A TALE OF TWO NORMS: INFLUENCE OF MARKET VS. SOCIAL SETTINGS ON TRUST AND PROSOCIAL BEHAVIOR

by

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ABSTRACT OF THE THESIS

A Tale of Two Norms: Influence of Market vs. Social Settings on Trust and Prosocial Behavior

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Recent work has demonstrated that social preferences (choice functions that include the impact on others in the calculation) may be different for monetary vs. nonmonetary decisions. The current work utilized the Dictator Game (and Trust Game, Study 2) to provide a test of this notion and examine whether it is driven by social norms. Study 1 found support for the idea that individuals may be more generous for food compared with money, but Study 2 and Study 3 failed to replicate this effect. Study 2 and Study 3 also added a condition where the food was monetized (i.e., described as having a specific monetary value), but behavior in this condition was not significantly different from situations in which the food was not monetized. The impact of social norms was measured in Study 2 and Study 3, but the results were inconclusive due to the lack of behavioral differences across conditions.

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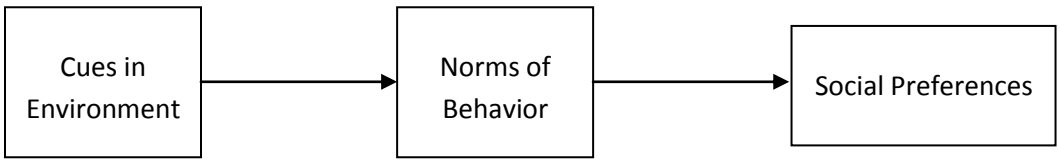
A Tale of Two Norms: Influence of Market vs. Social Settings on Trust and Prosocial Behavior

People care about themselves, but many also have other-regarding preferences. In particular, the current work examines the influence of social norms on our preferences for altruism and trust. The hypothesis to be tested is that when the same resources are presented to a person under different norm-evoking frames (market vs. social settings), these frames will influence her expectations of others' behavior (Study 3) as well as her beliefs about others' expectations of her (Study 2 and Study 3), which will in turn shape her social preferences (utility she derives from others' welfare and hence her choice). The proposed path is therefore:



The next section briefly discusses the methodology that was used in these studies and the following section provides the theoretical background for this work.

Methodological Background

This project utilized the experimental games methodology for conducting research on social preferences. This methodology is often used by experimental economists, and three of its advantages are motivated behavior, control of confounds, and a lack of deception. To elaborate, behavior is motivated through monetary payments that are contingent on the choices participants make in the experiment. Therefore, if you

claim you want to help others (potentially "cheap talk"), you actually have to sacrifice your own narrow self-interest (decrease your own payment) to actualize your concerns for someone else (increasing their payment). In addition, confounds of motivation are controlled for by making the interactions between participants anonymous and in one-shot. These constraints limit participants' potential for future interactions and are an attempt to control for motivations such as reputation building, quid pro quo, fear of reprisal, etc. These controls simplify the tasks, but this simplification serves as a benchmark for when experimenters want to observe the effects of including complexity (e.g. repeated interactions with the same participant). Lastly, deception is strictly excluded from experimental games because researchers want to foster an environment where participants trust the instructions they receive and believe that the rules of the game will be enforced (helps prevent "magical thinking"). The two games that were used in the current work were the Dictator Game (DG) and the Trust Game (TG).

In the DG, participants are organized into groups of two, and one person (the dictator) is given an endowment of money, usually $10, which she may divide between herself and the other person (the recipient). The recipient makes no decisions in this task and has no means of protesting the allocation (in this sense it is not really a "game" as there is no strategic interaction). Because participants are paired anonymously and payments are made in private, any deviation by the dictator from keeping all of the endowment for herself is often viewed as a measure of "pure altruism" (though we dislike this label because motivations such as the "warm glow" feeling from giving, which is often classified as "impure altruism," are not controlled for here). The Trust Game can be thought of as a variation of DG and the standard version also involves two people. In

this game, both participants receive the same initial endowment, and the first mover (the investor) makes a choice of whether to invest any/all of their money by sending it to the other participant (the trustee). Any amount sent by the investor will be increased by a known multiplier (normally the investment is tripled), and then the trustee makes a decision of whether or not to return any/all of the investment back to the investor (who cannot retaliate). For our purposes, the interesting aspect of this game is that once the trustee receives the investment, she is essentially playing the DG with an endowment determined by the investor.

In summary, experimental games offer an alternative avenue to asking questions like those on the General Social Survey, for example, "Do you think of yourself as a trusting person? Are you…" with a 4-point response scale from "Very Distrusting" to "Very Trusting." Instead of using scale items like these, we can have people participate in a Trust Game where the experimenter's conception of trust is more concrete, the measurement of trust is tied to behavior, and the results are more likely to be interpreted consistently across people (Camerer & Fehr, 2001).

Theoretical Background

In both normative (e.g. von Neumann-Morgenstern's (1944) utility theory) and descriptive (e.g. cumulative prospect theory (Tversky & Kahneman, 1992)) accounts of decision making, individuals and firms are assumed to behave as if they maximize the sum of their subjective utilities (preferences among goods or services). There has been much research focused on systematic deviations from this standard of the summing of utilities, but efforts have also been directed towards what defines utility for a given

person. The focus of the present work will be on the sources/construction of utility when the choice alternatives impact others (in particular, when decisions must be made regarding how goods are allocated between oneself and others), or what are often referred to as "social preferences."

Social preference models attempt to explain utility as being derived from a combination of one's own welfare (or narrow self-interest) and that of others affected by the allocation of goods or services (often thought to reflect a preference for "fairness"). For example, one popular model by Fehr and Schmidt (1999) can capture many findings in the literature by proposing that people are inequity-averse. In words, the model states that when a person evaluates the distribution of goods between herself and others, many derive disutility from feelings of envy if they have received less than average (disadvantageous inequity) as well as something close to guilt if they have received more (advantageous inequity). Formally, the model looks as follows:

$$U_i = x_i - \alpha_i \frac{1}{n-1} \sum_{j \neq i} \max(x_j - x_i, 0) - \beta_i \frac{1}{n-1} \sum_{j \neq i} \max(x_i - x_j, 0)$$

where x_i represents the utility *i* derives from the receipt of good *x*, *n* is the number of people involved in the distribution, α_i is the envy parameter, and β_i is the guilt parameter. Fehr and Schmidt assume that $\alpha \geq \beta$ which agrees with intuition and findings that people care somewhat more about disadvantageous inequity than advantageous, and they also assume that $0 \leq \beta < 1$ because people who enjoy or hate being above others beyond those values are rare. This type of model is one of several in a class that has been referred to as "distributional models" of social preference because utility is constructed based on either

absolute or relative differences in the allocation of goods among all parties involved (Dana, Cain & Dawes, 2006). Other models in this class construct utility as the maximization of the sum of all goods (social welfare/efficiency), the maximization of the minimum amount any one person receives (maximin), and self-interested models where a person increases their own utility by allocating goods to others (accounts for "warm glow" altruism). While these theories are simple and can account for other-regarding behavior in many games, they cannot easily explain behavioral changes that occur when outcomes remain the same but the context changes (for example, why do dictators increase self-interested choices when a layer of uncertainty (that can be removed freely with one mouse click) is added to the recipient's payment? (Dana, Weber & Kuang, 2007)). Other (admittedly more complicated) models that include a person's beliefs, their beliefs about others' beliefs, their beliefs about others' beliefs of others' beliefs, etc. offer a potential explanation in these cases and are the focus of the current work.

