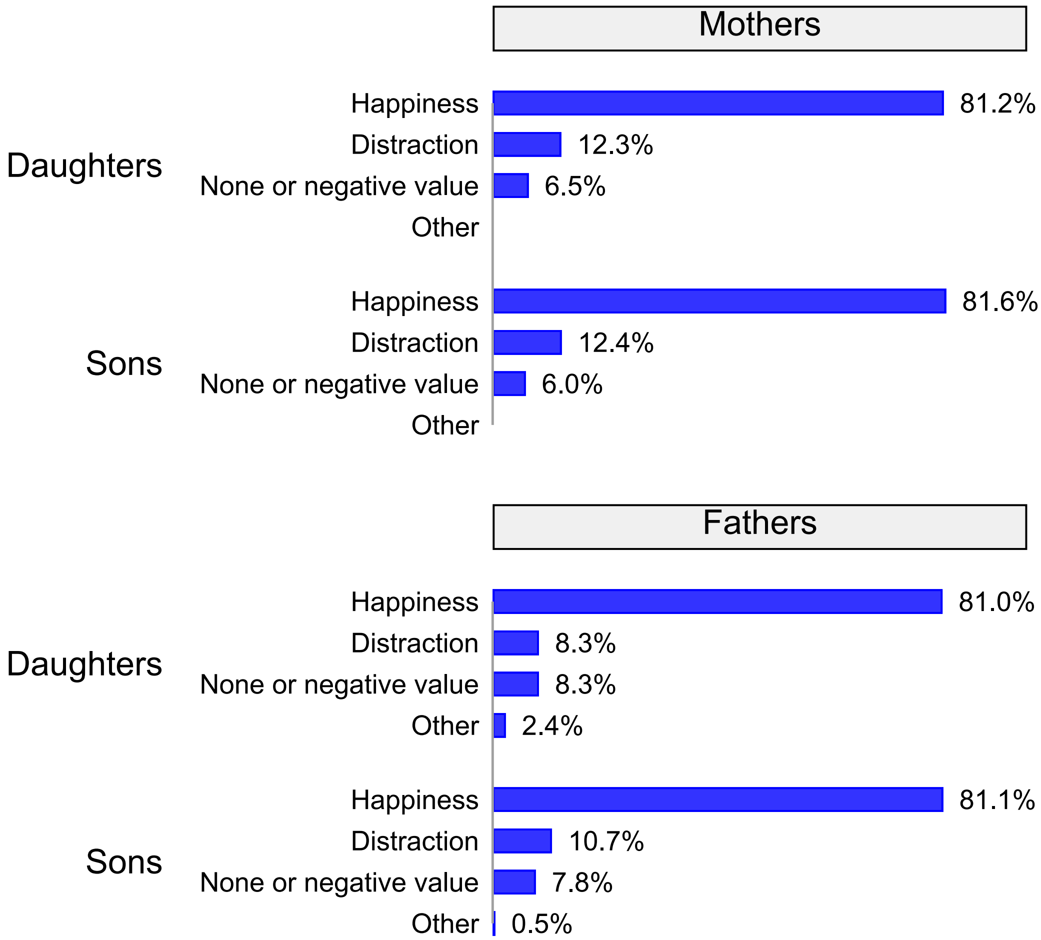
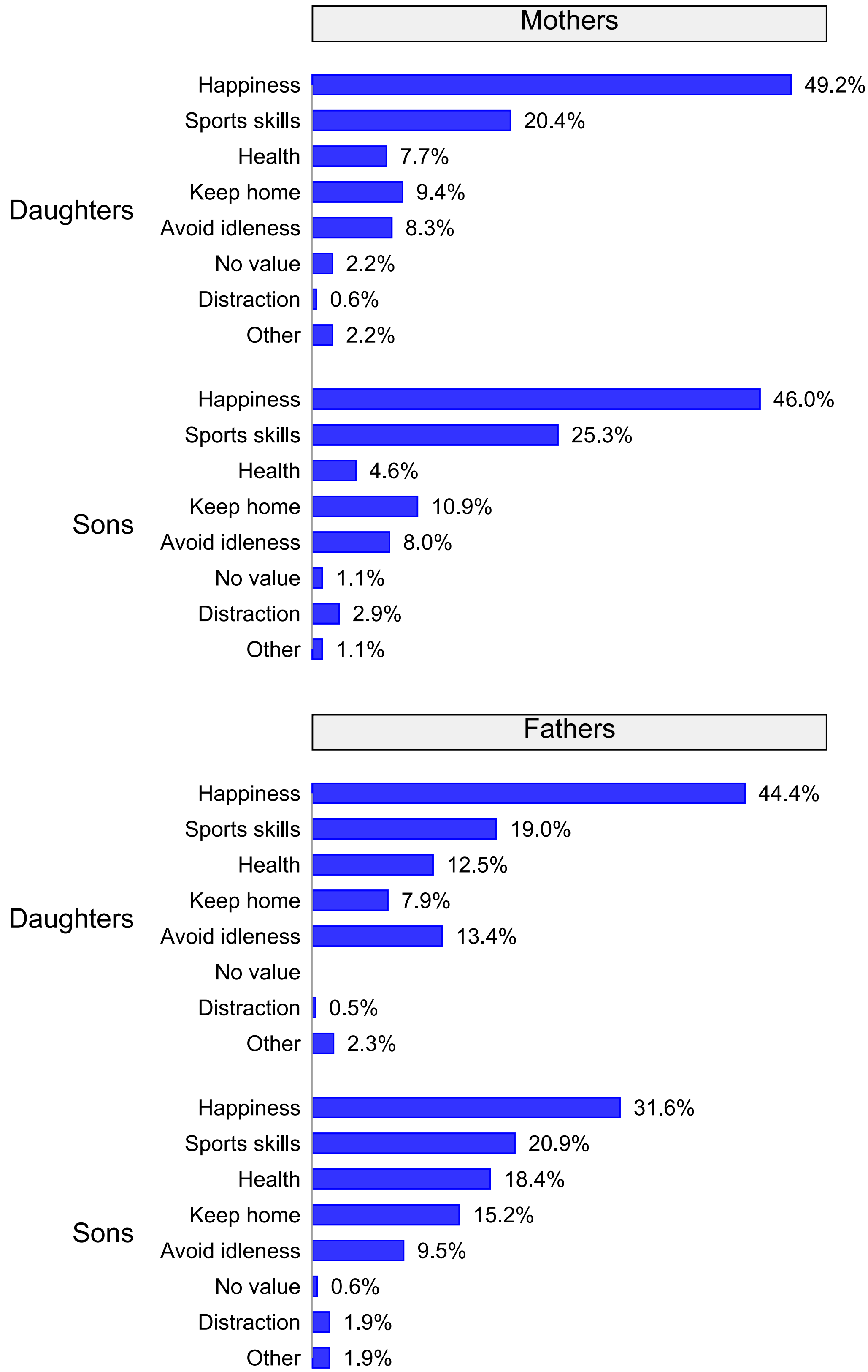
Online Appendix

