

# On the Interpretation of Giving in Dictator Games

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The dictator game represents a workhorse within experimental economics, frequently used to test theory and to provide insights into the prevalence of social preferences. This study explores more closely the dictator game and the literature's preferred interpretation of its meaning by collecting data from nearly 200 dictators across treatments that varied the action set and the origin of endowment. The action set variation includes choices in which the dictator can "take" money from the other player. Empirical results question the received interpretation of dictator game giving: many fewer agents are willing to transfer money when the action set includes taking. Yet, a result that holds regardless of action set composition is that agents do not ubiquitously choose the most selfish outcome. The results have implications for theoretical models of social preferences, highlight that "institutions" matter a great deal, and point to useful avenues for future research using simple dictator games and relevant manipulations.

The past two decades have witnessed an explosion of experimentation with ultimatum, dictator, and trust games.<sup>1</sup> The common interpretation

I thank Steve Levitt for urging me to complete this study. The editor and two anonymous referees provided very insightful comments that helped to shape the manuscript. Remarks of Glenn Harrison, Emir Kamenica, Uri Simonsohn, and Chad Syverson improved the paper considerably. During the vetting process I learned of a fascinating experiment by Bardsley (2005) that predated my experiment. As discussed in the text, Bardsley uses a similar framing exercise and finds qualitatively similar results.

<sup>1</sup> The ultimatum game, as originally reported by Guth, Schmittberger, and Schwarze (1982), is a two-stage game in which two people, a proposer and a responder, bargain over a fixed amount of money. In the first stage, the proposer offers a split of the money, and in the second stage, the responder decides to accept or reject the offer. If it is accepted, each player receives money according to the offer; if rejected, each player receives nothing. The dictator game is a simple variant of the ultimatum game: strategic concerns are absent

of the empirical results is echoed in Henrich et al.'s (2004) abstract: "Over the past decade, research in experimental economics has emphatically falsified the textbook representation of *Homo economicus*, with hundreds of experiments that have suggested that people care not only about their own material payoffs but also about such things as fairness, equity, and reciprocity." Such results have also stimulated an impressive array of theoretical work (for models of reciprocity, see Rabin [1993]; for models of inequity aversion, see Fehr and Schmidt [1999] and Bolton and Ockenfels [2000]; on altruism and spite, see Levine [1998]).

In this study, I explore more closely the dictator game and the literature's preferred interpretation of its meaning. The first dictator game experiment in economics is due to Kahneman, Knetsch, and Thaler (1986), who gave subjects a choice (albeit hypothetical) of dictating either an even split of \$20 (\$10 each) with another student or an uneven split (\$18, \$2), favoring themselves. Three-quarters of the students opted for the equal split. In an effort to learn more about first-mover play in ultimatum games, Forsythe et al. (1994) later executed the dictator game with real stakes and made the action set less discrete and found similar results: a mean allocation of roughly 20 percent of the endowment. As Camerer (2003, 57, table 2.4) points out, a plethora of subsequent dictator experimental studies replicate these results, finding that usually more than 60 percent of subjects pass a positive amount of money, with the mean transfer roughly 20 percent of the endowment. Similar behavior observed in other related strategic games—for example, trust and gift exchange games—has been interpreted as evidence that agents behave in a manner that is at odds with the standard Nash equilibrium posited by economists.<sup>2</sup> To provide theoretical underpinnings for these

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since the proposer simply states what the split will be and the proposer has no veto power, rendering the proposed split as effective. The trust game is a sequential prisoner's dilemma game wherein the first mover decides how much money to pass to the second mover. All money passed is increased by a factor  $f > 1$ , and the second mover then decides how much of this to return to the first mover. In this light, the second mover is a dictator who has been given his endowment by the first mover. See Camerer and Weigelt (1988) for an early game in this spirit.

