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Dictator giving and taking: Evidence from Africa ☆

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ABSTRACT

Replication lies at the heart of economic analysis and is of crucial importance for science progression. Previous studies find evidence that framing significantly matters in dictator games. These findings mostly rely on societies considered as being WEIRD. We explore the generalizability of these results by collecting data from 165 dictators in Botswana. Our findings show that average giving is significantly reduced when the action set includes taking, but by substantially less than what has been found previously in a WEIRD society. We calculate the post-study probability estimates showing how our priors change with the results reported here. Our study further highlights the importance of institutions and has significant implications for future research.

1. Introduction

Replication is the cornerstone for the advancement of knowledge and the progression of sciences, and economics is no exception. Camerer et al. (2016) reports a replicability rate of 61% of the original experimental studies which were attempted to be replicated and were published in top economics journals. This finding suggests that reproducibility in experimental economics still remains a challenge and more emphasis needs to be placed on scrutinizing key research findings. While replication of scientific findings has gathered broad acceptance in the scientific community (McNutt, 2014), surprisingly it is rarely observed in empirical social sciences, and in particular, economics. It is therefore of crucial importance to intensify our efforts to replicate highly influential studies that affect our thinking and, more systematically, explore whether the associations observed in a study can be attributed to true effects and how these depend on our priors about the replicability of our findings.

In this paper, we explore the generalizability of dictator game experiments casting doubts on the robustness of elicited social preferences to seemingly irrelevant contextual cues. It is by now well established that a large body of literature in behavioral economics research has provided strong evidence showing substantial and consistent deviations from what we refer to as the selfishness axiom which assumes that individuals care only about maximizing their own material payoffs. These violations have been observed using a broad range of experimental frameworks, of which the most commonly used is probably the so-called dictator game. In this game, individuals are asked to indicate how they would like to split a fixed

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amount of money between themselves and a randomly selected recipient who has no power but to accept the suggested split made by the dictator. Empirical evidence over more than three decades of research indicates that dictators are willing to sacrifice part of their own income and on average, offer approximately between 10% and 25% of the initial pie to the recipient (e.g., Forsythe et al., 1994). These findings (surveyed in Camerer, 2003) have been interpreted as evidence that dictators do not exclusively rely on maximizing their own material gains but also care about the welfare of others.[1]

Until recently, this evidence mainly relied on observing behavior in societies characterized as being WEIRD (Western, Educated, Industrialized, Rich, Democratic). A growing strand of literature has emerged, examining the generalizability of experimental findings by looking at a broader sample of individuals with diverse social and cultural environments. Two highly cited cross-cultural studies are due to Henrich et al. (2001, 2005) analyzing human behavior in a set of experimental games (like dictator, public good and trust games) from 15 small-scale societies exhibiting a wide variety of economic and social conditions. The main findings from these experiments indicate that, while individuals across societies exhibit more variation than what was previously observed in western societies, observed behavior was far from being consistent with the self-interest hypothesis. Individuals were willing to exhibit other-regarding preferences and in particular, offer positive amounts of money to recipients in standard dictator games (e.g. for a recent overview, see Drouvelis, 2021). Taken together, the existing evidence shows that a significant percentage of individuals are strongly motivated by social preferences and have concerns for the welfare of others, with this finding being universal across societies.

However, the literature's preferred interpretation of these findings has been put under scrutiny in a novel experiment by List (2007) who examines dictator giving when dictators are given the opportunity not only to give but also to take money from their paired recipient. As compared to a baseline dictator game, where individuals can only give money to the recipient, List finds that taking leads to drastic changes in behavior, observing significantly less giving. In a follow-up experiment, Bardsley (2008) finds corroborating evidence for List's experiment.[2] These results cast doubt on the robustness of elicited social preferences to framing and contextual changes. Both List's and Bardsley's experiments were conducted in western societies. It is, however, important to empirically test whether claims about human behavior based on samples from western societies are replicable to other populations with different cultural and socioeconomic backgrounds. This naturally opens the following question: are framing differences in dictator giving generalizable to different cultural environments?[3]