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

Rebecca Dizon-Ross and Seema Jayachandran



Appendix Figure A.1. Parents' statements of the candy's primary value, by child and parent gender



Appendix Figure A.2. Parents' statements of the rubber ball's primary value, by child and parent gender

Appendix Table A.1—Compensation for study participation does not affect WTP

	Adult good (cup) WTP	Tests WTP	Shoes WTP
	(1)	(2)	(3)
Received higher payment	-0.036	0.004	-0.001
	(0.063)	(0.063)	(0.083)
Observations	1084	1084	680

Notes: Analysis uses first survey round, in which compensation was randomized. The omitted group received 8,000 UGX for participation. The higher payment amount was 10,000 UGX; the payment level was randomized. The analysis omits deworming medicine WTP, as it was elicited only for the higher-payment group. All regressions include strata fixed effects. Standard errors are heteroskedasticity-robust.

Appendix Table A.2—Household and child characteristics are balanced across mother and father samples

Variable	Mothers (1)	Fathers (2)	Standardized diff (3)
Panel A: Household characteristics			
Number of children	9.119 [3.101]	9.025 [2.967]	0.031
Number of cattle	1.006 [1.338]	1.069 [1.372]	-0.046
Number of motos	0.041 [0.199]	0.042 [0.200]	-0.005
Number of rooms	3.014 [1.197]	3.047 [1.189]	-0.028
Owns land	0.914 [0.280]	0.934 [0.248]	-0.076
Polygamous	0.247 [0.434]	0.248 [0.434]	-0.002
Panel B: Focal child characteristics			
Older focal child male	0.544 [0.498]	0.538 [0.499]	0.012
Older focal child age	11.958 [1.949]	12.047 [2.034]	-0.045
Weekly study hours	4.875 [5.305]	5.396 [9.155]	-0.070
Older focal child school performance	3.175 [0.944]	3.233 [0.939]	-0.062
Believes older focal child will support parents more than other children	0.480 [0.500]	0.495 [0.500]	-0.030
Has younger focal child	0.782 [0.413]	0.796 [0.403]	-0.034
Younger focal child male	0.553 [0.498]	0.552 [0.498]	0.002
Younger focal child age	5.733 [1.783]	5.784 [1.824]	-0.028
Younger focal child in school	0.625 [0.485]	0.675 [0.469]	-0.105
Younger focal child grade	1.488 [1.044]	1.538 [1.073]	-0.047
Number of observations	900	913	
Joint p-value	0.495		

Notes: In the regression to test for joint orthogonality, we impute missing values with the sample mean and include missing flags. We also control for survey round and strata fixed effects, to match the main specification. Standard errors are clustered at the household level. The unit of observation is a household-parent.

Appendix Table A.3—Regressions underlying Figures 3 and 4 + results by human capital type

