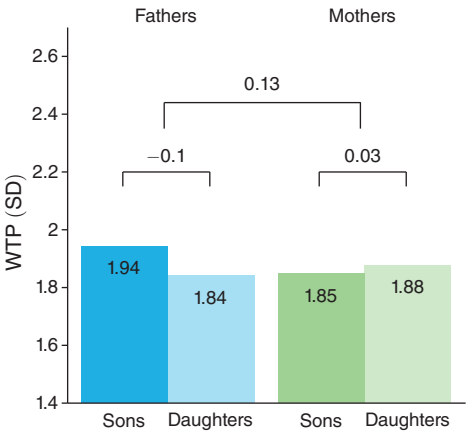

FIGURE 2. FATHERS SPEND LESS ON GIRLS BUT MOTHERS DO NOT

Note: Figure is based on the regression reported in Table 1, column 2.

In this case, the coefficient on *Daughter* tells us how much lower fathers' WTP is for daughters than sons, and the coefficient on *Mother* × *Daughter* tells us how different the *Daughter* effect (i.e., the spending on daughters relative to sons) is for mothers than fathers. Finally, the coefficient on *Mother* represents how much less mothers spend overall (on sons) than fathers.

Column 2 of Table 1 shows that fathers have a lower WTP for goods for their daughters, while mothers do not. Figure 2 displays the same result graphically. In the figure, the left set of bars shows that fathers have a 0.10 standard deviation lower WTP for daughters than sons. (In the table, this corresponds to the coefficient of −0.10 for *Daughter*.) The bars on the right show that in contrast to fathers, mothers spend similarly on their daughters and sons—a 0.03 standard deviation difference, which, if anything, points to spending more on their daughters. (In the table, the 0.03 standard deviation estimate is the sum of the *Daughter* and *Mother* × *Daughter* coefficients, and the *p*-value at the bottom of the table shows that the difference is not significant.) Finally, one can statistically reject at the 1 percent level that fathers and mothers have the same boy-girl gap in spending. (This corresponds to the 0.13 standard deviation *Mother* × *Daughter* coefficient in the table.)

To help gauge the magnitudes of these boy-girl and mother-father differences, the bottom row of Table 1 reports the mean of WTP for the father-son subsample. Dividing the effect sizes by that mean expresses how large the WTP gaps are in percentage terms. For example, the daughter-son gap for fathers seen in Figure 2 (i.e., the *Daughter* coefficient in Table 1, column 2) maps to fathers being willing to pay 5 percent less for goods for their daughters than their sons. Moreover, under certain assumptions, the percent WTP gap can also be interpreted as the percent gap in demand (i.e., in the expected quantity of goods purchased). Thus, fathers also have 5 percent lower demand for goods for their daughters than sons. This mapping from WTP to overall demand is laid out in a simple framework in online Appendix D that assumes there are an array of goods available at different prices.

Similarly, dividing the *Mother* × *Daughter* coefficient by the father-son dependent variable mean shows that that effect represents a 7 percent change in WTP. Adding that term to the negative 5 percent *Daughter* effect suggests that mothers have 2 percent higher demand for goods for their daughters than their sons. Online Appendix D also discusses how to estimate the percent gaps in expenditures (as opposed to quantity demanded) and finds similar magnitudes. For example, the estimates in Figure 2 map to fathers spending 8 percent less on their daughters than sons.[8]

The findings shown in Figure 2 and Table 1, column 2 are robust across several different specifications. Table 1, column 3 shows robustness to normalizing the WTP for each good by its market price. The main effect of −0.03 for *Daughter* normalized by the dependent variable mean for fathers and sons again suggests that fathers have 5 percent lower demand for goods for their daughters than for their sons. Column 4 shows that the results are robust to including household fixed effects.

Our main findings are based on pooling incentivized and nonincentivized WTP observations. One potential concern with using nonincentivized WTP data is that perhaps mothers are more prone to social desirability bias than fathers (or vice versa), which could cause mothers to have inflated nonincentivized WTP relative to fathers. However, we collected a measure of the respondent's propensity to give socially desirable survey answers (the Marlowe-Crowne scale) in our second survey round and find no differences between mothers and fathers (Crowne and Marlowe 1960).[9] Moreover, we can test whether our results depend on whether we incentivized the elicitation of WTP. Columns 5 and 6 of Table 1 display the results from estimating equation (1) separately for the goods for which the elicitation was incentivized and nonincentivized, respectively. While these estimates are less precise than the pooled estimate in column 2, the qualitative takeaway is the same in both cases: fathers have significantly lower spending on daughters than sons (i.e., *Daughter* is negative), whereas mothers do not (i.e., *Daughter* + *Mother* × *Daughter* is not negative). We cannot reject that the coefficients in columns 5 and 6 are identical (p-values for equality: 0.16, 0.13, and 0.92 for the *Daughter*, *Mother* × *Daughter*, and *Mother* coefficients, respectively), although the coefficient magnitudes vary between the columns, so we also cannot rule out substantive differences.