<sup>2</sup> It is important to keep in mind that expected utility axioms are mute about whether agents care about others' income etc. Recall that von Neumann and Morgenstern ([1944] 1947) carefully developed both a theory of play for strategic games and a theory of utility. Game theorists focused their energies on the former, and experimentalists testing game theory naturally followed, leading the literature to use purely self-regarding preferences in formulating the standard Nash equilibrium (Cox 2004). If one desired, however, it would not be difficult to include a preference for giving into utility functionals directly and then apply Nash or subgame perfection to the resulting game. Strictly speaking, therefore, the results for strategic lab games are not a rejection of Nash equilibrium or subgame-perfect Nash equilibrium, since they represent a rejection of the joint hypothesis of Nash equilibrium (or subgame-perfect Nash equilibrium) and the auxiliary assumption that preferences are self-regarding.

results, utility theories that invoke social preferences have typically been called on—that is, the inequity aversion models of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000).

This study reports experimental evidence questioning the received interpretation of dictator game data. The evidence is drawn from nearly 200 dictators in treatments that varied the action set and the origin of endowment (earned vs. unearned). The action set variation includes choices in which the dictator can “take” money from the other player (a related study is Bardsley [2005]). The evidence shows that the simple manipulation of the action set leads to drastic changes in behavior: many fewer agents are willing to give money when the action set includes taking. Yet, a result that holds regardless of action set composition is that agents do not ubiquitously choose the most selfish outcome.

Beyond questioning the standard interpretation of data from this class of games, these results suggest that “institutions” matter a great deal, not simply in an obvious manner that only permissible actions will be observed, but that restrictions of the action set affect behavior more profoundly: the distribution of offers in the positive quadrant shifts, depending on whether or not the negative quadrant is in the permissible set. In this way, the results begin to provide insights into how we can (and cannot) use dictator game experiments to ultimately understand generosity outside of the lab.

The current set of treatments cannot pinpoint exactly the underlying mechanism responsible for this distributional shift in the positive quadrant, but the behavioral changes are consistent with the framework introduced by Levitt and List (2007). Making use of decades of evidence from psychological and economic experiments, Levitt and List argue that behavior is crucially linked to not only the preferences of people but also the properties of the situation. In the dictator game, the traditional action set invokes expectations of the givers and receivers that seemingly “demand” a positive gift, since a zero transfer is equivalent to being entirely selfish with money that an authoritative figure has just kindly endowed. In lieu of the fact that this same authoritative figure asks the subject if she would like to share the endowment, the wheels of motion for giving are set in place. In the Levitt and List framework, this effect is denoted as “social norms,” and they argue that the power of such norms can move choices consistently and significantly away from the subgame-perfect refinement.

By allowing choices that are not entirely selfish in the nonpositive domain, the social norms of the game change, providing the dictator with the “moral authority” to give nothing. In this spirit, subjects are using the contextual cues of the game to figure out which set of norms

applies to the particular problem at hand.<sup>3</sup> In addition, the dictator now has many choices that signal she is not entirely selfish. One can therefore more cleanly distinguish between theories of giving in such games. For example, by using a choice set only over the positive domain, the researcher cannot cleanly interpret the meaning of a positive gift: is it that the subject has preferences over the other agent's outcomes or the subject is merely acting on signaling or self-signaling motives to avoid appearing completely selfish?

In this light, the observed data patterns provide evidence of the importance of social preferences in this domain, but not as *currently* modeled in the oft-cited literature. If this argument extends to other related games, then it places the current interpretation of lab experiments purporting to measure individual propensities that apply broadly on shaky ground; a more appropriate theoretical framework must be advanced and subsequently tested in order for the meaning of giving to be more fully understood. This study provides one step in furthering our understanding of the psychological and economic properties of people and situations that might aid in constructing such a framework.

The remainder of this study proceeds as follows. Section I summarizes the experimental design and empirical results. Section II provides a concluding discussion.

## I. Experimental Design and Results

My experimental design is most similar to that of Bardsley (2005), who showed that willingness to give is vulnerable to taking options. In the treatment that is the most similar to those treatments herein, Bardsley observes dictator decisions when the dictator can give up to seven units and take away up to two units. In my treatments described below, I extend this design by varying both the origin of the endowment and the level of units that can be taken—from an asymmetric to a symmetric treatment.<sup>4</sup> As discussed more fully below, this permits me to trace out the “moral” cost function.

### A. Design

Subjects were recruited from the undergraduate student body at the University of Maryland in the spring of 2005. A baseline and three treatments were conducted. In all respects great care was taken to follow

<sup>3</sup> A complementary set of arguments can be found in the paper by Andreoni and Bernheim (2006), who present evidence on the power of “audience effects” and the importance of feeling good when others think highly of us.

