



Proportion offered in the Dictator and Ultimatum Games decreases with amount and social distance



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ABSTRACT

Behavior in both the Dictator Game and the Ultimatum Game is of special interest because proposers often violate the predictions of normative economic theory: On average, offers in both games are higher than what would be considered income-maximizing. In the present study, the initial amount provided to the proposer and the social distance between the proposer and the responder were both varied across a wide range, and the effects of these manipulations on offers in the Dictator Game and the Ultimatum Game were examined in a broad sample of participants recruited via MTurk. Although the amount offered was consistently higher in the Ultimatum Game, the proportion of the amount offered decreased as the size of the initial amount increased in both games. Moreover, the proportion offered also decreased as a function of the social distance between the proposer and the responder. The present results extend our knowledge of the determinants of proposers' behavior in two-person economic games and emphasize the importance of social distance and the amount of money at stake as factors that affect people's economic decisions.

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1. Introduction

Two-person economic games are widely used in experimental and behavioral economics to test predictions of economic theories and to gain insight into factors that influence people's choices in everyday social interactions (Camerer et al., 2011). Two economic games, the Dictator Game and the Ultimatum Game, have received considerable attention as tests of normative economic theory, particularly as a means of studying the potential roles of self-interest and altruism in economic decision-making (for a review, see Camerer, 2003). These two games also have real-world applications (e.g., contract negotiations). In the Dictator Game, a first player (the 'proposer') is given a sum of money and is free to offer as much or as little of this amount to a second player (the 'responder'), and keep what is left. The responder has no say in the matter. The Ultimatum Game is similar except that the responder has the option to accept or reject the proposer's offer. If the offer is accepted, then both players receive the amounts agreed on; if the offer is rejected, however, both players receive nothing.

Normative economic theory predicts that in a non-repeated game, "rational" proposers will offer the smallest amount possible to the responder regardless of which form of the game is played, and that in the Ultimatum Game, the "rational" responder should

always accept the offer. However, participants typically do not act as theory predicts. Rather, proposers often offer considerably more than the minimum amount predicted. Mean offers in the Dictator Game are about 20% of the initial amount (Oxoby and Spraggon, 2008), and mean offers in the Ultimatum Game are usually between 30 and 40% of the initial amount, with the most common offer being a 50–50 split (Camerer and Thaler, 1995). Responders in the Ultimatum Game also behave "irrationally" from the point of view of normative theory, typically rejecting offers lower than 20% of the initial amount (Camerer and Thaler, 1995).

One suggestion as to why more than the minimum is offered in both games and why responders often reject an offer in the Ultimatum Game is that proposers and responders are both influenced by the perceived fairness of the offer. That is, proposers may offer more than the minimum predicted by normative theory because they think the minimum offer would be unfair, and responders may reject such offers for the same reason. Consistent with this interpretation, proposers offer less and responders are willing to accept less when the proposer has done something either to earn the original sum of money or to deserve being in the role of proposer (Hoffman et al., 1994). Fairness alone, however, cannot explain why observed offers are consistently greater than predicted. If fairness alone were the reason, then proposers should offer equivalent amounts in both the Dictator and Ultimatum Games, whereas in fact, proposers offer a significantly lower percentage in the Dictator Game (e.g., Forsythe et al., 1994). This difference in offers between the two games is presumably because in the Ultimatum Game, proposers consider the

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fact that if their offer is judged by the responder to be too low, then it risks being rejected, in which case they would receive nothing (Roth, 1995).

Of course, economic behavior may have multiple determinants even in simple situations, and behavioral economic research in other areas suggests further possible determinants that have yet to be rigorously studied. For example, few studies have evaluated whether magnitude effects occur in Ultimatum and Dictator Game situations, yet such effects are known to be extremely robust in other choice situations where behavior presents challenges to normative theory. For example, magnitude effects have been studied extensively in other behavioral economic experiments, perhaps most notably those on intertemporal choice in which the observed shapes of discounting curves clearly violate the stationarity hypothesis of discounted utility theory (Koopmans, 1960; Koopmans et al., 1964). More specifically, the discounting rate (i.e., the rate at which the value of a delayed reward is discounted as the wait until receipt of that reward increases) is greater for smaller amounts of delayed reward than it is for larger amounts (for reviews, see Frederick et al., 2002; Green and Myerson, 2004). To date, however, there has been relatively little research that systematically examines the effect of the initial amount of money given the proposer on the percentage offered the responder in either Dictator or Ultimatum Games.

