Social preferences across different populations: Meta-analyses of the ultimatum and dictator games

Abstract

The ultimatum and dictator games are undoubtedly among the most studied experimental games. Even though meta-analyses of both games have already been performed separately, the statistical power of meta-analysis has still not been exploited to establish a comparative study of these two games. In this article, we investigate the fairness hypothesis of Forsythe, Horowitz, Savin and Sefton (1994), that dictator and ultimatum games offers are not significantly different across different populations. For that purpose, we perform meta-regressions on a single database containing 96 observations of simple ultimatum games and 144 observations of simple dictator games. Our results show in particular that the lower the level of economic development of a country, the less likely the rejection of the fairness hypothesis.

Keywords: ultimatum game, dictator game, meta-analysis, social preferences
JEL Classification: C13, C78, D03, D64

1 Introduction

In the ultimatum game (Güth, Schmittberger and Schwarze, 1982), the proposer is endowed with an amount of money by the experimenter and has to decide how much to keep for himself and how much to offer another anonymous subject (the recipient). The recipient has the opportunity to accept or refuse the offer. In case of refusal, the proposer has to return all the money to the experimenter, so neither subject gains anything. The subgame perfect equilibrium offer is for the proposer to offer the minimal amount of money because it is supposed to be accepted by the recipient. Experiments show that, perhaps not surprisingly for most people, the recipient usually does not behave according to this prediction and prefers to reject low offers. The majority of proposers share equally, and the average offer is of 40% of their endowment. The majority of recipients reject offers lower than or equal to 20% of the endowment (see for example Roth, 1995; Camerer, 2003; Oosterbeek, Sloof and Kuilen, 2004; Chaudhuri, 2008; Cooper and Dutcher, 2011; Güth and Kocher, 2014).

Of course, offers in the ultimatum game can be motivated by the proposer's willingness to be fair. This is what Forsythe et al. (1994) refer to as the "fairness hypothesis". However, the structure of the game is such that the proposer's greed can be punished by the responder. Bearing this in mind, the substantive positive offers observed in all ultimatum games could be explained by fear of rejection rather than "fairness" motives. To test the fairness hypothesis, Forsythe et al. (1994) compare offers in the ultimatum and the dictator games, in which the recipient no longer has any possibility of rejecting the offer. They find that offers are significantly larger in the ultimatum than in the dictator game. This result suggests that fairness alone is generally not appropriate for explaining the observed behaviors in the ultimatum game.[1] In this article, we investigate whether the rejection of the "fairness hypothesis" depends on the level of economic development of different countries or societies.

Our article is motivated by the fact that experimental economics has recently provided very interesting but seemingly contradictory evidence to the debate. Henrich,

[1] See also Bolton and Zwick (1995) for a proof that proposers fear rejection by the recipient.

Boyd, Bowles, Camerer, Fehr, Gintis and McElreath (2001) and Henrich, Boyd, Bowles, Camerer, Fehr, Gintis, McElreath, Alvard, Barr, Ensminger, Henrich, Hill, Gil-White, Gurven, Marlowe, Patton and Tracer (2005) investigate how the social and economic environment as well as cultural differences can shape the subject's behavior in experimental games. Their studies focus on small-scale societies' inhabitants rather than university students. Using five different proxies for market integration in different locations, their ultimatum and dictator game results show that exposure to markets is positively correlated to higher offers from proposers. Similarly, Ensminger (2004) performed an experimental study involving ultimatum and dictator games. The results of the study show that proposers' offers are positively correlated with market integration in both games. Taken together, these results of the ultimatum and dictator games provide no clues as to whether the fairness hypothesis is more or less satisfied depending on market integration. Indeed, when market integration is higher, both ultimatum and dictator offers are higher.

However, a recent meta-study by Engel (2011) provides results that may appear somehow different for the dictator game. He summarizes the evidence about the past 25 years' dictator experiments and also addresses the issue of the relation between dictator game offers and the level of development of countries. Using an ordered categorical variable to distinguish between more or less developed countries, Engel finds a strongly significant negative correlation between dictator game offers and the level of development of countries. He concludes that "the more a society is primal, the more dictators are willing to share". As development shows high correlation with market integration, this may suggest a contradiction with the previous results. In any case, this suggests a conjecture regarding the fairness hypothesis. When market integration is lower, if proposers offer less in the ultimatum game as found by Henrich, Ensminger, McElreath, Barr, Barrett, Bolyanatz, Cardenas, Gurven, Gwako, Henrich et al. (2010), and if they offer more in the dictator game as suggested by Engel (2011), then the fairness hypothesis might have more chances of being accepted than in a society where market integration is higher.

To investigate this issue, we carry out a meta-analysis on hundreds of ultimatum and dictator game experiments to test whether the fairness hypothesis depends on the level of economic development of a society. Apart from the obvious advantage of statistical power, the method of meta-analysis is particularly crucial for investigating such a research question. Indeed, very few cross-country experimental studies comparing offers in both games are available in the literature. The only ones we are aware of are Henrich (2000), Ensminger (2004) and Henrich et al. (2010), and only for small-scale societies. The meta-analyses by Engel (2011) and Oosterbeek et al. (2004) focus respectively on the dictator and on the ultimatum games, they do not compare the two.

The first attempt to investigate cultural differences in bargaining behavior was undertaken by Roth, Prasnikar, Okuno-Fujiwara and Zamir (1991). Their paper reports data from ultimatum games that were collected in four different countries: Israel, Japan, the United States, and Yugoslavia. The data show that the observed bargaining outcomes are significantly different from the perfect-equilibrium predictions in every country. Yet, offers made by proposers vary substantially across countries: the highest offers are observed in the United States and Yugoslavia while the lowest offers are made in Israel. Using data from 75 ultimatum games, Oosterbeek et al. (2004) conduct a meta-analysis in which they investigate the forces that shape the amount offered by the proposer in the ultimatum game. They found no significant differences in proposers' offers across different countries. However, it is useful to bear in mind that the authors clustered the countries of their database by continents, using a dummy variable for each continent.

As mentioned earlier, our study is a meta-analysis, i.e. a quantitative synthesis of a large number of independent studies that have been collected systematically (see e.g. Borenstein, Hedges, Higgins and Rothstein, 2011; Stanley and Doucouliagos, 2012). The database used in a meta-analysis does not consist of the concatenation of the databases of each individual study. In the meta-analysis, only the dispersion and average values of the variable of interest of each study are required. While these two pieces of information are often provided by the authors in articles, the full databases are not always included. Taking into account only the studies that provide their full database might lead to a severe selection bias. This risk is certainly less prominent in a meta-analysis which includes a much larger set of studies. A meta-analysis allows the researcher to take into account a much larger number of studies than a traditional narrative review. A meta-analysis can also be considered as less subjective as its conclusions do not rely on the reviewer's way of synthesizing the contradictory results of studies. For example, one reviewer might consider that larger studies are more reliable, while another one may have more faith in the quality of studies (measured by their publication rank for example).

Our meta-analysis provides striking support for our conjecture. We observe that the fairness hypothesis is all the more likely to be accepted when the country is less developed, according to three different proxies for the degree of economic development of countries. Hence the fairness hypothesis will not be rejected for the less developed countries, contrary to what has be found in all past studies generally based on western countries' subject pools.

The rest of the article is organized as follows. Section 2 offers a very simple model clearly defining the fairness hypothesis. Section 3 presents the data and design of the meta-analysis. Section 4 is devoted to the comparative meta-analysis of dictator and ultimatum games. Section 5 concludes.

2 The fairness hypothesis

Fairness is not an absolute but a relative concept that depends on the norms that apply in a given culture or in a given geographical area. As stated by Chaudhuri (2008), "notions of fairness may vary across cultures in that offers that are considered unfair and routinely turned down in one society are readily accepted in others." Giving 30% of your endowment can appear greedy if recipients expect you to give 50% but can also appear decidedly generous if they expect you to give 10%. For simplification purposes, it is reasonable to consider that fairness is a matter of norms and expectations where giving the norm (or above) is fair while giving under the norm is not.

According to this definition of fairness, measuring and comparing proposers' fairness would require estimating the difference between the actual norm of fairness in a given country or in a given culture and the share proposers give when nothing forces them to (the dictator game). But what defines the norm? The average "maximal acceptable offer" (hereafter MAO) of recipients in a population does. More precisely, the MAO can be interpreted as the recipient's aversion to disadvantageous inequality. Supposing that proposers are good at guessing the threshold below which their offer will be refused, average ultimatum game offers just reflect the norm of tolerance to disadvantageous inequality. Under the assumption that proposers' beliefs about recipients' MAO are accurate, our study aims at investigating whether proposers' fairness depends on the level of economic development of countries.

Let us formalize this interpretation for more clarity. Let w denote the proposer's initial endowment and $y_{ult} \in [0, w]$ (respect. $y_{dic} \in [0, w]$) denote his offer in the ultimatum

(respect. dictator) game. The value $\tilde{x} \in [0, w]$ denotes the recipient's MAO. The distribution of $\tilde{x}$ in the population may vary with the country where the ultimatum game is played. Let $\tilde{\theta}$ denote the proposer's belief about $\tilde{x}$. We need to formulate two hypotheses:

Hypothesis 1: Proposers have a correct belief about the distribution of the recipients' MAOs: $\tilde{\theta} = \tilde{x}$, so that they correctly infer the recipients' average MAO, i.e. $E(\tilde{\theta}) = E(\tilde{x})$.

Hypothesis 2: Proposers are risk-neutral.

Under these hypotheses, the proposers' payoff maximizing strategy in the ultimatum game is clearly to offer $y_{ult} = E(\tilde{x})$. A definition follows straightforwardly:

Definition: In the dictator game, under Hypotheses 1 and 2, a fair (respect. unfair) offer y_{dic} is characterized by $y_{dic} \geq y_{ult}$ (respect. $y_{dic} < y_{ult}$).

Of course if proposers are risk- or ambiguity-averse, they may add a safety margin in addition to the mean MAO. In this case, our reasoning still holds if that safety margin is constant across all countries, i.e. supposing that risk aversion does not substantially differ across different countries. Similarly, if proposers' MAO estimates are inaccurate, our result holds provided that the estimation biases do not vary across countries.

Hence, under our hypotheses, if we consider that the recipients' MAO reflects the norm of fairness in a given culture or in a given geographical area, our study allows us to investigate whether proposers' fairness depends on a country's level of economic development.

3 Data and design

3.1 Design of meta-analysis

For this comparative meta-analysis of the ultimatum and the dictator games, we first constructed two separate databases that were merged later. We used Econlit and Google Scholar with four different combinations of keywords: "Dictator game", "Dictator experiment", "Ultimatum game", and "Ultimatum experiment". The search for "dictator game" and "dictator experiment" papers in Econlit yielded respectively 368 and 110 results while we obtained 396 and 105 results for "ultimatum game" and "ultimatum experiment". On Google scholar, results are much more numerous but are also ever less relevant over pages.[2] We obviously found a large number of articles in common in the two databases which still provided a fair amount of studies with which to perform meta-analyses. The search was completed in February 2014.

