Chapter 48

PROMPTING STRATEGIC REASONING INCREASES OTHER-REGARDING BEHAVIOR

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1. Introduction

1.1. Previous Results

In two previous papers (Hoffman et al., 1994; Hoffman, McCabe, and Smith, 1996) we document the effects of property rights and monetary stakes on first-mover offers and second-mover responses in an ultimatum game based on the design of Kahneman, Knetsch, and Thaler (1986) and Forsythe et al. (1994). In the Kahneman, Knetsch, and Thaler (1986) and Forsythe et al. (1994) design, two players, are "provisionally allocated" $\$M$. Player 1 is asked to propose a "division" of the $\$M$, by making a offer of $\$X$ to player 2. Player 2 then indicates whether he or she accepts or rejects the division. If player 2 accepts the division, player 2 receives $\$X$ and player 1 receives $\$M - \$X$. If player 2 rejects the division, both players receive \$0. Under the usual rationality conditions, the equilibrium of this game is for player 1 to offer player 2 the smallest \$ unit of account, and for player 2 to accept that offer. Hereafter we refer to player 1 as the proposer and player 2 as the recipient.

In the Kahneman, Knetsch, and Thaler (1986) and Forsythe et al. (1994) design, which we replicate in Hoffman et al. (1994), players do not behave as predicted by economic/game theoretic equilibrium theory. Instead, most proposers offer half the pie to recipients and some recipients reject offers of less than half the pie. This has led to considerable discussion in the literature about "fairness" in ultimatum and related two-person interactive games, where use of the word "fairness" implies an other-regarding utilitarian basis for the behavior.

We have taken a different perspective. In Hoffman et al. (1994), we consider the effect of inducing a property right in the proposer position. Our reasoning is that proposers may be more inclined to pursue their self interest when endowed with rights to the proposer position that are deemed legitimate. Similarly, subject expectations may be

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more compatible, and the recipients less inclined to reject, if the proposer is endowed with a legitimizing property right. Hoffman and Spitzer (1985) present experimental data which support this view.

We use both a general knowledge quiz, reinforced by telling the proposers they have "earned the right" to be proposers (contest), and a seller–buyer market frame (exchange) to induce property rights in being sellers. We refer to the Kahneman, Knetsch, and Thaler (1986) and Forsythe et al. (1994) design as random/divide and compare it to a contest/exchange treatment that combines the two methods of inducing property rights. This combined treatment change significantly lowers proposer/seller offers with no change in the rejection rate.

In Hoffman, McCabe, and Smith (1996), we replicate the above experiments using $100 to divide in $10 increments, instead of $10 to divide in $1 increments. Some might reason that with $100 to divide, subjects would be more likely to play the game "correctly" (i.e., play the equilibrium strategy). On the other hand, if reciprocity norms are important in determining recipient inclinations to reject, then raising the stakes to $100 can also be seen as raising the opportunity cost of making the "wrong" offer.

We find the second explanation more compelling than the first. We compare random/divide $10, random/divide $100, contest/exchange $10, and contest/exchange $100. We find no significant differences in proposer/seller offers as a result of the change in monetary stakes. Random/divide $10 leads to $5 offers and random/divide $100 leads to $50 offers. Contest/exchange $10 and $100 both lead to lower offers that are still above the predicted equilibrium. Moreover, in the random/divide $100 experiments, subjects reject as much as $40, just as $4 is occasionally rejected in $10 ultimatums.

The only difference we detect is that the rejection rate in the contest/exchange $100 experiments is significantly higher than in the other experiments, although it is still quite low. We hypothesize that, with $100 at stake, the property right leads sellers to attempt to exploit their strategic advantage by slightly more than buyers are willing to accept. The offers are slightly lower in contest/exchange $100 than in contest/exchange $10, although the difference is not statistically significant. In the unfamiliar world of $100 ultimatum experiments, the property right treatment is not fully successful in inducing a change in shared expectations about a equitable division of the $100.

