https://doi.org/10.1027/1864-9335/a000506

Electronic Supplementary Materials 1

Parenting daughters does not increase monetary prosocial behavior: evidence from the Dictator Game

Measures

Donation (UE72 Experiment, SOEP-IS, Goebel et al., 2018)

General instructions. Now, we would like to give you two tasks with which you could earn money again. In the two tasks, you have to decide whether to split a certain amount of money between another household and you or not. At the end, every 7th participant will be selected and their decision in one of the two tasks will be paid out. Whether your decision will be paid out is determined at the end of the module. The actual payment will occur at the end of the interview.

Domestic recipient. You were paired with another household in Germany who is also a participant in the innovation sample "Leben in Deutschland" but is not taking part in this interview. This household belongs to the poorest 10 percent of households in Germany. Now, you have 50 EUR at your disposal and can split this amount between the other household and you in any way you want. If this task is selected for payout, you will receive the amount you decided to keep at the end of the interview. The amount you want to give the other household will be given in full to the other household (without transaction costs) at the end of the field period by Kantar Public. In full means that every given euro will be received by the other household 1:1. I ask you to make this decision alone now.

> How much of the 50 EUR do you want to keep and how much do you want to give the other household?
>
> I keep EUR … [1] and give EUR [2] to the other household.

Foreign recipient. You were paired with another household in Kenya or Uganda. This household belongs to the poorest 10 percent of households worldwide. Now, you have 50 EUR at your disposal and can split this amount between the other household and you in any way you want. If this task is selected for payout, you will receive the amount you decided to keep at the end of the interview. The amount you want to give the other household will be given in full to the other household (without transaction costs) at the end of the field period by Heidelberg University via a charitable organization. In full means that every given euro will be received by the other household 1:1. A leaflet with information about the donations will be given to you after you have made your decision. I ask you to make this decision alone now.

> How much of the 50 EUR do you want to keep and how much do you want to give the other household?
>
> I keep EUR … [1] and give EUR [2] to the other household.

Independent variables

Number of daughters/Number of children. The number and sex of children were determined based on the birth data provided by the SOEP for each participant.

Female participant (*1 = female, 0 = male*). Biological sex codes of each participant in the SOEP as “male” or “female” were used.

Married (*1 = yes, 0 = no*). Marital status was determined based on SOEP-data from the 2017 wave.

Income. Income corresponds to monthly net income (in EUR) and was measured using self-reports responding to the question about their monthly net income from work, including overtime pay, but excluding vacation or back pay in the 2017 wave. The imputed values were provided by the SOEP (for the imputation process see Frick & Grapka, 2014). As the distribution was right-skewed, we log-transformed values.

Age. Age was measured based on participants´ date of birth as reported in the SOEP. To compute age in years, we subtracted the year of birth from the year of the data collection period.

Education. Education corresponds to years of education. This variable was computed and provided by the SOEP, taking years of schooling, professional training, and university education into account.

Catholic/Protestant/Other religion (*1 = yes, 0 = no*). Religion was obtained from the life course data provided by the SOEP, but only entries from the year of the 2017 wave were used.

Tables

Table S1. Descriptive statistics.

Overall (*N* = 1,461)	
Sex	
Female	805 (55.1%)
Male	656 (44.9%)
Age in years	
Mean	54.016
SD	18.836
Median	56.000
Q1, Q3	40.000, 69.000
Religion	
N-Miss	853
Catholic	174 (28.6%)
Islamic Religion	4 (0.7%)
Member of an Islamic religious community	4 (0.7%)
Member of another Christian denomination or religious community	10 (1.6%)
Member of another religious community	5 (0.8%)
No	92 (15.1%)
Non-Denominational	106 (17.4%)
Other Christian Religious Organization	13 (2.1%)
Protestant	200 (32.9%)
Marital status	
N-Miss	1
Single	338 (23.2%)
Divorced	178 (12.2%)
Married	766 (52.5%)
Married, But Separated	36 (2.5%)
Registered same sex partnership	4 (0.3%)
Widowed	138 (9.5%)
Net household income in €	
Mean	2890.486
SD	1745.740
Median	2700.000
Q1, Q3	1700.000, 3800.000
Number of biological daughters	
Mean	0.771
SD	0.900
Median	1.000
Q1, Q3	0.000, 1.000
Number of biological sons	
Mean	0.687
SD	0.834
Median	0.000
Q1, Q3	0.000, 1.000
Number of biological children	
Mean	1.458
SD	1.236