One alternate class of models, which is often associated with Rabin (1993), includes the intentionality of others' choices affecting one's own utility function. Rabin's model has a sympathy coefficient that is positive when another person chooses an action that helps you, but is negative when the other person hurts you (resulting in "intention-based" reciprocity). If people maximize their utility through helping others that have good intentions and hurting those that have bad intentions, classic scenarios like the Prisoner's Dilemma can change from social dilemmas into coordination games if played repeatedly. The idea that our beliefs about other people's beliefs (here our beliefs about another's intentions) can change the utility associated with choices is important to the current work as well as Dana et al.'s (2006) alternative account. Dana et al.

employed the Dictator Game (because it removes intentionality from consideration by removing the recipient's ability to retaliate) and found evidence supporting the theory that people derive utility from acting in accordance with the expectations of those impacted by their choice. If people expect you to behave fairly, you may find added value in the appearance of fairness and act accordingly (or you may experience disutility/guilt in not meeting those expectations). Note that if a person is choosing fair outcomes for the sake of appearance, this does not mean she would not prefer/choose the most self-interested option under different circumstances (that may in fact be the outcome she "likes" the best). Whereas Dana et al. manipulated expectations by letting participants change the information given to those affected by their choice (dictators could prevent recipients from ever knowing that a DG task had been played if they accepted less money), the current research employs a more subtle norm manipulation.

The aforementioned models and research help to place the current research design into context, but the impetus for the design itself comes from two sources. The first source is a recent working paper showing that social preferences may be different for monetary vs. nonmonetary goods, and in particular that generosity in the Dictator Game and other tasks may be higher in non-monetary contexts (Davis, Miller & Weber, 2011). If true, how would we explain such behavior? One way would be to posit that some people have more guilt when faced with nonmonetary decisions, but a changing β would limit the usefulness of the inequity-averse model. Another explanation is that the social norms surrounding monetary vs. nonmonetary goods are different and that they trigger different expectations that affect our conditional preference to be prosocial. One piece of

evidence in favor of a norms based view for monetary vs. nonmonetary goods comes from the findings of Heyman and Ariely (2004).

Heyman and Ariely conducted a series of studies investigating how different amounts and types of incentives would affect the amount of effort participants put forth on a variety of tasks. They found that offering non-monetary (candy) incentives for work resulted in effort that was on par with a no incentive condition and did not change as a function of the amount of "payment" offered (candy bar vs. box of chocolates). However, they did find an interaction between the type (candy vs. money) and magnitude (low vs moderate) of payment whereby low monetary incentives ($0.50) resulted in less effort than no incentive or non-monetary incentives, and moderate payments ($5.00) increased effort to the same level as in the control and non-monetary conditions. What is particularly interesting for the proposed research are Heyman and Ariely's additional findings that when the non-monetary payments were "monetized" by placing a dollar value on the incentive ("$0.50 candy bar" or "$5.00 box of chocolates"), then the effort participants spent on their tasks dropped and looked exactly like the money conditions (effort was low for $0.50 chocolate bar and was higher and statistically the same as the control condition for the $5.00 box of chocolates). One might be concerned that this effect is driven by the fact that a primary use of prices is to signal value, whereas value is ambiguous in non-monetary domains. A pilot study (data not shown) using the hypothetical scenario from Heyman and Ariely's first experiment (their other 2 studies were behavioral) did not support this idea, however. Thus, the Heyman and Ariely results are best explained by the authors' claim that monetizing the chocolate activated monetary market norms, encouraging reciprocity of effort for the amount of payment.

The idea that monetizing a situation can have psychological consequences is further supported by the work of Vohs, Mead, and Goode (2008) who found that participants primed with money acted as if they cared more about self-sufficiency than those primed with neutral concepts (money primes were associated with an increased preference for working alone/refusing help and a decreased preference for donations of time and money to others). If introducing money into a context can change motivations and behaviors towards self-sufficiency and self-interest, a possible mechanism is that money changes one's expectations of others as well as one's beliefs about others' expectations of them. The corollary to the present work is that the Dictator in a DG may be more likely to believe that other Dictators will give fewer resources and that the recipient expects her to give less too when allocating a monetary vs. non-monetary good.

Study 1

Groups of 7 or more participants were brought into the lab to play a variation of the Dictator Game (n = 87). The game included 6 rounds of dictator choices, each of which the participants played with a different person in the room. In each round the endowment changed in magnitude and possibly resource type. The 6 endowments were: $2, $4, $8, 6 chocolate Lindt truffles, 12 truffles, and 24 truffles (truffle values were picked in an attempt to match the subjective valuation of truffles to $2, $4, and $8 respectively). Participants were informed of all 6 endowments prior to Round 1 and the order was randomized on two dimensions: 1) Either all three monetary endowments were shown first or the three truffle endowments, and 2) Both endowments were either ascending or descending in magnitude. We had every participant play in the role of the dictator to maximize data collection, but they each knew that only half would end up in

the role of dictator for payment purposes (where 1 of their 6 rounds was randomly chosen to pay out) and the other half would be paid as the recipient via a coin flip at the end of the task. Lastly, although most DG tasks allow for any allocation of the endowment by certain increments (usually $1.00), our task limited the choice options to 5 because of the stark difference in endowment sizes. The 5 options were to keep everything for yourself, give it all away, split it in half, or keep/give roughly 75% of the endowment (there were also 2 extra options for each choice that were included to catch irregular behavior (they were both weakly dominated by another option)).

We predicted that, similar to Davis, Miller and Weber (2011), participants would be more generous for the truffle endowments than the monetary endowments. In addition, we also predicted an endowment type by magnitude of endowment interaction (loosely based on the findings of Heyman and Ariely (2004)). Specifically, we hypothesized that the level of generosity would remain constant across the various nonmonetary endowments (consistent 50-50 choices), but that generosity would vary as a function of the monetary endowment. We predicted that people would be more likely to split the small monetary endowment (because others would expect this when the cost of fairness was cheap, i.e. $1), but that the prevalence of self-interested choices would increase as the endowment grew (because expectations would shift in this direction as the temptation for keeping more of the resources grew).

Figure 1 summarizes the data and illustrates that, although participants were slightly more likely to keep the entire endowment when the resource was monetary, the vast majority of people had a preference for giving something to the other participant regardless of the endowment type or size. When examining the distributions further, it

appears that the preference for others' welfare may decrease in the monetary domain as a function of the size of the endowment, but remain constant in the non-monetary domain. A logistic regression confirmed that giving half or more of the endowment was significantly less likely for monetary endowments than for truffle endowments, $\beta = -.195$, Wald $\chi^2(1, N = 87) = 13.76$, $p < .001$. However, there was no significant effect of magnitude on the likelihood of giving half or more of the endowment, $\beta = -.012$, Wald $\chi^2(1, N = 87) = 1.64$, $p = .44$, and no magnitude × endowment interaction, $\beta = -.103$, Wald $\chi^2(1, N = 87) = 2.01$, $p = .37$ (although the difference between the three magnitudes of monetary endowments was trending in the hypothesized direction).

