Abstract: We design an experiment to identify the motivation underlying dictators’ behavior. In the typical dictator game, the recipient’s payoff is completely determined by the amount passed. We give an endowment to the recipient as well as the dictator, breaking the equivalence between the amount passed and the recipient’s payoff. The majority of dictators behave as if recipients’ payoffs are normal goods. When we increased recipients’ endowments, dictators decreased the amounts passed. More than half of dictators are averse to inequality. They passed nothing when endowments were equalized. We conclude that in the standard dictator game most dictators pass because the recipients are given no endowments and inequality is at its maximum.

Keywords: Other-regarding utility, dictator game

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JEL Classifications: C91, D63, D64
1. Introduction

In the standard dictator game the dictator receives an endowment that she allocates between herself and the recipient. A selfish dictator should keep the entire endowment leaving the recipient with nothing. However, many experimental studies find that, on average, only 30\% of the dictators act selfishly. The remaining 70\% pass at least a portion of their endowment.\(^1\) Thus, dictators appear to be motivated by considerations beyond their own personal payoffs. The question is: “What exactly are these additional considerations?”

Two alternatives are advanced in the literature. First, Andreoni and Miller (2002) propose a model of other-regarding preferences in which the utility of the dictator depends on the final payoffs both to herself and to the recipient. A special case of the other-regarding preferences is the inequality aversion model suggested by Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) to explain the outcomes in a variety of settings that are not consistent with a pure selfish utility function. Second, Andreoni (1990) suggests that individuals derive positive utility from the act of giving (a warm glow).

We present here the results of an experiment designed to identify more clearly the motivation underlying dictators’ behavior. In the typical dictator game, the recipient’s payoff is completely determined by the amount passed. We give an endowment to the recipient as well as the dictator, breaking the dependence and identity between the amount passed and the recipient’s payoff. The recipient’s endowment introduces a new dimension in the recipient’s final payoff that is independent of the dictator’s act of giving. This new dimension allows us to distinguish dictator’s giving motivated by warm glow from giving motivated by other-regarding preferences.

Our results are generally consistent with other-regarding preferences. In particular, the recipient’s final payoff is a key determinant of the dictator’s giving and the majority of dictators exhibit behavior consistent with inequality aversion. As we increase the recipient’s endowment from 0 to an amount equal to the dictator’s endowment, the

\(^1\) See, for a discussion, the excellent survey by Camerer (2003).
mean amount passed drops from 30% to less than 12% of the dictator’s endowment, and the proportion of dictators who pass positive amounts falls from 75% to 25%.

Our experiment complements Andreoni and Miller (2002) experimental findings. They vary the dictators’ endowments and costs of giving and find that the results are generally consistent with the generalized axiom of revealed preference and, therefore, with other-regarding utility functions. However, in the Andreoni and Miller’s experiment the recipient final payoff depends on the amount passed by the dictator. Therefore, the motivations for giving cannot be completely disentangled from the amount passed.

Four sections follow. Section 2 describes the other-regarding utility functions and derives theoretical predictions. The experimental design is presented in the Section 3, and the results are reported in Sections 4 and 5. A final section contains a summary.

2. Models of Dictator’s Preferences

The dictator is given an endowment $E_d > 0$ and chooses from it a discrete amount, $P$, to pass to the recipient, subject to $0 \leq P \leq E_d$. Let $E_r$ denote the endowment given to the recipient. In the standard dictator game, $E_r = 0$. In our experiment, the recipient may also be given a positive endowment. That is, $E_r \geq 0$. The final payoffs to the dictator and to the recipient, $\pi_d$, and $\pi_r$, are, therefore, given by

$$ \pi_d = E_d - P \quad \text{and} \quad \pi_r = E_r + P. $$

Recent work by Bardsley (2008), List (2007), Bolton and Katok (1998), and Eckel, Grossman and Johnston (2005) include experiments in which $E_r > 0$. Bardsley (2008) and List (2007) consider a “taking game,” in which the dictator has the option of taking from the recipient’s endowment. Similarly in Bolton and Katok (1998), and Eckel, Grossman and Johnston (2005) the recipient is given an endowment which is taken from the dictator’s endowment. Our design differs from these in that dictators may only pass, and the increase in the recipient’s endowment is independent of the dictator’s endowment. Konow (2006), as part of a study on altruism, designed a “subsidy” treatment in which the recipients are given a positive endowment independent on the dictators’ endowment. His design is the closest to ours.

