

Cultural Differences in Ultimatum Game Experiments: Evidence from a Meta-Analysis

A Review of Oosterbeek, Sloof, and Van de Kuilen (2004)

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Introduction

The question for today

Do cultural, economic, and methodological differences explain how people behave in ultimatum-game experiments?

- The paper studies whether people from different societies bargain differently.
- It focuses on two outcomes: average offers and rejection rates.
- The authors use a meta-analysis of existing ultimatum-game experiments.
- The key issue is whether observed differences are really cultural, or whether they come from stakes, design choices, or sample composition.

The Paper's Core Contribution

What the paper does

- It collects results from standard ultimatum-game experiments across countries.
- It documents average behavior across the literature.
- It tests whether countries and regions differ systematically.
- It evaluates whether cultural indicators explain those differences.
- It also controls for stakes, subject pools, and experimental procedures.

Main idea

The paper asks whether deviations from standard game theory are universal, culturally specific, or driven by experimental design.

The Ultimatum Game

Game structure

- Two players divide a fixed amount of money M .
- The proposer chooses an offer x .
- The responder decides whether to accept or reject.

- If accepted:

$$(\pi_P, \pi_R) = (M - x, x)$$

- If rejected:

$$(\pi_P, \pi_R) = (0, 0)$$

Standard Prediction

Backward induction

- A self-interested responder should accept any positive offer.
- Any positive amount is better than receiving zero.
- Therefore:

$$x > 0 \Rightarrow \text{accept}$$

- Anticipating this, the proposer should offer the smallest possible positive amount.
- The predicted offer is:

$$x^* \approx 0$$

The Empirical Puzzle

Observed behavior does not match the theory

- Proposers usually offer far more than the minimum.
- Responders frequently reject low offers.
- People seem willing to sacrifice income to punish unfairness.
- This suggests that fairness, reciprocity, or social norms affect behavior.

Puzzle

Why are offers high and rejection rates non-trivial if standard theory predicts near-zero offers and almost universal acceptance?

Dataset

Data collected by the authors

- 37 papers.
- 75 experimental results.
- 25 countries.
- Real monetary stakes.
- Standard ultimatum-game designs only.

Important limitation

The authors use study-level averages rather than individual-level raw data.

Table 1: Descriptive Statistics

Table 1. Descriptive statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Year of publication	75	1998.0 <i>1998.4</i>	3.66 <i>3.60</i>	1982	2001
Year of experiment	28	1993.9 <i>1994.7</i>	3.37 <i>3.13</i>	1988	1998
Pie size in USD	57	37.12 <i>44.08</i>	86.05 <i>100.95</i>	.33	400
100 * pie size in USD/GDP per capita	57	0.6527 <i>0.9258</i>	2.534 <i>3.296</i>	0.0034	17.62
Number of observations	74	31.57 <i>48.09</i>	22.99 <i>29.10</i>	3	112
Offered percentage of pie	75	40.41 <i>40.54</i>	5.85 <i>4.94</i>	26	58
Rejection rate	66	16.20 <i>15.75</i>	10.74 <i>10.18</i>	0	40
Dummy first/single round	75	0.75 <i>0.74</i>	0.44 <i>0.44</i>	0	1
Dummy strategy method	75	0.16 <i>0.21</i>	0.37 <i>0.41</i>	0	1
Dummy economics students	75	0.64 <i>0.65</i>	0.48 <i>0.48</i>	0	1

Note. In normal font are unweighted descriptive statistics; descriptive statistics in italics are weighted by number of observations of studies.

Reading Table 1

What Table 1 establishes

- The average offer is about 40.4% of the pie.
- The average rejection rate is about 16.2%.
- The average pie size is about USD 37, but stakes vary substantially.
- Most experiments are one-shot or first-round observations.
- Most studies use student subjects.
- Weighted and unweighted averages are very similar for the main outcomes.

Immediate conclusion

The standard self-interest prediction fails very strongly in the pooled data.

Table 2: Country-Level Outcomes

Table 2. Descriptive statistics by country.