Our main purpose is to establish a comparative study of the dictator and ultimatum games. It is thus important that the average offers of both games are computed on the basis of very similar criteria and are not affected by protocol differences. Since it is difficult to control for precise protocol variation in the literature,[3] we chose to set a large number of restrictions for the selection of the studies.

For the dictator games we chose to retain only standard protocols referring to the dictator game under its original form initially proposed by Forsythe et al. (1994), with

[2] On Google Scholar, we obtained 70,800 results for the dictator game and 42,700 for the ultimatum game. Among these numerous results, approximately the first 30 pages, with 10 results per page, displayed articles related to our study.

[3] A large number of protocols are unique or have only been performed a few times. Even if it would technically be possible to include a dummy variable to control for the effect of one particular study, the statistical power of such a "control" would be too weak to draw any conclusions.

two anonymous subjects and a random entitlement. Restricting the selected studies to such dictator games led us to exclude a large number of studies, for example those with the following characteristics:

- Studies in which the available set of actions is too restricted, constraining subjects to choose either the selfish outcome or the equal share. We thus chose to keep the studies in which the number of feasible actions for dictators was at least eight.

- Studies in which no money or fake money is at stake. As assumed by economic theory, subjects are sensitive to monetary incentives. We have no reason to believe that a dictator would make the same decision when earnings are hypothetical. Moreover, we also excluded studies in which dictators are endowed with less than \$4. We made this choice to ensure that monetary incentives were non-negligible.

- Studies in which dictators are asked to give their money to a charity association. In this case subjects' behavior may obviously be altered compared to a standard protocol.

- Studies in which subjects "earned" the dictator position. In this case, since subjects deserve the dictator position, they may behave more selfishly than usual.

- Studies in which the subjects' anonymity is not totally guaranteed. Such a protocol can improve subjects' generosity in case of observability of their choice.

- Studies which involve any form of competition. Such protocols modify subjects' incentives depending on the purpose of the competition.

- Studies in which subjects played any other game prior to the dictator game. This restriction is set to avoid contagion effect across treatments.

- Studies implying more than two subjects or computerized subjects.

- Framed studies in which players do not have neutral denominations. For exemple protocols in which the recipient is called the "partner" can increase dictators' generosity toward the recipient. Similarly, framed studies in which players are called "sellers" and "buyers" can influence players' decisions and are thus excluded.

These restriction criteria led us to rule out a lot of studies and to select only one observation for many articles—the control treatment. As we seek to estimate the average proportion of the endowment offered in a standard dictator game, we set these restrictions to ensure that our estimate is not altered by uncontrolled protocol differences.

For the ultimatum games we also chose to retain only standard protocols, referring to the ultimatum game under its original form initially proposed by Güth et al. (1982) with two anonymous subjects and a random entitlement. We thus, for example, excluded studies having the following characteristics:

- Repeated games in which subjects are matched with the same subject for all the periods (partner protocols). We retained only stranger protocols to avoid reputation effects.

- Repeated games in which players' mean offer is revealed at the end of each period. This information can influence players' decisions.

- Studies which involve any form of competition.

- Studies in which the information differs between the proposer and the responder. In these studies, there is uncertainty about the endowment or the offer made by the proposer.

- Studies in which decisions are taken in groups and studies involving more than two subjects or computerized subjects.

- Studies in which the set of actions available to proposers is not at least eight.

- Studies in which there is no real money at stake. Studies in which proposers are not endowed with at least \$4 (or equivalent).

- Studies in which proposers earned the proposer position.

- Studies in which anonymity is not totally guaranteed.

- Studies in which subjects played another game prior to the ultimatum game.

- Studies in which the Nash perfect sub-game equilibrium is revealed to players before they make a decision. This information can obviously influence players' decisions.

- Framed studies in which players are called seller/buyer in the experiment.

Again, we chose to set these restrictions to ensure an accurate estimate of the average proportion of the endowment offered by a proposer in the standard ultimatum game, excluding protocol differences.

Although these criteria may seem restrictive, they are necessary for the dictator game and the ultimatum game to be comparable.[4] Finally, the dictator game database contains a total of 144 observations collected from 96 articles. The articles were published between 1994 and 2013, 2008 being the median date of the sample. Regarding the geographical diversity of the studies, observations were collected from 30 different countries (see the list of included countries in Table 10 in the Appendix). Our ultimatum game database contains a total of 96 observations collected from 42 articles and one book. The articles were published between 1983 and 2011, 2001 being the median date of the sample. The ultimatum games selected were collected from a set of 29 different countries.

3.2 Variables

For each selected article, ultimatum or dictator, we recorded three categories of information. First, the essential information:

- The average offer of the study, as it is our dependent variable of interest, expressed as a percentage of the initial proposer's endowment.

- The standard error of the average offer, which allows us to define the appropriate weights of the studies. Some papers did not report information about the dispersion of offers or the distribution of offers. In these cases, we sent emails to the authors whose papers did not allow us to record the standard deviations of offers.

The second category of variables are the explanatory variables of interest, related to the game (ultimatum or dictator) and to the degree of economic development of the country where the experiment was run. Since there is no standard method to measure how developed a country is, we used three different proxies, each measuring economic development level by very different approaches. We choose to rely on heterogeneous measures of economic development as a robustness check of our results. Table 10 in the Appendix shows the value of these variables for each country involved in the analysis.

- *Macroeconomic development*

Our first proxy relies exclusively on macroeconomic indicators. It considers the GDP per capita, the HDI (Human Development Indicator) index, the poverty rate of the country where the experiment was run, and the year it was run. This information was available on the World Bank database (www.worldbank.org). As including them simultaneously in the meta-regressions would lead to serious multicolinearity problems, we built a synthetic variable based on a principal component analysis (PCA) of these three variables. From this analysis, we only kept the first axis since it explained more than 80% of the total variation.

[4]Given the purpose of our meta-analysis, we did not systematically supplement our list of papers by those from the meta-analyses of Engel (2011) and Oosterbeek et al. (2004). We found it more important to avoid biases between the searches for ultimatum and dictator game papers than to find as many papers as possible.

- *Ease of doing business*

The second proxy refers to the regulatory environment of business. We use the "ease of doing business" indicator of the World Bank website (www.doingbusiness.org/rankings). The ease of doing business index ranks economies from 1 to 189 with first place referring to the most business-friendly economy. A high ranking (a low numerical rank) means that the regulatory environment is conducive to business operation. The index averages the country's percentile rankings on 10 topics covered in the World Bank's Doing Business.[5] In contrast to the other two proxies, highly developed countries are thus among the lowest numerical values. Hence, for comparison purposes, we report the results obtained when the scale of this variable is reversed.

- *Bank account penetration*

The third proxy is a measure of financial inclusion. We use the "account penetration" rate of the global Findex database (datatopics.worldbank.org/ financialinclusion) to assess countries' financial inclusion. This rate is the percentage of inhabitants (aged 15+) who possess a bank account with a financial institution.

There is no consensus about the effect of the degree of economic development of a country on subjects' choices in both games. On the one hand, the results of Henrich (2000), Henrich et al. (2010), and Ensminger (2004) show that exposure to markets is positively correlated to higher offers from proposers in both the ultimatum and dictator games. On the other hand, Engel (2011) finds a strongly significant negative correlation between dictator game offers and the level of development of countries. As regards the ultimatum game, Oosterbeek et al. (2004) find no evidence that countries influence subjects' choices. However, it is useful to bear in mind that the authors clustered the countries of their database by continent.

The third category of variables are control variables:

- Amount of money to share (proposer's endowment). We systematically converted this amount into dollars in Purchasing Power Parity (PPP) at the date of the article. Neither in the ultimatum game (Hoffman, McCabe and Smith, 1996; Slonim and Roth, 1998; Cameron, 1999) nor in the dictator game (Carpenter, Verhoogen and Burks, 2005; Cherry, Frykblom and Shogren, 2002; Forsythe et al., 1994) has the literature shown evidence of any significant effect of the amount of money at stake on the subject's choices. We nevertheless include this variable for better control.

- Whether or not subjects are students of economics.[6] In the ultimatum game, Carter and Irons (1991) show that economics students behave in a more selfish way than other subjects. In the dictator game, this variable has not been studied to our knowledge.

- Whether or not the experiment has been run in a laboratory. Note that since the proportion of experiments that are run in a laboratory is greater in developed countries than in undeveloped countries, this variable is highly correlated with our development variables. Moreover, since all except one study in labs involve students, we did not add an additional dummy variable when the subjects are students or not.

- Whether or not the game has been run with a double blind procedure. Players may be more selfish when they are ensured anonymity toward experimenters. In his meta-study, Engel (2011) finds no significant effect for the double blind procedure in the

[5]This ranking takes account of the ease of doing the following actions: resolving insolvency, enforcing contracts, trading across borders, protecting minority investors, obtaining credit, registering property, getting electricity, paying taxes, dealing with construction permits, and starting a business.

[6]This does not include business students. This variable equals 1 only if 100% of the subjects in the study are students of economics.

dictator game.

- Whether or not the game is repeated. Since proposers in repeated ultimatum games have the opportunity to play the game multiple times, it is possible that the mean of the mean offers across all periods in a repeated ultimatum game could differ from the mean of one-shot offers in non-repeated ultimatum games. Studies by Roth and Erev (1995) and Tisserand (2016) suggest that proposers' offers remain constant over time. Cooper and Dutcher (2011) find that proposers adjust their behavior according to responders' choices in order to maximize their profit.

- We also coded two dummy variables to control for the two possible strategy methods. These variables are equal to 1 when the strategy method is used, and 0 when it is not. As these protocols may be more likely to be used in field experiments for organizational purposes, their effect could be correlated with economic development. There are two possible uses of the strategy method. The first strategy method concerns the responder in the ultimatum game. The responder must announce his minimum acceptable offer before receiving the proposer's offer. The second strategy method, in both the ultimatum and dictator games, consists of making decisions for the two possible roles before players' roles are randomly drawn.

Table 1 gives an overview of the main descriptive statistics of our two databases.

Table 1: **Descriptive statistics of the ultimatum and dictator game studies**

	Ultimatum game				Dictator game			
	Mean	*Median*	*Min*	*Max.*	*Mean*	*Median*	*Min.*	*Max.*
Mean offer	41.50%	42.40%	25%	56.80%	25.31%	25%	6.30%	47%
Number of subjects	82	40	14	320	66	35.5	12	426
Publication date	2001	2001	1983	2011	2006	2008	1994	2013
GDP per capita[(a)]	23096	28459	349	87998	32592	38175	350	93352
HDI	0.779	0.880	0.4	0.93	0.8756	0.951	0.467	0.961
Poverty	13.08%	8.50%	1%	35%	17.86%	13.20%	1.16%	63.70%
Account penetration	80.04%	94%	7%	99%	82.15%	94%	7%	100%
Ease of doing business (reversed)	147.1	173	19	184	152.6	181	19	188
Amount at stake (PPP)[(a)]	41.21	11.56	2	700	19.25	10	1	110
Economist subjects	18.75%				10.42%			
Laboratory	72.92%				75%			
Double-blind	-				49.31%			
Repeated	18.75 %				2.77%			
Strategy method 1	14.58%				-			
Strategy method 2	3.12%				7.63%			

[(a)] In US dollars at the time the paper was published.