Overall (*N* = 1,461)	
Median	2.000
Q1, Q3	0.000, 2.000
Years of education	
Mean	12.380
SD	2.723
Median	11.500
Q1, Q3	10.500, 14.000

Table S2. Correlations between key variables

Variable	1	2	3	4	5	6
1. Age						
2. Income	-.22** [-.27, -.17]					
3. Married	.21** [.16, .26]	.29** [.24, .34]				
4. Years of education	-.04 [-.10, .01]	.34** [.29, .38]	.06* [.01, .11]			
5. Number of biological daughters	.24** [.19, .29]	.03 [-.03, .08]	.25** [.20, .29]	-.08** [-.13, -.03]		
6. Number of biological children	.36** [.32, .41]	.01 [-.04, .07]	.31** [.27, .36]	-.10** [-.16, -.05]	.74** [.71, .76]	
7. Proportion of endowment donated	-.07** [-.12, -.02]	.21** [.16, .26]	-.01 [-.06, .04]	.24** [.19, .29]	-.04 [-.09, .01]	-.05 [-.10, .00]

Notes: Values in square brackets indicate the 95% *CI*s for each correlation. * $p < 0.05$, ** $p < 0.01$

Table S3. The number of daughters, sons and children that participants had.

	Count	Frequency	Relative frequency
Number of daughters	0	701	0.48
	1	472	0.32
	2	221	0.15
	3	56	0.04
	4	8	0.01
	>4	2	0.00
Number of sons	0	738	0.51
	1	495	0.34
	2	186	0.13
	3	30	0.02
	4	9	0.01
	>4	2	0.00
Number of children	0	431	0.30
	1	291	0.20
	2	485	0.33
	3	173	0.12
	4	57	0.04
	>4	23	0.02

Table S4. Results of linear regression models predicting generosity, with standardized coefficients without experimental treatment factor recipient family origin.

	Model 1	Model 2	Model 3	Model 4
Intercept	0.00 [-0.05, 0.05]	-0.09 * [-0.16, -0.02]	-0.10 ** [-0.17, -0.03]	-0.19 [-0.40, 0.01]
Number of daughters	0.02 [-0.05, 0.09]	0.06 [-0.03, 0.15]	0.01 [-0.08, 0.10]	-0.02 [-0.18, 0.14]
Number of children	-0.07 * [-0.14, -0.00]	-0.08 * [-0.15, -0.01]	-0.04 [-0.11, 0.03]	0.02 [-0.10, 0.14]
Female respondent		0.16 *** [0.07, 0.26]	0.18 *** [0.09, 0.28]	0.29 *** [0.14, 0.44]
Number of daughters × Female respondent		-0.06 [-0.15, 0.04]	0.01 [-0.09, 0.10]	-0.01 [-0.17, 0.15]
Married			-0.08 ** [-0.13, -0.02]	-0.08 [-0.16, 0.01]
Income			0.20 *** [0.15, 0.26]	0.16 *** [0.07, 0.25]
Education			0.17 *** [0.12, 0.23]	0.22 *** [0.14, 0.31]
Age			-0.02 [-0.07, 0.03]	-0.03 [-0.11, 0.06]
Religion = Catholic				0.14 [-0.10, 0.38]
Religion = Protestant				0.02 [-0.21, 0.26]
Religion = Other				-0.05 [-0.30, 0.20]
Random Effects				
σ^2	0.03	0.03	0.03	0.03
τ_{00}	0.07 $_{pid}$	0.07 $_{pid}$	0.06 $_{pid}$	0.06 $_{pid}$
ICC	0.71	0.71	0.69	0.71
N	1460 $_{pid}$	1460 $_{pid}$	1368 $_{pid}$	559 $_{pid}$
Observations	2918	2918	2734	1116
Marginal R^2 / Conditional R^2	0.003 / 0.715	0.011 / 0.715	0.098 / 0.720	0.119 / 0.740
Deviance	392.564	379.654	168.227	48.141
AICc	425.858	429.876	261.590	154.947
log-Likelihood	-207.919	-207.919	-119.747	-63.283

Notes: 95% *CI*s are shown in brackets. σ^2 shows the within-subjects standard deviation. τ_{00} shows the between-subject standard deviation. ICC indicates the intra-class correlation, i.e., the proportion of variation between individuals (τ_{00}) explained by the overall variance ($\sigma^2 + \tau_{00}$). Marginal R^2 provides the variance explained only by fixed effects and conditional R^2 provides the variance explained by the entire model, i.e., both fixed effects and random effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S5. Results of hurdle regression models predicting generosity without experimental treatment factor recipient family origin.