Thus, while nonincentivized WTP seems to have performed well, and thus our results are promising for combining nonincentivized WTP with incentivized WTP to identify parents' spending patterns in future work, there is still some uncertainty about how much real stakes matter for the quantitative estimates.

Online Appendix E presents further sensitivity analyses on the results shown in Figure 2, such as excluding WTP for the adult good as a control variable, and concludes that it is robust across several alternative specifications.

[8] Online Appendix D also presents a second way to calculate the implied effect on expenditures that assumes different market prices for the goods we asked about, which yields similar magnitudes.

[9] The Marlowe-Crowne measure captures a person's general tendency to give socially desirable survey answers so does not allow us to assess whether mothers or fathers have different levels of social desirability bias when asked about girls in particular. Nonetheless, we view the lack of mother-father differences in the general propensity for social desirability bias as reassuring.

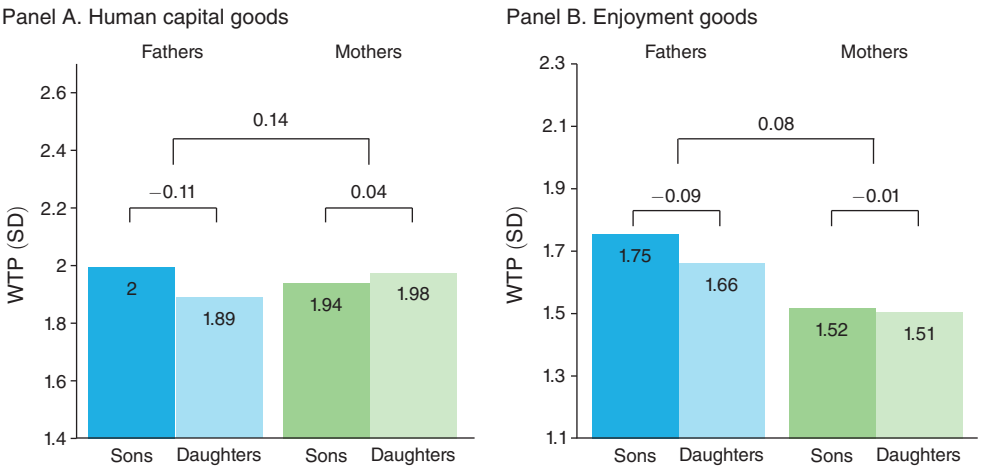

FIGURE 3. FOR BOTH HUMAN CAPITAL AND ENJOYMENT GOODS, FATHERS SPEND LESS ON DAUGHTERS BUT MOTHERS DO NOT

Note: Panels A and B present the coefficient estimates from estimating equation (2) using only human capital goods and only enjoyment goods, respectively.

B. *Spending on Human Capital*

The child development implications of parents' spending preferences depend on whether the results reported in Table 1 hold for human capital in particular. We estimate equation (2) using human capital goods only and show the results in Figure 3, panel A as well as in column 1 of online Appendix Table A.3. Mean WTP for each human capital good is 2,100 UGX, roughly 15 percent of total per-term per-child educational spending.

Again, fathers have significantly lower WTP and demand for goods for their sons than daughters, with an effect size of −0.11 standard deviations, or −5 percent. Meanwhile, mothers, if anything, have higher demand for goods for daughters than sons. Mothers spend roughly 0.09 standard deviations (4 percent) more on daughters than fathers do, and roughly 0.06 standard deviations (3 percent) less on sons than fathers do, although only the former difference is statistically significant. (See the p-values on $Mother + Mother \times Daughter$ and on $Mother$, respectively, in column 1 of online Appendix Table A.3.) The difference in mothers' and fathers' pattern of spending on daughters relative to sons (i.e., the $Mother \times Daughter$ effect) is the highly significant (p-value < 0.01) 0.14 standard deviation or 7 percent gap shown in Figure 3, panel A.

Columns 2 and 3 of online Appendix Table A.3 show that the patterns are qualitatively similar for the two subcategories of human capital—education and health—with the magnitude and significance of the coefficients larger for health.