4 Meta-regression and the fairness hypothesis

According to Forsythe et al. (1994), under the fairness hypothesis, distributions of offers in both the dictator and ultimatum games should be the same. Alternatively, if the distribution of offers differs between the two games, then fairness alone is not enough to explain the subjects' choices in the ultimatum game. In other words, the veto power conferred on the respondent in the ultimatum game creates a strategic configuration that may encourage the proposer to offer a greater amount to avoid rejection by the respondent. In fact, this only occurs if the proposer believes that the amount he would be willing to give in the absence of veto power would not satisfy the recipient's minimum acceptable offer (MAO). In this situation, the proposer will consider the recipient's preferences and increase his offer to meet the recipient's MAO and avoid rejection. This extra gift can be described as a "strategic gift". In this section, we aim at exploiting meta-analysis statistical power

to investigate the fairness hypothesis across different countries. In particular, we test the fairness hypothesis for different degrees of economic development, measured by three different proxies.

Our analysis is based on the collection of two separate datasets that have been merged. The dictator game database contains a total of 144 observations, while the ultimatum game database contains a total of 96 observations. Since meta-studies by Engel (2011) and Oosterbeek et al. (2004) provided an exhaustive analysis of both the dictator and the ultimatum games, we only provide a quick overview of the separate meta-analyses of the ultimatum game and dictator game in the Appendix. Regarding the amount offered in both games at the aggregate level, our results are very similar to those of Engel (2011) for the dictator game and Oosterbeek et al. (2004) for the ultimatum game. Using a simple FAT-PET-MRA model for each game, it appears that estimated mean offers are respectively of 30.6% and 42.58% of the total amount to share and the estimated 95% confidence intervals for the average value of the offer are respectively of [29.05%; 32.17%] and [40.88%; 44.28%].

Subsequently, we perform a meta-regression on the merged sample to investigate the fairness hypothesis across different types of populations.[7] Our model is specified as follows:

$$\hat{\gamma}_{is} = \gamma_0 + \gamma_1 D_{is} + x_{is}\beta_1 + x_i D_{is}\beta_2 + z_{1is}\beta_3 + z_{2is} D_{is}\beta_4 + \phi_1 se(\hat{\gamma}_{is}) + \phi_2 D_{is} se(\hat{\gamma}_{is}) + \epsilon_{is} \quad (1)$$

where $\hat{\gamma}_{is}$ represents the s^{th} mean offer sampled from study i; γ_0 is the intercept; D_{is} is a dummy variable aimed at distinguishing between the dictator game and the ultimatum game, this dummy is equal to 1 if the s^{th} in study i is an ultimatum game and 0 otherwise.

x_{is} is the vector with the variables of interest (macroeconomic development, account penetration, ease of doing business). β_1 is then the corresponding vector of parameters to be estimated that capture the specific impact of these variables on the estimated offer in dictator games. β_2 is the vector of parameters to be estimated that should be interpreted as the difference in impact of these variables between the ultimatum and the dictator game. We consider four specifications, depending on the content of x_{is}. In the first three specifications, the three variables of interest are introduced separately and in the fourth specification, they are all included.

z_{1is} is the vector with the control variables relevant for the dictator game: Amount at stake, Economist, Laboratory, Double.blind, Repeated and Strategic2. β_3 is the corresponding vector and indicates the specific impact on the estimated offer of these variables for the dictator game.

z_{2is} is the vector with the control variables relevant for the ultimatum game: Amount at stake, Economist, Laboratory, Repeated, Strategic1 and Strategic2. β_4 is the corresponding vector to be estimated. For these variables common to the dictator game, the corresponding coefficients must be interpreted as the difference in impact of these variables between the ultimatum and the dictator games. For the variable Strategic1, which is specific to the ultimatum game, the coefficient should be interpreted as the specific impact of this variable on the estimated offer in the ultimatum games.

$se(\hat{\gamma})$ is the estimated standard error of the mean offer. It is introduced as an additional moderator variable in the meta-regression in order to control for potential publication bias (Stanley, 2005). As this publication bias might be different for the ultimatum and dictator games, we also include an interaction variable between $se(\hat{\gamma})$ and D_{is}. Hence, ϕ_1 controls

[7] The meta-analysis focuses on the value of the variable of interest whereas the meta-regression focuses on the variables that influence this variable. Further information in Stanley and Doucouliagos (2012).

for publication bias in the dictator game and ϕ_2 controls whether there is a difference in publication bias between the ultimatum and the dictator game.

Finally, ϵ_{is} is the error term with $\epsilon_{is} \sim iid(0, \sigma_{is}^2)$. Several estimation methods can be used to calibrate this model. Obviously, a fixed effect estimator is not relevant for our purpose, since it assumes that all studies share the same real variable of interest. Because of unobserved protocol differences, it is impossible to reliably apply this estimation method. This is further confirmed by the fact that the Q-test of heterogeneity applied to equation (1) strongly rejects the null hypothesis of between-study homogeneity for all four configurations of x_{is}. Conversely, the random effects estimator allows the real variables of interest to vary from one study to the other but this method is highly sensitive to the accuracy of the estimated between-study variance and has greater biases than fixed effects in case of publication bias. Therefore, we follow Stanley and Doucouliagos (2015, 2016) and estimate the different versions of equation (1) using an unrestricted least squares (WLS) model as they show that this method dominates random effects in the case of publication selection biais. This approach consists simply in estimating equation (1) using weighted least squares with $1/se^2(\hat{\gamma}_{is})$ as the weights. A final issue relates to statistical inference. We performed Breusch-Pagan tests against all variables and a White test, and in all specifications, the null hypothesis of homoscedasticity is strongly rejected. Hence, we computed White robust-standard errors and the estimation results are reported accordingly.[8]

With respect to the specification, we looked at the correlations between our three variables of interest and the control variables. It appears that the correlations between the three variables of interest and the variable Amount at stake are very low (around -0.15). With respect to the dummy control variables, we systematically investigated whether or not our three variables of interest display different means between the modalities of these binary control variables. We could not reject the null of similar means for the development variables between the modalities of Economist, Double.blind, Repeated, Strategic1 and Strategic2. However, the mean of our variables of interest is significantly higher for lab experiments (see Table 2), hence including this variable together with the variables of interest leads to strong multicolinearity problems. Therefore, we first show in Table 3 the results obtained with all control variables, except the dummy variable Laboratory. The results including the additional dummy Laboratory will be discussed later. Four columns are displayed. In the first three specifications, the economic development variables are introduced separately and in the fourth specification, they are all included. The variables appear in the order of equation (1).

Table 2: Mean economic development according to dummy lab variable.

	Macroeconomic development (mean)	**Ease of doing business (mean)**	**Account penetration (mean)**
Lab experiments	0.6518	165.88	87.63%
Non-lab (field) experiments	-0.9343	106.00	63.16%
t-test of mean difference	p <0.0000	p <0.0000	p <0.0000

[8]We also computed Breusch-Pagan tests against a clustering variable related to each study to check for within-dependence study but could not reject the null assumption of homoscedasticity in this case.

Table 3: **Meta-regression for the pooled sample: Unrestricted Weighted Least Squares Model**

	Dependent variable: Mean offer			
	(1)	(2)	(3)	(4)
Ultimatum	0.132***	0.017	0.013	−0.091
	(0.021)	(0.057)	(0.037)	(0.073)
Macroeconomic development	−0.025***			0.012
	(0.004)			(0.010)
Account penetration		−0.002***		−0.0001
		(0.0004)		(0.001)
Ease of doing business (reversed)			−0.001***	−0.001***
			(0.0001)	(0.0003)
Amount at stake	0.0003	0.00004	0.0002	0.0001
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Economist	−0.031	−0.056	−0.029	−0.031
	(0.022)	(0.035)	(0.020)	(0.022)
Double blind	−0.007	−0.025	−0.016	−0.022
	(0.016)	(0.018)	(0.015)	(0.018)
Repeated	−0.161***	−0.176***	−0.157***	−0.158**
	(0.059)	(0.060)	(0.060)	(0.062)
Strategy2	−0.010	−0.025	−0.016	−0.022
	(0.017)	(0.017)	(0.017)	(0.019)
Macroeconomic development*Ultimatum	0.019***			−0.031***
	(0.007)			(0.011)
Account penetration*Ultimatum		0.001**		−0.001
		(0.001)		(0.001)
Ease business (reversed)*Ultimatum			0.001***	0.002***
			(0.0002)	(0.0004)
Amount at stake*Ultimatum	−0.0003	−0.0001	−0.0002	−0.0002
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Economist*Ultimatum	−0.007	0.019	−0.012	0.010
	(0.026)	(0.038)	(0.026)	(0.025)
Repeated*Ultimatum	0.131**	0.144**	0.129**	0.117*
	(0.060)	(0.061)	(0.061)	(0.062)
Strategy1*Ultimatum	0.006	0.006	0.005	0.005
	(0.007)	(0.007)	(0.008)	(0.007)
Strategy2*Ultimatum	−0.014	−0.00003	−0.008	0.002
	(0.019)	(0.019)	(0.019)	(0.021)
Std.err	−2.480***	−2.519***	−2.341***	−2.278***
	(0.433)	(0.448)	(0.432)	(0.413)
Std.err*Ultimatum	0.179	0.148	0.136	−0.006
	(0.839)	(0.874)	(0.843)	(0.760)
Constant	0.337***	0.478***	0.457***	0.512***
	(0.016)	(0.042)	(0.021)	(0.058)
Observations	240	240	240	240
Adjusted R^2	0.732	0.717	0.750	0.760

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%
White robust standard errors in brackets.

First, with respect to the control variables, our results show that the amount of money at stake does not significantly influence the choice of the proposer in the ultimatum game or the dictator game. In other words, the remuneration of subjects is unable to explain the observed average offers. These results are consistent with studies by Cameron (1999), Hoffman et al. (1996) and Slonim and Roth (1998) for the amount of money at stake.[9]

Second, the level of economic development of countries in which experiments were run as measured by the different proxies significantly influences subjects' offers in all specifications for the dictator game: dictators' offers tend to fall as the level of economic development rises (significant and negative coefficients in specifications (1), (2), and (3)). Offers in ultimatum games also decrease with the level of economic development but less than in dictator games. Indeed, the coefficients related to the interactions between the ultimatum dummy and the development variables are positive and significant but the levels of these coefficients are lower in absolute values than the coefficients related to the development variables. Obviously, the development variables are highly correlated (from 0.7 between Macroeconomic development and account penetration to 0.9 between Macroeconomic development and Ease of doing business). Hence, including them simultaneously in the regressions leads to multicolinearity issues as shown in specification (4): only the coefficient for Ease of doing business remains negative and significant.