Country	N (1)	Mean offer (2)	Mean reject (3)	IDV (4)	PDI (5)	AUTH (6)	TRUST (7)	COMP (8)	GDP pc (9)	GINI index (10)
Austria	1	39.21	16.10	55	11	-0.05	0.32	6.78	12955	23.1
Bolivia	1	37.00	0.00						1721	42.0
Chile	1	34.00	6.70	23	63	1.10	0.23	5.94	4890	56.5
Ecuador	2	34.50	7.50	8	78				2830	46.6
France	3	40.24	30.78	71	68	-0.15	0.23	5.97	13918	32.7
Germany	1	36.70	9.52	67	35	-1.30	0.38	6.75	11666	30.0
Honduras	1	45.70	23.05						1385	53.7
Indonesia	4	46.63	14.63	14	78				2102	36.5
Israel	5	41.71	17.73	54	13				9843	35.5
Japan	3	44.73	19.27	46	54	-1.58	0.42	5.52	15105	24.9
Yugoslavia	1	44.33	26.67	27	76	-0.65	0.30	7.07	4548	31.9
Kenya	1	44.00	4.00	27	64				914	57.5
Mongolia	2	35.50	5.00						1842	33.2
Netherlands	2	42.25	9.24	80	38	-0.55	0.56	5.60	13281	31.5
Papua New-Guinea	2	40.50	33.50						1606	50.9
Paraguay	1	51.00	0.00						2178	59.1
Peru	1	26.00	4.80	16	64	1.75	0.05	6.54	2092	46.2
Romania	2	36.95	23.50				0.16	7.32	2043	28.2
Slovakia	3	43.17	12.67			-0.55	0.23	6.97	4095	19.5
Spain	1	26.66	29.17	51	57	0.60	0.34	5.70	9802	38.5
Sweden	1	35.23	18.18	71	31	-1.35	0.66	6.78	13986	25.0
Tanzania	4	37.50	19.25	27	64				534	38.2
UK	2	34.33	23.38	89	35	0.10	0.44	6.19	12724	32.6
US East	22	40.54	17.15	91	40	1.11	0.50	6.70	17945	40.1
US West	6	42.64	9.41	91	40	1.11	0.50	6.70	17945	40.1
Zimbabwe	2	43.00	8.50						1162	56.8

Reading Table 2

Country-level variation

- Average offers differ across countries.
- Rejection rates differ even more strongly across countries.
- No country behaves close to the standard game-theoretic prediction.
- Most country-level offers remain within a relatively narrow range.
- Rejection behavior appears more culturally variable than proposer behavior.

Important pattern

Cross-country differences are more visible in responder behavior than in proposer behavior.

Explanatory Variables

What factors are tested?

- Pie size.
- Pie size relative to GDP per capita.
- Strategy method.
- First or single round.
- Economics/business student dummy.
- Country or regional indicators.
- Cultural variables: individualism, power distance, authority, trust, competitiveness.
- Economic variables: GDP per capita and Gini index.

Cultural Variables

How does the paper measure culture?

- IDV (Individualism)
 - Degree to which individuals identify with personal goals rather than collective goals.
 - Higher values indicate more individualistic societies.
 - Source: Hofstede (1980).
- PDI (Power Distance)
 - Acceptance of unequal distributions of power.
 - Higher values indicate greater acceptance of hierarchy.
 - Source: Hofstede (1980).
- AUTH (Respect for Authority)
 - Preference for obedience and deference to authority.
 - Higher values indicate stronger authority-oriented norms.
 - Source: Inglehart (1997).

Additional Cultural and Economic Variables

- TRUST
 - Share of respondents reporting that most people can be trusted.
 - Source: World Values Survey.
- COMP (Competitiveness)
 - Attitudes toward competition.
 - Higher values indicate more positive views of competitive outcomes.
 - Source: World Values Survey.
- GDP per capita
 - Average income level of a country.
 - Proxy for economic development.
- GINI
 - Standard measure of income inequality.
 - Higher values indicate greater inequality.

Table 3: Basic Meta-Regression (Offers)

Table 3. Determinants of offered shares.