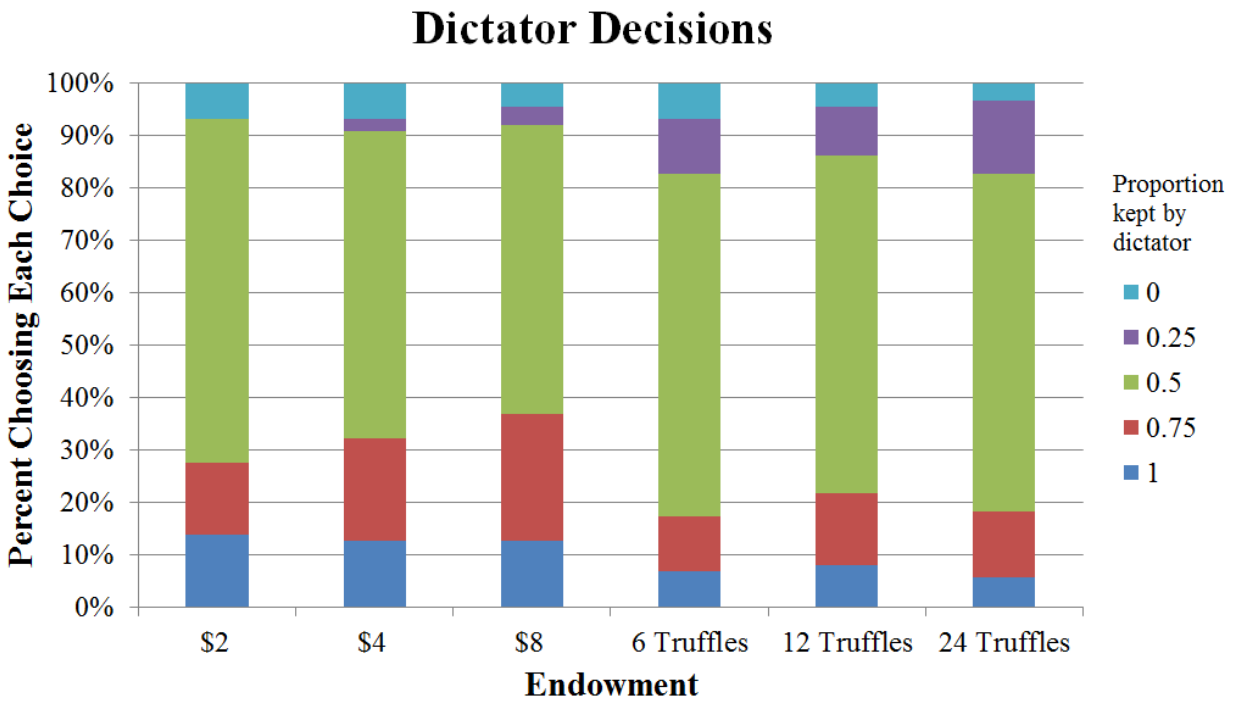


Figure 1. Prevalence of each dictator decision in Study 1 for each of the six endowments. The stacks at the bottom of each endowment represent more self-interested decision making.

Finding that people have different social preferences for monetary and non-monetary goods could be the (not very interesting) result of participants having different utility functions for money and truffles. Although, in an independent sample, we attempted to match average Willingness to Pay (WTP) judgments for truffles to the dollar values in our task, these judgments may have been incorrect or not relevant to our convenience sample of students (WTP was elicited from online workers at Amazon's Mechanical Turk marketplace (MTurk)). In Study 2 we matched the truffle amounts to WTP judgments from Rutgers students and in Study 3 we limited participation in the experiment to those who reported liking truffles on a prescreen questionnaire. Furthermore, in both Study 2 and Study 3 we included two truffle conditions (one the same as in Study 1, the other using "monetized" truffles). Because participants received the same good across the two different truffle conditions, we expected that their utility ratings of the goods themselves would be very similar between conditions.

Although in Study 1 we did not find statistical support for an endowment × magnitude interaction, roughly 25% of participants chose to split the $2 evenly but also kept more than half of the pie for one of the other monetary allocations. Findings such as these are tough to explain under the distributional social preference models noted above. For instance, if we adopt the inequity-averse model (Fehr & Schmidt, 1999), we would need to assume that β changes along with the endowment size in order to fit the data (if I split 50-50 for $2, this indicates that my $\beta \geq 0.5$ which means I would also split for $4 and $8 if I were consistent). However, a changing β implies that preferences are not stable and would be a major cause for concern for the inequity-averse model. On the other hand, a social norms account would predict changes in behavior across endowment

types/sizes in so far as these situational changes resulted in different expectations of others' behavior as well as changes in one's beliefs about others' expectations of them. Study 2A was designed as an initial test of this hypothesis.

Study 2A

Study 2A was similar to Study 1 but with some modifications. The major changes from Study 1 were the addition of the Trust Game, the addition of a monetized truffles condition, and the fact that endowment type was a between-subjects variable. Participants were recruited from the Economics SONA pool and were compensated with a $5 gift card to Barnes and Noble for showing up on time. Using the Economics SONA pool removed the ability to prescreen those that liked truffles, but the hope was that it would be easier to recruit large groups using this pool compared to the Psychology pool in the Spring (it is also standard practice to offer a $5 show-up fee for economic experiments (not a gift card as in our design), but we wanted to keep the type of compensation different from any payment in the task).

Participants came into the lab in groups of 8 or 10 and were randomly assigned to 1 of 3 conditions (money, truffles, or monetized truffles). All instructions were read aloud and participants were given quizzes on both the Dictator Game and Trust Game (order counterbalanced). Participants made 3 decisions in the Dictator Game (endowments: $2, $4, $8; 8, 16, and 32 truffles (or monetized, e.g. "32 truffles ($8 value)")) and the order of endowments was either ascending or descending in magnitude (randomly determined). All participants played in the role of the Dictator (as in Study 1) and were matched with a different participant for each decision. Participants also made 3

decisions in the Trust Game and the endowments were set such that full trust would yield the same decision as in the DG for the 2nd mover/Trustee (endowments: $1, $2, $4; 4, 8, 16 truffles (2x multiplier on investment)). Each TG round was also played with a different participant, but in this game roles were divided among the subjects (half played as Investor and the other half as Trustee). After the Investors made their 3 investment decisions they were asked to specify what they believed the Trustee expected to be sent for each endowment (modeled after the scoring rule used by Schotter & Sopher (2006)). Because we wanted to maximize the information obtained from Trustees, we elicited their preferences for how much to return to the Investor via the strategy method (they made a series of "Return" decisions for each possible investment that could occur, instead of simply the one investment choice that did occur). After making these decisions the Trustees then provided their expectations of their Investor's behavior for each of the three endowments. When both tasks (DG and TG) were completed, participants filled out a demographic questionnaire before exiting the experiment (collected age, gender, major, and attitudes towards chocolate truffles (including willingness to pay)).

The predictions we made a priori were that participants would be more altruistic in the DG for truffles (as compared to both the money and monetized truffles conditions, which would not be different from each other), more trusting for truffles, and return more of the investment for truffles. We also predicted that the level of altruism, trust, and reciprocity for truffles would remain relatively stable across different endowment sizes but that people would be more fair/trusting/reciprocating for small amounts of money and monetized truffles as compared to larger amounts. Lastly, we believed that all these differences in behavior would be predicted by differences in beliefs about others'

expectations in the tasks/conditions (only measured in the TG because everyone played as Dictator in the DG).

Subject recruitment ended up being much more difficult than anticipated. We had no trouble filling sessions (even when we overbooked to 16 subjects) but suffered from significant no-show rates (over 50% of enrollment/session) and we had to cancel 50% (7/14) of our scheduled sessions. We tried increasing the show-up payment as the semester progressed ($10 gift card) and including psychology sign-ups but this did not fix the problem. As a result, our findings are underpowered so any conclusions are tentative at best (and the Trust Game should not be interpreted at all because the samples are halved for each role). Figure 2 summarizes the data for the Dictator Game across all three conditions (money (N = 16), truffles (N = 16), and monetized truffles (N = 18)).