The finding that, by changing the allocation rule for assigning the property right to be the proposer we generally change both proposer offers and recipient acceptances, raises interesting questions about how individuals form and change expectations about equitable divisions. We explore the foundations of subject expectations in Hoffman, McCabe, and Smith (1998). In that paper, we hypothesize, based on research in evolutionary psychology that the evolution of the human brain has resulted in the development of specialized mental modules for the solution of complex problems involving cooperation: trust and trustworthy behavior, cheater detection, and reciprocity. These mental modules lead human beings to respond to situations encouraging cooperation with behaviors that cannot be sustained if humans were to make decisions on the basis of the propositional logic. Subjects bring to the lab behaviors and strategies that promote cooperation and they rely upon those known behaviors and strategies when they

face decision problems in the unfamiliar world of the experimental laboratory. Certain experimental mechanisms we study in the lab, such as the double auction, successfully extinguish cooperative behavior in a short period of time. Others, such as the asset market (Smith, Suchanek, and Williams, 1988) and the fiat money market (McCabe, 1989), require several periods of "training" before subjects abandon their preconceived notions of cooperation and behave as predicted by standard game theoretic models. Still others, such as the ultimatum game, may simply reinforce cooperative behavior. Our continuing research agenda involves studying the connections between brain function and economic decisionmaking.

1.2. The Current Experiment

One of the questions left unanswered from the results of Hoffman et al. (1994) is the potential effect of calling subjects' attention to the interactive property of the task at hand. In other words, what will happen if proposers are primed, or prompted, to think strategically about the problem before making an offer. This question was partially answered in the $100 experiments reported in Hoffman, McCabe, and Smith (1996). Presumably, raising the stakes to $100 induces at least some subjects to think more carefully about the consequences of their decisions than when the stakes are $10. As we saw, raising the stakes from $10 to $100 had no significant effect on proposer offers; although, it did have a small but significant effect on recipient rejections. This result suggests that making it more salient to be attentive to the task does not, by itself, have the effect of moving subjects closer to a game theoretic equilibrium.

In the experiments reported in this chapter we address this issue more directly. Focusing just on the exchange treatments, we add to both the random/exchange and the contest/exchange designs, outlined in Hoffman et al. (1994), as a suggestion to the seller to consider what the buyer will do. The results are dramatic and in the opposite direction from what might be expected. In both the random/exchange and the contest/exchange treatments, there is a significant increase in seller offers to buyers as a consequence of introducing the added instructions. Moreover, with the added instructions, there is no longer any significant difference between random/exchange and contest/exchange and there is no longer any significant difference between the original random/divide treatment without the added instructions and the contest/exchange and random/exchange treatments with the added instructions. This result suggests that encouraging sellers to be more thoughtful focuses their attention on the strategic interaction with humans who think the way they do, and who may punish them for unacceptable behavior, and not on the logic of the game theoretic structure of the problem.

2. Experimental Design and Subject Recruitment

Subjects are recruited according to the usual recruitment procedures at the University of Arizona Economic Science Laboratory. The experiments without the added instructions

Table 1
Wilcoxon rank-sum test (level of significance)

	Random exchange added instruction	Contest exchange added instruction
Hoffman et al. (1994) random exchange	1.9 (0.06)	
Hoffman et al. (1994) contest exchange		2.7 (0.01)

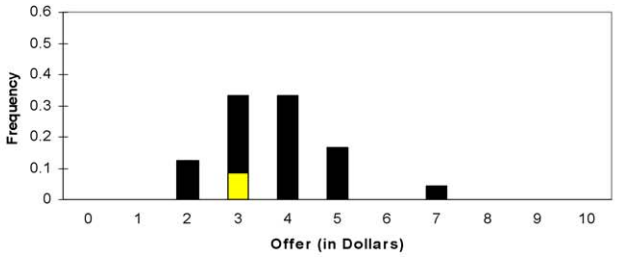
are the same as the random/exchange and contest/exchange experiments reported in the appendix of Hoffman et al. (1994). In the new experiments, we add the two sentences to the sellers' choice forms. These two sentences are designed to prompt the subjects to think about the strategic aspects of their decisions: "Before making your choice, consider what choice you expect the buyer to make. Also consider what you think the buyer expects you to choose." Otherwise, the instructions and experimental procedures are identical to those reported in Hoffman et al. (1994).