In this paper, we provide such evidence by analyzing behavior in Botswana, a middle-income country located at the center of Southern Africa. Botswana's prudent policies have resulted in stability and good performances, ranking the country in one of the least corrupt places for business in Sub-Saharan Africa. While Botswana has enjoyed stable growth since independence in 1966, the economy still suffers from poverty and high rates of unemployment. In 2015–16, Botswana's Gini coefficient of 0.52 ranked the country among the ones with the highest income inequality globally.[4] Surprisingly, there has been no experimental study exploring giving behavior in Botswana yet, making this country an even more interesting case to be studied. An advantage for replicating experiments in Botswana is that the country's official language is English, allowing us to rule out potential language effects and using exactly the same language as in identical instructions produced in List's experiment.

Our experimental evidence, thus, relies on the first laboratory dictator game experiment conducted at the University of Botswana in Gaborone. We collected data from 165 subjects who participated in identical experiments as introduced by List (2007). The experimental design (outlined in detail in Section 2) consists of three main treatments. In the baseline treatment, we examine giving in a standard dictator game, whereby the dictators have to decide how to allocate their 10 Pula endowment between themselves and a stranger. In two variants of the baseline treatment, we explore giving when taking options are allowed. Specifically, the action set is expanded such that the dictators can take 1 Pula or 10 Pula (depending on the treatment) from their partner. Any standard social preference account would predict that the introduction of taking options should not have any impact on subjects' generosity.

In contrast, our findings provide new evidence demonstrating that introducing taking options in a simple dictator game leads to drastic changes in giving behavior. Average offers go down by more than 50% when taking opportunities are present. This replicates previous evidence as shown in List (2007) and Bardsley (2008) and, importantly, extends their generalizability to broader populations. It is worth noting that average giving is reduced by substantially less than what has been found in List's experiment. We conjecture that this may be linked to socio-economic characteristics present in Botswana such as the concept of *botho* which defines the social relationships of the local population (see Section 3.1 for further discussion). Overall, our study replicates the power of seemingly irrelevant contextual cues in simple dictator games in a distinct socioeconomic and cultural environment from the one typically observed in western societies. In addition, we calculate the post-study probability (PSP) estimates as in Maniadis et al. (2014), allowing us to understand how our priors change depending on the power of the corresponding treatment comparison and the number of competitors in the field. Our study

[1] As a result, these findings have inspired the development of theoretical models incorporating pro-social motives surveyed in Fehr and Schmidt (2006).

[2] A follow-up study by Grossman and Eckel (2015) examines whether the initial allocation of the endowment affects giving when the recipient is an actual charity and reports insignificant differences across treatments.

[3] More recently, there have been a number of studies which examine dictator game giving vs. taking in non-WEIRD populations (e.g., Jakiela, 2011; Jakiela, 2015; Jakiela et al. 2015; Leibbrandt et al., 2015), with the literature producing mixed evidence. Importantly, these studies do not aim at replicating List's original design.

[4] See https://www.statsbots.org.bw/.

further shows that institutions do matter and highlights the importance of replicating and scaling up evidence to better understand human economic behavior (List, 2022).

The paper is organized as follows. Section 2 outlines our experimental design and procedures. Section 3 reports the findings from the dictator game experiments and the PSP estimates of our replication study. Section 4 concludes.

2. Experimental design and procedures

Our experimental design has adopted identical treatments as specified in List (2007). In particular, we observe giving behavior in three treatments using a between-subjects design. In all treatments, great care was taken to follow identical procedures. To control for sessions effects, all treatments were conducted within a given session by randomly assigning treatments to subjects. Subjects were randomly assigned to two groups: one group was placed in Room A and the other was placed in Room B. No communication was allowed during the experiment and subjects were allowed to ask questions only to administrators.