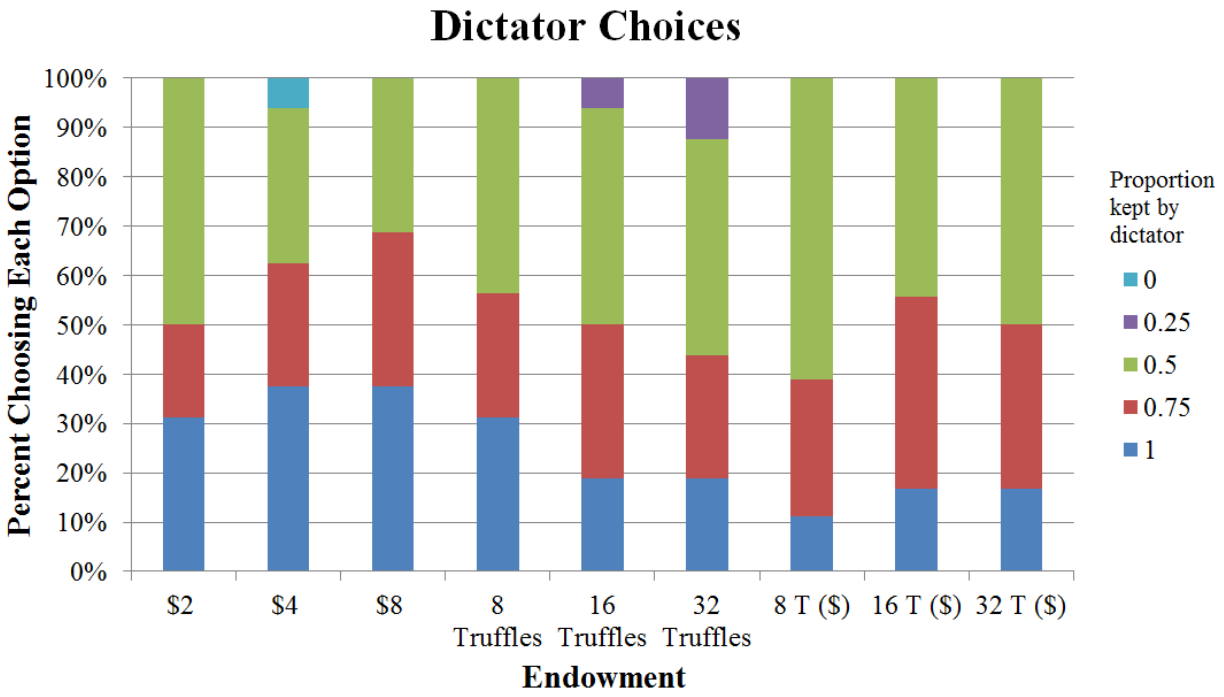


Figure 2. Prevalence of each dictator decision in Study 2A for all endowments (endowment type varied between-subjects). The stacks at the bottom of each endowment represent more self-interested decision making.

A Kruskal-Wallis test was conducted to determine whether the median Dictator choice varied as a function of endowment type across each different magnitude of the endowment. Results of this analysis indicated that there were no median differences among the small endowments, $p = .41$, medium endowments, $p = .59$, or large endowments, $p = .19$. In a multi-level model logistic regression, the dependent variable was giving half or more of the endowment to the recipient. The level 1 independent variable was experimental condition –monetary vs. truffle vs. monetized truffle rounds. The level 2 independent variable was endowment magnitude (low, medium or high). The analysis revealed no main effects and no interactions (all ps > 0.50). Unlike Study 1, we found no significant effect of endowment type on generosity and no interaction whereby people are less generous as monetary endowments grow in size (though again it is trending in that direction). We also find no evidence that monetizing the truffles has any effect on social preferences in this task.

Figures 3 and 4 summarize the behavior of the Investors and Trustees in the Trust Game (Trustee data illustrate the situation in which the Investor fully invested and therefore the Trustee was in the same position as the Dictator Game).

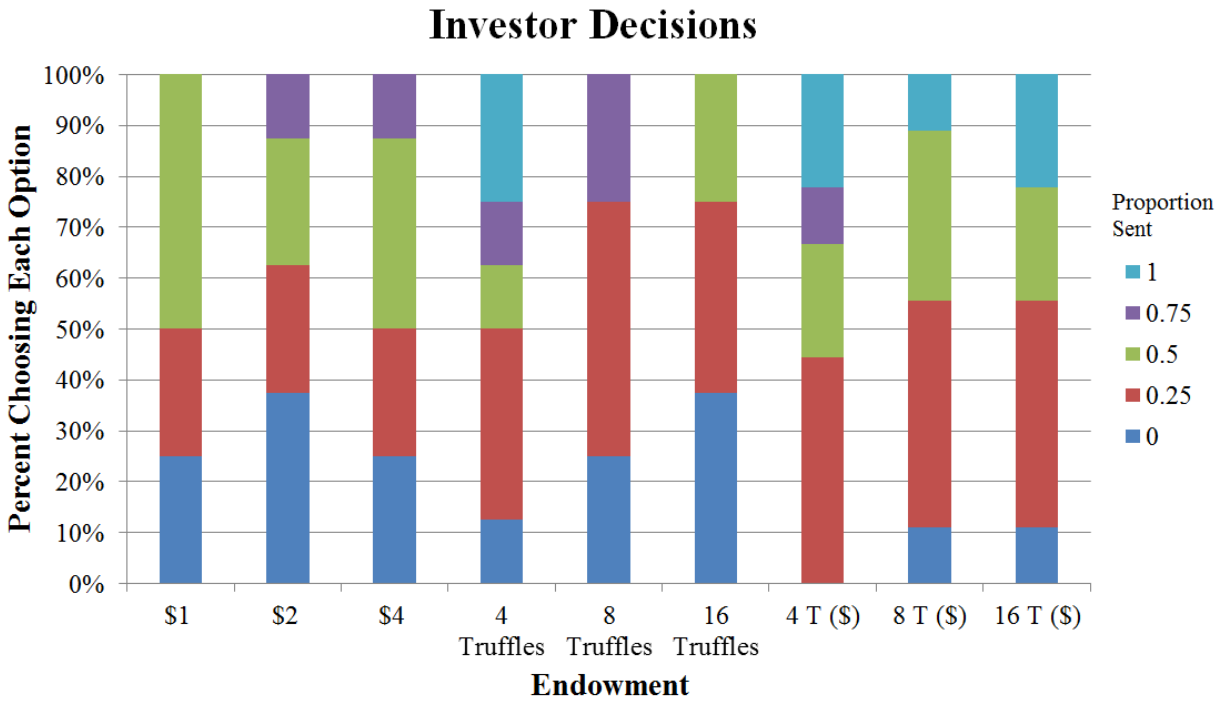


Figure 3. Prevalence of each Investor decision in the Trust Game. The stacks at the bottom of each endowment represent less trust in the Trustee.