	Goods included:						
	Human Capital (1)	Education (2)	Health (3)	Enjoyment (4)	Enjoyment (5)	All (6)	Human Capital (7)
Daughter	-0.106	-0.081	-0.145	-0.091	-0.085	-0.106	-0.072
	(0.036)	(0.051)	(0.052)	(0.051)	(0.051)	(0.037)	(0.059)
Mother × Daughter	0.143	0.085	0.197	0.081	0.074	0.143	0.040
	(0.051)	(0.070)	(0.075)	(0.081)	(0.081)	(0.051)	(0.085)
Mother	-0.057	-0.064	-0.043	-0.237	-0.230	-0.057	-0.060
	(0.039)	(0.052)	(0.052)	(0.062)	(0.062)	(0.040)	(0.066)
Mother × Daughter × Covariate						-0.062	0.196
						(0.086)	(0.111)
Daughter × Covariate						0.015	-0.110
						(0.057)	(0.079)
Mother × Covariate						-0.180	0.011
						(0.065)	(0.085)
Main perceived benefit X good fixed effects	No	No	No	No	Yes	No	No
Covariate used in interactions						Enjoyment good	Mothers love more
p-val: Mother + Mother × Daughter = 0	0.025	0.639	0.006	0.016	0.016		
p-val: Daughter + Mother × Daughter = 0	0.325	0.930	0.323	0.866	0.859		
p-val: Mother × Daughter + Mother × Daughter × Cov. = 0						0.312	0.001
p-val: Daughter + Daughter × Cov. = 0						0.070	0.001
Dep. var. mean father-son	1.996	1.618	2.299	1.754	1.754	1.943	2.028
Number of observations	5,215	2,542	2,673	1,458	1,458	6,673	4,640

Notes: The dependent variable is WTP for the good. Columns 1,2,3, and 7 control for strata and good fixed effects, survey round, adult WTP, adult WTP interacted with survey round, and all previous controls interacted with the covariate of interest. Columns 4 to 6 control for strata and good fixed effects, survey round, adult WTP, and adult WTP interacted with survey round. Column 5 additionally controls for fixed effects for the parent's main perceived benefit of the good × good fixed effects.The column 4 regression is the analog of Figure 3(b), and includes only the two enjoyment goods (rubber ball and candy). Column 7 is limited to the households with observations from both the mother and the father.

Appendix Table A.4—Summary statistics on mothers' and fathers' beliefs about education

Variable	Full sample (1)	Mothers (2)	Fathers (3)	Standardized diff (4)
Agree: It is useless to send girls to secondary school since they will marry	0.041 [0.198]	0.037 [0.188]	0.045 [0.207]	-0.040
Agree: Even boys who will become farmers will be better at farming if they have gone to school.	0.905 [0.293]	0.890 [0.313]	0.920 [0.271]	-0.102
Would make son finish primary if they wanted to quit	0.881 [0.323]	0.879 [0.326]	0.884 [0.321]	-0.015
[If yes to above] Would make son finish O levels if they wanted to quit	0.943 [0.231]	0.955 [0.208]	0.932 [0.252]	0.100
Would make daughter finish primary if they wanted to quit	0.855 [0.352]	0.847 [0.361]	0.864 [0.343]	-0.048
[If yes to above] Would make daughter finish O levels if they wanted to quit	0.945 [0.229]	0.942 [0.233]	0.947 [0.225]	-0.022
Number of observations	1813	900	913	

Notes: All variables are observed in both survey rounds, except the one reported in the first row, which is only available in the first round.

Validation of non-incentivized WTP

To assess the performance of our non-incentivized WTP elicitation, we examine WTP for practice tests, which is a good we asked the sample about in both an incentivized and non-incentivized manner. In the first round, the WTP elicitation for tests was incentivized and in the second round it was not. In addition, we asked several survey questions in both rounds that might predict demand for tests, such as perceived quality of the tests and spending on educational inputs, which we can use as potential predictors. We also use household and child characteristics as potential predictors.

Using the households surveyed in both rounds, we first use LASSO to identify the primary predictors of non-incentivized WTP and of incentivized WTP. We then use OLS to test for differences in the relationships between non-incentivized WTP and incentivized WTP and their primary predictors. To be able to conduct valid inference in the second step, we randomly split our sample in half and use one half to fit the predictive LASSO model and the second half for OLS inference on the predictive coefficients.

The evidence suggests that non-incentivized WTP performs well. We find that LASSO identifies the same predictors for non-incentivized and incentivized WTP, and that the predictive coefficients are similar. In addition, with OLS, we are unable to reject equality in the predictive relationships. We first show the LASSO results and then the OLS.

Table B.1 displays the coefficients from using LASSO in the first half of the sample to identify the two most informative predictors of incentivized WTP (column 1) and non-incentivized WTP (column 2). Notably, the table shows that LASSO selects the same primary predictors for both incentivized and non-incentivized WTP. In addition, the predictors it chooses are both intuitive and sensible: WTP for the adult good, and an indicator for the parent thinking that the tests are higher-quality than the tests offered by the child's school. The fact that LASSO picks the same predictors for both incentivized and non-incentivized WTP – and with similar predictive coefficients – is evidence that non-incentivized WTP performed well.

Appendix Table B.1—LASSO chooses the same predictors of incentivized WTP and non-incentivized WTP for tests

Variable	Dep. var.: WTP for tests Incentivized (1)	Non-incentivized (2)
Number of children	.	.
Number of cattle	.	.
Number of motos	.	.
Number of rooms	.	.
Owns land	.	.
Polygamous	.	.
Assets PCA	.	.
Adult Good WTP	0.420	0.445
Believes child is very likely to attend school	.	.
Expect child to finish primary	.	.
Would spend more on child's education than other parent	.	.
Would spend less on child's education than other parent	.	.
Tests more useful than classes	.	.
Tests more useful than workbook	.	.
Believes tests are higher quality than those school offers	0.117	0.082
Food fees from school	.	.
Uniform fees from school	.	.
Textbook fees from school	.	.
Spending on non-school books	.	.
Spending on extra lessons/coaching	.	.
Spending on education outside school	.	.
Supplemental expenses	.	.
Total spending on education	.	.
Total spending on education (log)	.	.
Child is male	.	.
Child age	.	.
Has younger focal child	.	.
Younger focal child male	.	.
Younger focal child age	.	.
Number of observations	364	364

Notes: Columns show coefficients from LASSO regressions that regress the WTP for tests on all of the predictors listed in the rows. Column (1) uses incentivized WTP for tests f as the dependent variable, and column (2) uses non-incentivized WTP for tests as the dependent variable. "." means that the LASSO coefficient is 0.