	Model 1	Model 2	Model 3	Model 4
Beta regression (conditional model)				
Intercept	-0.41 *** [-0.54, -0.27]	-0.55 *** [-0.73, -0.36]	-0.46 *** [-0.68, -0.25]	-0.83 *** [-1.29, -0.37]
Precision	2.15	2.15	2.17	2.15
Number of daughters	0.11 [-0.03, 0.25]	0.13 [-0.05, 0.31]	0.09 [-0.08, 0.27]	0.03 [-0.30, 0.36]
Number of children	-0.18 *** [-0.28, -0.07]	-0.19 *** [-0.29, -0.09]	-0.15 ** [-0.26, -0.04]	-0.11 [-0.28, 0.06]
Female respondent		0.25 * [0.03, 0.48]	0.27 * [0.04, 0.49]	0.52 ** [0.20, 0.85]
Number of daughters × Female respondent		-0.03 [-0.22, 0.16]	0.01 [-0.18, 0.20]	0.04 [-0.29, 0.37]
Married			-0.06 [-0.26, 0.14]	0.07 [-0.23, 0.38]
Income			0.87 *** [0.44, 1.31]	0.84 ** [0.21, 1.47]
Education			0.08 *** [0.04, 0.11]	0.07 * [0.02, 0.12]
Age			-0.00 [-0.01, 0.00]	-0.01 [-0.01, 0.00]
Religion = Catholic				0.33 [-0.10, 0.75]
Religion = Protestant				0.16 [-0.26, 0.57]
Religion = Other				-0.09 [-0.53, 0.36]
Logistic regression (hurdle model predicting non-perfect altruism)				
(Intercept)	8.03 *** [7.29, 8.77]	8.26 *** [7.35, 9.18]	7.87 *** [6.74, 9.00]	7.41 *** [5.04, 9.78]
Number of daughters	0.06 [-0.52, 0.63]	-0.09 [-0.81, 0.63]	0.03 [-0.76, 0.82]	0.10 [-1.36, 1.56]
Number of children	-0.03 [-0.44, 0.38]	-0.02 [-0.43, 0.40]	-0.08 [-0.56, 0.40]	-0.29 [-1.06, 0.49]

Notes: 95% *CI*s are shown in brackets. The conditional model was fitted using a beta regression for proportional data reflecting the degree of generosity. The estimates are under a logit-link function. The intercept shows the alpha and the precision the beta parameter. The hurdle model was fitted using a binomial regression (logistic) predicting keeping some (0) vs. keeping nothing (1). The estimates are under a logit-link function. σ^2 shows the within-subjects standard deviation. τ_{00} shows the between-subject standard deviation. ICC indicates the intra-class correlation, i.e. the proportion of variation between individuals (τ_{00}) explained by the overall variance ($\sigma^2 + \tau_{00}$). Marginal R^2 provides the variance explained only by fixed effects and conditional R^2 provides the variance explained by the entire model, i.e., both fixed effects and random effects.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S6. Results of linear and hurdle regression models: subset of people that either had no children or one child without experimental treatment factor recipient family origin.