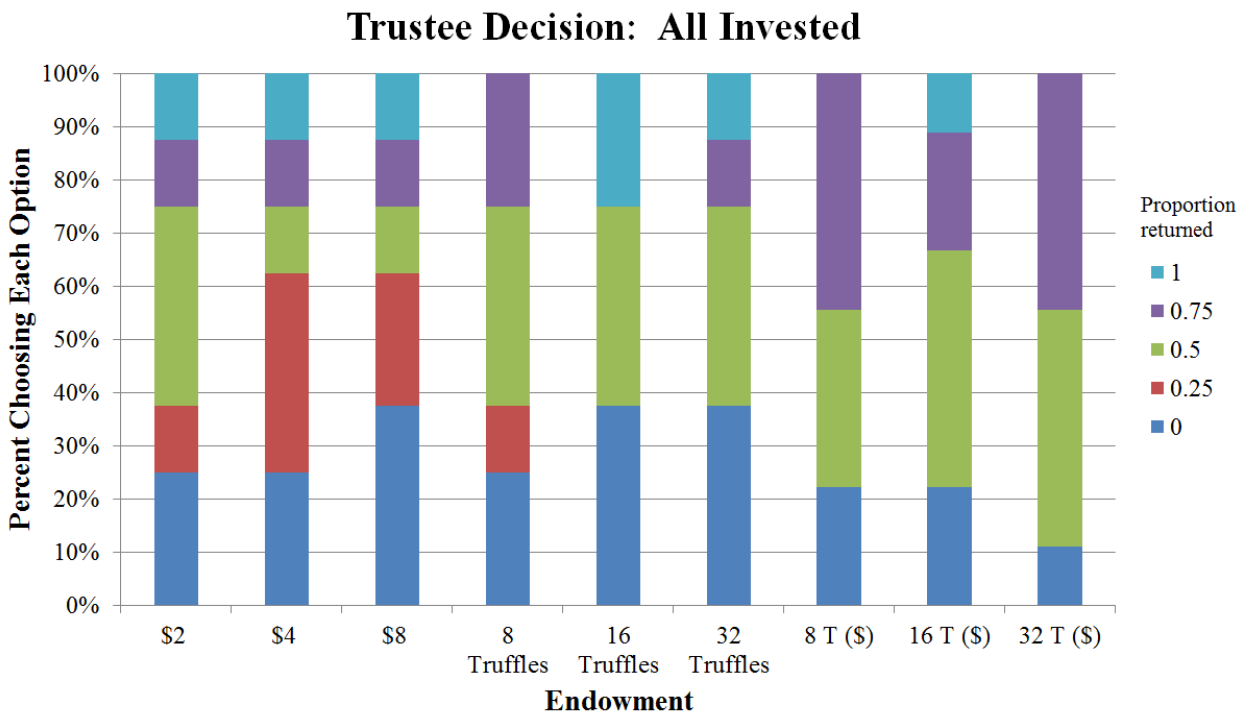


Figure 4. Prevalence of each Trustee decision for the situation in which the Investor invested all of their resources. The stacks at the bottom of each endowment represent less reciprocity/trustworthiness on the part of the Trustee.

Although it may appear that participants were slightly less trustworthy for monetary endowments, the sample sizes are so small that they make an analysis of any differences between conditions meaningless (only 8 or 9 participants per role depending on the condition). Figures 5 and 6 summarize the data on expectations with the same caveat.

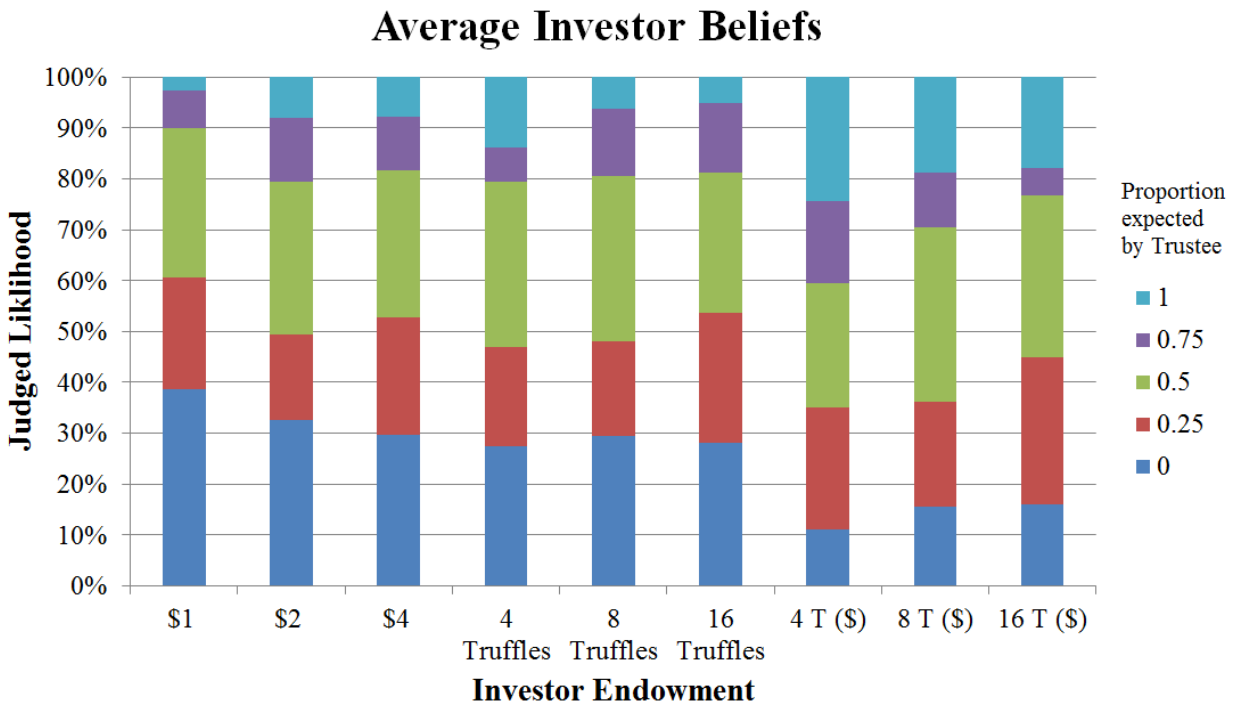


Figure 5. The average beliefs of Investors as to what the Trustee expected to be sent for each endowment. The stacks at the bottom of each endowment represent expectations of less trust on the part of the Trustee.

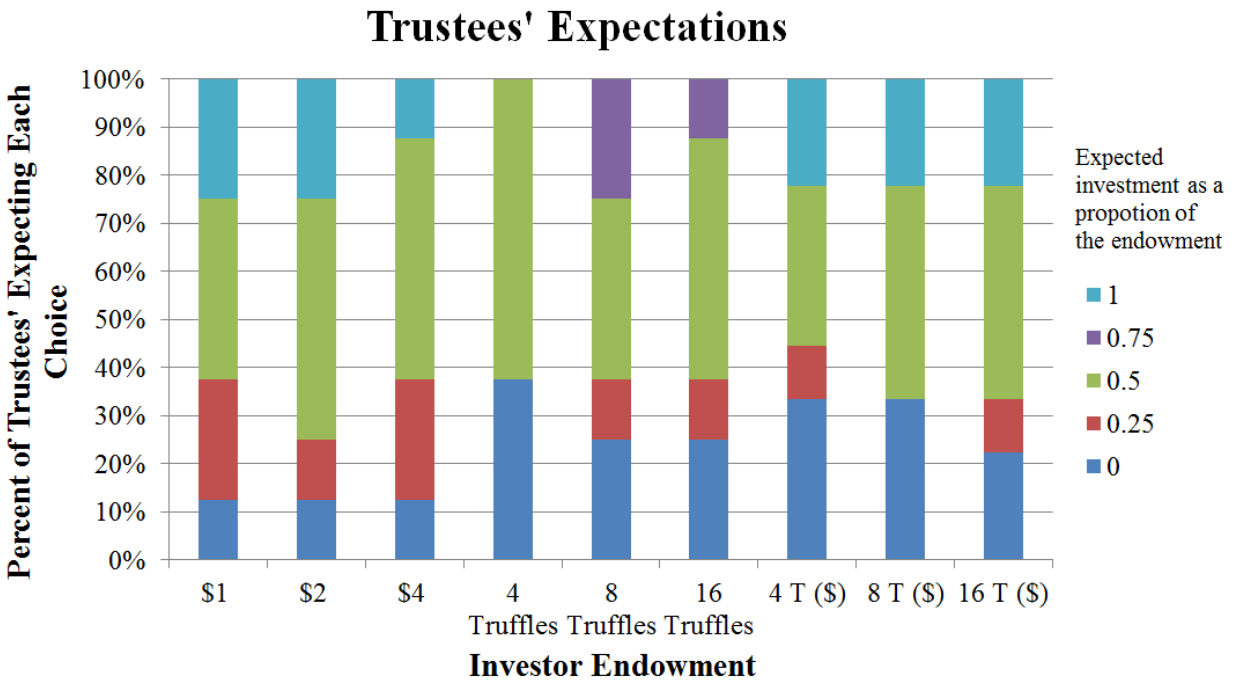


Figure 6. Prevalence of Trustees' expectations regarding the Investor's behavior for each endowment. The stacks at the bottom of each endowment represent expectations of less trust on the part of the Investor.