In a meta-analysis examining a variety of different potential predictors of offers in Dictator Game experiments, which themselves were done for a variety of different purposes, Engel (2011) reported that there was no effect of initial amount on the proportion offered in Dictator Game studies. When analysis was restricted to studies that used more than one initial amount, however, there was evidence of a very small magnitude effect, with dictators offering a smaller proportion when the stakes were higher. However, the range over which amounts varied was quite limited, with the highest initial amount being \$130, and further research is clearly needed which examines the effect of initial amount over a much wider range.

With respect to the Ultimatum Game, Forsythe et al. (1994) compared offers in the Ultimatum Game when proposers were given either \$5 or \$10 in real money, and found no significant difference in the proportion offered. Hoffman et al. (1996) were concerned that the non-normative behavior typically observed was an artifact of the small stakes involved, and therefore gave proposers an initial amount of either \$10 or \$100, and reported no significant difference in the percentage offered. The usual finding continues to be that proposers offer approximately 30–40% of the initial amount regardless of what that amount was (i.e., there is no magnitude effect), but as noted previously, the initial amount has rarely been varied systematically.

A recent study conducted in India (Andersen et al., 2011) did report a magnitude effect on proposers' behavior (percentage offered decreased as the initial amount increased). Participants received actual money for their participation and initial amounts ranged from 20 to 20,000 rupees, with the highest stakes condition amounting to about a year's wages locally. However, the primary focus of the study was on responders' behavior, and proposers were given special instructions designed to elicit low offers in order to increase the likelihood that there would be rejections. As a result, it is unclear whether the magnitude effect observed in this study was due to the special instructions, the relatively high stakes in terms of local wages, or the special population studied (villagers in rural India). It is especially unclear because a study in Indonesia that compared low and high stakes, again relative to local wages, found no difference in the mean proportion offered (Cameron, 1999). Thus, the question of whether there is a magnitude effect in the Ultimatum Game such that the proportion offered varies systematically

with the initial amount remains unresolved, and accordingly, the present study was designed to address this question.

Another variable of interest that may well influence the proportion of the initial amount that is offered is the social distance between proposer and responder. Previous research in behavioral economics under this rubric has focused on the degree of anonymity of the proposer and responder (e.g., Charness & Gneezy, 2008; Hoffman et al., 1996). Although this research may have important implications for theories of reciprocal altruism and hypotheses concerning the role of anticipated social consequences in economic decision making, there is another aspect of social distance that corresponds more closely to what is usually meant by this term outside economics. That is, social distance, in addition to referring to the degree of social isolation, in the sense of freedom from repercussions, also often refers simply to how close one person feels to another. In a series of studies, Rachlin and Jones (2008a; 2008b; Jones and Rachlin, 2006) had participants imagine that they had made a list of the 100 people closest to them in the world, ranging from their dearest friend or relative at position #1 to a mere acquaintance at #100. Rachlin and Jones (2008a,b) showed that the amount of money a participant would forego in order to give money to another person varies inversely with the social distance between them.

Rachlin and Jones (2010) describe a study that examined offers in both the Ultimatum and Dictator Games, which varied the range of amounts from \$10 to \$100,000 and the social distance from 1 to 100. They report that the percentage of the initial endowment offered decreased with increases in amount and social distance. The study used a between group design for amount and an undergraduate sample. The present study examines the effect of social distance in the sense studied by Rachlin and Jones on offers in both the Dictator and Ultimatum Games, using a broad sample of participants recruited from MTurk rather than the more-typical college-student sample. In addition, unlike the study reported by Rachlin and Jones, the present study varied amount within participants, used more participants per condition, and varied amount over an even larger range.

The Dictator and Ultimatum Games are often assumed to model economic decision making in social situations outside the laboratory. Many kinds of negotiations may be thought of as analogous to the Ultimatum Game in that one person makes an offer that another person either accepts or rejects, but if the offer is not accepted, both may receive nothing. The Dictator Game provides a way of determining what the behavior of the person making the offer would be if he or she did not have to consider the possibility of rejection, which may then be compared with behavior in the Ultimatum Game. Whereas actual negotiations often take the form of iterated games, the Dictator and Ultimatum Games address the important initial step in such negotiations. The amounts of money involved may range from relatively small (e.g., at yard sales) to extremely large (e.g., buying a house), and may take place between individuals who do not know each other at all as well as between close relatives. The present study examines the roles played by these factors in determining initial offers. Finally, because the participants in the present study were extremely diverse, we also were able to examine proposers' behavior in the Dictator and Ultimatum Games as a function of demographic factors: age, gender, education, and household income.

2. Methods

2.1. Participants

201 participants were recruited through the Amazon Mechanical Turk (MTurk) participant pool for the Dictator Game, and

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