In our baseline treatment (which we refer to as "Give"), we implemented a standard dictator game whereby both players were allocated 10 Pula.[5] Participants in Room A (i.e. the "dictators") were allocated an additional 10 Pula. In a one-shot allocation game, dictators had to decide how to allocate the additional amount of 10 Pula, by selecting an integer amount from 0 to 10 Pula. The chosen allocation determined the final earnings between the dictator and the recipient (who corresponded to a randomly selected subject from Room B).

In the two remaining treatments, we allow dictators to take money from the recipients by extending the action set to the negative domain. Specifically, in the Take (1P) treatment, the action set not only extends over 0–10 Pula but also includes –1 Pula (namely, taking 1 Pula). By comparing the baseline treatment with the Take (1P) allows us to assess whether allowing for taking changes giving behavior. In the Take (10P) treatment, the dictator is allowed to take up to 10 Pula from the recipient. In this treatment, the midpoint of the action set is no taking or giving as the action set is symmetric for the dictator.

Procedures: The experiment was conducted at the University of Botswana in October and November 2019. In total, we collected data from 165 dictators. Of them, 53 subjects participated in the baseline treatment, 53 subjects in the Take (1P) treatment and 59 subjects in the Take (10P) treatment. We chose a similar sample size as in the original study by List (2007).[6]

Subjects were randomly assigned to treatments.[7] The experiment was pen and paper and participants were undergraduate and postgraduate students from the University of Botswana. The instructions used for the experiment are reproduced in Appendix B. All subjects were paid in cash and in private at the end of the session depending on their decisions in the experiment.

3. Results

3.1. Aggregate behavior

Figs. 1-3 show the distribution of the decisions made by the dictators in each our three treatments, separately, along with the distributions of dictators' offers in List (2007). To allow for comparability between the two studies, we plot the percentage money transferred from the dictators to recipients. Consonant with previous dictator game studies in developing countries (see the meta-analysis by Engel, 2011), the modal offer (almost 38%) is the equal 50–50 split. However, we observe that, in our baseline treatment, dictators are more generous than what is typically observed in previous dictator game experiments conducted in western societies including List's (2007) experiment. In particular, the selfish outcome was chosen by approximately 8% of the dictators (whereas nearly 30% give 0 in List's data). Only about 25% give half of their endowment in List's data; nearly 40% do so in our sample. Compared to the Maryland subjects in List (2007), we find that, on average, dictators offer 26.67% of their endowment to recipients which is significantly less than the average dictator offers of 45.47% observed in Botswana ($p = 0.006$).[8]

In the two Take treatments, we observe that the percentage of dictators splitting their endowment with the recipient goes down substantially. 26.42% and 25.42% of dictators choose to offer 5 Pula to the recipient in our Take (1P) and Take (10P) treatments, respectively. In the Take (1P) treatment, offering 0 Pula increases by nearly 20 percentage points compared to the baseline treatment while in the Take (10P) treatment, we observe that the percentage of dictators giving 0 Pula to their recipients (8.47%) is similar to that of the baseline treatment. However, we also see that expanding the action set

[5] The exchange rate between Pula (the national currency of Botswana) and US Dollars was approximately 10.80 Pula per dollar, at the time of the experiment. The hourly minimum wage in Botswana was equal to 3.8 Pula and that in the US was $2.90 in 2005 (where List's experiment was conducted). The corresponding average earnings in the Botswana and the Maryland experiments are 12.79 Pula and $4.27, respectively. The average payment/minimum wage ratio is equal to 3.37 in the Botswana study and 1.47 in the Maryland study, suggesting that stakes in our study were somewhat higher.

[6] In particular, List had 24 subjects in his baseline treatment, 46 in his Take ($1) and 50 in his Take ($5) treatments. The corresponding mean offer (standard deviation) is $1.33 (s.d 1.33) in the baseline treatment, $0.09 (s.d. 1.21) in the Take ($1) and $−2.48 (s.d. 2.69) 46 in the Take ($5).