The effect of an increase in the recipient’s endowment on the optimal amount to pass depends upon the utility function motivating the dictator’s giving. The other-
regarding utility function can be written as \( U_{\text{OR}}(\pi_d, \pi_r) \). Since \( \pi_d = Ed - P \) and \( \pi_r = Er + P \), the dictator’s utility depends on both endowments. The assumption that both final payoffs are normal goods yields more specific predictions. Final payoffs are normal goods when the optimal values of each increases as the budget defined as sum of the endowments increases. That is,

\[
\frac{\partial \pi_{d,\text{OR}}}{\partial (Ed + Er)} > 0 \text{ and } \frac{\partial \pi_{r,\text{OR}}}{\partial (Ed + Er)} > 0,
\]

with \( \pi_{d,\text{OR}} \) and \( \pi_{r,\text{OR}} \) denoting the optimal dictator’s and recipient’s payoffs under \( U_{\text{OR}} \) preferences. Using \( P = Ed - \pi_d \) and \( P = \pi_r - Er \), and assuming normality, we derive that

\[
-1 < \frac{\partial P_{\text{OR}}}{\partial Er} < 0, \tag{2}
\]

where \( P_{\text{OR}} \) is the optimal amount passed under \( U_{\text{OR}} \) preferences. This is our first prediction.

**Normal Other-Regarding Prediction (P1):** Holding \( Ed \) constant, the optimal amount passed by a normal other-regarding dictator falls as the recipient’s endowment increases, with the amount passed falling by less than the increase in the recipient’s endowment.

The models of equity and reciprocity (Bolton and Ockenfels (2000)) and of income inequality aversion (Fehr and Schmidt (1999)) yield an alternative prediction. Both models are special cases of other-regarding utility functions and we will refer to them as inequality aversion preferences. Both models assume that \( \partial U/\partial \pi_d \geq 0 \) and that

\[
\frac{\partial U}{\partial \pi_d} = \frac{\partial U}{\partial \pi_r} = 0 \text{ or } \frac{\partial U}{\partial (\pi_d - \pi_r)} = 0 \text{ according to } \pi_d \geq \pi_r. \]

Let \( P_{ER} \) and \( P_{IA} \) be, respectively, the optimal choices of the amount to pass under the two models. Both models imply\(^2\) that

\[
0 \leq P_{ER}, P_{IA} \leq \frac{(Ed - Er)}{2}. \tag{3}
\]

This is our second prediction.

\(^2\)A proof by contradiction establishes the result. Suppose that \( P_{ER} > (Ed - Er)/2 \). This can be rewritten as \( Ed - P_{ER} = \pi_d < (Er + P) = \pi_r \). Since \( \pi_d < \pi_r \), a decrease in \( P \) unambiguously increases utility. The decrease both increases \( \pi_d \) and decreases \( \pi_d/\pi_r \) and both effects increase utility. Similarly, if \( P_{IA} > (Ed - Er)/2 \) then \( \pi_d < \pi_r \) and a decrease in \( P_{IA} \) would unambiguously increase utility.
**Inequality Averse Prediction (P2):** The optimal amount passed by an inequality averse dictator is bounded by 0 and one-half of the difference between the two endowments.

Inequality aversion implies that the optimal amount passed exceeds zero whenever the dictator’s endowment exceeds the recipient’s, and that the optimal amount passed falls to zero when the two endowments are equal. Therefore, the Normal Other-Regarding Prediction tends to hold for inequality averse dictators as well. As the difference between the endowments decreases, the optimal amount passed under inequality averse preferences must eventually fall, and this holds even without imposing the normality assumption. However, without normality, the decrease needs not be monotonic. Moreover, the normal other-regarding model never requires the optimal amount passed to fall to zero. When the assumption of normality is added to the inequality aversion model, the latter becomes a special case of the normal other-regarding model.

The implications of warm glow preferences stand in stark contrast to the predictions of the other-regarding models. If dictator’s giving is motivated solely by warm glow, the utility function can be written as \( U_{WG}(\pi_d, P) \) and dictators’ utility is completely determined by her own endowment and the amount passed. In this model, the recipient’s endowment does not affect the dictator’s choices. This leads to our final prediction.