Next, we use the other half of the sample to conduct statistical inference on whether the relationship between WTP for tests and the two primary predictors chosen by LASSO differs for incentivized and non-incentivized WTP. We regress WTP for tests, pooled across incentivized and non-incentivized observations, on the two primary predictors and their interactions with whether a WTP observation was gathered in an incentivized or non-incentivized manner.[1] Table B.2 shows the results.

Reassuringly, neither interaction term is significant. Note that, while there is no significant difference in the predictors of WTP between incentivized and non-incentivized WTP, average incentivized WTP for the tests is lower than average non-incentivized WTP. However, this marginally significant effect is difficult to interpret: the incentivized and non-incentivized WTP were collected in different time periods (i.e., different survey waves, which occurred during different school years), and so we cannot distinguish whether this negative main effect simply reflects a time effect.

[1]We estimate the following regression:

(A1)

$$\begin{aligned} WTP_{ihc}^{test} =& \alpha + \beta AdultGoodWTP_{ihc} + \gamma AdultGoodWTP_{ihc} \times NonIncentivized_{ihc} + \\ & \lambda HiQuality_{ihc} + \delta HighQuality_{ihc} \times NonIncentivized_{ihc} + \nu NonIncentivized_{ihc} + \varepsilon_{ihc} \end{aligned}$$

where WTP_{ihc}^{test} is parent i in household h's WTP, either incentivized or non-incentivized, for tests for child c; $AdultGoodWTP_{ihc}$ is that same parent's WTP for the adult good; $HiQuality_{ihc}$ is an indicator for the parent thinking the tests were higher quality than the school's regular offering; and $NonIncentivized_{ihc}$ is an indicator that WTP was gathered in a non-incentivized way.

Appendix Table B.2—No significant difference in predictive coefficients for incentivized WTP and non-incentivized WTP

	Tests WTP (1)
Adult good WTP	0.502 (0.049)
Adult good WTP × Non-incentivized	0.087 (0.073)
Believes tests high quality	0.158 (0.095)
Believes tests high quality × Non-incentivized	-0.036 (0.132)
Non-incentivized	0.188 (0.148)
Number of observations	730

Notes: The dependent variable is the WTP for tests, pooled across incentivized and non-incentivized elicitations. "Believes test high quality" is an indicator for the respondent thinking the tests are higher quality than those offered by their child's school. The regression additionally controls for missing flags for adult good WTP and high-quality tests, and missing flags interacted with the non-incentivized binary. Standard errors clustered at household level.

Summary statistics and balance tests

This section describes several tests to confirm balance. For 729 households, we have surveys of both the mother and father. For 355 additional households that we did not revisit in the second round, we have data for one randomly-chosen parent. To verify that the randomization yielded balance, Appendix Table A.2 conducts an omnibus balance test between the mother and father subsamples. We fail to reject the null of joint orthogonality of all variables (p-value 0.50). Following **?**, we also calculate the difference between groups divided by the pooled standard deviation. These standardized differences are all far below the rule-of-thumb "cutoff" for good balance of 0.25 SD. Table C.1 shows that, in addition, within the subsamples of male focal children and of female focal children, mothers and fathers have balanced characteristics.

While we randomized the gender of the parent within each household, we did not randomize child gender. Reassuringly, Table C.2 shows that household and parent characteristics are nevertheless similar between the girl and boy subsamples. An omnibus balance test fails to reject the null that they are identical, and all standardized differences between the two samples are far below 0.25 SD. Appendix Table C.3 shows that there is also boy-girl balance within the subsamples of mothers and of fathers.

A parent's gender is bundled with other individual characteristics, such as earnings, and child gender is similarly bundled with other traits. Tables C.4 and C.5 summarize the personal characteristics of mothers and fathers, and of daughters and sons, respectively. Mothers are younger and have less income than fathers, on average. In contrast, daughters and sons have similar characteristics, such as age and school performance.[2]

[2]We have relatively more older focal children among girls (standardized difference of 0.185), likely due to sampling error. We show that all of our results are robust to controlling for whether the child is the younger focal child in parallel to how child gender enters the regressions.