	(1)	(2)	(3)	(4)	(5)	(6)
Year	-0.153 (0.158)	-0.146 (0.162)	-0.167 (0.154)	-0.114 (0.168)	-0.169 (0.159)	-0.252 (0.175)
100 * Pie/GDP per capita	-0.329** (0.161)	-0.484** (0.216)	-0.326** (0.164)	-0.303** (0.142)	-0.292** (0.144)	-0.434** (0.195)
Strategy method	2.289* (1.232)	3.144** (1.518)	2.029 (1.312)	2.837** (1.191)	2.325* (1.307)	2.676* (1.367)
First/single round	2.872* (1.478)	3.487** (1.493)	2.930* (1.535)	3.735** (1.411)	2.688 (2.042)	2.505 (1.631)
Economics students	-0.464 (1.346)	1.147 (1.699)	-0.213 (1.583)	-0.592 (1.259)	-0.576 (1.368)	1.447 (1.373)
Europe East		3.435 (2.637)				
Europe West		-0.105 (1.875)				
Israel		0.999 (2.833)				
Asia		2.898 (1.834)				
South America		1.950 (3.143)				
Africa		3.866 (2.433)				
US West		2.365 (1.661)				
US East		reference				

Table 3: Basic Meta-Regression (Offers)

IDV				0.006 (0.031)		
PDI				0.034 (0.040)		
AUTH				-1.562** (0.743)		
TRUST					1.504 (8.151)	
COMP					0.474 (1.248)	
GDP per capita/100						-0.015 (0.010)
Gini index						0.093 (0.088)
Constant	40.958** (3.164)	37.851** (3.596)	39.055** (4.380)	40.389** (3.170)	39.148** (5.522)	39.512** (3.931)
<i>R</i> -squared	0.1423	0.2089	0.1479	0.1827	0.1442	0.1815
# studies	75	75	75	75	75	75

Note. Mean values (see Tables 1 and 2) were imputed for missing values of explanatory variables. Studies are weighted with number of pairs. Robust standard deviations in parentheses; **/* indicates significance at the 5/10% level.

Table 3 Findings: Stakes and Procedure

- Larger pie sizes are associated with lower offered shares.
- The stakes effect is statistically significant but economically modest.
- Moving from the smallest to the largest observed pie size reduces offers by less than six percentage points.
- The strategy method is associated with higher offers.
- First-round and one-shot experiments generate higher offers.
- Repeated interaction lowers offers.
- Economics students do not systematically differ from other subjects.

Interpretation

Experimental design affects behavior, but none of these effects restore the standard game-theoretic prediction.

Table 3 Findings: Cultural Variables

- Individualism (IDV) does not explain offers.
- Power Distance (PDI) does not explain offers.
- Trust does not explain offers.
- Competitiveness does not explain offers.
- GDP per capita does not explain offers.
- Income inequality (GINI) does not explain offers.
- Respect for Authority (AUTH) is the only cultural variable that consistently predicts offers.
- Countries with stronger authority-oriented norms tend to make lower offers.

Key Result

Most standard cultural measures fail to explain proposer behavior.

Table 3: Main Takeaway

- Offer behavior is remarkably stable across countries.
- Experimental design matters more than most cultural variables.
- The strongest cultural result is the negative relationship between authority and offers.
- The standard prediction of near-zero offers remains strongly rejected.

Table 4: Regional Differences (Rejection)

Table 4. Determinants of rejection rates.

	(1)	(2)	(3)	(4)	(5)	(6)
Year	-0.507 (0.373)	-0.327 (0.403)	-0.377 (0.387)	-0.473 (0.370)	-0.551 (0.424)	-0.489 (0.372)
100 * Pie/GDP per capita	-1.019** (0.239)	-1.009** (0.208)	-1.022** (0.238)	-1.003** (0.233)	-0.973** (0.216)	-1.194** (0.276)
Strategy method	12.611** 3.422	13.724** (3.684)	11.727** (3.504)	12.800** (3.498)	12.970** (3.760)	12.512** (3.707)
First/single round	-2.562 (2.498)	-1.505 (3.552)	-2.220 (2.645)	-2.114 (2.735)	-3.004 (3.385)	-1.870 (3.072)
Economics students	1.345 (3.036)	7.797 (7.419)	4.826 (4.861)	1.361 (3.059)	0.943 (3.777)	5.541 (4.941)
Offered share	-0.491** (0.228)	-0.541** (0.188)	-0.484** (0.224)	-0.512** (0.237)	-0.495** (0.236)	-0.547** (0.220)
Europe East		0.938 (4.671)				
Europe West		-0.462 (3.223)				
Israel		3.293 (6.892)				
Asia		12.981* (7.487)				
South America		0.156 (8.465)				
Africa		5.939 (7.812)				
US West		-7.042** (2.767)				
US East		Reference				