Third, the fact that the coefficient related to the standard error is negative and significant indeed highlights the presence of a negative publication bias.

To illustrate the differences between the ultimatum and the dictator game, we made in-sample predictions for the dictator and ultimatum game offers for the minimum and maximum values of the three variables of interest. Computing these offers involved defining a value for each control variable of each regression. For each control variable, we chose to set the value according to the number of observations available. In other words, each dummy control variable was set to its most common value. The two continuous control variables (amount at stake and standard error) were set to their average value. The offers displayed in Table 4 thus correspond to the following configuration: non-economist subject, non-strategic protocol, non-double blind, average amount at stake, average standard error. In each case, we also performed tests of mean difference between ultimatum game and dictator game offers for both the most and the least developed country. These F-tests were based on the estimation results in Table 2. Specifically, we tested the following null hypothesis: $H_0 : \gamma_1 + x_{is}\beta_2 + \tilde{z_2}\beta_4 + \phi_2 \bar{se}(\hat{\gamma}_{is}) = 0$ in equation (1), where $\tilde{z_2}$ has its variables set as explained above and $\bar{se}(\hat{\gamma}_{is})$ is the average standard error. If H_0 cannot be rejected for a given value of x_{is}, then there is no significant difference between the ultimatum and the dictator game offers for this value of x_{is}. We performed these tests for $min(x_{is})$ and $max(x_{is})$ for each variable of interest. The results of the in-sample predictions and the F-tests are displayed in Table 4.

[9] **Our results are unaffected if this variable is omitted from the regression.** Regarding the environment of the experiment, in all specifications, the dummy variable Repeated is negative and significant, which means that the dictator games run repeatedly lead to significantly lower offers. As the variable Repeated*Ultimatum is positive and significant, then compared to dictator games, the decrease in offers is not as important. None of the other control variables are significant at 5%. In particular, the two types of strategic protocols we considered do not significantly affect players' offers in both games. Similarly, offers made by non-economist and economist subjects do not significantly differ in both games, nor does the fact that the experiment was run in a double blind setting in dictator games.

Table 4: Estimated offers of non-economist subjects for an average amount at stake and standard error, non strategic settings, non-double blind, full sample

	Minimum macro. development	Maximum macro. development
Ultimatum	42.46%	38.31%
	(38.17% - 46.74%)	(34.38% - 42.23%)
Dictator	36.45%	20.61%
	(33.63% - 39.28%)	(17.75% - 23.47%)
F-test of difference between ultimatum and dictator offer	2.556	47.838***
	Minimum account penetration	Maximum account penetration
Ultimatum	42.10%	39.41%
	(37.26% - 46.95%)	(35.90% - 42.93%)
Dictator	39.30%	24.38%
	(35.86% - 42.74%)	(21.82% - 26.94%)
F-test of difference between ultimatum and dictator offer	2.094	42.962***
	Ease of doing business, last rank	Ease of doing business, first rank
Ultimatum	40.34%	40.09%
	(36.24% - 44.44%)	(36.85% - 43.33%)
Dictator	37.75%	23.43%
	(34.96% - 40.54%)	(21.01% - 25.85%)
F-test of difference between ultimatum and dictator offer	0.4215	62.734***

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%
5% prediction confidence intervals in parentheses.

We conclude that the gap between ultimatum and dictator game offers widens significantly as the level of economic development of countries decreases. Indeed the gap between the ultimatum game and the dictator game is on average equal to 6.01% for minimum macroeconomic development and equal to 17.7% for maximum macroeconomic development. The increased gap is even more striking for specification (3) using Ease of doing business. For the last ranked country, it is equal to 2.59% while it rises to 16.66% for the first ranked country. In all cases, as shown by the F-tests, the difference between ultimatum and dictator games is not significant for the least developed country while it is highly significant for the most developed country. These results show that the less developed countries are less likely to fail to reject the fairness hypothesis of Forsythe et al. (1994). According to the definition of fairness we proposed in section 2, we conclude that people from less developed countries tend to be fair whereas people from more developed countries tend to be unfair.

We now investigate some alternative specifications. First, as there are only four studies with a repeated protocol in dictator games and only three studies with a Strategic2 protocol in ultimatum games, we have removed these studies from the sample and reestimated the model without the variables Repeated and Strategic2*Ultimatum. On this specification, we then performed the same in-sample predictions as before. The results are shown in Table 9 in Appendix B. Our findings are robust to this change.

Second, we estimated again equation (1) by including two additional variables: the Lab dummy and its interaction with the Ultimatum dummy. As argued before, as lab experiments are more frequent in more developed countries, these variables are highly correlated with our three development variables of interest. The estimation results are shown in Table 5. They show that offers made in laboratory experiments differ significantly from offers made in field experiments. Dictator games that are run in a laboratory rather than in the field lead to significantly lower offers (for instance, -6.10% in specification (1)) while ultimatum games that are run in a laboratory lead to significantly greater offers (for instance, $-6.10\% + 9.40\% = 3.3\%$ in specification (1)). Regarding the effect of development, it appears that the three development variables are still negative. Hence, offers in dictator games still significantly decrease with the level of development. Turning to the ultimatum game, the interactions with the ultimatum dummy tend to be positive but not significant except for Ease of business. The important point is that the global marginal effect of economic development is negative but non significant in each specification. Thus, offers do not significantly vary with the level of economic development in the ultimatum game. In a nutshell, our results concerning the effect of economic development on offers are robust to the introduction of the lab control variable.

Finally, we performed the same in-sample predictions as before based on this new specification. The results are shown in Table 6 for predicted offers in labs and in Table 7 for predicted offers not in labs.

Table 5: **Meta-regression for the pooled sample with Lab dummy: Unrestricted Weighted Least Squares Model**

	Dependent variable: Mean offer			
	(1)	(2)	(3)	(4)
Ultimatum	0.056	0.012	0.007	−0.099
	(0.037)	(0.050)	(0.035)	(0.076)
Macroeconomic development	−0.014***			0.013
	(0.005)			(0.011)
Account penetration		−0.001**		−0.0002
		(0.0003)		(0.001)
Ease of doing business (reversed)			−0.001***	−0.001**
			(0.0002)	(0.0004)
Amount at stake	0.0001	−0.0001	0.0001	0.00003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Economist	−0.045**	−0.060***	−0.038**	−0.041*
	(0.018)	(0.021)	(0.019)	(0.022)
Double blind	−0.020	−0.031*	−0.021	−0.028
	(0.019)	(0.018)	(0.017)	(0.020)
Repeated	−0.160**	−0.165***	−0.157**	−0.158**
	(0.063)	(0.063)	(0.062)	(0.064)
Strategy2	−0.015	−0.022	−0.018	−0.023
	(0.018)	(0.018)	(0.017)	(0.019)
Lab	−0.061**	−0.073***	−0.038	−0.039
	(0.024)	(0.018)	(0.024)	(0.026)
Macroeconomic development*Ultimatum	0.005			−0.031**
	(0.007)			(0.012)
Account penetration*Ultimatum		0.0004		−0.001
		(0.0005)		(0.001)
Ease business (reversed)*Ultimatum			0.001**	0.002***
			(0.0002)	(0.0004)
Amount at stake*Ultimatum	−0.0001	0.0001	−0.0001	−0.00003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Economist*Ultimatum	0.011	0.028	−0.0003	0.020
	(0.023)	(0.026)	(0.024)	(0.025)
Repeated*Ultimatum	0.118*	0.123*	0.119*	0.111*
	(0.064)	(0.065)	(0.063)	(0.065)
Strategy1*Ultimatum	0.008	0.007	0.006	0.007
	(0.007)	(0.007)	(0.008)	(0.007)
Strategy2*Ultimatum	0.009	0.013	0.008	0.015
	(0.022)	(0.020)	(0.020)	(0.022)
Lab*Ultimatum	0.094***	0.104***	0.068**	0.063**
	(0.026)	(0.021)	(0.027)	(0.028)
Std.err	−2.512***	−2.564***	−2.403***	−2.349***
	(0.419)	(0.435)	(0.432)	(0.430)
Std.err*Ultimatum	−0.048	−0.102	−0.103	−0.140
	(0.801)	(0.840)	(0.833)	(0.785)
Constant	0.393***	0.477***	0.460***	0.519***
	(0.034)	(0.037)	(0.022)	(0.064)
Observations	240	240	240	240
Adjusted R^2	0.752	0.751	0.759	0.767

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%
Robust standard errors in brackets

Table 6: **Estimated offers of non-economist subjects for an average amount at stake and standard error, non strategic settings, non-double blind, *in the lab***

	Minimum macro. development	Maximum macro. development
Ultimatum	44.04%	38.15%
	(39.54% - 48.55%)	(34.18% - 42.13%)
Dictator	29.88%	20.23%
	(25.72% - 34.02%)	(17.38% - 23.10%)
F-test of difference between ultimatum and dictator offer	18.595***	29.113***
	Minimum account penetration	Maximum account penetration
Ultimatum	43.71%	39.62%
	(38.72% - 48.69%)	(39.62% - 43.11%)
Dictator	30.19%	22.28%
	(25.70% - 34.68%)	(19.89% - 24.68%)
F-test of difference between ultimatum and dictator offer	8.906***	40.872***
	Ease of doing business, last rank	Ease of doing business, first rank
Ultimatum	42.18%	40.15%
	(37.66% - 46.69%)	(36.81% - 43.50%)
Dictator	33.09%	21.79%
	(28.60% - 37.58%)	(19.44% - 24.13%)
F-test of difference between ultimatum and dictator offer	6.453**	44.573***

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%
5% prediction confidence intervals in parentheses.

Table 7: **Estimated offers of non-economist subjects for an average amount at stake and standard error, non strategic settings, non-double blind, *in the field***

	Minimum macro. development	Maximum macro. development
Ultimatum	40.70%	34.81%
	(36.18% - 45.22%)	(30.09% - 39.53%)
Dictator	36.13%	26.49%
	(33.27% - 38.99%)	(21.31% - 31.67%)
F-test of difference between ultimatum and dictator offer	2.326	3.405*
	Minimum account penetration	Maximum account penetration
Ultimatum	40.58%	36.49%
	(35.64% - 45.52%)	(32.32% - 40.67%)
Dictator	38.02%	30.12%
	(34.65% - 41.39%)	(26.32% - 33.91%)
F-test of difference between ultimatum and dictator offer	0.287	4.621**
	Ease of doing business, last rank	Ease of doing business, first rank
Ultimatum	39.06%	37.03%
	(34.71% - 43.40%)	(32.89% - 41.18%)
Dictator	36.92%	25.62%
	(34.07% - 39.78%)	(21.09% - 30.16%)
F-test of difference between ultimatum and dictator offer	0.673	9.021***

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%
5% prediction confidence intervals in parentheses.