Appendix Table C.1—Household and child characteristics are balanced across mothers and fathers within the daughter sample and within the son sample

Variable	Daughters			Sons		
	Mothers (1)	Fathers (2)	Std. diff (3)	Mothers (4)	Fathers (5)	Std. diff (6)
Panel A: Household characteristics						
Number of children	9.031 [3.058]	8.979 [2.917]	0.017	9.239 [3.050]	9.141 [2.963]	0.033
Number of cattle	0.937 [1.274]	0.995 [1.304]	-0.044	1.044 [1.352]	1.080 [1.368]	-0.027
Number of motos	0.040 [0.195]	0.035 [0.185]	0.026	0.043 [0.202]	0.043 [0.202]	0.000
Number of rooms	3.015 [1.164]	3.055 [1.160]	-0.034	2.941 [1.185]	3.021 [1.206]	-0.068
Owns land	0.912 [0.284]	0.938 [0.242]	-0.099	0.920 [0.272]	0.932 [0.252]	-0.046
Polygamous	0.242 [0.432]	0.247 [0.435]	-0.011	0.249 [0.436]	0.253 [0.438]	-0.009
Panel B: Focal child characteristics						
Older focal child male	0.820 [0.385]	0.821 [0.383]	-0.002	0.260 [0.439]	0.259 [0.438]	0.002
Older focal child age	11.827 [1.906]	11.918 [2.043]	-0.046	12.058 [1.982]	12.108 [2.003]	-0.025
Believes older focal child will support parents more than other children	0.475 [0.500]	0.497 [0.500]	-0.044	0.492 [0.500]	0.486 [0.500]	0.012
Has younger focal child	0.861 [0.346]	0.880 [0.325]	-0.059	0.895 [0.307]	0.893 [0.309]	0.006
Younger focal child male	0.335 [0.434]	0.327 [0.437]	0.017	0.771 [0.388]	0.775 [0.385]	-0.009
Younger focal child age	5.698 [1.632]	5.807 [1.713]	-0.064	5.774 [1.708]	5.756 [1.721]	0.011
Younger focal child in school	0.637 [0.410]	0.687 [0.395]	-0.122	0.625 [0.424]	0.650 [0.412]	-0.061
Younger focal child grade	1.501 [0.690]	1.545 [0.854]	-0.060	1.503 [0.733]	1.507 [0.657]	-0.005
Number of observations	805	817		799	823	
Joint p-value	0.576			0.968		

Notes: In the regression to test for joint orthogonality, we impute missing values with the sample mean and include missing flags. We also control for survey round and strata fixed effects, to match the main specification. Standard errors are clustered at the household level. The unit of observation is a household-parent.

Appendix Table C.2—Household and parent characteristics are balanced across daughter and son samples

Variable	Daughters (1)	Sons (2)	Standardized diff (3)
Panel A: Household characteristics			
Number of children	9.005 [2.987]	9.189 [3.005]	-0.061
Number of cattle	0.966 [1.289]	1.062 [1.360]	-0.072
Number of motos	0.038 [0.190]	0.043 [0.202]	-0.026
Number of rooms	3.035 [1.162]	2.982 [1.196]	0.045
Owns land	0.925 [0.264]	0.926 [0.262]	-0.004
Polygamous	0.245 [0.433]	0.251 [0.437]	-0.014
Panel B: Parent characteristics			
Parent age	39.426 [24.740]	40.076 [24.583]	-0.026
Has some education	0.813 [0.390]	0.799 [0.400]	0.035
Income (10000s UGX)	56.980 [126.025]	55.853 [124.525]	0.009
Number of observations	1622	1622	
Joint p-value	0.284		

Notes: In the regression to test for joint orthogonality, we impute missing values with the sample mean and include missing flags. We also control for survey round and strata fixed effects, to match the main specification. Standard errors are clustered at the household level. The unit of observation is a household-parent-focal child.

Appendix Table C.3—Household characteristics are balanced across daughters and sons within the mother sample and within the father sample

Variable	Mothers			Fathers		
	Daughters (1)	Sons (2)	Std. diff (3)	Daughters (4)	Sons (5)	Std. diff (6)
Panel A: Household characteristics						
Number of children	9.031 [3.058]	9.239 [3.050]	-0.069	8.979 [2.917]	9.141 [2.963]	-0.054
Number of cattle	0.937 [1.274]	1.044 [1.352]	-0.081	0.995 [1.304]	1.080 [1.368]	-0.064
Number of motos	0.040 [0.195]	0.043 [0.202]	-0.015	0.035 [0.185]	0.043 [0.202]	-0.041
Number of rooms	3.015 [1.164]	2.941 [1.185]	0.063	3.055 [1.160]	3.021 [1.206]	0.029
Owns land	0.912 [0.284]	0.920 [0.272]	-0.030	0.938 [0.242]	0.932 [0.252]	0.023
Polygamous	0.242 [0.432]	0.249 [0.436]	-0.016	0.247 [0.435]	0.253 [0.438]	-0.014
Panel B: Parent characteristics						
Age	34.900 [33.229]	35.671 [33.383]	-0.031	43.886 [9.374]	44.352 [8.526]	-0.019
Has some education	0.763 [0.426]	0.731 [0.444]	0.081	0.863 [0.344]	0.865 [0.340]	-0.005
Income (10000s UGX)	27.776 [85.183]	28.273 [82.761]	-0.004	85.755 [150.766]	82.629 [149.908]	0.025
Number of observations	805	799		817	823	
Joint p-value	0.242			0.716		

Notes: In the regression to test for joint orthogonality, we impute missing values with the sample mean and include missing flags. We also control for survey round and strata fixed effects, to match the main specification. Standard errors are clustered at the household level. The unit of observation is a household-parent-focal child.

