ELECTRONIC SUPPLEMENTARY MATERIAL

Why household inefficiency? An experimental approach to assess spousal resource distribution preferences in a subsistence population undergoing socioeconomic change

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2. MATERIAL AND METHODS
2.2. Experimental assessment of spousal resource distribution preferences
<u>Introduction to the distribution task and instructions</u>

Welcome and thank you for participating. The study in which you are about to participate is a way for us to learn about spousal relations, and in particular how husbands and wives make decisions about resource distribution within the family. The relationship between a husband and wife might be the most complicated relationship that we as humans form, and there is a lot about spousal relations that we still do not understand. We are conducting this study to learn more about how spouses distribute various resources. If at any point during the study you feel embarrassed or uncomfortable please let us know, and you can stop participating in the study. None of your responses will be discussed with other individuals, especially your partner. All of your responses are private, confidential and anonymous. The information we obtain from this study will be used for scientific purposes only. Participating in this study will take approximately 20 minutes.

This study is composed of three rounds. In each round you will make a series of decisions that influence the outcome for yourself and for your partner. Each round involves a different type of resource: dried meat (round one), money (round two), and fresh meat (round three). In each round you will be presented with different questions, and you will be asked to select your preferred outcome for each question (you will have two options for each question). To make a decision you will be asked to state and/or point toward option #1 or #2, but never both. For example, which do you prefer? Option #1: 0.4 kilograms (kg) of dried meat for yourself and 0.1 kg of dried meat for your spouse, or Option #2: 0.5 kg of dried meat for yourself and 0.5 kg of dried meat for your spouse? You must pick either option #1 or #2. Because there will be three different rounds, and because for each round we will ask you to make five decisions, in total you will make 15 decisions.

Each participant will receive 0.67 kg of dried meat for participating. In addition, after all couples have participated in your village, one decision from round one (involving dried meat) will be randomly selected to be given to your household as a second gift. To determine how much your household receives for this second gift, we will randomly select the decision from either you or your spouse. Each of your decisions is therefore important; pay attention and decide carefully, since your responses will affect how much you receive as a second gift. Each participant will receive their compensation after all couples in your village have participated. Dried meat will be weighed and then given to you in a plastic bag. Your first gift for participating (0.67 kg of dried meat) and your second gift of dried meat (based on a randomly selected decision by either you or your spouse in round one) will be placed in the same plastic bag.
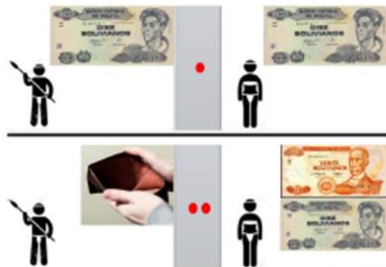
Your decisions in round two (involving money) and round three (involving fresh meat) will not be used to determine another gift for you (i.e. there are only two gifts of dried meat). However, we ask that you answer all questions as honestly as possible, and as if you were making these decisions in your daily life.

Let's do an example (*researcher shows a laminated card to the participant, depicting Question #3 from Round 2* [see Figure S1 below]):
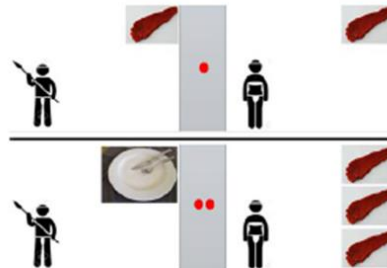
- Consider option #1, indicated by one red circle: you receive 15 Bolivianos and your partner receives 15 Bolivianos.
- Now consider option #2, indicated by two red circles: you receive 10 Bolivianos and your partner receives 10 Bolivianos.
- Which option, #1 or #2, do you prefer? (*respondent then selects his/her preference, verbally and/or pointing to the relevant image*).