<sup>4</sup> The interested reader should also see the work of Cox (2005), who examines first movers' behavior in an anonymous truncated “moonlighting” game.

identical procedures and use parallel instructions, which were similar to those in Forsythe et al. (1994), in each session (see online App. A for the instructions). Participants were randomly assigned to two groups: one placed in room A and the other placed in room B. The two groups did not have any contact before, during, or after the session. Within each group, subjects were allowed to talk only to administrators. No subject participated in more than one treatment; thus the empirical results rely on purely between-subject variation.

The baseline treatment was in the spirit of standard dictator game experiments: both players were allocated \$5. Further, dictators, who were situated in room A, were allocated an additional \$5. In a one-shot allocation game, dictators could allocate from \$0 to \$5 (in \$0.50 increments) of this \$5 endowment to their randomly determined partner in room B. The chosen allocation determined final earnings.

Treatment Take (\$1) is identical in every respect to the baseline treatment except the action set not only extends over \$0–\$5 but also includes –\$1. More specifically, dictators can now *take* \$1 from room B subjects. This treatment permits an exploration of whether simply allowing taking can yield differences in behavior. Treatment Take (\$5) makes the choice set symmetric for the dictator, permitting a take of up to \$5. Use of two take treatments in this manner permits me to explore two points on the “moral cost function.” In addition, the symmetric treatment permits an observation of behavior in a game in which the neutral reference point, or the midpoint of the choice range, is naturally no taking or giving.

Completing the experimental design is an earnings treatment (Treatment Earnings), which is identical to Treatment Take (\$5), except subjects now earn their monies. In particular, before the allocation stage, all subjects (rooms A and B) participated in the earnings session. Subjects were also told that room A (B) agents earned \$10 (\$5) for completing the task. Agents in both rooms earned money by participating in a 30-minute task that included sorting and handling mail solicitations for a charitable fund-raiser.

### B. Results

Table 1 and figures 1–4 summarize the individual data obtained from the dictator games. In sum, I had 24 dictators in the baseline treatment and roughly 48 dictators in each of the other three treatments. Of first note is the finding that the baseline data are qualitatively similar to results reported in other dictator games: 17 of 24 dictators gave a non-zero amount, and the mean amount given was roughly 25 percent of the endowment (\$32 of \$120 was given). Two oft-cited theoretical studies

TABLE 1  
AGGREGATE BEHAVIOR

Treatment (N)	Rate of Positive Offers	Median Offer	Mean Offer	Average Positive Offer*
Baseline (24)	.71	\$1.00	\$1.33	.38
Take (\$1) (46)	.35	\$0.00	\$0.33	.31
Take (\$5) (50)	.10	−\$4.50	−\$2.48	.42
Earnings (47)	.06	\$0.00	−\$1.00	.40

\* Reported as a percentage of the total amount available in the allocation decision (average positive offer ignores zero and negative offers).

that provide underpinnings for such behavior are the inequity aversion models of Fehr and Schmidt (1999) and Bolton and Ockenfels (2000).

If behavior in the baseline treatment is due to social preferences as per these models, then simply manipulating the choice set should have no influence on outcomes. Yet, it has considerable effects. A comparison of figures 1 and 2 (rows 1 and 2 in table 1) shows that allowing taking significantly shifts the distribution leftward: in Treatment Take (\$1), only 16 of 46 gave a positive amount, a percentage that is significantly lower than the proportion that gave in the baseline.<sup>5</sup> This result provides a signal of the contextual strength of simply adding *one* choice in the negative domain.

Figure 3 provides an indication of the substantial change in behavior when the action set is made symmetric. In this case, very few agents give a positive amount—five of 50—a proportion that is significantly lower than the proportion of givers in the baseline and Take (\$1) treatments. This result shows that when one simply makes the action set symmetric, nearly all giving vanishes. This result calls into question the underlying mechanism at work when agents are observed giving in typical dictator games. An interesting further result is that the data show that when the choice set is expanded, agents continue to avoid the most selfish allocation.