[7] At the end of a session, we collected data on subjects' demographics. In Appendix A, we perform balance checks and provide evidence that there are no significant differences in subjects' observable characteristics across treatments (Table A.1).

[8] All tests reported in this section correspond to two-sided tests. Each subject is treated as the independent unit of observation.

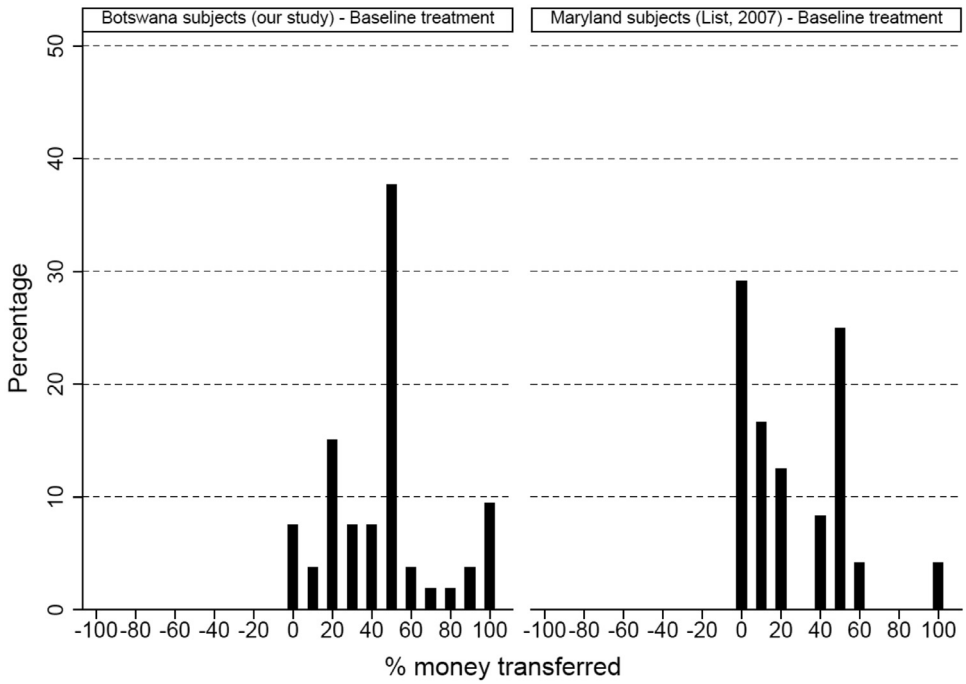

Fig. 1. Distribution of percentage money transferred in the baseline (Give) treatment.