In both cases, the gap between ultimatum and dictator increases with the level of economic development. However, our previous main result that the fairness hypothesis is not rejected for the least developed countries is now only true for field studies. For lab experiments, this gap is always significant, indicating that the fairness hypothesis is rejected at any level of development.

Although our result only holds for field experiments, it is important to recall that the list of countries included in the lab and in the field samples are very different. While field experiments are frequently run in less developed countries, the vast majority of lab experiments takes place in developed countries (see again Table 2).Therefore, because of multicolinearity issues, we feel that it would be premature to conclude that economic development has no effect on the rejection of the fairness hypothesis in lab experiments. It may well be the case that our main result would still hold even in lab experiments if less developed countries were present in this sample. To reach a definitive conclusion, more lab studies have to be run in less developed countries.

5 Conclusion

In this study, we have exploited the hundreds of experiments that have been carried out on the ultimatum and dictator games to improve our understanding of fairness across

different types of populations. As first suggested by Henrich et al. (2001), notions of fairness vary across cultures and countries, and situations that constitute the norm in some societies might be perceived as unfair in others. Our results show that the degree of economic development of a country influences both ultimatum and dictator game offers. In particular, we find that people from more developed countries tend to give more in the ultimatum game and less in the dictator game. While the former effect appears to be mild, the latter is much sharper. As regards the dictator game, our results confirm the findings of Engel (2011) but differ from the results of Henrich (2000) and Henrich et al. (2010). Indeed, while those authors find that dictator game offers are positively correlated with market integration, we find that the more developed a country the lower the dictator game offer.

When controlling for the lab or field nature of experiments, we confirm our conclusions for field experiments. For lab experiments, it is not possible to reach definitive conclusions as there are too few studies in poorly developed countries. However, we still observe that the difference between ultimatum and dictator game offers significantly increases with economic development.

The conclusions that can be drawn about fairness from these results depend on how fairness is defined. In our study, we defined fairness as a relative rather than absolute concept, liable to vary across different countries or cultures. In particular, for simplification purposes, we define fairness as a matter of norms and expectations where giving the norm (or above) is fair while giving less than the norm is not. Following this definition, we then seek to compare fairness across different populations by comparing the difference between the actual norm of fairness in a given country or in a given culture and the share proposers give when nothing forces them to (the dictator game). We assume that, on average, ultimatum game proposers have an accurate idea of recipients' MAO and take the mean ultimatum game offers as a measure of fairness norms in different locations. Under this hypothesis and considering our simplified definition of fairness, we show that the less developed a country, the fairer its inhabitants. Our results suggest that this effect is due rather to differences in what proposers are willing to give in the absence of fear of rejection than to variation in fairness norms across different countries.

As interesting as the result may be, it relies on rather bold assumptions: we assume that ultimatum game offers are representative of fairness norms in a given country or population. Indeed, it is reasonable to suppose that ultimatum game offers are not simple predictions of recipients' MAO but also include a safety margin in addition to the proposer's guess as to the recipient's MAO. In particular, different people from different countries or societies might have different levels of risk aversion, implying that the ultimatum game offer may not be a suitable proxy for fairness norms in a given society. Supposing that the aforementioned hypotheses do not hold, our results show that the fairness hypothesis of Forsythe et al. (1994) is rejected in highly developed countries while it is not for (at least) the least developed county of our database.

Overall, our results do not seem to be in line with Montesquieu's famous thesis of "doux commerce", that the involvement in market interactions tends to pacify relations with others. Neither do they support the virtuous side of markets regarding fairness defended by Paganelli (2013). In a more developed country, market integration supposedly makes subjects more sensitive to fairness. The subject has nevertheless long been debated. Authors such as Marx insist on the negative impact of commercial interactions on the moral foundations of society.[10] Moreover, in a complex society, where life is regulated

[10]For further details on this debate, see Hirschman (1982) and the summary for example in Ensminger

and protected almost exclusively by large and anonymous institutions (the constitution, laws, social security, big companies, etc.), close relationships with others may become less frequent and less necessary. In more developed societies, individuals know that social security will provide them with some protection in the event of severe illness or if their home is destroyed by fire. So, what is the purpose of maintaining good relations with others? Things are completely different in traditional (small) societies, where life-changing events require the help of relatives, friends, but also other acquaintances.

Further research is nevertheless necessary to test the robustness of our results. More lab experiments are needed in less developed countries in order to be able to investigate the effect of economic development in lab studies.

(2004).

References

Bolton, G. E. and Zwick, R.: 1995, Anonymity versus punishment in ultimatum bargaining, *Games and Economic behavior* **10**(1), 95–121.

Borenstein, M., Hedges, L. V., Higgins, J. P. and Rothstein, H. R.: 2011, *Introduction to meta-analysis*, John Wiley & Sons.

Camerer, C. F.: 2003, *Behavioral Game Theory: Experiments in Strategic Interaction*, Princeton University Press.

Cameron, L. A.: 1999, Raising the stakes in the ultimatum game: Experimental evidence from indonesia, *Economic Inquiry* **37**, 47–59.

Carpenter, J., Verhoogen, E. and Burks, S.: 2005, The effect of stakes in distribution experiments, *Economics Letters* **86**, 393–398.

Carter, J. R. and Irons, M. D.: 1991, Are economists different, and if so, why?, *The Journal of Economic Perspectives* **5**, 171–177.

Chaudhuri, A.: 2008, *Experiments in economics: playing fair with money*, Routledge.

Cherry, T. L., Frykblom, P. and Shogren, J. F.: 2002, Hardnose the dictator, *The American Economic Review* **92**, 1218–1221.

Cooper, D. J. and Dutcher, E. G.: 2011, The dynamics of responder behavior in ultimatum games: a meta-study, *Experimental Economics* **14**, 519–546.

Egger, M., Smith, G. D., Schneider, M. and Minder, C.: 1997, Bias in meta-analysis detected by a simple, graphical test, *BMJ* **315**, 629–634.

Engel, C.: 2011, Dictator games: a meta study, *Experimental Economics* **14**, 583–610.

Ensminger, J.: 2004, Market integration and fairness: evidence from ultimatum, dictator, and public goods experiments in east africa, *Foundations of human sociality: economic experiments and ethnographic evidence from 15 small-scale societies* pp. 356–381.

Forsythe, R., Horowitz, J. L., Savin, N. E. and Sefton, M.: 1994, Fairness in simple bargaining experiments, *Games and Economic Behavior* **6**, 347–369.

Güth, W. and Kocher, M. G.: 2014, More than thirty years of ultimatum bargaining experiments: Motives, variations, and a survey of the recent literature, *Journal of Economic Behavior and Organization* **108**, 396–409.

Güth, W., Schmittberger, R. and Schwarze, B.: 1982, An experimental analysis of ultimatum bargaining, *Journal of Economic Behavior and Organization* **3**, 367–388.

Henrich, J.: 2000, Does culture matter in economic behavior? ultimatum game bargaining among the machiguenga of the peruvian amazon, *American Economic Review* **90**, 973–979.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H. and McElreath, R.: 2001, In search of homo economicus: behavioral experiments in 15 small-scale societies, *The American Economic Review* **91**(2), 73–78.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., McElreath, R., Alvard, M., Barr, A., Ensminger, J., Henrich, N. S., Hill, K., Gil-White, F., Gurven, M., Marlowe, F. W., Patton, J. Q. and Tracer, D.: 2005, in cross-cultural perspective: Behavioral experiments in 15 small-scale societies, *Behavioral and Brain Sciences* **28**, 795–815.

Henrich, J., Ensminger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., Cardenas, J. C., Gurven, M., Gwako, E., Henrich, N. et al.: 2010, Markets, religion, community size, and the evolution of fairness and punishment, *science* **327**(5972), 1480–1484.

Hirschman, A.: 1982, Rival interpretations of market society: Civilizing, destructive, or feeble, *Journal of Economic Literature* **XX**, 1463–1484.

Hoffman, E., McCabe, K. A. and Smith, V. L.: 1996, On expectations and the monetary stakes in ultimatum games, *International Journal of Game Theory* **25**, 289–301.

Oosterbeek, H., Sloof, R. and Kuilen, G. V. D.: 2004, Cultural differences in ultimatum game experiments: Evidence from a meta-analysis, *Experimental Economics* **7**, 171–188.

Paganelli, M. P.: 2013, Commercial relations: From adam smith to field experiments.

Roth, A. E.: 1995, Introduction to experimental economics, *in* J. Kagel and A. E. Roth (eds), *Handbook of Experimental Economics*, Princeton: Princeton University Press, pp. 2–109.

Roth, A. E. and Erev, I.: 1995, Learning in extensive-form games: Experimental data and simple dynamic models in the intermediate term, *Games and Economic Behavior* **8**, 164–212.

Roth, A. E., Prasnikar, V., Okuno-Fujiwara, M. and Zamir, S.: 1991, Bargaining and market behavior in jerusalem, ljubljana, pittsburgh, and tokyo: An experimental study, *The American Economic Review* pp. 1068–1095.

Slonim, R. and Roth, A. E.: 1998, Learning in high stakes ultimatum games: An experiment in the slovak republic, *Econometrica* **66**, 569–596.

Stanley, T. D.: 2005, Beyond publication bias, *Journal of Economic Surveys* **15**, 131–150.

Stanley, T. D.: 2008, Meta-regression methods for detecting and estimating empirical effect in the presence of publication bias, *Oxford Bulletin of Economics and Statistics* **70**, 103–127.

Stanley, T. D. and Doucouliagos, H.: 2012, *Meta-regression analysis in economics and business*, Vol. 5, Routledge.

Stanley, T. D. and Doucouliagos, H.: 2015, Neither fixed nor random: weighted least squares meta-analysis, *Statistics in Medicine* **34**, 2116–2127.

Stanley, T. D. and Doucouliagos, H.: 2016, Neither fixed nor random: weighted least squares meta-regression, *Research Synthesis Methods* **forthcoming**.

Sterne, J. A. C. and Harbord, R. M.: 2004, Funnel plots in meta-analysis, *Stata Journal* **4**, 127–141.

Tisserand, J.-C.: 2016, Le jeu de l?ultimatum, état de l?art et méta-analyse de 30 années de recherches expérimentales, *Actualité économique* **92**.