3. Experimental Results

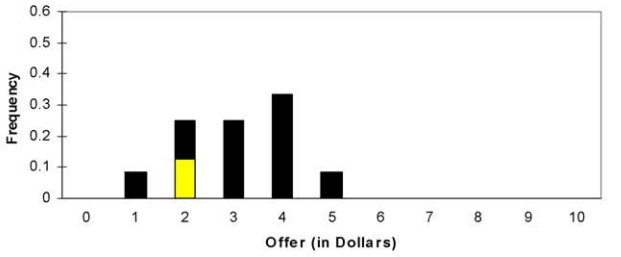
Figure 1 summarizes the experimental results for random/exchange and contest/exchange, with and without the added instructions. Notice that the added instructions, which simply urge sellers to think about buyer responses, shift both the random/exchange and the contest/exchange offers back toward the more equal splits characteristic of Kahneman, Knetsch, and Thaler (1986), Forsythe et al. (1994), and the Hoffman et al. (1994) random/divide treatment. The random/exchange offers shift from a dual mode of \$3 and \$4 to a strong mode of \$5. In the contest/exchange experiments, the added instructions eliminate all offers of \$1 or \$2, and increase the proportion of offers between \$4 and \$6. Table 1 shows that these shifts are significant under the Wilcoxon test. These results suggest that, when sellers are reminded of the strategic nature of buyer/seller interaction and the possibility of rejection, sellers are more likely to share their profits equally with buyers.

4. Discussion

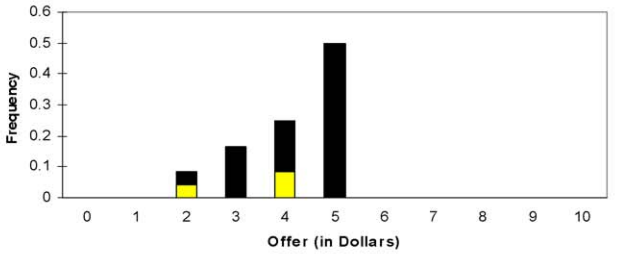
As we note in Hoffman et al. (1994) and Hoffman, McCabe, and Smith (1996, 1998), current cultural norms with regard to sharing, cooperation, trust, and punishment are the result of 2–3 million years of evolution and adaptation. During most of those 2–3 million years, humans lived in small interactive groups and developed behaviors and strategies to promote cooperation and social exchange within the group. Within such groups, humans were expected to share with one another and to cooperate to advance the group. This is clear in contemporary studies of extant hunter–gatherer societies.

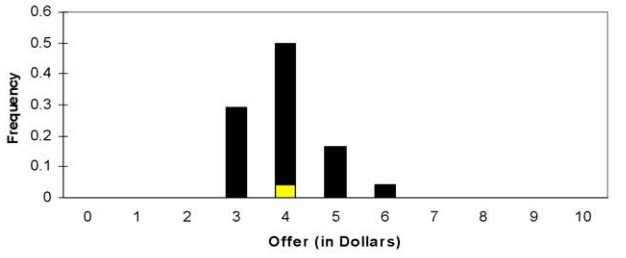


24 pairs use instructions which formulate the $10 ultimatum game as an exchange between a buyer and a seller. In each pair the right to be the seller-proposer is assigned at random.



24 pairs use the buyer/seller exchange instructions, but the right to be the seller-proposer is earned by scoring highest on the general knowledge test as above.





Each of the two bottom treatments are the same as the one above it, but with the instructions prompting the seller as follows: "Before making your choice, consider what choice you expect the buyer to make. Also consider what you think the buyer expects you to choose."

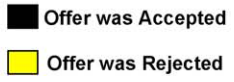


Figure 1. Offers: frequency and rejection rates.

Today, experimental subjects bring many of the same behaviors and strategies to our laboratories. This results in far more cooperative and sharing behavior in first-time decisions than standard game theory would predict. Yet, as we showed in Hoffman et al. (1994) and Hoffman, McCabe, and Smith (1996), we can induce a more game theoretic solution by giving the proposer/sellers a legitimizing property right in their position. Our current results show how fragile is that change. When we draw sellers' attention to considering what the buyer will do, they internalize the potential threat of punishment, not that the buyer prefers more money to less and will thus accept a lower offer. Prompting not only does not help; it makes the results once again like what we observe in the random/divide treatment, the treatment that started so many psychologists and economists wondering about the standard economics rationality assumption.

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