	Linear	Hurdle
		Beta regression (conditional model)
Intercept	0.59 *** [0.55, 0.63]	-0.35 ** [-0.59, -0.11]
Precision		-2.26
One daughter	0.01 [-0.07, 0.09]	-0.15 [-0.60, 0.30]
One son	-0.01 [-0.08, 0.07]	0.10 [-0.34, 0.54]
Female respondent	0.07 * [0.01, 0.12]	0.40 * [0.09, 0.71]
Married	-0.04 [-0.09, 0.01]	0.01 [-0.27, 0.30]
Income	0.18 *** [0.09, 0.28]	0.56 [-0.00, 1.12]
Education	0.02 *** [0.01, 0.03]	0.10 *** [0.06, 0.15]
Age	-0.00 [-0.00, 0.00]	-0.01 * [-0.01, -0.00]
One daughter × Female respondent	-0.02 [-0.12, 0.09]	-0.10 [-0.70, 0.50]
One son × Female respondent	0.00 (-0.11, 0.10)	-0.02 [-0.62, 0.57]
		Logistic regression (hurdle model predicting non-perfect altruism)
Intercept		7.86 *** [6.49, 9.24]
One daughter		-0.30 [-2.36, 1.77]
One son		0.37 [-1.80, 2.53]

Notes: 95% *CI*s are shown in brackets. In the hurdle model, the conditional model was fitted using a beta regression for proportional data reflecting the degree of generosity. The estimates are under a logit-link function. The first hurdle was fitted using a binomial regression (logistic) predicting keeping some (0) vs. keeping nothing (1). The estimates are under a logit-link function. σ^2 shows the within-subjects standard deviation. τ_{00} shows the between-subject standard deviation. ICC indicates the intra-class correlation, i.e. the proportion of variation between individuals (τ_{00}) explained by the overall variance ($\sigma^2 + \tau_{00}$). Marginal R^2 provides the variance explained only by fixed effects and conditional R^2 provides the variance explained by the entire model, i.e., both fixed effects and random effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S7. Standardized regression models predicting generosity accounting for the experimental treatment factor recipient family origin.

	Linear Model	Hurdle Model
		Beta regression (conditional model)
Intercept	-0.20 *** [-0.28, -0.13]	-0.54 *** [-0.76, -0.31]
Precision		-2.20
Number of daughters	0.01 [-0.08, 0.11]	0.09 [-0.10, 0.27]
Female respondent	0.16 ** [0.06, 0.27]	0.27 * [0.03, 0.51]
Foreign recipient	0.21 *** [0.15, 0.26]	0.15 * [0.03, 0.27]
Number of children	-0.04 [-0.11, 0.03]	-0.15 ** [-0.26, -0.05]
Married	-0.08 ** [-0.13, -0.02]	-0.06 [-0.26 0.14]
Income	0.20 *** [0.15, 0.26]	0.89 *** [0.45, 1.32]
Education	0.17 *** [0.12, 0.23]	0.08 *** [0.04, 0.11]
Age	-0.02 [-0.07, 0.03]	-0.00 [-0.01, 0.00]
Number of daughters × Female respondent	-0.02 [-0.12, 0.08]	-0.00 [-0.21, 0.20]
Number of daughters × Foreign recipient	-0.01 [-0.07, 0.05]	0.02 [-0.09, 0.12,]
Female respondent × Foreign recipient	0.04 [-0.04, 0.11]	0.00 [-0.17, 0.17]
Number of daughters × Female respondent × Foreign recipient	0.05 [-0.03, 0.12]	0.04 [-0.10, 0.19]
		Logistic regression (hurdle model predicting non- perfect altruism)

Intercept		20.64 *** [18.36, 22.92]
Number of daughters		-2.43 ** [-4.10, -0.77]
Female		-0.61 [-2.70, 1.48]
Foreign recipient		-10.05 *** [-8.59, -11.52]
Number of children		-0.03 [0.69, -0.75]
Married		0.25 [1.57, -1.06]
Income		-2.12 [0.88, -5.13]
Education		-0.16 [0.06, -0.37]
Age		-0.00 [0.03, -0.04]
Number of daughters × Female respondent		2.91 ** [4.83, 0.98]
Number of daughters × Foreign recipient		2.56 *** [3.86, 1.26]
Female respondent × Foreign recipient		0.22 [1.86, -1.42]
Number of daughters × Female respondent × Foreign recipient		-3.05 *** [-1.42, -4.68]
Random Effects		
σ^2	0.02	-0.03
$\tau_{00\ pid}$	0.06	1.80
ICC	0.71	1.02
N_{pid}	1368	1368
Observations	2734	2734

Marginal R^2 / Conditional R^2	0.111 / 0.746	0.090 / 1.014
AICc	30.256	-705.083
log-Likelihood	162.058	381.863