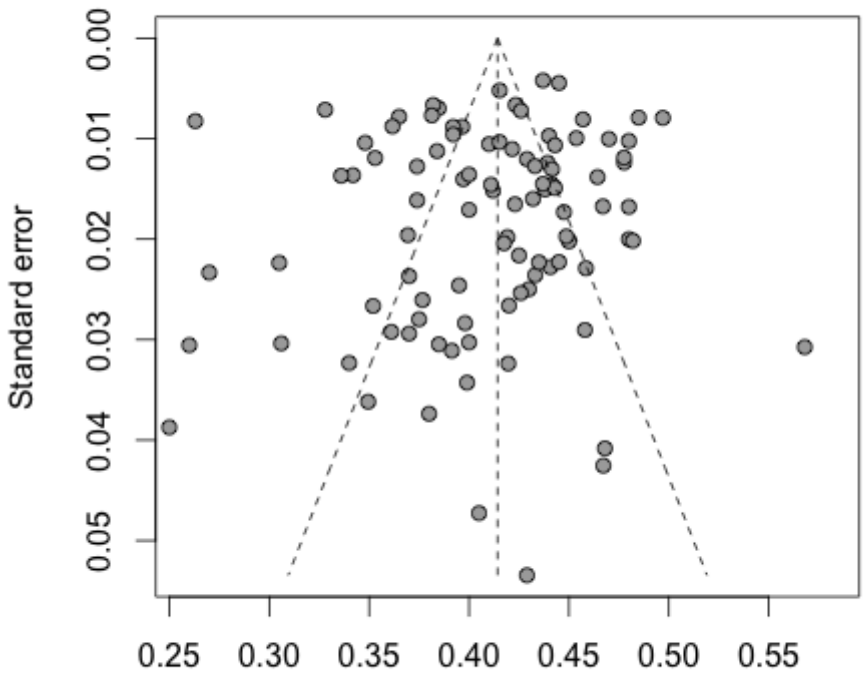
Appendix A

Meta-analysis on separate samples

The ultimatum game. Oosterbeek et al. (2004) performed a thorough meta-analysis on the ultimatum game but were unable to collect the full data about standard deviations. Instead of using the above mentioned traditional estimation models, the authors weighted each study by the number of participants, which led to very heterogeneous weights among the pool of studies. To overcome this shortcoming, we sent emails to the authors whose papers did not report the information on the dispersion of offers or the distribution of offers. Despite this methodological difference, our results at the aggregate level are similar to those of Oosterbeek et al. (2004).

With respect to the ultimatum game, the funnel plot (Figure 1) can be used to check for selection bias in the sample of studies. The funnel plot offers an overview of the mean offers and standard errors of the studies included in the sample. On the graph, the average effect of each study is reported on the x-axis and standard error on the y-axis. Sampling errors are assumed to be random and distributed according to a normal distribution. Then, in the absence of bias, the studies should be distributed symmetrically on either side of the estimated effect by the meta-analysis (represented by the central axis). If the cloud of points returned by the funnel plot displays strong asymmetry, it is likely that some studies with common characteristics were omitted during the data collection phase.

Figure 1: **Funnel plot for the ultimatum game**



For the ultimatum game, the visual impression is that the studies are indeed homogeneously distributed on either side of the central axis. However, a graphical analysis is not sufficient to reveal publication bias. Hence, we estimated the FAT-PET-MRA model as follows:

$$t_{is} = \beta_0 + \beta_1(1/se(\hat{\gamma}_{is}) + u_{is} \tag{2}$$

where t_{is} is the conventional t-value for the estimated mean offer of estimate i in study s and $se(\hat{\gamma}_{is})$ is the estimated standard error of the mean offer. The conventional t-test of the intercept β_0 in equation (2) is a test for publication selection (Egger, Smith, Schneider and Minder, 1997) whereas its estimate, if significant, indicates the direction and magnitude of the bias (Stanley, 2008). The first column of Table 8 reports the estimates of equation (2) for the dataset of ultimatum games.

Table 8: **Tests for publication selection**

	(1)	(2)
Variables	Ultimatum	Dictator
Constant	-0.5627	-1.7478***
	(0.7007)	(0.5340)
$se(\hat{\gamma}_{is})$	0.4258***	0.3061***
	(0.0086)	(0.0079)
n	96	144
k	42	96
R^2	0.963	0.913

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%.
n is the number of mean offer estimates and k is the number of independent studies.
Standard error in parentheses.

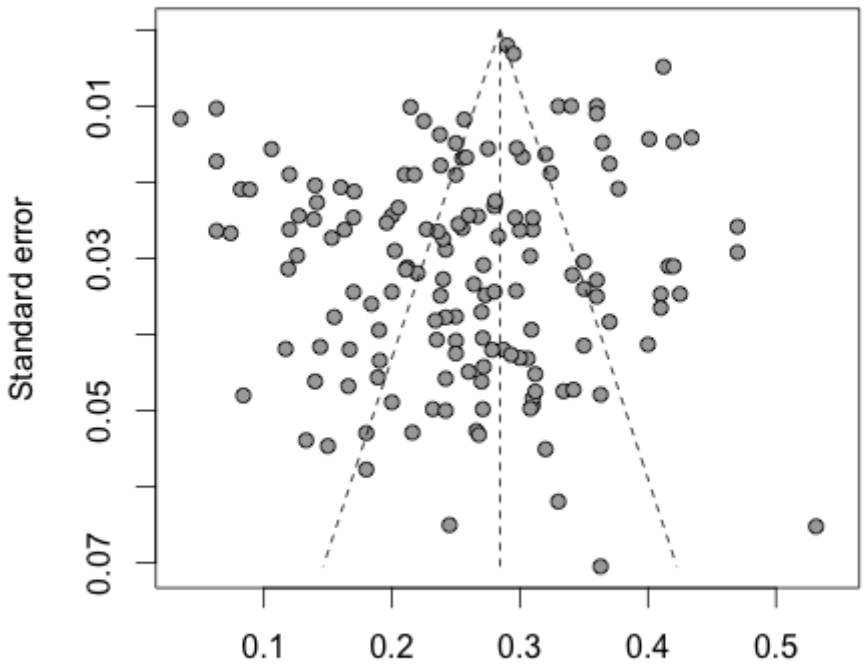
It appears that there is no evidence of publication bias in the case of the ultimatum game as the intercept is not significant at conventional significance levels. The estimated mean offer is then 42.58% of the whole amount to the responder. The high statistical power provided by the aggregation of 96 observations allows us to ensure the accuracy of this estimate: indeed, the standard error is 0.009 yielding a 95% confidence interval for the average value of the offer of [40.88%; 44.28%].

The dictator game. Engel (2011) provides an exhaustive meta-analysis of the dictator game. The study nevertheless aggregates the results of heterogeneous experiments, including previously described types of protocols that we decided to exclude. Even though the method of meta-analysis is suitable for handling a large number of (possibly heterogeneous) studies, the purpose of our study involves performing a more specific analysis on the simple dictator only, as described in the main text.

The funnel plot for the dictator meta-analysis is provided in Figure 2 and the estimation results of the FAT-PET-MRA model are displayed in the second column of Table 8. The estimated mean offer is then 30.61% of the whole amount to the responder. The standard error is 0.008 yielding a 95% confidence interval for the average value of the offer of [29.05%; 32.17%].

For the dictator game, as we can see graphically, the scatterplot is slightly offset to the left. This is confirmed by the Egger's test of symmetry of our funnel plot. The Egger

Figure 2: **Funnel plot for the dictator game, random effect model**



test shows that the null hypothesis of symmetry of the funnel plot is rejected: there is a significant negative bias as the estimated constant in equation (2) is significant and negative. Note that publication bias is not the only source of funnel plot asymmetry. Other sources such as data irregularities, true heterogeneity, or other selection biases could also be part of this negative bias. To control for these different potential sources of bias, we include the standard error of each study as a control variable in all our meta-regressions (Sterne and Harbord, 2004; Stanley, 2005).

Appendix B

Table 9: **Estimated offers of non-economist subjects for an average amount at stake and standard error, non strategic settings, non-double blind, *restricted sample***

	Minimum macro. development	Maximum macro. development
Ultimatum	42.47%	38.16%
	(38.20% - 46.74%)	(34.30% - 42.02%)
Dictator	36.09%	20.54%
	(33.33% - 38.84%)	(17.76% - 23.32%)
F-test of difference between ultimatum and dictator offer	2.362	44.894***
	Minimum account penetration	Maximum account penetration
Ultimatum	42.10%	39.28%
	(37.29% - 46.91%)	(35.80% - 42.76%)
Dictator	38.87%	24.24%
	(35.51% - 42.22%)	(21.75% - 26.73%)
F-test of difference between ultimatum and dictator offer	0.193	42.472***
	Ease of doing business, last rank	Ease of doing business, first rank
Ultimatum	40.24%	39.98%
	(36.16% - 44.31%)	(36.80% - 43.16%)
Dictator	37.74%	23.28%
	(34.70% - 40.11%)	(20.09% - 25.62%)
F-test of difference between ultimatum and dictator offer	0.313	61.603***

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%
5% prediction confidence intervals in parentheses.

Appendix C

Table 10: List of countries included in the meta-analysis

Country	Ease of doing business		Account penetration
Australia	13		99
Bolivia	147		42
Canada	20		99
Chile	55		63
China	80		79
Colombia	51		39
Denmark	2		100
Dominica	95		54
Ecuador	114		46
Egypt	126		14
Fiji	84		
France	28		97
Germany	14		99
Ghana	111		41
Guinea	161		7
Honduras	101		31
India	131		53
Indonesia	106		36
Israel	49		90
Italy	44		87
Jamaica	65		78
Japan	32		97
Kenya	113		75
Mexico	45		39
Netherlands	27		99
New Zealand	1		100
Nigeria	170		44
Papua New Guinea	133		7
Paraguay	102		
Peru	53		29
Qatar	74		
Russia	36		67
Slovakia	30		77
Slovenia	30		97
South Africa	72		70
Spain	33		98
Sweden	9		100
Switzerland	29		98
Taiwan	80		91
Tajikistan	130		11
Tanzania	144		40
Thailand	46		78
United Kingdom	6		99
United States	7		94
Zimbabwe	157	27	32

List of studies included in the meta-analyses

Meta-analysis: ultimatum game references

Anderson, L., Rodgers, Y., Rodriguez, R., 2000, Cultural differences in attitudes toward bargaining, Economics Letters 69, 45-54.

Andersson, O., Galizzi, M. M., Hoppe, T., Kranz, S., der Wiel, K. V., Wengström, E.,2010, Persuasion in experimental ultimatum games, Economics Letters 108, 16-18.

Bahry, D., Wilson, R., 2006, Confusion or fairness in the field ? Rejections in the ultimatum game under the strategy method, Journal of Economic Behavior & Organization 60, 37-54.

Barmettler, F., Fehr, E., & Zehnder, C. (2012). Big experimenter is watching you! Anonymity and prosocial behavior in the laboratory. Games and Economic Behavior, 75(1), 17-34.

Boarini, R., Laslier J-F., Robin, S., 2009, Interpersonal Comparisons of utility in Bargaining: evidence from a transcontinental ultimatum game, Theory and Decision 67, 341-373.

Bohnet, I., Zeckhauser, R., 2004, Social comparisons in ultimatum bargaining, The scandinavian Journal of Economics 106, Behaviorial Economics 495-510

Cameron, L., 1999, Raising the stakes in the ultimatum game : experimental evidence from Indonesia, Economic Inquiry 37, 47-59.