Study 2B

Following Study 2A we ran Study 2B – a survey on MTurk (N=51) explaining the (simplified) design of Study 2A and eliciting predictions about expected behavior in the DG and TG, as well as the "fairness" of various decisions (following the norm elicitation questions used by Chavez & Bicchieri (2012)). In particular we asked for predictions in the $8 and 32 truffle DG, the TG where the Investor was endowed with $4 or 16 truffles, and the TG where the Investor invested everything and the Trustee had the option to return $8 or 32 truffles. We found that our predictions were in line with those of MTurk workers for the DG in that they expected significantly more equal splits for truffles (M = 55%, SD = 24%) than money (M = 39%, SD = 26%), $t(50) = 5.42$, $p < .001$. However, when we asked them what percent of Investors would not trust at all, they predicted no difference between truffles (M = 43%, SD = 27%) and money (M = 38%, SD = 28%), $t(50) = 1.19$, $p = .24$. MTurk workers did, however, predict a difference in Trustee behavior as a function of the endowment type in the predicted direction. When asked what percent of Trustees would return half or more of the doubled investment they predicted that more people would return truffles (M = 60%, SD = 23%) than money (M = 49%, SD = 26%), $t(50) = 5.42$, $p < .001$. Whereas some of the MTurk participants' predictions were in line with our own (and not with our data from Study 2A), their judgments about the norms surrounding the monetary and nonmonetary contexts actually predicted a null result (if you believe that norms drive social preference construction). Figure 7 displays their judgments of fairness in the Dictator Game (pattern between conditions was the same for both roles in the Trust Game).

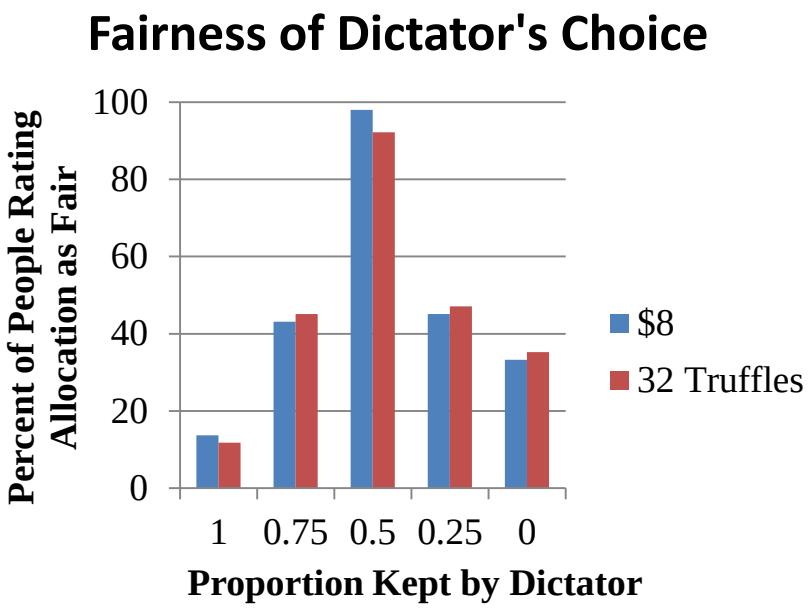


Figure 7. Percent of MTurkers who thought that choosing each option was "fair" for the monetary and nonmonetary endowment.

The lack of a trend in the predicted direction for monetized truffles in the Dictator Game data from Study 2A coupled with the results from Study 2B suggesting that norms may not differ between nonmonetary vs. monetary contexts in this design led us to believe that it would not be fruitful to continue with this setup this Fall (in addition to the difficulty in recruiting enough subjects for 3 conditions in one semester). We thought that it was possible that the comparison between monetary and nonmonetary contexts was necessary to see the change in behavior we observed in Study 1, so we returned to that design in Study 3.

Study 3

Study 3 replicated the design of Study 1 but added an additional condition that replaced the truffle rounds with monetized truffles. Therefore, participants came into the lab in groups of 7 or more and played six rounds of the Dictator Game (3 with money

($2, $4, and $8) and 3 with truffles or monetized truffles (8, 16, and 32 truffles)). Thus, the comparison between truffles (N=43) and monetized truffles (N=42) was between-subjects, whereas the comparison between money and one of the truffle conditions was within-subjects. The only other modification was the inclusion of questions aimed at capturing social norm information. Following the definition of social norms provided by Bicchieri (2006), we measured both empirical expectations (beliefs about how others would choose in the DG) and normative expectations (beliefs about how others' believe one should/will act). We did not make these judgments incentive compatible (traded off this aspect for ease of programming late in the process), but if the results came out as predicted (same predictions as Studies 1 and 2) we planned on running a replication that included this feature.

Subject recruitment for Study 3 was done through the Psychology SONA pool (to add a prescreen qualification that they liked truffles) and each subject was compensated with 1.5 RPUs for showing up on time. However, we again ran into issues with subject cancellation that resulted in 50% (10/20) of our scheduled sessions not running. Figure 8 summarizes the data from the Dictator Game across conditions.

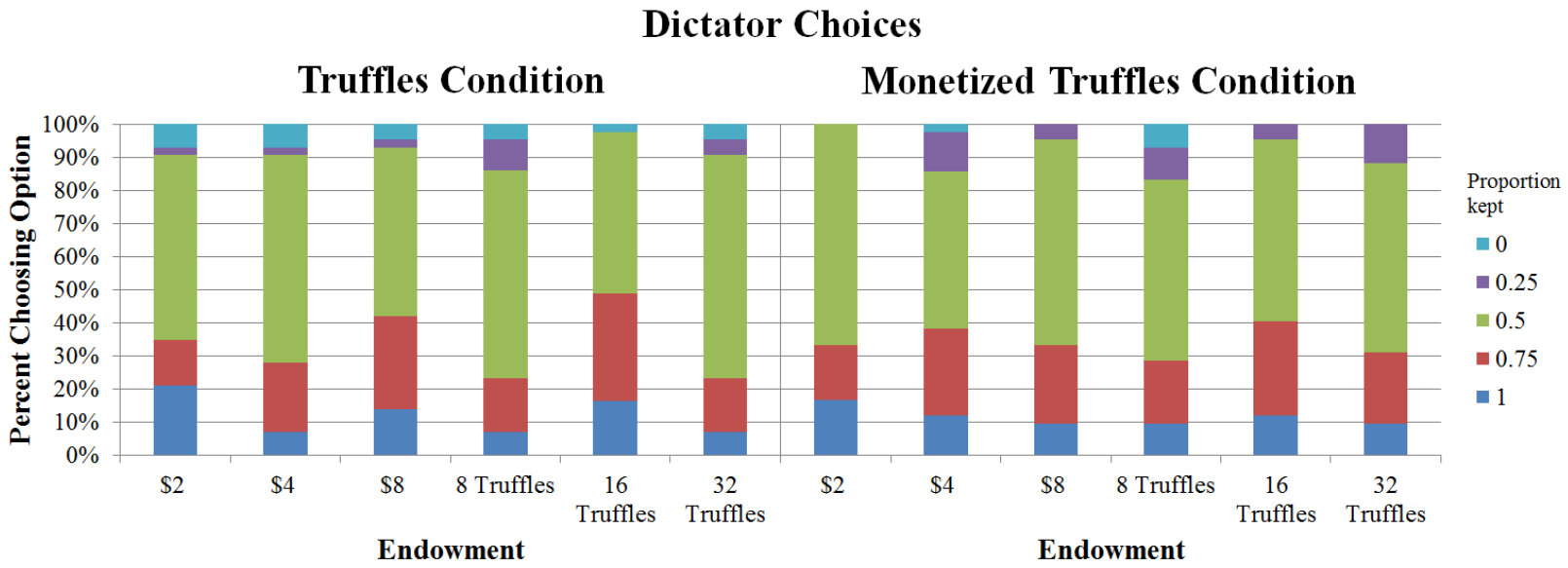


Figure 8. Prevalence of each Dictator choice across all endowments. The stacks at the bottom of each endowment represent more self-interested decision making.