To provide additional insights, I construct figure 4. Figure 4 shows that when individuals might view it as “morally wrong” to take or the social norm considerably changes, the vast amount of play (66 percent) occurs at the neutral point, neither taking nor giving. In this case, only 13 of 47 individuals take, a significantly lower proportion than observed taking in Treatment Take (\$5). This result, which is consonant with the results in List and Cherry (2007), highlights that simply changing the origin of endowment to one of earning money versus playing over “wind-fall” money causes a number of dictators to abstain from taking. Additionally, the data now show a sharp tendency toward leaving even more money on the table than in the Take (\$5) treatment.

<sup>5</sup> All inference is based on results from Fisher’s exact tests at the  $p < .05$  level.

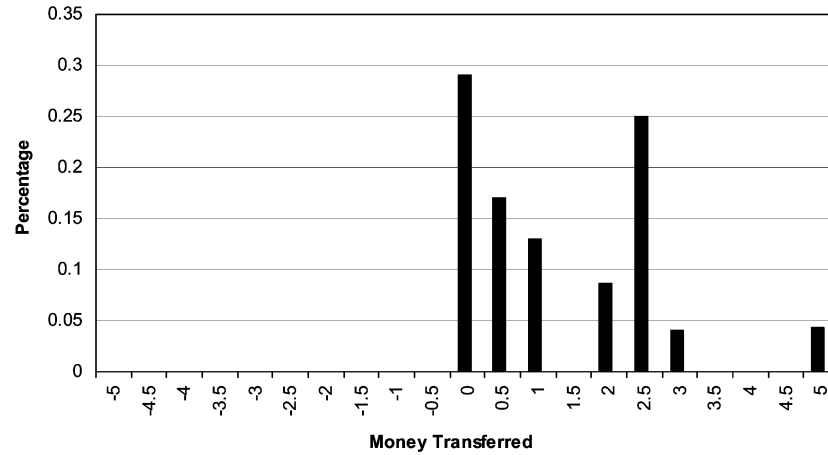


FIG. 1.—Baseline treatment (data online table B1)

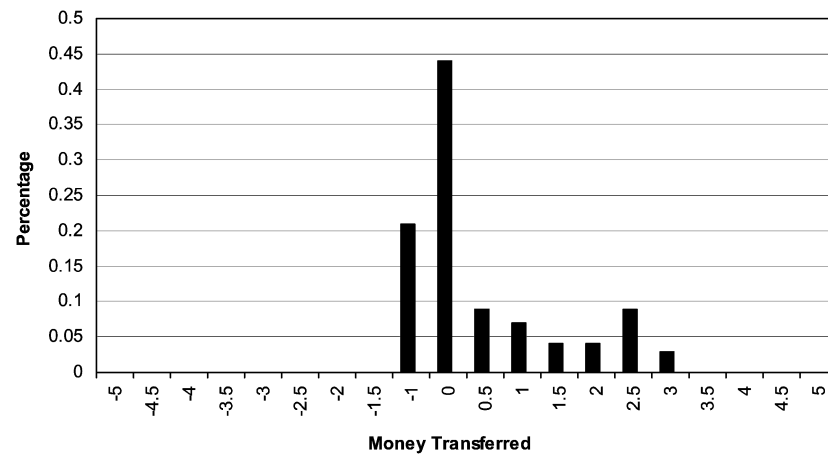


FIG. 2.—Treatment Take (\$1) (data online table B2)

Overall, these results provide some empirical content for the framework advanced in Levitt and List (2007). The authors argue that there is a moral cost of behaving selfishly in such games that can move behavior away from the wealth-maximizing choice. If one considers the moral cost to be fixed over the range of actions in this experiment, then the empirical results reveal that there are many more subjects for whom the cost is less than \$5 than there are subjects for whom the cost is less than \$1: nearly twice as many subjects take \$5 in Treatment Take (\$5)