Table 4: Basic Meta-Regression (Rejection)

IDV			-0.058			
			(0.079)			
PDI			0.060			
			(0.087)			
AUTH				-0.827		
				(1.396)		
TRUST					3.696	
					(13.842)	
COMP					0.449	
					(1.945)	
GDP per capita/100						-0.033
						(0.025)
Gini index						0.026
						(0.151)
Constant	44.070**	35.731**	40.140**	44.286**	42.401**	44.945**
	(13.802)	(15.735)	(14.044)	(14.256)	(14.321)	(13.806)
R-squared	0.3411	0.4826	0.3644	0.3437	0.3421	0.3603
# studies	66	66	66	66	66	66

Note. Mean values (see Tables 1 and 2) were imputed for missing values of explanatory variables. Studies are weighted with number of pairs. Robust standard deviations in parentheses; **/* indicates significance at the 5/10% level.

Table 4 Findings: Stakes and Fairness

- As the stakes become more economically important relative to local income, rejection rates fall.
- Responders become less willing to reject when more money is at stake.
- Rejection rates decrease as offered shares increase.
- Responders care strongly about relative fairness.
- Economic importance appears to have a stronger statistical relationship with rejection rates than fairness considerations.

Interpretation

Responders are motivated by fairness concerns, but those concerns weaken when the monetary stakes become sufficiently large.

Table 4 Findings: Experimental Procedure

- The strategy method increases rejection rates.
- The strategy method appears to strengthen fairness-based responses.
- Repeated interaction has little effect on rejection behavior.
- Economics students do not systematically differ from other participants.

Table 4 Findings: Regional Effects

- Regional effects are much stronger for rejection rates than for offers.
- Asian responders reject significantly more often than responders in the United States.
- Responders in the western United States reject less often than responders in the eastern United States.
- Cross-country variation is driven primarily by responder behavior.

Key Result

Cultural differences appear mainly through willingness to reject unfair offers.

Table 4 Findings: Cultural Variables

- Individualism (IDV) does not explain rejection rates.
- Power Distance (PDI) does not explain rejection rates.
- Respect for Authority (AUTH) does not explain rejection rates.
- Trust does not explain rejection rates.
- Competitiveness does not explain rejection rates.
- GDP per capita does not explain rejection rates.
- Income inequality (GINI) does not explain rejection rates.

Key Result

Standard cultural indicators have almost no explanatory power for rejection behavior.

Table 4: Main Takeaway

- Rejection behavior varies much more across regions than offer behavior.
- Most cultural measures fail to explain this variation.
- Regional effects remain significant even after controlling for study characteristics.
- The strongest evidence for cultural differences appears among responders rather than proposers.
- Differences can't be attributed to standard measures of culture such as individualism, power distance, trust, competitiveness, income, or inequality. The source of the regional gap therefore remains largely unexplained.

What Culture Explains

Culture matters, but not in a simple way

- Broad cultural indices explain less than expected.
- With one major exception, the paper cannot attribute observed differences to Hofstede or Inglehart classifications.
- The authority variable is the only cultural measure that clearly predicts lower offers.
- The findings do not support a simple story where national culture strongly determines proposer generosity.
- They also do not support a simple story where national culture strongly determines punishment behavior.
- Other studies point towards enforcement of social norms, levels of cooperation required in production, and participation in markets as possible explanations.

Offers and Rejections

Behavioral interpretation

- Proposer behavior may reflect fairness preferences.
- It may also reflect strategic fear that low offers will be rejected.
- Responder behavior reveals willingness to punish unfair offers.
- Rejections show that relative fairness matters, not only absolute money.

Key insight

The ultimatum game is not only about income maximization; it also captures perceived fairness and punishment.

What About Theory?

Implications for standard economics

- The evidence rejects pure self-interest.
- Offers are far above zero.
- Rejections are common.
- Fairness concerns are economically important.
- Proposers likely combine fairness motives with strategic concerns about rejection.
- Responders reveal willingness to punish unfairness even at a cost.

Final Message

The paper in one sentence

People do not behave as narrow self-interest predicts in ultimatum games, and although cultures differ, standard cultural measures explain much less of that variation than expected.

Thank you.