Figure S1. A sub-set of distribution task questions presented to respondents. In round one respondents indicate distribution preferences for actual shares of dried meat (not shown), and responses are used to determine participant compensation. In round two respondents indicate distribution preferences for hypothetical shares of money (unincentivized). In round three respondents indicate distribution preferences for hypothetical shares of fresh meat (unincentivized).
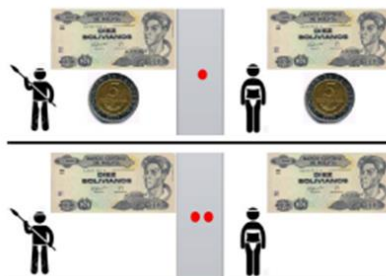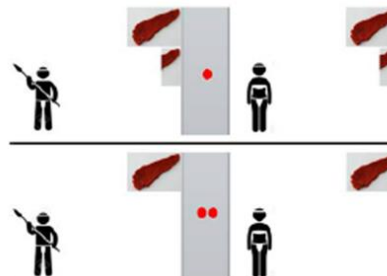

ROUND 2: QUESTION 1   ROUND 3: QUESTION 1

ROUND 2: QUESTION 3   ROUND 3: QUESTION 3

Finally, before we begin the study I will ask you two questions to ensure that you understand the outcome of each decision that you will make (*researcher then selects a laminated card at random and asks the participant the following*):

- Consider option #1.
- You receive:_____Bolivianos (or pieces of fresh meat).
- Your partner receives: _____ Bolivianos (or pieces of fresh meat).

2.4. Data analysis
No study participant was excluded from analyses.

3. RESULTS

3.1. Classification of Tsimane spouses based on aggregate distribution task preferences

Table S1. Sample descriptives (mean±SD, or %) by wife's money distribution preferences (n=53 wives). Gray highlight indicates a group-level difference (from Mann-Whitney U, χ^2, or Fisher's Exact Test). All group-level differences are tested (nonsignificant results are not highlighted).

Variable	Efficient (n=37)	Asymmetric selfish (n=7)	Asymmetric altruistic (n=4)	Extreme altruistic (n=2)	Symmetric-inequality averse (n=3)
Demographic					
Age (years)	32.1 (13.6)	30.3 (8.9)	25.4 (1.6)	29.7 (3.8)	25.3 (5.5)
Spousal age difference (H-W, years)	3.9 (4.6)	3.3 (2.6)	4.1 (1.5)	1.0 (4.2)	7.0 (10.1)
Marital duration (years)	13.2 (11.8)	13.3 (9.0)	8.0 (1.4)	11.5 (0.7)	7.3 (3.8)
# joint children	3.3 (3.6)	4.0 (4.3)	2.5 (1.9)	2.0 (0)	1.7 (1.5)
# joint children < age 10	1.3[*] (1.1)	1.9 (0.7)	2.5 (1.9)	1.5 (0.7)	1.7 (1.5)
Any living children from prior union (%)	11	14	25	0	33
Indicator of reduced marital quality					
Any serious verbal dispute with partner in past 3 months (%)	70	86	50	50	100
Any dispute over paternal disinvestment[a] (%)	22	86[**^¶]	0	0	0
Indicator of modernization					
Schooling (years)	3.4 (3.2)	6.1 (5.8)	2.0 (1.8)	2.0 (0.0)	7.0 (7.0)
Literate (%)	14	29	25	0	33
Fluent in Spanish (%)	16	29	25	0	33
Partner schooling (years)	6.4 (4.6)	8.0 (5.3)	5.5 (6.4)	8.0 (7.1)	6.3 (3.1)
Partner literate (%)	51	57	25	50	67
Partner fluent in Spanish (%)	62	57	25	50	67
Time since H's last wage opportunity[b] (months)	12.8 (16.2)	5.4 (5.3)	8.3 (4.9)	12.1 (2.5)	4.6 (3.1)
H's daily wage from last opportunity[b] (2014 Bs)	59.1 (17.4)	59.9 (17.4)	64.0 (17.5)	60.0 (0.0)	57.9 (9.7)
Task perception					
Realistic (% agree)	57	43	25	100	67
Easy (% agree)	68	43	75	100	67

[a]Refers to serious disputes in the past three months. Dispute causes were free-listed by respondents without prompts. Paternal disinvestment includes excessive alcohol consumption, infidelity (perceived or real) or irresponsible use of money (see Stieglitz et al. 2011, 2012). [b]As reported by husband.

[*]$p \leq 0.1$ (vs. all other classifications) [**]$p \leq 0.1$ (vs. extreme altruistic) [^]$p \leq 0.05$ (vs. asymmetric altruistic, and vs. symmetric) [¶]$p \leq 0.01$ (vs. efficient)

Table S2. Sample descriptives (mean±SD, or %) by husband's money distribution preferences (n=53 husbands). Gray highlight indicates a group-level difference (from Mann-Whitney U, χ², or Fisher's Exact Test). All group-level differences are tested (nonsignificant results are not highlighted).