Notes: 95% *CI*s are shown in brackets. Linear model shows standardized β. The conditional model was fitted using a beta regression for proportional data reflecting the degree of generosity. The estimates are under a logit-link function. The intercept shows the alpha and the precision the beta parameter. The hurdle model was fitted using a binomial regression (logistic) predicting keeping some (0) vs. keeping nothing (1). The estimates are under a logit-link function. σ^2 shows the within-subjects standard deviation. τ_{00} shows the between-subject standard deviation. ICC indicates the intra-class correlation, i.e. the proportion of variation between individuals (τ_{00}) explained by the overall variance ($\sigma^2 + \tau_{00}$). Marginal R^2 provides the variance explained only by fixed effects and conditional R^2 provides the variance explained by the entire model, i.e., both fixed effects and random effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S8. Bayesian Analysis for Model 2 predicting donation size.

Predictors	*B*
Intercept	27.55 [25.96, 29.14]
Number of daughters (1)	1.02 [-0.56, 2.64]
Female participant (2)	3.28 [1.18, 5.26]
Foreign donation (3)	3.64 [2.51, 4.72]
Number of children (4)	-1.03 [-1.94, -0.17]
1 × 2	-1.30 [-3.04, 0.44]
1 × 3	-0.24 [-1.18, 0.70]
2 × 3	0.03 [-1.45, 1.57]
1 × 2 × 3	0.66 [-0.60, 1.92]
Random Effects	
σ^2	61.62
$\tau_{00\ pid}$	173.03
ICC	0.74
$N_{\ pid}$	1460
Observations	2918
Marginal R^2 / Conditional R^2	0.028 / 0.744

Notes: 95% *CI*s are shown in brackets. σ^2 shows the within-subjects standard deviation. τ_{00} shows the between-subject standard deviation. ICC indicates the intra-class correlation, i.e. the proportion of variation between individuals (τ_{00}) explained by the overall variance ($\sigma^2 + \tau_{00}$). Marginal R^2 provides the variance explained only by fixed effects and conditional R^2 provides the variance explained by the entire model, i.e., both fixed effects and random effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S9. Bayesian Analysis for Model 2 predicting donation size assuming a binary daughter predictor.

Predictors	*B*
Intercept	28.56 [27.23, 29.90]
Has daughter (=1 yes, =0 no) (1)	-0.11 [-1.57, 1.32]
Female participant (2)	1.45 [0.18, 2.77]
Foreign donation (3)	2.89 [2.05, 3.74]
Number of children (4)	-0.66 [-1.35, 0.03]
1 × 2	-0.56 [-1.99, 0.96]
1 × 3	0.17 [-0.92, 1.25]
2 × 3	0.99 [-0.07, 2.03]
1 × 2 × 3	0.02 [-1.28, 1.26]
Random Effects	
σ^2	61.71
$\tau_{00\ pid}$	172.79
ICC	0.74
$N_{\ pid}$	1460
Observations	2918
Marginal R^2 / Conditional R^2	0.020 / 0.743

Notes: 95% *CI*s are shown in brackets. σ^2 shows the within-subjects standard deviation. τ_{00} shows the between-subject standard deviation. ICC indicates the intra-class correlation, i.e. the proportion of variation between individuals (τ_{00}) explained by the overall variance ($\sigma^2 + \tau_{00}$). Marginal R^2 provides the variance explained only by fixed effects and conditional R^2 provides the variance explained by the entire model, i.e., both fixed effects and random effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table S10. Bayesian Analysis for Model 2 predicting donation size assuming an ordered categorical daughter predictor.