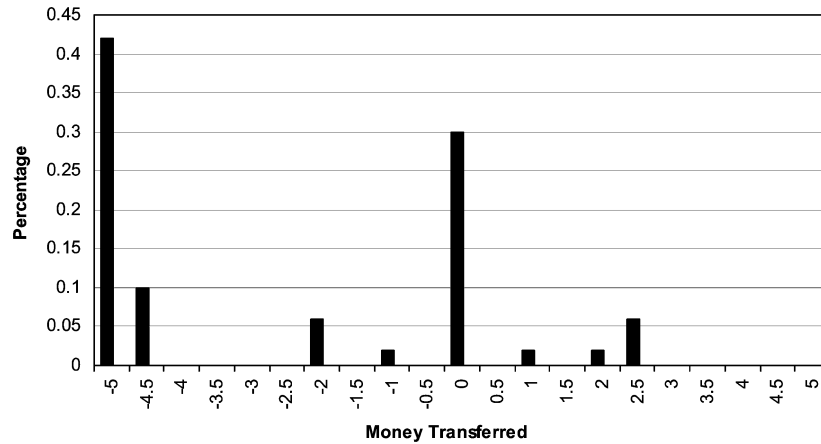


FIG. 3.—Treatment Take (\$5) (data online table B3)

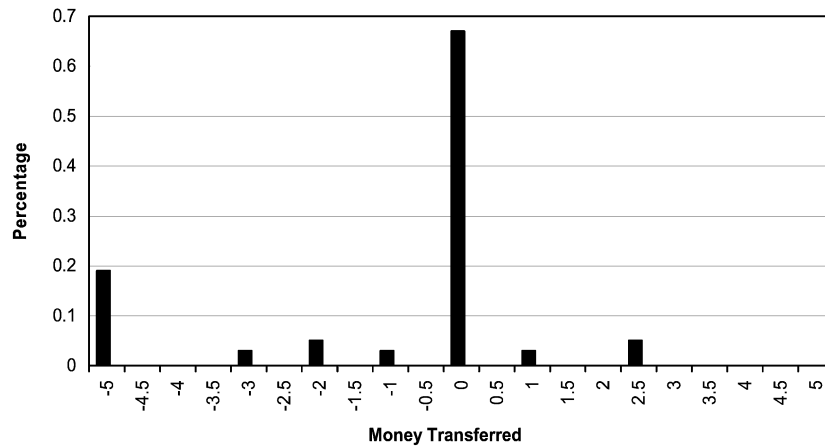


FIG. 4.—Treatment earnings (data online table B4)

as take \$1 in Treatment Take (\$1).<sup>6</sup> Alternatively, in comparisons of the baseline results to those of the take treatments, there appears to be a different type of moral cost to not giving anything, which operates differently than taking everything. This represents a fruitful area for future research.

As a whole, these results tie nicely back to the literature that shows it is rare to find evidence for aversion against advantageous inequality

<sup>6</sup> An assumption of a variable moral cost would indicate that over the \$1–\$5 range, utility is steeper in wealth than in morality.



or altruism in certain settings, for instance, the “best-shot” and “impunity” games, where rather extreme perfect equilibria are descriptive of behavior (see, e.g., Harrison and Hirshleifer 1989; Roth 1995). In addition, ultimatum games with incomplete information (e.g., Guth, Huck, and Ockenfels 1996) and Stackelberg games in which followers have multidimensional action sets bolster these results. Moreover, they corroborate and extend the results described in Bardsley (2005).

## II. Discussion

A recent surge of research in economics uses the laboratory as a tool to measure preferences. One stylized fact from this literature is that a majority of agents in standard dictator games pass a portion of their funds to an anonymous agent, and the amount is nontrivial—roughly 20 percent of the endowment. Utility theories that invoke social preferences have been forwarded to explain such data patterns. One puzzling feature of everyday life, however, is that even though scores of students around the world have outwardly exhibited their preferences for equality in laboratory experiments by sending anonymous cash gifts to anonymous souls (in some cases not even knowing that such a soul actually exists), why is it rare to find such data patterns in the extra-lab world?

To provide insights into these issues, I design an experiment that exogenously varies the action set and the origin of the endowment. The action set variation includes choices in which the dictator can take money from the other player. This simple manipulation permits me to trace out certain points along the “moral cost function.” By crossing these treatments with a treatment wherein subjects earn their monies, I can effectively analyze an exogenous increase in the moral cost of taking since taking earned money is likely met with greater social disdain than taking the experimenter’s money. Similar to Bardsley (2005), I find that such manipulations lead to drastic changes in behavior, since many fewer agents give money when the action set includes taking, and the earnings treatment leads to intuitive changes in behavior as well.