C. *Testing Why Mothers and Fathers Spend Differently*

What underlies these differences between mothers and fathers in their spending on sons versus daughters? We begin by testing whether altruism toward sons

relative to daughters plays a role. We examine parents' WTP for goods that are purely for their children's enjoyment and do not build human capital. Differential WTP for those goods by child gender suggests differences in altruism toward sons and daughters.

We estimate equation (2) using only the "pure enjoyment" (nonhuman capital) goods and display the results in Figure 3, panel B. We also report the result in online Appendix Table A.3, column 4. Among fathers, WTP for fun items for daughters is considerably lower than for boys (p-value $= 0.07$). Comparing the two panels of Figure 3, for both enjoyment goods and human capital goods, fathers have around 0.1 standard deviation lower WTP for their daughters than their sons. The similar pattern for enjoyment goods as for human capital is consistent with fathers having lower altruism for their daughters than sons.[10] Meanwhile, mothers have no lower WTP for their daughters' enjoyment than their sons.'[11]

One concern in interpreting these findings is that parents might see the rubber ball and candy as having other benefits besides joy for their children, and these perceptions might differ by parent or child gender. For example, the items might keep the child busy, and mothers, as the primary caregivers, might value this more than fathers do. Online Appendix Figures A.1 and A.2 verify that the main benefit of these goods, according to parents, was joy for their children. Keeping the child occupied was a negligible benefit cited for the rubber ball, and, while it was mentioned as a benefit of the candy, there are no significant gender differences in these responses. Moreover, the results are robust to controlling for fixed effects for the parent's main reason for valuing each good (see online Appendix Table A.3, column 5), so they are not driven by parental differences in perceived benefits of the candy and ball.

We conclude from Figure 3 that altruism is likely an important reason for mother-father differences in spending on daughters. At the same time, the evidence leaves scope for other explanations too. The magnitude of the *Mother* $\times$ *Daughter* effect for enjoyment goods (0.08 standard deviations) is smaller than the corresponding *Mother* $\times$ *Daughter* effect for human capital (0.14 standard deviations), although we cannot reject equality (online Appendix Table A.3, column 6, p-value $= 0.31$). Taking the two effect sizes at face value would imply that altruism explains around half ($0.08/0.14$) of the *Mother* $\times$ *Daughter* effect on human capital. This suggests that a second explanation—such as investment motives—might explain the other half. Consistent with this idea, the difference between the *Mother* $\times$ *Daughter* effects for human capital and enjoyment goods stems from mothers spending more on their daughters' human capital than their sons', while

[10] We cannot reject that fathers have the daughter-son gap in spending for human capital and enjoyment goods. We estimate equation (2) using both types of goods, adding in interactions of all of the regressors with a dummy for the good being an enjoyment good. The regression is reported in online Appendix Table A.3, column 6, and the relevant coefficient is for *Daughter* $\times$ *EnjoymentGood*.

[11] Mothers also have markedly lower spending than fathers on enjoyment goods for both sons and daughters. While this could reflect mothers having lower altruism overall toward their children, it could also stem from mothers not believing in spending on "frivolous" goods or fathers wanting to be the "fun" parent. It could also reflect women having less control over household income than their husbands, as average income is three times as high for fathers as for mothers, and 73 percent of female and 92 percent of male respondents say that the man does more of the household spending than the woman does. Notably, however, these other factors (i.e., mothers' different attitudes toward frivolous goods or mothers' different income levels) should not differ between sons and daughters.