Appendix Table C.4—Mothers and fathers have different characteristics

Variable	Mothers (1)	Fathers (2)	Standardized diff (3)
Age	35.784 [31.608]	44.650 [9.258]	-0.375
Has some education	0.743 [0.437]	0.865 [0.342]	-0.307
Income (10000s UGX)	29.536 [89.637]	88.185 [155.526]	-0.450
Number of observations	899	913	

Notes: The unit of observation is a household-parent.

Appendix Table C.5—Summary statistics: Boys and girls have similar characteristics

Variable	Daughters (1)	Sons (2)	Standardized diff (3)
Panel A: All focal children			
Older focal child	0.605	0.513	0.185
	[0.489]	[0.500]	
Panel B: Older focal children			
Child age	11.873	12.083	-0.106
	[1.980]	[1.994]	
Grade	4.655	4.620	0.046
	[0.773]	[0.733]	
Weekly study hours	5.226	4.960	0.039
	[7.422]	[6.073]	
School performance	3.208	3.189	0.020
	[0.948]	[0.944]	
Will support parents more than other children	0.486	0.489	-0.006
	[0.500]	[0.500]	
Panel C: Younger focal children			
Child age	5.752	5.766	-0.008
	[1.794]	[1.813]	
In school	0.667	0.634	0.069
	[0.472]	[0.482]	
Grade	1.533	1.495	0.036
	[1.110]	[1.004]	
Number of observations	1622	1622	

Notes: The unit of observation is a household-parent-focal child.

Interpreting the magnitudes of the estimates

In this subsection, we set up a simple framework to elucidate how the gender gaps in WTP that we estimate map to gender gaps in purchases and spending. Let each individual i have an underlying willingness pay parameter wtp_i. We assume that a person's willingness to pay for a specific good, wtp_{ig}, is wtp_i scaled by a good-specific constant, β_g. That is, $wtp_{ig} \equiv \beta_g wtp_i$.[3] We assume that wtp_i is drawn from a bounded distribution with a minimum of 0 and a standard deviation of 1. (Note that all of our wtp_{ig} observations in practice already have a minimum of 0.)

With these assumptions, to recover the latent distribution of wtp_i from our data on wtp_{ig}, we normalize wtp_{ig} by its standard deviation in our sample. When we do this for each good, we can stack them in a regression, having essentially partialled out the good-specific β_g parameters.

We want to use our empirical estimate of the wtp distribution to compare how much different subpopulations (e.g., fathers with daughters, or mothers with sons) would purchase of some good g'. The quantity purchased and expenditures depend on the market price of the good. We outline two approaches below: one that assesses purchases and expenditures under a range of potential prices that are distributed uniformly, and one that assesses them under specific assumed price points. We first describe the approaches and then present the results.

Below, without loss of generality, we assume that $\beta_{g'} = 1$, so $wtp_{ig'} = wtp_i$.[4] Hence, we drop the g' subscript for simplicity going forward.

[3]For simplicity, we are ignoring the error term. More precisely, $wtp_{ig} \equiv \beta_g wtp_i + \varepsilon_{ig}$, where ε_g has mean 0, is independent of wtp, and has a standard deviation that is proportional to β_g (so that the distribution of wtp has the same coefficient of variation for all goods). Note that the addition of an error term means that wtp_{ig} can in practice be negative. We assume that this will be rare in practice and ignore going forward for simplicity.

[4]This is without loss of generality since assuming a different $\beta_{g'}$ is isomorphic to assuming a different price distribution.

Purchases and expenditures under uniform prices.

We assume that the potential market prices for good g', p, are realizations of a random variable P that is distributed uniformly between 0 and $\bar{P}$, with $\bar{P}$ greater than or equal to the maximum value of WTP.

Consider multiple subpopulations s that we want to compare. Let wtp_{is} represent willingness to pay of member i of subpopulation s for good g', and let $x_{is}(p) = 1\{p < wtp_{is}\}$ be an indicator for whether that person would purchase the good at price realization p. Note that, by construction, $wtp_{is} \leq \bar{P}$.

The expected proportion of price realizations for which individual i from subpopulation s would purchase the good is then $x_{is} \equiv E_P[x_{is}(p)] = wtp_{is}/\bar{P}$.[5] That is, they purchase the good if the price is between 0 and their willingness to pay, and this occurs with probability $wtp_{is}/\bar{P}$ given the uniform distribution. The expected share of the subpopulation who would purchase the good (averaged across potential price realizations) is $E_X[x_{is}] = E_{WTP}[wtp_{is}]/\bar{P}$, where the expectations are taken across all individuals i in subpopulation s.

The ratio of expected purchases between two subpopulations, $s = m, f$, is: $\frac{E_{X_m}[x_{im}]}{E_{X_f}[x_{jf}]} = \frac{E_{WTP_m}[wtp_{im}]/\bar{P}}{E_{WTP_f}[wtp_{jf}]/\bar{P}} = \frac{E_{WTP_m}[wtp_{im}]}{E_{WTP_f}[wtp_{jf}]}$. Thus, under these assumptions, the ratio of average standardized WTP for two subpopulations gives us an estimate of the ratio of goods purchased between those groups. Hence, in our regression analysis, the point estimates for WTP (in a specification where WTP has been standardized across the population by the good-specific standard deviation) can be divided by the mean in the reference group to obtain an estimate of the the percent difference in expected purchases across those two subpopulations (e.g., fathers with sons versus fathers with

[5]To see this more rigorously: $E_P[x_{is}(p)] = E[1\{p < wtp_{is}\}] = \int_0^{\bar{P}} 1\{p < wtp_{is}\}/\bar{P}dp = \int_0^{wtp_{is}} dp/\bar{P} = wtp_{is}/\bar{P}$.

daughters).