I draw several lessons from these results. First, the data suggest that current interpretations of dictator game data likely need revision. Rather than representing social preferences as currently modeled in the oft-cited literature, the data are consistent with the power of changing the giver and recipient expectations. While a speculative interpretation, this follows from the choice sets functionally invoking different social norms. In this manner, the choice set is a particularly subtle way to influence expectations, but unduly powerful, in much the same way that expanding the choice set has been shown to influence choices in other settings,

such as consumer purchases (see, e.g., Simonson 1989; Simonson and Tversky 1992).<sup>7</sup>

Second, understanding how this change of expectation occurs is very important and can potentially allow us to more accurately predict when we should expect generosity outside of the lab. Given the special features of the laboratory situation, one might wonder whether the dictator game has any useful parallels in the extra-lab world. It is true that few of us receive anonymous envelopes stuffed with cash, but in the standard dictator game, several reasons beyond the specificities of the choice set vary across the lab and the field.

This fact underscores the dangers of generalizing laboratory results without a proper theoretical framework that accounts for both the psychological and economic properties of people and situations. In much the same way that the experimental environment of the traditional dictator game induces subjects to give money to an anonymous recipient—an authoritative figure who has credibility in the eyes of the subjects inquires into whether they would like to share money with someone who did not receive as much money—when nature randomly pairs us with individuals in a field setting that suggests we are responsible for their well-being (an old lady crossing the street), our behavior accords with social norms.

This intuition emphasizes that we must be more cognizant of using theory when exporting lab insights to the field domain. One approach is to recognize explicitly the situational features that vary across environments and detail how they induce important behavioral changes (see, e.g., Harrison and List 2004; Levitt and List 2007). Under this approach, it is clear that before one can begin to argue about the generalizability of lab results, the relevant properties of situations must be addressed.<sup>8</sup> Putting subjects on an artificial margin in the laboratory, for example, necessarily limits the ability of the experimenter to make direct inference about markets of interest. Indeed, if the experimenter does not understand how subjects react to such factors, invalid conclusions might be drawn. We can, and should, however, explore to what extent this artificial margin influences behavior, for this knowledge is

<sup>7</sup> The interested reader should also see the provocative work of Kamenica (2006).

<sup>8</sup> This has only recently begun in the literature. For instance, in anonymous dictator games with neutral instructions, behavior approaches the canonical model (Hoffman, McCabe, and Smith 1996). When nonneutral words are used in the instructions or dictators are given recipient information, giving substantially increases (see Branas-Garza and Morales [2005] and the citations therein). In this light, I suspect that with full anonymity and proper wording, nearly all subjects would take the full amount in Treatment Take (\$5). Cox (2005) provides some evidence in this direction by showing that very few first movers in an anonymous truncated moonlighting game give to their partners.

necessary to provide an empirical account of behavioral principles that are shared across domains.<sup>9</sup>

In this way, the data highlight one important use of a simple dictator game and relevant manipulations: they can elicit different behaviors toward others and shed light on how institutions affect behavior in subtle ways. One important insight gained in this regard is that range restrictions influence behavior in important and unexpected ways. The need for future empirical efforts is clear, since further treatments are necessary to figure out what these restrictions mean for social preference models and what they teach us about related field applications. I suspect that we can learn something about giving in the “real world” from dictator games, and suitable manipulations will yield that fruit.