Cappelletti, D., Güth, W., & Ploner, M. (2011). Being of two minds: Ultimatum offers under cognitive constraints. Journal of Economic Psychology, 32(6), 940-950.

Carter, J., Irons, M., 1991, Are Economists Different, and If So, Why?, The Journal of Economic Perspectives 5, 171-177.

Carpenter, J., Verhoogen, E., & Burks, S. (2005). The effect of stakes in distribution experiments. Economics Letters, 86(3), 393-398.

Carter, J., McAloonb, S., 1996, A test for comparative income effects in an ultimatum bargaining ex-periment, Journal of Economic Behavior & Organization 31, 369-380.

Charness, G., Gneezy, U., 2008, What's in a name? Anonimity and social distance in dictator and ulti-matum game, Journal of Economical Behavior & Organization, 29-35.

Chuaha, S-H., Hoffmann, R., Jones, M., Williams, G., 2007, Do cultures clash? Evidence from cross-national ultimatum game experiments, Journal of Economic Behavior & Organization 64, 35-48.

Croson, R., 1996, Information in ultimatum games: An experimental study, Journal of Economic Behavior & Organisation 30, 197-212.

Dickinson, D., 2000, Ultimatum decision making: a test of reciprocal kindness, Theory and Decision 48, 151-177.

Eckel, C., Grossman, P., 2001, Chivalry and solidarity in ultimatum games, Economic Inquiry 39, 171-188.

Ensminger, J., 2004, Market integration and fairness: evidence from ultimatum, dictator, and public goods experiments in East Africa, Foundations of human sociality:

Economic experiments and ethnographic evidence from fifteen small-scale societies, 356-381.

Fershtman, C., Gneezy, U., 2001, Strategic Delegation: An Experiment, The rand Journal of Economics 32, 352-368.

Forsythe, R., Horowitz, J. L., Savin, N. E., & Sefton, M. (1994). Fairness in simple bargaining experiments. Games and Economic behavior, 6(3), 347-369.

Gil-White, F. J., 2004, Ultimatum game with an ethnicity manipulation, Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies, 260-304.

Güth, W., Schmittberger, R., Schwarze, B., 1982, An experimental analysis of ultimatum bargaining, Journal of Economic Behavior & Organization 3, 367-388.

Henrich, J., 2000, Does culture matter in economic behavior? Ultimatum game Bargaining among the machiguenga of the Peruvian Amazon, The American Economic Review 90, 973-979.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., 2005, Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies, Published to Oxford Scholarship.

Haselhuhn, M. P., & Mellers, B. A. (2005). Emotions and cooperation in economic games. Cognitive brain research, 23(1), 24-33.

Hennig-Schmidta, H., Lib, Z-Y., Yang, C., 2008, Why people reject advantageous offers: Non-monotonic strategies in ultimatum bargaining evaluating a video experiment run in PR China, Journal of Economic Behavior & Organization 65, 373-384.

Hoffman, E., McCabe, K., Shachat, K., Smith, V., 1994, Preferences, Property Rights, and Anonymity in Bargaining Games, Games and economic behavior 7, 346-380.

Hoffman, E., McCabe, K., Smith, V., 1996, On Expectations and the Monetary Stakes in Ultimatum Games, International Journal of Game Theory 25, 289-301.

Hoffman, E., McCabe, K., Smith, V., 2000, The Impact of Exchange Context on the Activation of Equity in Ultimatum Games, Experimental Economics 3, 5-9.

Hoffmann, R., Tee, J-Y., 2006, Adolescent-adult interactions and culture in the ultimatum game, Journal of Economic Psychology 27, 98-116.

Macfarlan, S., Quinlan Kinship, R., 2008, Family and Gender Effects in the Ultimatum Game, Human Nature 19, 294-309.

Marlowe, F. W. (2004). What explains Hadza food sharing. Research in economic Anthropology, 23(4), 69-88.

Murnighan, J. K., Saxon, M. S., 1998, Ultimatum bargaining by children and adults, Journal of Economic Psychology 19, 415-445.

Oxoby, R., McLeish, K., 2004, Sequential decision and strategy vector methods in ultimatum bargaining: evidence on the strength of other-regarding behaviour, Economics Letters 84, 399-405.

Roth, A., Prasnikar, V., Okuno-Fujiwara, M., Zamir, S., 1991, Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study, The American Economic Review 81, 1068-1095.

Ruffle, B. J. (1998). More is better, but fair is fair: Tipping in dictator and ultimatum games. Games and Economic Behavior, 23(2), 247-265.

Slonim, R., Roth, A., 1998, Learning in High Stakes Ultimatum Games: An Experiment in the Slovak Republic, Econometrica 63, 569-596.

Smith, V. L. (1998). The two faces of Adam Smith. Southern economic journal, 2-19.

Solnick, SJ., 2001, Gender differences in the ultimatum game, Economic Inquiry 39, 189-200.

Suleiman, R., 1996, Expectations and fairness in a modified ultimatum game, Journal of Economical Psychology 17, 531-554.

Tracer, D., 2004 Market integration, reciprocity and fairness in rural papua new guinea: Results from a two-village ultimatum game study, The Field Experiments Website.

Xiao, E., Houser, D., 2005, Emotion expression in human punishment behaviour, Proceedings of the National Academy of Sciences 102, 7398-7401.

Zaatari, D., Trivers, R., 2007, Fluctuating asymmetry and behavior in the ultimatum game in Jamaïca, Evolution and Human Behavior 28, 223-227.

Meta-analysis: dictator game references

Aguiar, F., Brañas-Garza, P., Espinosa, M. P., Miller, L. M. (2007). Personal identity in the dictator game. Jena Economic Research Paper, (2007-007).

Ahmed, A.M., 2009. Are Religious People More Prosocial? A Quasi-Experimental Study with Madrasah Pupils in a Rural Community in India. Journal for the Scientific Study of Religion 48, 368-374.

Anderson, L.R., Rodgers, Y.V., Rodriguez, R.R., 2000. Cultural differences in attitudes toward bargaining. Economics Letters 69, 45-54.

Antoniades, A., Seshan, G., Weber, R., & Zubrickas, R. (2013). On altruism and remittances (No. 131). Department of Economics-University of Zurich.

Artinger, F., Exadaktylos, F., Koppel, H., & Sääksvuori, L. (2010). Applying quadratic scoring rule transparently in multiple choice setting: a note.

Ashraf, N., Bohnet, I., Piankov, N., 2006. Decomposing trust and trustworthiness. Experimental Economics 9, 193-208.

Barmettler, F., Fehr, E., Zehnder, C., 2012. Big experimenter is watching you! Anonymity and prosocial behavior in the laboratory. Games and Economic Behavior 75, 17-34.

Barr, A., Ensminger, J., Henrich, J., Wallace, C., Barrette, C., Bolyanatz, A., ... & Marlowe, F. (2009). Homo aequalis: a cross-society experimental analysis of three bargaining games.

Benjamin, D.J., Choi, J.J., Fisher, G.W., 2010. Religious Identity and Economic Behavior (Working Paper No. 15925). National Bureau of Economic Research.

Ben-Ner, A., Kong, F., Putterman, L., 2004a. Share and share alike? Gender-pairing, personality, and cognitive ability as determinants of giving. Journal of Economic Psychology 25, 581-589.

Ben-Ner, A., Kramer, A., Levy, O., 2008. Economic and hypothetical dictator game experiments: Incentive effects at the individual level. The Journal of Socio-Economics 37

Binzel, C., Fehr, D., 2013. Social distance and trust: Experimental evidence from a slum in Cairo. Journal of Development Economics 103, 99-106.

Bohnet, I., Frey, B.S., 1999. The sound of silence in prisoner's dilemma and dictator games. Journal of Economic Behavior & Organization 38, 43-57.

Bolton, G.E., Katok, E., Zwick, R., 1998. Dictator game giving: Rules of fairness versus acts of kindness. International Journal of Game Theory 27, 269-299.

Boschini, A., Muren, A., & Persson, M. (2009). Constructing gender in the economics lab. Research Papers in Economics, Department of Economics, Stockholm University, (2009), 15.

Bosco, L. (2007). Power, hierarchy and social preferences. Available at SSRN 1089470.

Brañas-Garza, P., 2006. Poverty in dictator games: Awakening solidarity. Journal of Economic Behavior & Organization 60, 306-320

Brañas-Garza, P., Espín, A.M., Neuman, S., 2014. Religious Pro-Sociality? Experimental Evidence from a Sample of 766 Spaniards. PLoS ONE 9, e104685.

Brañas-Garza, P., Ottone, S., 2009. Third-party punishment is more effective on women: experimental evidence.

Broberg, T., Ellingsen, T., Johannesson, M., 2007. Is generosity involuntary? Economics Letters 94, 32-37.

Brock, J.M., Lange, A., Ozbay, E.Y., 2013. Dictating the Risk: Experimental Evidence on Giving in Risky Environments. The American Economic Review 103, 415-437.

Burnham, T.C., 2003. Engineering altruism: a theoretical and experimental investigation of anonymity and gift giving. Journal of Economic Behavior & Organization 50, 133-144.

Cameron, L., Erkal, N., Gangadharan, L., Meng, X., 2013. Little Emperors: Behavioral Impacts of China's One-Child Policy. Science 339, 953-957.

Cappelen, A.W., Nielsen, U.H., Sorensen, E.O., Tungodden, B., Tyran, J.-R., 2013. Give and take in dictator games. Economics Letters 118, 280-283.

Carpenter, J., Liati, A., Vickery, B., 2010. They Come To Play Supply Effects in an Economic Experiment. Rationality and Society 22, 83-102.

Carpenter, J., Verhoogen, E., Burks, S., 2005. The effect of stakes in distribution experiments. Economics Letters 86, 393-398.

Carpenter, J., Burks, S., & Verhoogen, E. (2005). Comparing students to workers: The effects of social framing on behavior in distribution games. Research in Experimental Economics, 10, 261-290.

Cassar, A., Grosjean, P. A., Whitt, S. (2011). Civil war, social capital and market development: Experimental and survey evidence on the negative consequences of violence. Social Capital and Market Development: Experimental and Survey Evidence on the Negative Consequences of Violence (August 25, 2011).

Castillo, M.E., Cross, P.J., 2008. Of mice and men: Within gender variation in strategic behavior. Games and Economic Behavior, Special Issue in Honor of Michael B. Maschler 64, 421-432.

Cadsby, C. B., Servátka, M., & Song, F. (2010). Gender and generosity: does degree of anonymity or group gender composition matter?. Experimental economics, 13(3), 299-308.

Charness, G., Gneezy, U., 2008. What's in a name? Anonymity and social distance in dictator and ultimatum games. Journal of Economic Behavior & Organization 68, 29-35.