In a multi-level model logistic regression, the dependent variable was giving half or more of the endowment to the recipient. The level 1 independent variable was experimental condition – whether participants faced monetary and truffle rounds or monetary and monetized truffle rounds. The level 2 independent variables were endowment type (money or truffles) and magnitude of the endowment (low, medium or high). The analysis revealed a marginal interaction between endowment type and endowment magnitude, $F(2,16)=3.55$, $p=0.053$, but no other significant main effects or interactions (all *p*s > 0.17). The marginal interaction reflects the fact that for truffles, dictators were slightly less generous for the medium magnitude than for the low and high magnitudes (with 74%, 55%, and 73% of dictators giving half or more for the low, medium, and high magnitudes, respectively). In contrast, there was no such magnitude effect for money (with 66%, 67%, and 62% of dictators giving half or more for the low, medium, and high magnitudes, respectively). Overall, the Dictator Game results do not support our prediction of different social preferences for money vs. truffles or the prediction that monetizing truffles would result in more self-interested decision making compared with "regular" truffles.

Figure 9 displays the average of what participants' expected other Dictators to choose in their session. Comparing the expected percentages against the observed percentages (Figure 7 vs. Figure 8) reveals that in many cases participants overestimated the amount of self-interested behavior, particularly for money (which was also our prediction). On average, in the truffles condition the participants' predictions were not significantly different from the observed percentages for the $2 endowment, $\chi^2(4, N = 86)$

= 4.57, p = .34, the 16 truffle endowment, $\chi^2(4, N = 86) = 7.23$, p = .12, and the 32 truffle endowment, $\chi^2(4, N = 86) = 7.59$, p = .11. However, they significantly overestimated the amount of self-interested choices for the $4 endowment, $\chi^2(4, N = 86) = 14.62$, p = .006, the 8 truffle endowment, $\chi^2(4, N = 86) = 9.93$, p = .04, and marginally for the $8 endowment, $\chi^2(4, N = 86) = 8.46$, p = .08. In the monetized truffles condition the participants' predictions were not significantly different from the observed percentages for any of the truffle endowments: 8 truffles, $\chi^2(4, N = 84) = 5.02$, p = .29, 16 truffles, $\chi^2(4, N = 84) = 3.88$, p = .42, and 32 truffles, $\chi^2(4, N = 84) = 3.87$, p = .42. However, participants (marginally) overestimated the amount of self-interested choices for all of the monetary endowments: $2, $\chi^2(4, N = 84) = 9.79$, p = .04, $4, $\chi^2(4, N = 84) = 8.38$, p = .08, and $8, $\chi^2(4, N = 84) = 8.57$, p = .07.

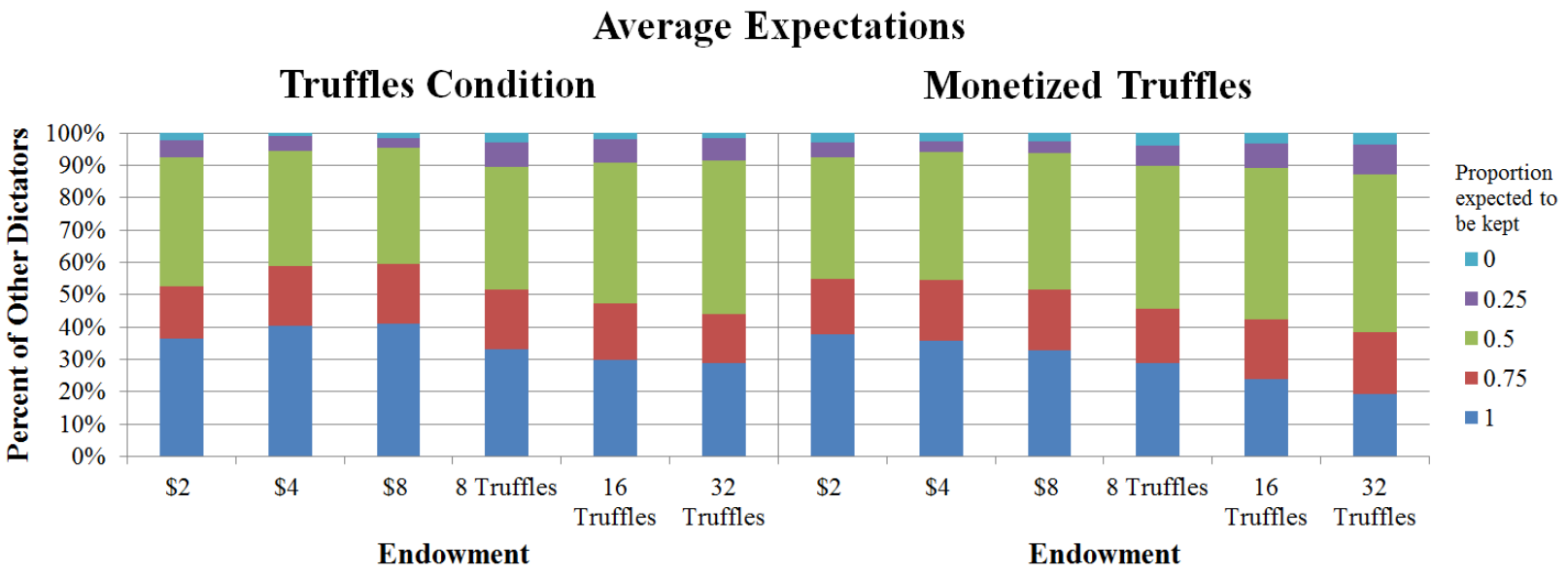


Figure 9. Average percent of other players expected to select each choice in the Dictator Game. The stacks at the bottom of each endowment represent more self-interested expectations.

A 2 (condition: money & truffles vs. money & monetized truffles) × 2 (endowment type: money or truffles) × 3 (magnitude: small, medium, large) repeated multi-level model was conducted with condition at level 1 and endowment type and magnitude at level 2. The continuous dependent variable was expectation ratings (on a 0-100 scale) that the dictator would keep the entire endowment. The analysis included only 62 subjects because many were missing these ratings (failed to complete or skipped the survey). The model revealed a main effect of endowment type, $F(1, 300)=48.37$, $p < .0001$, such that participants gave a higher expectation rating (LSmean = 37.49) that dictators would keep all the money than the expectation (LSmean = 27.08) that they would keep all the truffles. There was also a marginal effect of endowment magnitude, $F(2, 300) = 2.36$, $p = 0.10$, such that participants gave higher ratings for low magnitudes (LS means 34.26, 32.33, and 30.27, respectively). There were no other main effects or interactions (all ps > 0.12). Overall, these findings support our predictions of different social preferences for money vs. truffles, but run counter to our hypothesis that monetizing the truffles would change expectations to be in line with those for money itself.

Whereas Figure 9 illustrates the empirical expectations of our participants (how they expect others to act), Table 1 illustrates their normative expectations (beliefs about how they believe others think they should act), both of which are necessary for social norms to influence social preferences according to Bicchieri's (2006) definition. Table 2 offers a means to compare agreement between personal beliefs and normative beliefs, but this does not play a role in Bicchieri's model. We predicted that a person's expectations

of what others' think she should do would change as a function of the endowment type (and as a function of magnitude for money), but it is evident that there no difference within condition, and any difference between conditions is due to participants in the monetized truffle condition expecting more equal splits overall.