### References

- Andreoni, James, and B. D. Bernheim. 2006. “Social Image and the 50-50 Norm: A Theoretical and Experimental Analysis of Audience Effects.” Working paper, Stanford Univ.
- Bardsley, Nicholas. 2005. “Dictator Game Giving: Altruism or Artefact? A Note.” Paper presented at the Economic Science Association meeting, Montreal, June. Forthcoming, *Experimental Econ.*
- Bolton, Gary E., and Axel Ockenfels. 2000. “ERC: A Theory of Equity, Reciprocity, and Competition.” *A.E.R.* 90 (March): 166–93.
- Branas-Garza, Pablo, and Antonio J. Morales. 2005. “Moral Framing in Dictator Games by Short Sentences.” Working paper, Univ. Granada.
- Camerer, Colin F. 2003. *Behavioral Game Theory: Experiments in Strategic Interaction*. Princeton, NJ: Princeton Univ. Press.
- Camerer, Colin F., and Keith Weigelt. 1988. “Experimental Tests of a Sequential Equilibrium Reputation Model.” *Econometrica* 56 (January): 1–36.
- Cox, James C. 2004. “How to Identify Trust and Reciprocity.” *Games and Econ. Behavior* 46 (February): 260–81.
- . 2005. “Trust, Fear, Reciprocity, and Altruism: Theory and Experiment.” Paper presented at the Economic Science Association meeting, Montreal, June.
- Fehr, Ernst, and Klaus M. Schmidt. 1999. “A Theory of Fairness, Competition, and Cooperation.” *Q.J.E.* 114 (August): 817–68.
- Forsythe, Robert, Joel L. Horowitz, N. E. Savin, and Martin Sefton. 1994. “Fairness in Simple Bargaining Experiments.” *Games and Econ. Behavior* 6 (May): 347–69.
- Guth, Werner, Steffen Huck, and Peter Ockenfels. 1996. “Two-Level Ultimatum Bargaining with Incomplete Information: An Experimental Study.” *Econ. J.* 106 (May): 593–604.
- Guth, Werner, Rolf Schmittberger, and Bernd Schwarze. 1982. “An Experimental Analysis of Ultimatum Bargaining.” *J. Econ. Behavior and Organization* 3 (December): 367–88.
- Harrison, Glenn W., and Jack Hirshleifer. 1989. “An Experimental Evaluation

<sup>9</sup> The astute reader will note that this point is similar to the arguments about constraints on one margin influencing behavior on another in the theory of the second best in public economics (see Harrison and List 2004).

- of Weakest Link/Best Shot Models of Public Goods." *J.P.E.* 97 (February): 201–25.
- Harrison, Glenn W., and John A. List. 2004. "Field Experiments." *J. Econ. Literature* 42 (December): 1009–55.
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin F. Camerer, Ernst Fehr, and Herbert Gintis, eds. 2004. *Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies*. Oxford: Oxford Univ. Press. Oxford Scholarship Online. <http://www.oxfordscholarship.com>.
- Hoffman, Elizabeth, Kevin McCabe, and Vernon L. Smith. 1996. "Social Distance and Other-Regarding Behavior in Dictator Games." *A.E.R.* 86 (June): 653–60.
- Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler. 1986. "Fairness as a Constraint on Profit Seeking: Entitlements in the Market." *A.E.R.* 76 (September): 728–41.
- Kamenica, Emir. 2006. "Contextual Inference in Markets: On the Informational Content of Product Lines." Working paper, Univ. Chicago.
- Levine, David K. 1998. "Modeling Altruism and Spitefulness in Experiments." *Rev. Econ. Dynamics* 1 (July): 593–622.
- Levitt, Steven D., and John A. List. 2007. "What Do Laboratory Experiments Measuring Social Preferences Reveal about the Real World?" *J. Econ. Perspectives*, forthcoming.
- List, John A., and Todd Cherry. 2007. "Examining the Role of Fairness in Allocation Decisions." *J. Econ. Behavior and Organization*, forthcoming.
- Rabin, Matthew. 1993. "Incorporating Fairness into Game Theory and Economics." *A.E.R.* 83 (December): 1281–1302.
- Roth, Alvin E. 1995. "Bargaining Experiments." In *The Handbook of Experimental Economics*, edited by John H. Kagel and Alvin E. Roth. Princeton, NJ: Princeton Univ. Press.
- Simonson, Itamar. 1989. "Choice Based on Reasons: The Case of Attraction and Compromise Effects." *J. Consumer Res.* 16 (September): 158–74.
- Simonson, Itamar, and Amos Tversky. 1992. "Choice in Context: Tradeoff Contrast and Extremeness Aversion." *J. Marketing Res.* 29 (August): 281–95.
- von Neumann, John, and Oskar Morgenstern. [1944] 1947. *Theory of Games and Economic Behavior*. 2nd ed. Princeton, NJ: Princeton Univ. Press.