The above discussion regards the number of goods purchased, not expenditures. To estimate expenditures, we have $E_P[x_{is}(p)p] = E_P[1\{p < wtp_{is}\}p] = \int_0^{\bar{P}} 1\{p < wtp_{is}\}p/\bar{P}dp = \int_0^{wtp_{is}} p/\bar{P}dp = wtp_{is}^2/(2\bar{P})$. The ratio of expected expenditures between two subpopulations, $s = m, f$, is: $\frac{E_{X_m}[x_{im}(p)p]}{E_{X_f}[x_{jf}(p)p]} = \frac{E_{WTP_m}[wtp_{im}^2]/2\bar{P}}{E_{WTP_f}[wtp_{jf}^2]/2\bar{P}} = \frac{E_{WTP_m}[wtp_{im}^2]}{E_{WTP_f}[wtp_{jf}^2]}$. Hence to estimate differences across populations in expenditures, we use standardized willingness to pay squared as the dependent variable in the regression.

Purchases and expenditures for specific price points.

An alternate way to think about purchases and expenditures is to imagine that the potential good g' we are considering has a specific price point, p^*, where we could define p^* as, say, the 20th percentile of the wtp distribution or the 60th percentile. In that case, purchases become $x_{is}(p^*) = 1\{wtp_{is} > p^*\}$ and expenditures become $x_{is}(p^*)p^* = 1\{wtp_{is} > p^*\}p^*$. As a result, we have $\frac{E_{X_m}[x_{im}(p^*)]}{E_{X_f}[x_{jf}(p^*)]} = \frac{E_{WTP_m}[1\{wtp_{im} > p^*\}]}{E_{WTP_f}[1\{wtp_{jf} > p^*\}]}$ for demand and $\frac{E_{X_m}[x_{im}(p^*)p^*]}{E_{X_f}[x_{jf}(p^*)p^*]} = \frac{E_{WTP_m}[1\{wtp_{im} > p^*\}]}{E_{WTP_f}[1\{wtp_{jf} > p^*\}]}$ for expenditures. That is, the estimate for the difference in both purchases and expenditures across two subpopulations for a given price level p^* is the ratio across the subpopulations of the average of $1\{wtp_{is} > p^*\}$. Hence to estimate differences between subpopulations in purchases and expenditures for fixed price points, we use $1\{wtp_{is} > p^*\}$ as the dependent variable in the regression. To explore a range of potential prices, we set p^* at the 20th, 40th, 60th, and 80th percentile of the wtp distribution.

Results

Table D.1 shows the results of estimating equation 2 using the following as dependent variables: standardized WTP (column 1; this is our main specification, repeated for reference), standardized WTP squared (column 2), and indicators for whether standardized WTP is above the 20th, 40th, 60th, and 80th percentiles of the distribution in our sample (columns 3-6). Dividing the *Daughter* coefficients in each of these regressions by the dependent variable mean for fathers and sons (shown in a bottom row of the table) quantifies how much lower, in percent terms, father's demand (columns 1 and 2-6) and/or spending (columns 2 - 6) is for their daughters than their sons. The different columns assume either uniformly distributed potential prices (columns 1 and 2) or specific price points (columns 3-6). Although we lose some power in the percentile specifications in columns (3) - (6) due to not using all of the underlying variation in the data, the high-level take-away is similar across all columns. Across all specifications, the *Daughter* effect is meaningful in percent terms, with a median of 6%. The estimates from columns (1) and (2), which capture percent changes in demand and spending, respectively, under uniform prices are 5% and 8%. The estimates in columns (3) through (6), which allow us to calculate percent changes in both demand and spending at specific price points, are 3%, 5%, 6%, and 16%. (The observed increase in the percent effect across price points is almost mechanical, as a lower price point corresponds to a higher base level of spending.) Similarly, we can normalize the $Daughter \times Mother$ coefficient by the dependent variable mean for fathers and sons to understand how much smaller the *Daughter* effect is for mothers than fathers, in percentage terms. The estimates have a median of 7% and range across columns 1-6 from 5% (column 5) to 13% (column 6).

Appendix Table D.1—Results across the potential price distribution

	WTP specification					
	Standardized	Standardized squared	≥ 20th percentile	≥ 40th percentile	≥ 60th percentile	≥ 80th percentile
	(1)	(2)	(3)	(4)	(5)	(6)
Daughter	-0.102	-0.382	-0.027	-0.034	-0.024	-0.034
	(0.032)	(0.132)	(0.013)	(0.016)	(0.015)	(0.013)
Mother × Daughter	0.131	0.372	0.054	0.062	0.020	0.029
	(0.046)	(0.187)	(0.019)	(0.022)	(0.021)	(0.018)
Mother	-0.095	-0.140	-0.056	-0.053	-0.014	-0.001
	(0.036)	(0.148)	(0.015)	(0.017)	(0.016)	(0.014)
p-val: Mother + Mother × Daughter = 0	0.318	0.098	0.875	0.610	0.691	0.023
p-val: Daughter + Mother × Daughter = 0	0.399	0.942	0.064	0.087	0.786	0.722
Dep. var. mean father-son	1.943	5.088	0.834	0.638	0.423	0.219
Number of observations	6,673	6,673	6,673	6,673	6,673	6,673