Variable	Efficient (n=46)	Asymmetric selfish (n=3)	Extreme altruistic (n=1)	Symmetric-inequality averse (n=3)
Demographic				
Age (years)	34.5 (12.4)	31.5 (6.1)	33.0 (---)	42.9 (15.0)
Spousal age difference (H-W, years)	3.7 (4.7)	4.3 (1.5)	6.0 (---)	5.5 (6.4)
Marital duration (years)	12.2 (10.9)	11.0 (6.1)	9.0 (---)	19.0 (10.6)
# joint children	3.1 (3.5)	2.7 (2.9)	4.0 (---)	5.0 (4.4)
# joint children < age 10	1.4 (1.2)	1.3 (0.6)	4.0[*][^] (---)	1.7 (0.6)
Any living children from prior union (%)	15	0	0	33
Indicator of reduced marital quality				
Any serious verbal dispute with partner in past 3 months (%)	70	33	0	67
Any dispute over paternal disinvestment[a] (%)	13	33	0	33
Indicator of modernization				
Schooling (years)	6.7 (4.5)	7.0 (6.0)	1.0 (---)	5.7 (8.1)
Literate (%)	54	33	0	33
Fluent in Spanish (%)	63[*]	33	0	33
Partner schooling (years)	3.5 (3.7)	6.0[*][^] (1.7)	0.0 (---)	7.3 (6.7)
Partner literate (%)	15	33	0	33
Partner fluent in Spanish (%)	17	33	0	33
Time since H's last wage opportunity[b] (months)	11.3 (14.7)	12.9 (11.7)	11.9 (---)	4.2 (5.3)
H's daily wage from last opportunity[b] (2014 Bs)	68.0[*] (25.7)	53.3 (3.4)	50.0 (---)	62.2 (33.4)
Task perception				
Realistic (% agree)	65	33	100	33
Easy (% agree)	74[**]	33	0	33

[a]Refers to serious disputes in the past three months. Dispute causes were free-listed by respondents without prompts. Paternal disinvestment includes excessive alcohol consumption, infidelity (perceived or real) or irresponsible use of money (see Stieglitz et al. 2011, 2012). [b]As reported by husband.

[*]p≤0.1 (vs. all other classifications) [**]p≤0.05 (vs. all other classifications) [^]p≤0.1 (vs. efficient)

3.2. Is greater resource fungibility (i.e. money vs. meat) associated with reduced preference for joint efficiency (P1)? Yes.

Table S3. Binary logistic regression models of the probability of choosing efficiency in the distribution task (n=848 observations for 53 husbands and wives from the same marriage). Model 1 includes the primary predictor, resource type. Model 2 includes demographic controls. Model 3 includes as a control an indicator of marital quality and model 2 predictors if p≤0.1. Model 4 includes as controls indicators of modernization and model 2 predictors if p≤0.1. Model 5 includes as controls the respondent's task perception and predictors if p≤0.1 from models 2 and 4. Regression coefficients are presented as odds ratios (95% CIs). Fixed effects of village ID and distribution task question number (indicating degree and direction of inequality) are not significant and are thus omitted. All models are fitted using generalized estimating equations (GEE) analyses.