	Beliefs of Others' Beliefs of Acceptability											
	Truffles Condition						**Monetized Truffles Condition**					
Proportion Kept	$2	$4	$8	8 Truffles	16 Truffles	32 Truffles	$2	$4	$8	8 Truffles	16 Truffles	32 Truffles
1	25.58	25.58	20.93	20.93	18.60	18.60	23.81	21.43	19.05	21.43	14.29	16.67
.75	48.84	48.84	41.86	44.19	46.51	34.88	52.38	52.38	40.48	57.14	50.00	42.86
.5	67.44	62.79	62.79	62.79	60.47	60.47	80.95	80.95	80.95	80.95	80.95	80.95
.25	48.84	46.51	44.19	48.84	51.16	44.19	61.90	57.14	52.38	61.90	66.67	64.29
0	39.53	32.56	34.88	39.53	39.53	41.86	50.00	47.62	45.24	50.00	45.24	42.86

Table 1. Percent of participants who believed that the majority of other people in their session thought a given Dictator allocation was "socially acceptable." Expectations of 50-50 splits have been outlined to illustrate that the hypothesis of a norm for sharing food more equally than money is not supported.

	Personal Beliefs of Acceptability											
	Truffles Condition						**Monetized Truffles Condition**					
Proportion Kept	$2	$4	$8	8 Truffles	16 Truffles	32 Truffles	$2	$4	$8	8 Truffles	16 Truffles	32 Truffles
1	32.56	20.93	20.93	18.60	11.63	11.63	16.67	19.05	11.90	21.43	9.52	4.76
.75	46.51	41.86	34.88	44.19	30.23	23.26	50.00	42.86	35.71	54.76	47.62	40.48
.5	69.77	62.79	65.12	65.12	65.12	65.12	80.95	80.95	80.95	80.95	80.95	80.95
.25	51.16	46.51	48.84	53.49	53.49	51.16	66.67	61.90	59.52	66.67	66.67	66.67
0	39.53	46.51	39.53	46.51	44.19	39.53	52.38	50.00	47.62	52.38	54.76	45.24

Table 2. Percent of participants stating that a given Dictator allocation was "socially acceptable" by their own standards. Expectations of 50-50 splits have been outlined to illustrate that the hypothesis of a norm for sharing food more equally than money is not supported.

Discussion

Experiment 1 indicated that there may in fact be differences in social preferences for monetary vs. nonmonetary goods as measured in the Dictator Game. However, this finding was not substantiated in Studies 2 and 3, and neither was the prediction that monetizing a nonmonetary good would alter social preferences. In Study 3 we observed some support for the claim that empirical expectations of others' behavior (what others do) would change for monetary vs. nonmonetary goods, but we again found no evidence that monetizing a nonmonetary good would alter expectations in line with those for money itself. However, according to Bicchieri's theory of social norms (2006), empirical expectations are not sufficient in and of themselves to serve the role as a coordinating device upon which social preferences are formed. Normative expectations (what others think one should do) must also change with the context and we observed no evidence of this in Study 3. In light of these findings it might be tempting to claim that a social norms account of social preferences actually predicted a null result in Study 3. However, null results can have many causes and our design may not have been best suited for teasing apart theories.

The task we used for our studies was a modification of the standard Dictator Game that should have been able to demonstrate differences in preferences for monetary vs. nonmonetary goods as well as between nonmonetary and monetized nonmonetary goods if they exist. However, if we found the effect and our measure of social norms predicted it (with some noise), is our design able to rule out all alternative theories? For instance, a social welfare/efficiency theory of social preferences could fit any outcome as an equilibrium in the current task (because all choice options provided the same net

benefit to society (all options summed to $2, $4, $8, 8 truffles, etc.)) and a theory of maximin preferences (a preference for maximizing the minimum amount any person earns) could also account for a large amount of the variance because splitting equally was our most prevalent finding. By some schools of thought (Binmore, 1999; Samuelson, 2005; and Binmore & Shaked, 2010) one-shot Dictator Games are not a reasonable test for the falsification of the narrow self-interest theory either. People with these views maintain that standard theory does not expect anyone to play an equilibrium strategy from the beginning, but rather that behavior is nudged in this direction through trial-and-error learning if the incentives are sufficient. In Binmore and Shaked's (2010) critique of the inequity-averse model they state this and suggest a role for social norms, "Our own view is that subjects who are inexperienced or offered an inadequate incentive cannot usefully be modeled as optimizers of anything at all. We think they usually begin by operating whatever social norm happens to get triggered by the framing of the laboratory game." But is the usefulness of a norms-based approach to social decision making restricted simply to one-shot games where other theories may not apply?

If the claim is that players are learning how to "play the game" while gaining experience in a task, what is it that they are learning if not the social norms of their new environment? An example of learning expectations in the lab comes from a recent neuroimaging study by Xiang, Lohrenz and Montague (2013) that actually trained participants to believe particular norms while playing a $20 Ultimatum Game (which is like the DG but the recipient can reject the "dictator's" allocation in which case both of them end up with nothing). In particular, in one of the conditions the first 30 offers in the Ultimatum Game were drawn from a normal distribution with a very unfair mean ($4),

but the next 30 offers were drawn from a medium mean distribution ($8). In another condition, the first 30 offers were drawn from a hyper-fair mean ($12) while the next 30 were drawn from the same medium mean as in the first condition. Interestingly, when faced with the second 30 offers drawn from the medium distribution (same across conditions), participants who were trained on an unfair norm more frequently accepted offers in the range of $6-$8 than those trained on the hyper-fair norm. Not only can this result not be easily explained by distributional models of social preferences (same outcome across conditions), but it also suggests that a norm-based theory may be accurately describing the psychology of choices in circumstances outside of the one-shot domain as well. The strongest critique against a social norms account of social preferences is likely that it is heavily context dependent (social preferences are conditional on expectations generated by the situation) and therefore sacrifices generality and ease of use. The requirement of additional inputs for making behavioral predictions may not be appealing, but for those interested in a closer approximation of how the mind may actually make social decisions, it could be worth the tradeoff.

If future work would like to pursue the ideas that motivated the present paper, one suggestion would be to switch the task. Upon completing the present work we became aware of a paper by Dreber, Ellingsen, Johannessen, and Rand (2013) who investigated subtle framing effects in Dictator Games. A popular finding in the literature is that labeling a Prisoner's dilemma situation as the "Community Game" vs. the "Wall Street Game" can impact the choices people make (e.g. Liberman, Samuels & Ross (2004)). Dreber et al. (2013) attempted to replicate this effect along with another labeling effect in the DG to no avail. The explanation they give for this null result is that the social norms

of the DG are less ambiguous because one player is at the complete mercy of another (and hence the dictator may feel more socially responsible). In support of this idea they cite Handgraaf, Van Dijk, Vermunt, Wilke, and De Dreu (2008) who employed a twist on the Ultimatum Game (UG) invented by Suleiman (1996). The standard UG allows the Recipient of a Dictator (or "Proposer") allocation to respond by either accepting the offer in which case it is carried out, or rejecting the offer in which case both players end up with nothing. In Suleiman's (1996) version, choosing to reject an offer resulted in the offered split being reduced/discounted by a known factor, δ. If $\delta = 0$ then "rejecting" would have the same effect as the standard UG (both players got nothing), but if $\delta = 1$ then "rejecting" would have no effect on the outcome and the players were essentially in a Dictator Game. Suleiman (1996) and Handgraaf et al. (2008) varied δ and both found that Proposers made significantly more generous "offers" when $\delta = 1$ (they were playing the DG) than when δ was high but not exactly 1 (0.8 or 0.9). Handgraaf et al. (2008) argued that, essentially, competitive norms were activated when the Recipient had any power to retaliate ($\delta = 0.8$ or 0.9), but that when the Recipient was powerless ($\delta = 1$) norms of social responsibility were activated and strategic reasoning received less weight. If this is the case, it may be easier to manipulate social norms and find differences in preferences for monetary vs. nonmonetary goods in a game with more ambiguity about what is expected (e.g. Ultimatum Game) than the Dictator Game where the norm of sharing is possibly stronger.

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