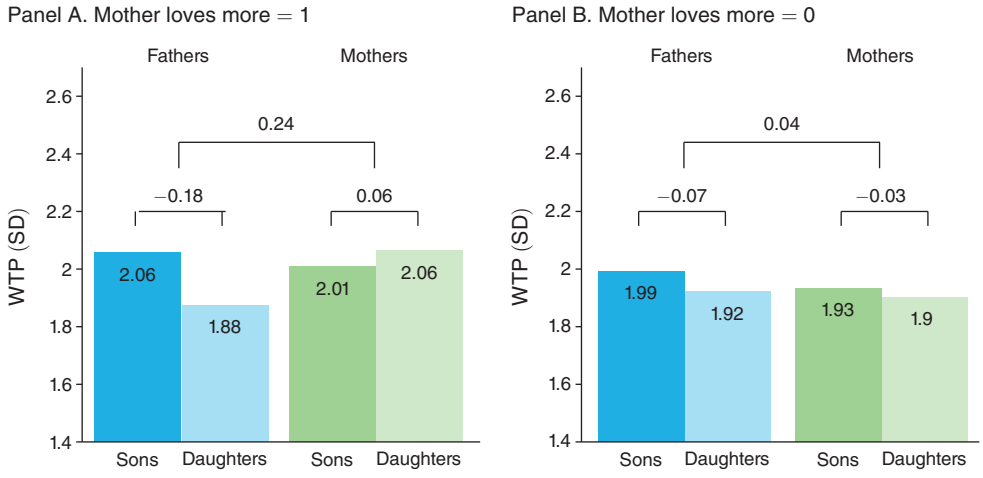

FIGURE 4. GENDERED SPENDING PATTERNS ARE DRIVEN BY HOUSEHOLDS THAT SAY THE MOTHER LOVES THE CHILDREN MORE

Notes: Panels A and B present the coefficient estimates from estimating equation (2) using human capital goods, for the subsample of households that say the mother loves the children more than the father does (panel A) and that say mothers and fathers care about the children equally or the father cares about the children more (panel B).

spending the same amount on their sons' and daughters' enjoyment goods. This pattern is what one would expect if mothers have stronger investment motives, specifically in daugthers. In our survey, 55 percent of parents stated that adult daughters support their parents more than adult sons do, compared to only 20 percent believing that sons provide more support. (The remaining 25 percent believed that sons and daughters provide equal support.) In addition, mothers were more likely than fathers to state that they were the parent who would receive the most support from their adult children.

A variant of the investment story is that mothers perceive the returns to female human capital (relative to male human capital) to be higher than men do. However, as shown in online Appendix Table A.4, across several questions about parents' beliefs about the value of schooling for boys and girls, there are no meaningful differences between mothers and fathers.

As our final analysis, we present a second test of the hypothesis that altruism underlies the mother-father differences in discrimination against daughters. We conduct heterogeneity analysis using a proxy for whether the mother is the more altruistic parent within the household. We estimate equation (2) for human capital goods, separately in two subsamples of households. The first is the roughly 50 percent of households where both parents identify the mother as the parent who cares more about the children. The second is the other 50 percent of households, in which either only one or neither of the parents identified the mother as the more loving parent.[12] While we did not ask about which parent cared more about their girls in particular,

[12] We can only construct this variable for households where we surveyed both parents, so this analysis only includes these households.

in a context where boys might be more universally beloved, caring more about children in general may also proxy for caring more about female children.

Figure 4 presents the results. The pattern that fathers spend less on daughters is much stronger and only statistically significant among households in which the mother is described as the more altruistic parent (panel A). Fathers' lower spending on daughters is nearly three times as large for these households compared to the rest of the sample (-0.18 versus -0.07). In addition, mothers' relatively greater WTP for daughters' human capital (the *Mother* $\times$ *Daughter* effect) is much larger and only significant in the mother-loves-the-children-more households (0.24 versus 0.04 in the other households). This difference across subsamples is statistically significant at the 10 percent level. (Online Appendix Table A.3, column 7 reports the pooled regression that enables this statistical test.) Thus, this second test also suggests that altruism underlies the mother-father differences in son preference.

III. Conclusion

We revisit the classic question in family economics of whether mothers and fathers spend differently on children, using a different approach than past studies: we elicit each parent's WTP for goods for their children. The advantages of this approach, compared to using exogenous changes in women's and men's income, are statistical power and the ability to choose goods with attributes that enable one to test mechanisms. We apply this method in rural Uganda.

We find that fathers but not mothers spend less on daughters than sons. We then investigate why that is. Specifically, we test between a preference-based explanation, in which mothers care about daughters relatively more than fathers do, and an investment-based explanation, in which mothers enjoy a higher financial return on investment in daughters. We find support for the preference-based explanation. A key test examines parents' WTP for goods that bring joy to the children but do not build their human capital. We find similar patterns for these enjoyment goods as we did for human capital, consistent with fathers' lower altruism toward their daughters playing an important role in spending differences.

Our investigation leaves unanswered many questions about what underlies parental spending differences. We do not consider all possible explanations. For example, gendered norms or specialization could also play a role.[13] We also do not explore the deep causes of preference differences. For example, the literature in sociology and psychology has proposed that preference differences could stem from parents identifying more closely with same-gender children (Belsky 1979; Nikiforidis et al. 2018). Our results are consistent with men and women both having same-gender favoritism. If mothers and fathers had equal financial resources, such favoritism would cancel out. However, because men control more resources than women do, daughters end up disadvantaged. Continuing to explore the reasons for parental differences in spending is a rich area for further research, and using WTP elicitation as a research design could aid in this exploration.

[13] Doepke and Tertilt (2019) present and test a model in which mothers spend more on children's human capital because each parent specializes in providing different public goods for the household.

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