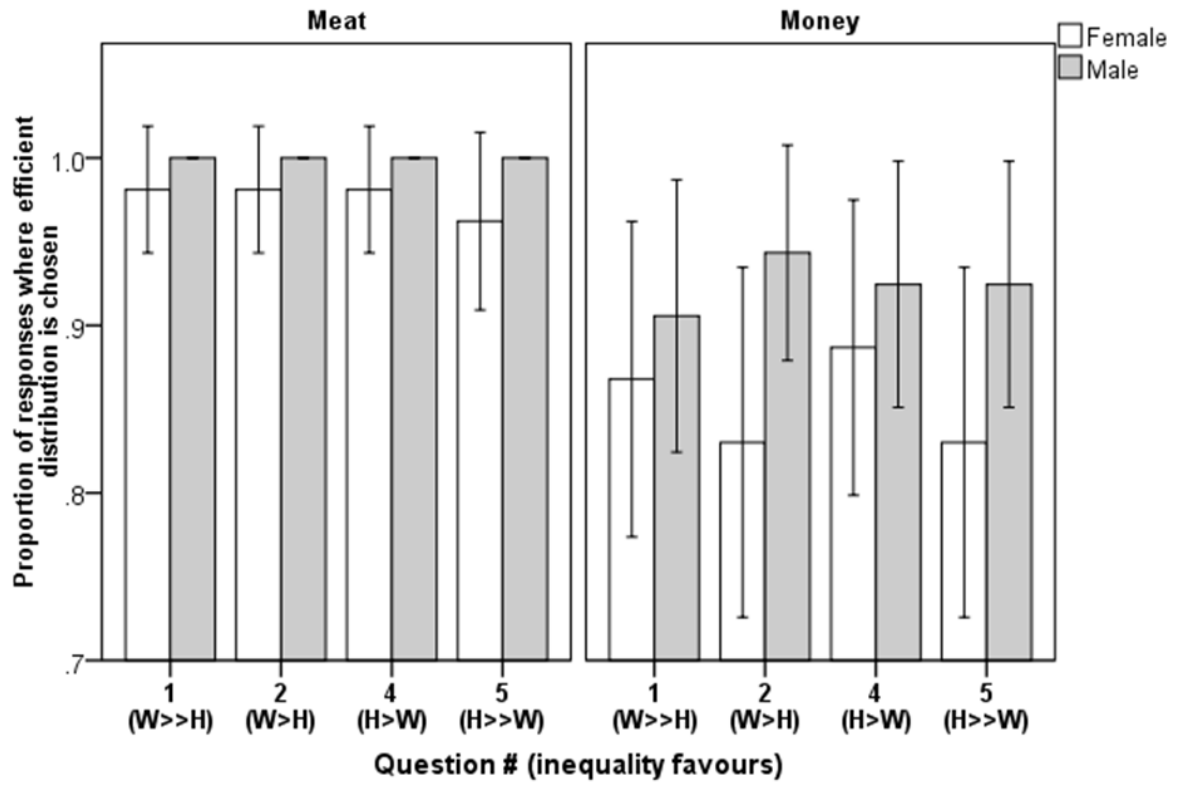| Predictor	(1)	(2)	(3)	(4)	(5)
Resource type=money (vs. fresh meat)	0.10** (0.02-0.43)	0.09*** (0.02-0.39)	0.09** (0.02-0.41)	0.08*** (0.02-0.33)	0.09*** (0.02-0.38)
Demographic					
Age[a] (years)		1.01 (0.96-1.07)	-----	-----	-----
Sex=male		2.50* (0.89-7.02)	2.52* (0.89-7.10)	2.72 (0.43-17.38)	-----
Spousal age difference (H-W, years)		0.97 (0.86-1.10)	-----	-----	-----
# joint children < age 10[b]		0.65** (0.46-0.92)	0.67** (0.49-0.91)	0.50** (0.30-0.84)	0.55** (0.36-0.86)
Any living children from prior union (vs. none)		0.45 (0.08-2.42)	-----	-----	-----
Indicator of reduced marital quality					
Any dispute reported[c,d] (vs. not reported)			1.08 (0.39-3.01)	-----	-----
Indicator of modernization					
Schooling[e] (years)				0.79** (0.64-0.97)	0.83** (0.71-0.96)
Fluent in Spanish (vs. not or partially)				3.15* (0.98-10.07)	4.00** (1.43-11.18)
Partner schooling[f] (years)				0.96 (0.83-1.12)	-----
Time since H's last wage opportunity[g] (months)				1.02* (1.00-1.04)	1.02** (1.00-1.05)
H's daily wage from last opportunity[g] (2014 Bs)				1.03 (0.99-1.07)	-----
Task perception					
Realistic (vs. not)					0.68 (0.20-2.38)
Easy (vs. not)					2.54 (0.71-9.17)

[a]Marital duration is strongly correlated with age (Pearson r=0.83, p<0.001) and is not a significant predictor in univariate models; marital duration is thus omitted. [b]# joint children (all ages) is not a significant predictor and is omitted. [c]Refers to serious verbal disputes with a partner in the past three months. [d]Whether disputes over paternal disinvestment were reported in the past three months (vs. not reported) is not a significant predictor and is omitted. [e]Literacy (vs. none or partial) is not a significant predictor and is omitted. [f]Neither partner literacy nor partner Spanish fluency are significant predictors and are omitted. [g]As reported by husband; logged value yields a nonsignificant result.
*p≤0.1 **p≤0.05 ***p≤0.001

Figure S2. Proportion of responses where the efficient distribution is chosen, by resource type, task question number and sex (n=848 observations for 53 husbands and wives from the same marriage).