Predictors	B
Intercept	27.58 [26.07, 29.14]
Daughter (ordered cat.) (1)	1.52 [-0.45, 5.92]
Female participant (2)	3.57 [1.35, 5.69]
Foreign donation (3)	3.55 [1.65, 5.46]
Number of children (4)	-1.00 [-1.64, -0.34]
1 × 2	-1.24 [-3.32, 0.92]
1 × 3	-0.26 [-3.76, 2.80]
2 × 3	0.17 [-2.36, 3.03]
1 × 2 × 3	0.88 [-2.34, 4.69]
Monotonic Effects	
simo_moordered_daughter1[1]	0.09 [0.01, 0.36]
simo_moordered_daughter1[2]	0.06 [0.00, 0.35]
simo_moordered_daughter1[3]	0.16 [0.01, 0.53]
simo_moordered_daughter1[4]	0.08 [0.00, 0.42]
simo_moordered_daughter1[5]	0.19 [0.01, 0.63]
simo_moordered_daughter1[6]	0.23 [0.01, 0.69]
simo_moordered_daughter:sexFemale1[1]	0.27 [0.02, 0.60]
simo_moordered_daughter:sexFemale1[2]	0.08 [0.00, 0.36]
simo_moordered_daughter:sexFemale1[3]	0.08 [0.00, 0.38]
simo_moordered_daughter:sexFemale1[4]	0.15 [0.01, 0.52]
simo_moordered_daughter:sexFemale1[5]	0.13 [0.01, 0.50]

simo_moordered_daughter:sexFemale1[6]	0.12 [0.00, 0.50]
simo_moordered_daughter:conditionforeign1[1]	0.09 [0.00, 0.41]
simo_moordered_daughter:conditionforeign1[2]	0.09 [0.00, 0.43]
simo_moordered_daughter:conditionforeign1[3]	0.12 [0.00, 0.50]
simo_moordered_daughter:conditionforeign1[4]	0.16 [0.01, 0.63]
simo_moordered_daughter:conditionforeign1[5]	0.15 [0.01, 0.56]
simo_moordered_daughter:conditionforeign1[6]	0.15 [0.01, 0.59]
simo_moordered_daughter:sexFemale:conditionforeign1[1]	0.08 [0.00, 0.44]
simo_moordered_daughter:sexFemale:conditionforeign1[2]	0.12 [0.00, 0.47]
simo_moordered_daughter:sexFemale:conditionforeign1[3]	0.14 [0.01, 0.51]
simo_moordered_daughter:sexFemale:conditionforeign1[4]	0.12 [0.00, 0.51]
simo_moordered_daughter:sexFemale:conditionforeign1[5]	0.15 [0.01, 0.56]
simo_moordered_daughter:sexFemale:conditionforeign1[6]	0.17 [0.01, 0.61]
Observations	2918
R^2 Bayes	0.030