Chavanne, D., McCabe, K., Paganelli, M.P., 2011. Whose money is it anyway? Ingroups and distributive behavior. Journal of Economic Behavior & Organization, Special Issue: Emotions, Natural Selection and Rationality 77, 31-39.

Cherry, T.L., 2001. Mental accounting and other-regarding behavior: Evidence from the lab. Journal of Economic Psychology 22, 605-615.

Cherry, T.L., Frykblom, P., Shogren, J.F., 2002. Hardnose the Dictator. The American Economic Review 92, 1218-1221.

Chiou, W.-B., Cheng, Y.-Y., 2013. In broad daylight, we trust in God! Brightness, the salience of morality, and ethical behavior. Journal of Environmental Psychology 36, 37-42.

Chiou, W.-B., Chen, S.-W., Liao, D.-C., 2013. Does Facebook Promote Self-Interest? Enactment of Indiscriminate One-to-Many Communication on Online Social Networking Sites Decreases Prosocial Behavior. Cyberpsychology, Behavior, and Social Networking 17, 68-73.

Cox, J. C. (2004). How to identify trust and reciprocity. Games and economic behavior, 46(2), 260-281.

Corazzini, L., Greiner, B., 2007. Herding, social preferences and (non-)conformity. Economics Letters 97, 74-80.

Dana, J., Cain, D.M., Dawes, R.M., 2006. What you don't know won't hurt me: Costly (but quiet) exit in dictator games. Organizational Behavior and Human Decision Processes 100, 193- 201.

Dreber, A., Ellingsen, T., Johannesson, M., Rand, D.G., 2012. Do people care about social context? Framing effects in dictator games. Experimental Economics 16, 349-371.

Duffy, J., & Kornienko, T. (2010). Does competition affect giving?. Journal of Economic Behavior & Organization, 74(1), 82-103.

Dufwenberg, M., Muren, A., 2006. Generosity, anonymity, gender. Journal of Economic Behavior & Organization 61, 42-49.

Eckel, C.C., Grossman, P.J., 1998. Are Women Less Selfish Than Men?: Evidence From Dictator Experiments. The Economic Journal 108, 726-735.

Edele, A., Dziobek, I., Keller, M., 2013. Explaining altruistic sharing in the dictator game: The role of affective empathy, cognitive empathy, and justice sensitivity. Learning and Individual Differences 24, 96-102.

Eichenberger, R., Oberholzer-Gee, F., 1998. Rational moralists: The role of fairness in democratic economic politics. Public Choice 94, 191-210.

Ellingsen, T., Johannesson, M., Tjotta, S., Torsvik, G., 2010. Testing guilt aversion. Games and Economic Behavior 68, 95-107.

Ensminger, J. (2004). Market integration and fairness: evidence from ultimatum, dictator, and public goods experiments in East Africa. Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies, 356-381.

Forsythe, R., Horowitz, J.L., Savin, N.E., Sefton, M., 1994. Fairness in Simple Bargaining Experiments. Games and Economic Behavior 6, 347-369.

Franzen, A., Pointner, S., 2012a. Anonymity in the dictator game revisited. Journal of Economic Behavior & Organization 81, 74-81.

Franzen, A., Pointner, S., 2012b. The external validity of giving in the dictator game. Experimental Economics 16, 155-169.

Franzen, A., Pointner, S., 2013. Giving according to preferences: Decision-making in the group dictator game (University of Bern Social Sciences Working Paper No. 2). University of Bern, Department of Social Sciences.‘

Bohnet, I., & Frey, B. S. (1999). The sound of silence in prisoner's dilemma and dictator games. Journal of economic behavior & organization, 38(1), 43-57.

Frohlich, N., Oppenheimer, J., & Moore, J. B. (2001). Some doubts about measuring self-interest using dictator experiments: the costs of anonymity. Journal of Economic Behavior & Organization, 46(3), 271-290.

Gong, B., Yan, H., Yang, C.-L., 2014. Gender differences in the dictator experiment: evidence from the matrilineal Mosuo and the patriarchal Yi. Experimental Economics 1-12.

Gowdy, J., Iorgulescu, R., & Onyeiwu, S. (2003). Fairness and retaliation in a rural Nigerian village. Journal of economic behavior & organization, 52(4), 469-479.

Gurven, M. (2004). Does market exposure affect economic game behavior. The ultimatum game and the public godds game among the Tsimane?of Bolivia, 194-231.

Gurven, M., Zanolini, A., Schniter, E., 2008. Culture sometimes matters: Intracultural variation in pro-social behavior among Tsimane Amerindians. Journal of Economic Behavior & Organization 67, 587-607.

Güth, W., Kliemt, H., Ockenfels, A., 2003. Fairness versus efficiency: An experimental study of (mutual) gift giving. Journal of Economic Behavior & Organization 50, 465-475.

Haley, K.J., Fessler, D.M.T., 2005. Nobody's watching?: Subtle cues affect generosity in an anonymous economic game. Evolution and Human Behavior 26, 245-256.

Haselhuhn, M.P., Mellers, B.A., 2005. Emotions and cooperation in economic games. Cognitive Brain Research, Multiple Perspectives on Decision Making Cognitive Neuroscience Society Meeting 23, 24-33.

Hoffman, E., McCabe, K., Shachat, K., Smith, V., 1994. Preferences, Property Rights, and Anonymity in Bargaining Games. Games and Economic Behavior 7, 346-380.

Hoffman, E., McCabe, K., Smith, V.L., 1996. Social Distance and Other-Regarding Behavior in Dictator Games. The American Economic Review 86, 653-660.

Houser, D., Vetter, S., & Winter, J. (2012). Fairness and cheating. European Economic Review, 56(8), 1645-1655.

Johannesson, M., Persson, B., 2000. Non-reciprocal altruism in dictator games. Economics Letters 69, 137-142.

Knafo, A., Israel, S., Darvasi, A., Bachner-Melman, R., Uzefovsky, F., Cohen, L., Feldman, E., Lerer, E., Laiba, E., Raz, Y., Nemanov, L., Gritsenko, I., Dina, C., Agam, G., Dean, B., Bornstein, G., Ebstein, R.P., 2008. Individual differences in allocation of funds in the dictator game associated with length of the arginine vasopressin 1a receptor RS3 promoter region and correlation between RS3 length and hippocampal mRNA. Genes, Brain and Behavior 7, 266-275.

Koch, A. K., & Normann, H. T. (2008). Giving in dictator games: Regard for others or regard by others?. Southern Economic Journal, 223-231.

Lazear, E. P., Malmendier, U., & Weber, R. A. (2009). Sorting and social preferences. Department of Social and Decision Sciences, 97.

List, J.A., 2007. On the Interpretation of Giving in Dictator Games. Journal of Political Economy 115, 482-493.

List, J.A., Cherry, T.L., 2008. Examining the role of fairness in high stakes allocation decisions. Journal of Economic Behavior & Organization 65, 1-8.

Marlowe, F. W. (2004). Dictators and ultimatums in an egalitarian society of hunter-gatherers: The Hadza of Tanzania. Foundations of human sociality: Economic experiments and ethnographic evidence from fifteen small-scale societies, 168-93.

Mohlin, E., Johannesson, M., 2008. Communication: Content or relationship? Journal of Economic Behavior & Organization 65, 409-419.

Moore, A., Taylor, M., 2007. Experimental Economics Research: Is there an alternative to having huge research budgets? Economics Bulletin 3, 1-6.

Nettle, D., Harper, Z., Kidson, A., Stone, R., Penton-Voak, I.S., Bateson, M., 2013. The watching eyes effect in the Dictator Game: it's not how much you give, it's being seen to give something. Evolution and Human Behavior 34, 35-40.

Niwa, Y., Hiraishi, K., Oda, R., 2011. A mirror has no effect on giving in the dictator game. Letters on Evolutionary Behavioral Science 2, 16-19.

Oda, R., Niwa, Y., Honma, A., Hiraishi, K., 2011. An eye-like painting enhances the expectation of a good reputation. Evolution and Human Behavior 32, 166-171.

Oxoby, R.J., Spraggon, J., 2008. Mine and yours: Property rights in dictator games. Journal of Economic Behavior & Organization 65, 703-713.

Panchanathan, K., Frankenhuis, W.E., Silk, J.B., 2013. The bystander effect in an N-person dictator game. Organizational Behavior and Human Decision Processes, Social Dilemmas 120, 285-297.

Radke, S., Güro?lu, B., & de Bruijn, E. R. (2012). There's something about a fair split: intentionality moderates context-based fairness considerations in social decision-making. PloS One, 7(2), e31491.

Ramalingam, A., 2012. The relevance of irrelevant information in the dictator game. Economics Bulletin 32, 746-754.

Rankin, F.W., 2006. Requests and social distance in dictator games. Journal of Economic Behavior & Organization 60, 27-36.

Rigdon, M., Ishii, K., Watabe, M., & Kitayama, S. (2009). Minimal social cues in the dictator game. Journal of Economic Psychology, 30(3), 358-367.

Ruffle, B.J., 1998. More Is Better, But Fair Is Fair: Tipping in Dictator and Ultimatum Games. Games and Economic Behavior 23, 247-265.

Saad, G., & Gill, T. (2001). The effects of a recipient's gender in a modified dictator game. Applied Economics Letters, 8(7), 463-466.

Scheres, A., Sanfey, A.G., 2006. Individual differences in decision making: Drive and reward responsiveness affect strategic bargaining in economic games. Behavioral and Brain Functions 2, 35.

Schotter, A., Weiss, A., Zapater, I., 1996. Fairness and survival in ultimatum and dictatorship games. Journal of Economic Behavior & Organization 31, 37-56.

Schurter, K., & Wilson, B. J. (2009). Justice and fairness in the dictator game. Southern Economic Journal, 76(1), 130-145.

Shariff, A.F., Norenzayan, A., 2007. God Is Watching You Priming God Concepts Increases Prosocial Behavior in an Anonymous Economic Game. Psychological Science 18, 803-809.

Shor, M. (2007). Rethinking the fairness hypothesis: procedural justice in simple bargaining games. Available at SSRN 1073885.

Small, D.A., Loewenstein, G., 2003. Helping a Victim or Helping the Victim: Altruism and Identifiability. Journal of Risk and Uncertainty 26, 5-16.

Smith, R., Lagarde, M., Blaauw, D., Goodman, C., English, M., Mullei, K., Pagaiya, N., Tangcharoensathien, V., Erasmus, E., Hanson, K., 2012. Appealing to altruism: an alternative strategy to address the health workforce crisis in developing countries? Journal of Public Health, fds066.

Winking, J., Mizer, N., 2013. Natural-field dictator game shows no altruistic giving. Evolution and Human Behavior 34, 288-293.

Xiao, E., & Houser, D. (2007). Emotion expression and fairness in economic exchange. University of Pennsylvania.

Yamamori, T., Kato, K., Kawagoe, T., Matsui, A., 2007. Online chat leads to fairness in dictator games. Working Paper. Tokyo: University of Tokyo.