3.3. Is lower self-reported marital quality associated with inefficient – particularly selfish – money distribution preferences (P2)? Yes.

Figure S3. "What is the most serious dispute that you have had with your spouse in the past three months?" (free list; n=53 husbands [H] and wives [W] from the same marriage). Multiple disputes could be listed, although only five respondents (5%) – all women – listed >1 dispute. Disputes are presented in descending order of total frequency. "H disinvesting" includes excessive alcohol consumption, infidelity (perceived or real) or irresponsible use of money (see Stieglitz et al. 2011, 2012). W or H "not caring for joint child" represents neglect that is unrelated to resource acquisition (e.g. not comforting a crying infant).

3.5. Are efficient distribution preferences more common among Tsimane than Western Europeans (P4)? Yes.

Table S4. Comparison of Tsimane vs. Western European money distribution preferences. Shown are percentages of individuals classified based on their aggregate preferences. Gray highlight indicates a group-level difference (from χ² or Fisher's Exact Test).

Classification based on aggregate preferences	HUSBANDS		WIVES		COMBINED	
	Tsimane (n=53)	Western European (n=156)	Tsimane (n=53)	Western European (n=156)	Tsimane (n=106)	Western European (n=312)
Efficient	86.8***	56.4	69.8*	52.6	78.3***	54.5
Asymmetric selfish	5.7	5.8	13.2**	1.9	9.4*	3.8
Extreme selfish	0.0	1.3	0.0	0.6	0.0	1.0
Asymmetric altruist	0.0	4.5	7.5	5.1	3.8	4.8
Extreme altruist	1.9	3.2	3.8	1.9	2.8	2.6
Symmetric-inequality averse	5.7*	19.9	5.7***	29.5	5.7***	24.7
Irrational	0.0*	9.0	0.0*	8.3	0.0**	8.7

^p≤0.1   *p≤0.05   **p≤0.01   ***p≤0.001

Figure S4. Predicted probability of choosing efficiency by age and group (interaction p=0.01, controlling for sex, n=418 individuals).
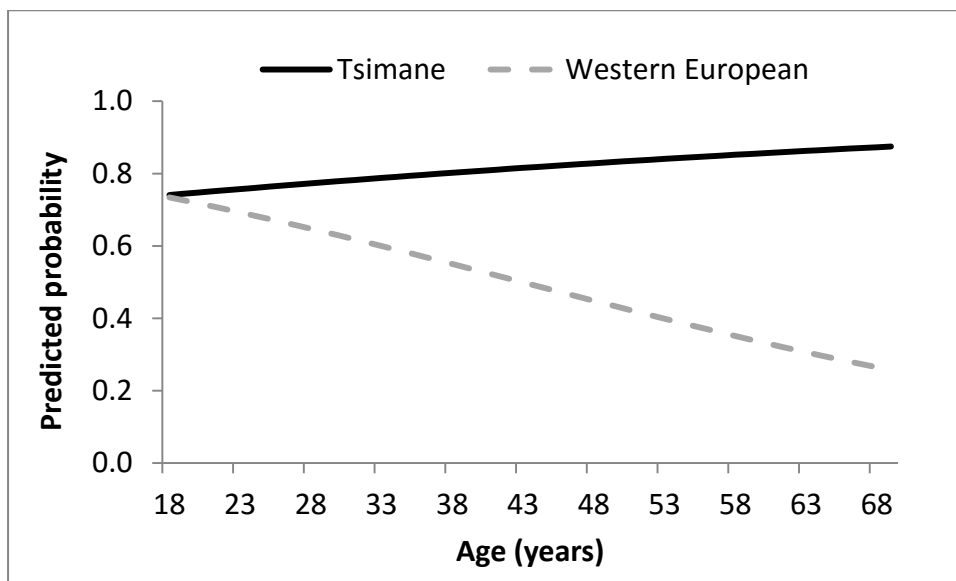
Figure S5. Predicted probability of being classified as asymmetric selfish by sex and group (interaction p=0.033, controlling for age, n=418 individuals).