Notes: The dependent variable in the first column is standardized WTP (i.e., WTP normalized by the good-level standard deviation), as in column (2) of Table 1. The dependent variable in the second column is standardized WTP squared. The dependent variable in columns (3), (4), (5), and (6) are indicators that standardized WTP is at least as large as the 20th, 40th, 60th, and 80th percentiles, respectively, of the standardized WTP distribution for the goods included in the regression.

Robustness of main results

Since daughters are marginally more likely than sons to be the older focal child, Appendix Table E.1 shows that the results are robust to controlling for an indicator that the child is the younger focal child in parallel to how *Daughter* enters the regression. In addition, Appendix Table E.2 shows that our results are robust to excluding the control for the respondent's WTP for the adult good; the main change is that the standard errors are about 30% larger when we omit this control variable.

Appendix Table E.3 repeats these robustness checks for the results corresponding to the two panels of Figure 3.

Appendix Table E.1—Robustness of Table 1 to controlling for *Mother* × *Younger child good*

	WTP normalized by...					
	SD	SD	Market price	SD	SD	SD
	(1)	(2)	(3)	(4)	(5)	(6)
Daughter	-0.037	-0.104	-0.029	-0.099	-0.065	-0.164
	(0.024)	(0.032)	(0.009)	(0.037)	(0.036)	(0.052)
Mother × Daughter		0.135	0.037	0.150	0.067	0.218
		(0.047)	(0.013)	(0.053)	(0.053)	(0.076)
Mother	-0.029	-0.115	-0.032	-0.101	-0.083	-0.144
	(0.028)	(0.039)	(0.012)	(0.046)	(0.043)	(0.067)
p-val: Mother + Mother × Daughter = 0		0.588	0.661	0.259	0.707	0.224
p-val: Daughter + Mother × Daughter = 0		0.367	0.428	0.177	0.950	0.308
Dep. var. mean father-son	1.943	1.943	0.537	1.943	1.793	2.164
Fixed effects	Stratum	Stratum	Stratum	HH	Stratum	Stratum
Goods included	All	All	All	All	Incentivized	Non-incentivized
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.

Appendix Table E.2—Robustness of Table 1 to omitting control for adult good WTP

	WTP normalized by...					
	SD	SD	Market price	SD	SD	SD
	(1)	(2)	(3)	(4)	(5)	(6)
Daughter	-0.064	-0.111	-0.029	-0.077	-0.082	-0.163
	(0.033)	(0.045)	(0.009)	(0.039)	(0.052)	(0.057)
Mother × Daughter		0.095	0.036	0.113	0.039	0.179
		(0.058)	(0.013)	(0.059)	(0.069)	(0.079)
Mother	-0.041	-0.089	-0.028	-0.053	-0.094	-0.081
	(0.036)	(0.047)	(0.010)	(0.049)	(0.056)	(0.062)
p-val: Mother + Mother × Daughter = 0		0.887	0.420	0.216	0.317	0.092
p-val: Daughter + Mother × Daughter = 0		0.705	0.454	0.374	0.413	0.781
Dep. var. mean father-son	1.943	1.943	0.537	1.943	1.793	2.164
Fixed effects	Stratum	Stratum	Stratum	HH	Stratum	Stratum
Goods included	All	All	All	All	Incentivized	Non-incentivized
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.

Appendix Table E.3—Robustness checks for Figure 3

	Human capital goods:				Enjoyment goods:		
WTP normalized by	Market price (1)	SD (2)	SD (3)	SD (4)	Market price (5)	SD (6)	SD (7)
Daughter	-0.029	-0.110	-0.120	-0.095	-0.028	-0.087	-0.087
	(0.010)	(0.037)	(0.045)	(0.045)	(0.015)	(0.051)	(0.072)
Mother × Daughter	0.039	0.152	0.114	0.149	0.023	0.073	0.024
	(0.014)	(0.051)	(0.059)	(0.061)	(0.024)	(0.081)	(0.103)
Mother	-0.017	-0.098	-0.054	-0.043	-0.070	-0.199	-0.218
	(0.011)	(0.043)	(0.046)	(0.048)	(0.018)	(0.073)	(0.085)
Extra control variables		Mother × YoungerChild		Household FEs		Mother × YoungerChild	
Excluded control variables			Adult good WTP				Adult good WTP
p-val: Mother + Mother × Daughter = 0	0.038	0.183	0.184	0.020	0.017	0.081	0.022
p-val: Daughter + Mother × Daughter = 0	0.356	0.269	0.884	0.246	0.812	0.831	0.403
Dep. var. mean father-son	0.543	1.996	1.996	1.996	0.518	1.754	1.754
Number of observations	5,215	5,215	5,215	5,215	1,458	1,458	1,458

Notes: All columns control for strata and good fixed effects, and survey round. All columns except columns 3 and 7, also control for adult WTP and adult WTP interacted with survey round. Standard errors are clustered by household.