Figures

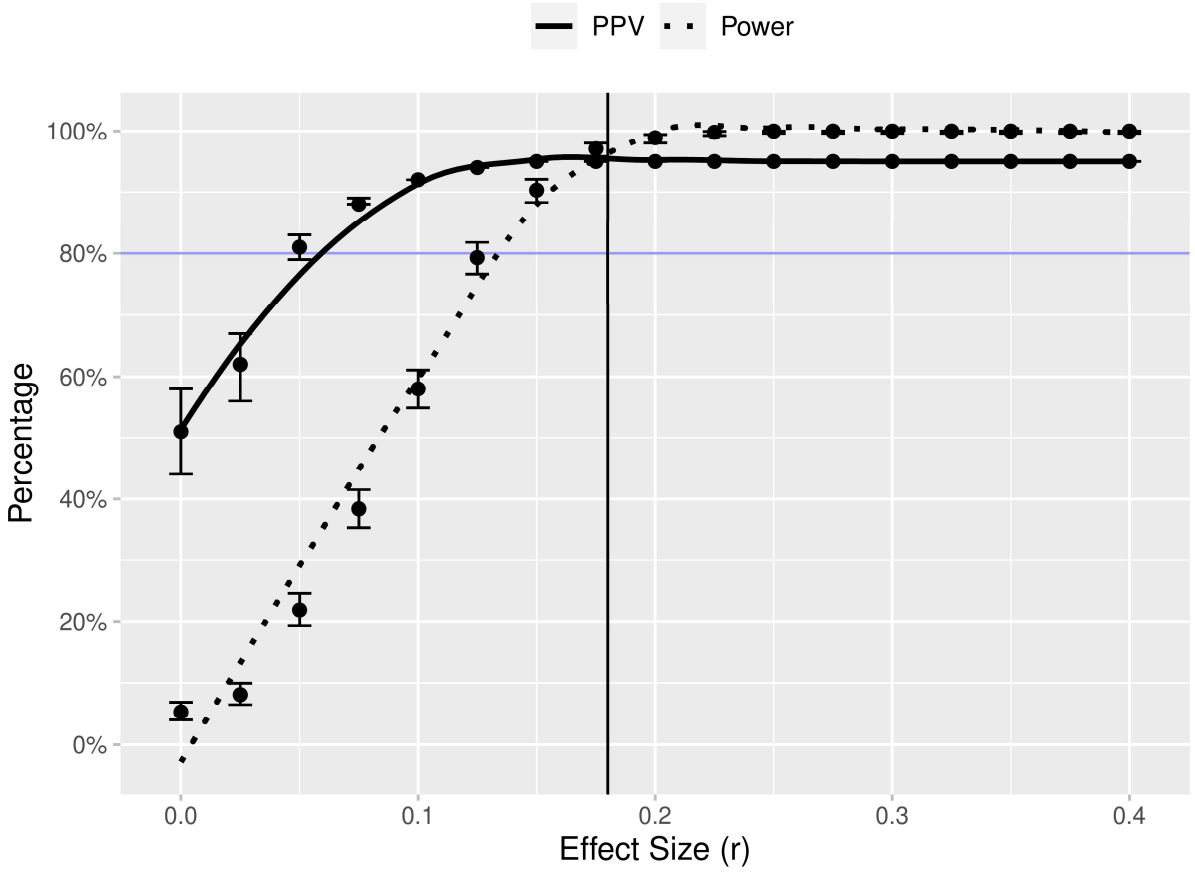

Fig. S1. Curve for the power and positive predictive values.

Notes: The horizontal blue line shows 80% power. The vertical black line shows the effect for being female.