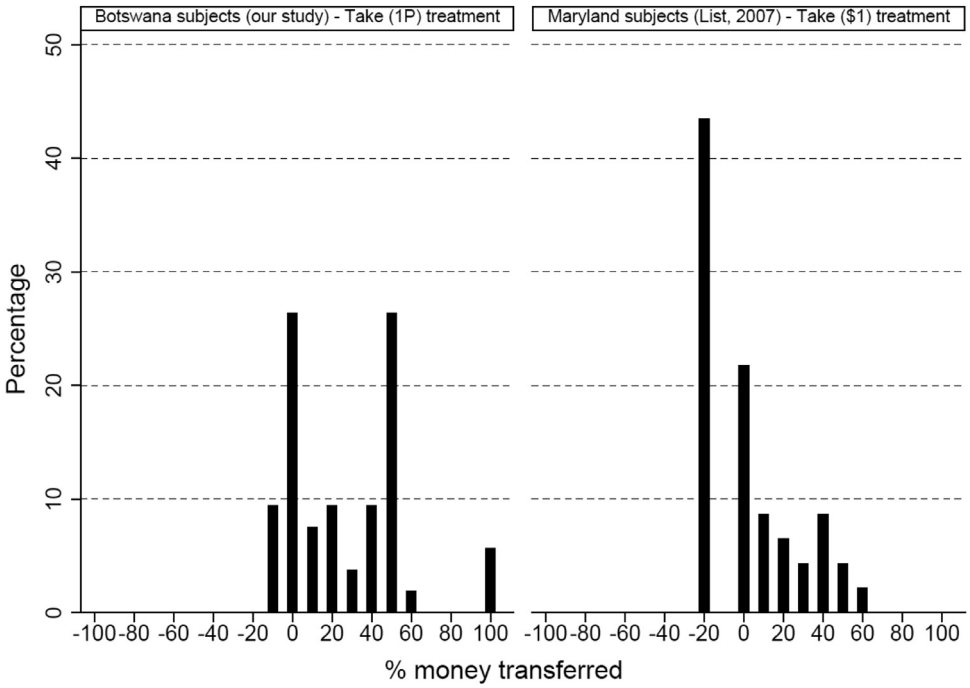

Fig. 2. Distribution of percentage money transferred in the Take (1P) treatment.

allowing dictators to take up to 10 Pula, causes a substantial shift of the giving distribution to the left. By performing a Kruskal-Wallis test, we find that the distribution of money transferred is significantly different across treatments ($p = 0.002$). When we compare our Take (1P) with the Take ($1) treatment of List (2007), we find that Botswana subjects are again more generous compared to Maryland subjects (26.60% vs. 1.74%; $p<0.001$). Yet, the magnitude of the decrease is far lower. List (2007) finds that, in the Take ($1) treatment, giving completely collapses and the median giving falls to $0. In our experiment, 64% still offer positive amounts and the average gift is about 25% of the endowment.

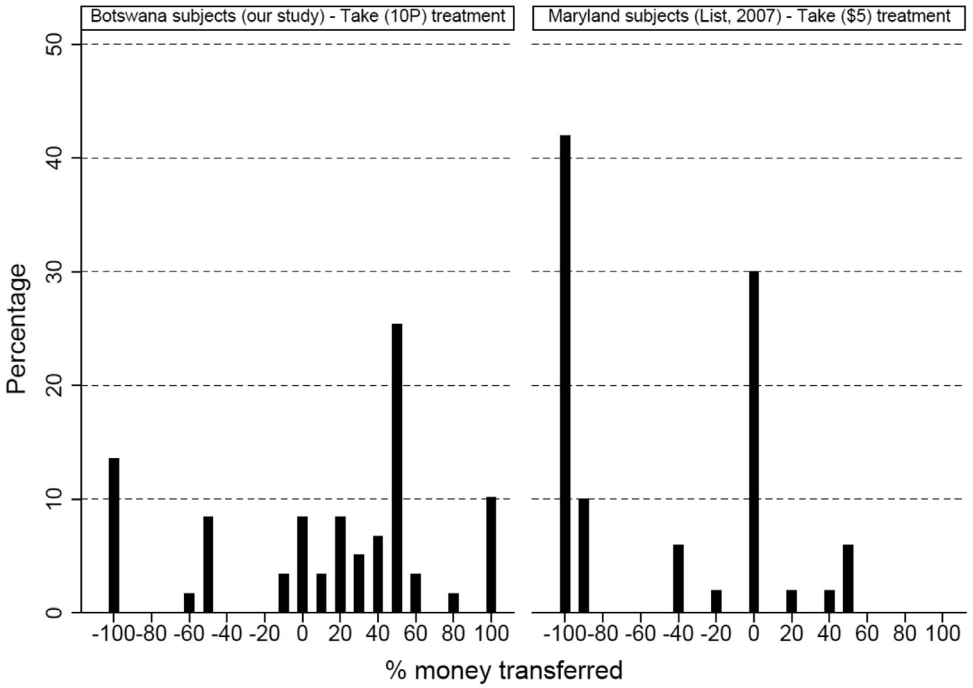

Fig. 3. Distribution of percentage money transferred in the Take (10P) treatment.

Table 1
Aggregate behavior across treatments.

	Botswana subjects (our study)			Maryland subjects (List, 2007)		
	Baseline	Take (1P)	Take (10P)	Baseline	Take ($1)	Take ($5)
Mean% offer	45.47%	26.60%	13.39%	26.67%	1.74%	−49.6%
Standard deviation	27.21	29.02	59.90	26.65	24.16	53.87
% of subjects offering positive amounts	92.45%	64.15%	64.41%	70.83%	34.78%	10%
N	53	53	59	24	46	50

Note: In absolute terms, the average transfer in our study is 4.55 (s.d. = 2.72) in the Give treatment, 2.66 (s.d. = 2.90) in the Take (1P) treatment and 1.34 (s.d. = 5.99) in the Take (10P) treatment. The average transfer in List's (2007) study is 1.33 (s.d. = 1.33) in the Give treatment, 0.09 (s.d. = 1.21) in the Take ($1) treatment and −2.48 (s.d. = 2.69) in the Take ($5) treatment.

A similar pattern is observed when we compare our Take (10P) with List's Take ($5) treatment. Specifically, in our Take(10P) treatment, giving does decline but we observe a high percentage (64%) of our sample that still gives a positive amount. List (2007) finds only about 10% do so. The modal gift is still half the endowment in our experiment, whereas, taking everything is the modal choice in List's data. On average, Botswana subjects offer 13.39% of their endowment as opposed to Maryland subjects who offer −49.6% of their endowment ($p<0.001$). Interestingly, we observe that average offers in our Take (1P) treatment are similar to List's (2007) baseline treatment.

Table 1 summarizes the descriptive statistics of dictators' decisions in each of our three treatments as well as List's treatments. In total, we have data from 53 dictators in the Give, 53 dictators in the Take (1P) treatment and 59 dictators in the Take (10P) treatment. On average, we observe that in the Give treatment dictators offer to the recipient 45.47% of their endowment. This is in line with the average giving previously observed in dictator games in developing countries (Engel, 2011). However, giving decreases in both Take treatments considerably: 26.60% in the Take (1P) and 13.39% Pula in the Take (10P). In line with List's experiment, we find that behavior across treatments varies substantially but as shown above, Botswana subjects are significantly more generous than Maryland subjects.

We next formally check whether aggregate giving is significantly different across our treatments by performing Mann-Whitney tests. Our analysis shows that there are significant differences between the baseline Give treatment and the other two Take treatments. Specifically, dictators give significantly less in both Take treatments ($p = 0.001$ when we compare Give vs. Take (1P); $p = 0.008$ when we compare Give vs. Take (10P)), suggesting that expanding the action set decreases giving behavior. This finding indicates that by either adding one choice in the negative domain or making the action set symmetric leads to substantial decreases in dictator giving. When we compare the two Take treatments, we find that average giving is

Table 2
Percentage of money transferred across treatments – Regression results.

	Dependent variable:% of money transferred	
	Model (1)	Model (2)
Botswana	38.385***	18.805***
	(5.437)	(6.532)
Take	−34.820***	−51.667***
	(4.744)	(7.365)
Botswana x Take		25.838***
		(9.430)
Constant	13.189***	26.667***
	(4.896)	(5.363)
Obs.	285	285

Notes: OLS regressions. Robust standard errors are reported in parentheses. The variable "Botswana" equals 1 for subjects participating in the Botswana study and 0 otherwise. The variable "Take" equals 1 for subjects participating in Take treatments 0 otherwise. The variable "Botswana x Take" is the interaction term between the dummy variables "Botswana" and "Take". $*\ p < 0.1$, $**\ p < 0.05$, $***\ p < 0.01$.

lower in the Take (10P) treatment; however, the difference with average offers in the Take (1P) treatment is not significantly different at conventional levels ($p = 0.887$).