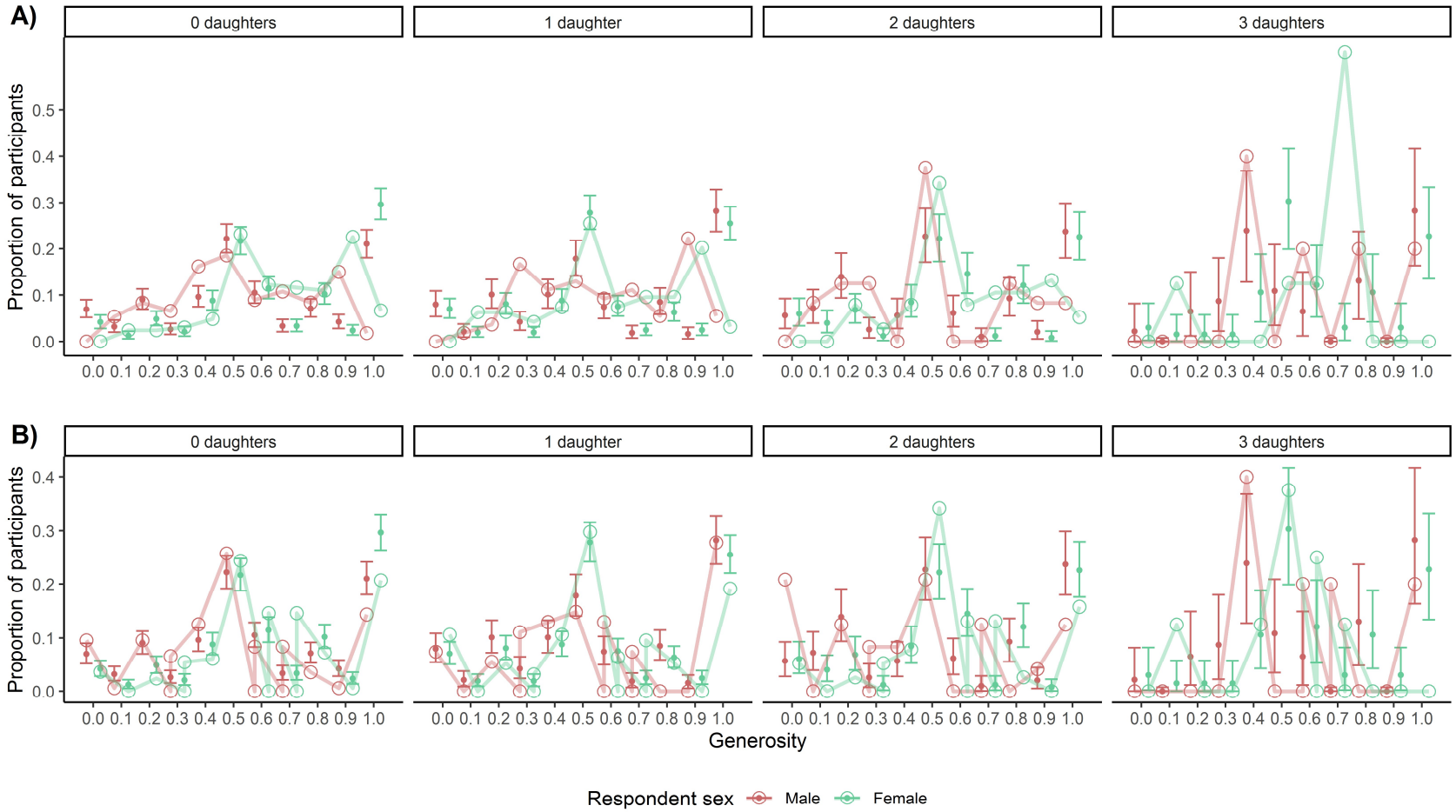

Fig. S2. Observed and predicted selfishness depending on the number of daughters.

Notes: The point and error bars show the observed proportion and 95% *CI*s for each level of generosity. The line and open point show the predicted proportion from the model. Panel A shows predictions from the linear model. Panel B shows predictions from the hurdle model.

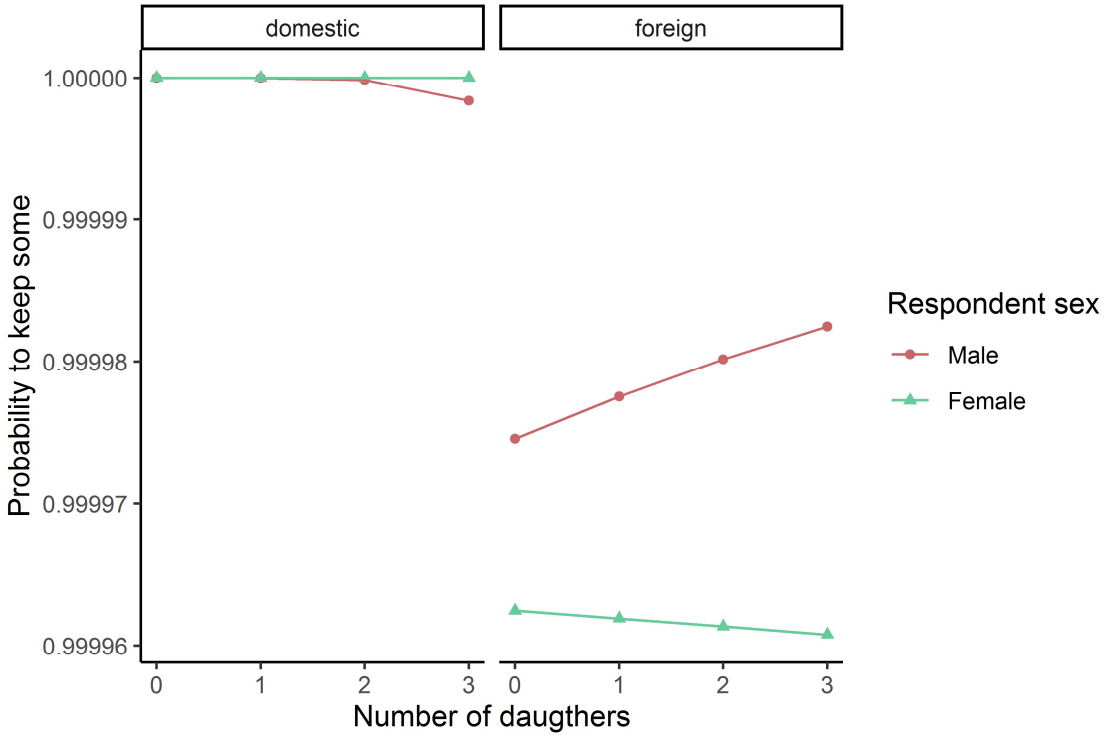

Fig. S3. Plotted prediction of the interaction of target origin × respondent sex × number of daughters in the binomial part of the hurdle model.