Our results from our non-parametric analysis are confirmed by the regressions reported in Table 2. Our analysis combines data from our experiment as well as List's study. We perform two OLS regressions where the dependent variable is "% money transferred". In Model (1), the independent variables consist of three dummy variables called "Botswana experiment" (which is equal to 1 if subjects participated in our experiment and 0 if subjects participated in List's experiment) and "Take" (which is equal to 1 if subjects participated in the Take treatments and 0 otherwise). Model (2) is augmented by including an interaction variable between these two dummies, called "Botswana x Take". Two observations clearly stand out from Table 2. First, we observe that average percentage of money transferred is significantly higher in our sample compared to the Maryland subjects both in the Give and Take treatments. Second, in both samples, subjects are, on average, more selfish in the Take compared to the Give treatment.

Overall, we offer new evidence that adding the take options has a detrimental effect on giving. Our treatment differences – especially when it comes to the comparison between the baseline Give treatment and either of the two Take treatments – are similar to the effects observed in List (2007). Consequently, it appears that earlier findings indicating the importance of framing effects in dictator giving behavior are reproducible in broader populations with different socioeconomic backgrounds. Interestingly, we also find that subjects in our Botswana experiment are more generous than the Maryland subjects in List's experiment.

The higher generosity observed in the Botswana sample may be linked to existing socioeconomic characteristics of the Botswanan population. It is worth highlighting that the local population is quite homogeneous in terms of ethnic groups (the Tswana (or Setswana) tribe represents 79% of the population). This might already generate a sense of belonging to a wider community. In addition, one of the main core values of the majority Tswana tribe is the so-called *botho* (in the Setswana national language) which means that "everyone is connected to the larger community as if it were an extended family".[9]

Consistent with the social norms of the Setswana culture, individuals are expected have *botho* (derived from '*motho*' which in local language translates to 'human being'); namely, they are expected to adopt attitudes which are associated with good human behavior including the possession of good manners, compassion, solidarity, sharing and caring about others. In Botswana's Vision 2016 (which defines the main principles for the nation's economic and social development), *botho* is referred to as one of the tenets of the African culture which 'must permeate every aspect' of all Batswana.[10] The positive effects of *botho* in Botswana communities have also been documented in recent case studies. For example, Steyn (2012) discusses the key role that *botho* has played in the social space and structures of the Botswanan population. More recently, Morapedi (2018) presents a case study where the principle of *botho* was used to enhance the educational skills of the youth in the context of the Moshupa village.

The concept of *botho* is a cultural characteristic that defines the social relationships of Batswana, generating feelings of group identification and strong social ties whereby the community comes first. Related to our experiment, we conjecture that the higher generosity levels observed in our dictator game (as compared to the behavior of Maryland subjects in List (2007)) may be due to the prescribed local social norms and expectations of having *botho*. This would be in line with

[9] See https://eu.usatoday.com/story/news/world/2019/01/31/botswana-offers-u-s-valuable-lesson-achieving-racial-harmony/2731108002/.
[10] See https://faolex.fao.org/docs/pdf/BOT181142.pdf.

Table 3
The PSP estimates as a function of prior probability (π), power, and competition (k) of our study.

Power = 0.80					
	$k = 1$	$k = 5$	$k = 10$	$k = 20$	$k = 50$
π			PSP		
0.01	**0.14**	**0.04**	**0.02**	**0.02**	**0.01**
0.05	**0.46**	**0.19**	**0.12**	**0.08**	**0.05**
0.1	0.64	**0.33**	**0.22**	**0.15**	**0.11**
0.2	0.80	0.52	**0.38**	**0.28**	**0.21**
0.35	0.90	0.70	0.57	**0.46**	**0.37**
0.55	0.95	0.84	0.75	0.66	0.57

existing experimental economics and psychology evidence, showing that groups of people with a greater degree of social similarity and stronger social ties tend to be more altruistic, trusting and cooperative (see Tajfel and Turner, 1979; 1986 on social identity theory). This calls for future research in Botswana which would formally test and quantify the impact of the *botho* principle on behavior in standard experimental games.

3.2. Post-study probabilities and List's SANS conditions

As a next step, we perform power calculations to estimate the minimum detectable effect (MDE) size to achieve power of 0.80. Based on our calculations, the MDE size is 1.54 for the Give vs. Take(1P) and for the Give vs. Take(10P) and 2.47 for the Take(1P) and Take(10P). These are reasonable MDEs as previous comparable dictator game studies (e.g. List (2007)) have detected effect sizes which are even higher than our MDEs. We also estimate the probability that a declaration of our findings (based on p-values) is true. To do so, we follow the framework proposed by Maniadis et al. (2014). We refer to this probability as the post-study probability (PSP), the estimates of which are reported in Table 3 when power is equal to 0.80. The calculation of the PSP allows us to observe how our priors about how likely our results are replicable (indicated by π in the table below) change depending on the level of power for each treatment comparison and the number of competitors (indicated by k in the table below) in the field.

The PSP estimates which correspond to values lower than 0.50 (those cases where the effect observed is less likely to be true) appear in bold face. We observe that as the prior probability increases, the PSP estimates also increase. This implies that as our priors increase, the more likely it is that the observed effect is true. In addition, we also find that as the number of researchers – as shown by k – increases, the probability that our declared research finding is true decreases.

Finally, we discuss List's (2020) SANS conditions (selection, attrition, naturalness and scaling) to address concerns about external validity. In terms of selection, in our laboratory experiment we used a student sample. Assignment to treatments was random and randomization was made to the individual level (i.e. subjects within a session were equally likely to participate in one of the three treatments). There was no attrition as all participants completed the experiment until the very end. The decision-making task that subjects participated was a simple dictator game employed in the laboratory and thus, our experimental setting is less natural to the decisions that subjects make outside the laboratory. Lastly, in terms of scaling, the dictator games and modified versions of it have been considered to provide standardized measures of generosity already employed by previous experimental studies (for an overview, see the meta-study by Engel (2011)). The evidence from these studies shows that it is by now clear that dictator game behavior is sensitive to contextual cues and in this respect, our results further contribute to this direction; in particular, we provide further evidence that framing effects can generalize to broader non-WEIRD populations.

4. Conclusions

The reproducibility of research findings is of paramount importance to the advancement of science and plays a major role in laying solid foundations for developing trusted research evidence. While replication is applauded by the broad scientific community, it is still rare to observe replication studies of highly influential papers, especially in economics. This paper contributes toward this direction by reporting results replicating List's (2007) experiment which casts doubts on the robustness of the elicited social preferences in laboratory dictator game experiments.

The overwhelming majority of experimental economics studies is drawn from societies which have been characterized as being Western, Educated, Industrialized, Rich and Democratic (WEIRD). Recent research has investigated whether and if so, how behavior in simple experimental games is shaped in societies with diverse economic and social background (see Henrich et al., 2010). However, little is known about whether the generalizability of dictator game experiments survives in different cultural environments. Previous studies have found that giving in dictator games is sensitive to the action set and in particular, have suggested that giving decreases substantially when taking a partner's money is possible. In a laboratory experiment conducted in Botswana, we find corroborating evidence to these findings: giving drops by more than 50% when dictators are allowed to take money from the recipients. However, our findings show that average giving is reduced substantially less than what has been found previously in a WEIRD society. Overall, we provide important evidence indicating that

giving in dictator games may be sensitive to framing effects, not only in western societies, but in broader culturally distinct populations.

Our study calls for further need to conduct more systematic research testing for the generalizability of seemingly irrelevant contextual cues in wider populations. Understanding the extent to which demand characteristics affects individuals' social preferences is one of the key questions for which behavioral theorists and applied economists need to put more emphasis on. The persistence of these results on broader samples is a key issue that needs to be explored more systematically. We hope that our study encourages researchers to conduct additional research toward this direction.

Declaration of Competing Interest

I declare that there is no relevant or material financial interests that relate to the research.

Data availability

Data will be made available on request.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2023.03.021.

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