**Warm Glow Prediction (P3):** The optimal amount passed by a pure warm glow dictator is independent on the recipient’s endowment.

3. **Experimental Design**

The experiments were conducted in the Laboratory for Experimental Research in Economics and Business at Virginia Commonwealth University, with student volunteers recruited from basic and intermediate economics courses. We conducted 4 sessions with a total of 68 subjects, 34 dictators and 34 recipients. Subjects earned an average of $11.21. The procedure follows.
Recruited subjects enter the lab and are randomly divided into two groups. The groups sit facing each other on opposite sides of the room. The monitor reads the instructions aloud. The instructions conclude with a quiz designed to help the participants become familiar with the type of choices involved in the dictator game. The monitor checks the quiz to be sure that all subjects clearly understand the nature of the choices. After the quiz, a common and public toss of a die determines which of the two groups contain the dictators (Blue players) and which contains the recipients (Green players).

Each dictator completes a total of 8 decisions for different values of the endowments, $E_r$ and $E_d$:

$E_r = \$0, \$2, \$4, \$6$ when $E_d = \$6$,

$E_r = \$0, \$4, \$8, \$12$ when $E_d = \$12$.

A particular level in inequality between the dictator and the recipient characterizes each decision. We define inequality as $i = \frac{E_d - E_r}{E_d}$, and it ranges from 0, when the two endowments are equal, to 1 when the difference in endowments is the highest.\(^3\)

Compared to the design by Konow (2006), we systematically vary the recipient’s endowment over a wide range of inequality values, as he compares the amount passed under $E_r = \$0$ and $E_d = \$10$ with the amount passed under $E_r = \$4$ and $E_d = \$10$.

The dictator makes all 8 decisions simultaneously by completing her Decision Record Sheet,\(^4\) shown in Table 1 below.\(^5\)

\(^3\) Complete inequality, $i=1$, corresponds to the standard set up for dictator games, when recipients are not given any endowment.

\(^4\) Soliciting all eight decisions simultaneously has at least two advantages. First, making all decisions simultaneously prevents any learning that may occur if subjects repeat the same decision over time. Second, choices may be more consistent because subjects can easily compare each setting and the impact of each choice.

\(^5\) In one of the four sessions (with $N=20$ subjects) the order of choices in Table 1 was reversed: D, C, B, A and H, G, F, E. Dictators made allocation decisions similar to the reversed case: in particular, for 6 out of 8 choices, we could not reject the Mann-Whitney null that the two samples were drawn from a single population. Therefore, we report all results as a joint sample.
She also records these decisions on her personal record sheet. Next, the dictator’s decisions are transmitted anonymously to the recipient randomly paired with that dictator. After the recipients record the 8 decisions on their own personal record sheets, the monitor collects the Decision Record Sheets and, then, publicly and randomly determines which of the 8 decisions will be implemented. The subjects record their payoffs in personal logs and complete a questionnaire. They then proceed to be paid privately by an assistant not involved with the experiment. At this time, the subjects also receive a $3 participation fee.

4. Experiment Findings

Descriptive statistics of the dictators’ choices are reported in Table 2. They are consistent with the Normal Other-Regarding and Inequality Averse Predictions, but not the Warm Glow Prediction. For each of the eight different scenarios in the experiment, Table 2 reports the proportion of dictators who pass a positive amount, and the mean and

<table>
<thead>
<tr>
<th>Decision</th>
<th>Ed</th>
<th>Er</th>
<th>Proposed Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kept by</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blue Player</td>
</tr>
<tr>
<td>A</td>
<td>$6</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>$6</td>
<td>$2</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>$6</td>
<td>$4</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>$6</td>
<td>$6</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>$12</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>$12</td>
<td>$4</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>$12</td>
<td>$8</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>$12</td>
<td>$12</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Decision Record Sheet
median dollar amounts passed in each case. The table also reports means and medians of
the pass rates, defined as the ratio of the amount passed to the dictator’s endowment
\( P/Ed \).

As predicted by the Normal Other-Regarding Prediction, the mean and median
amounts passed fall as the recipient’s endowment increases. The mean pass rate falls
from about 30% when the recipient’s endowment is $0 and inequality equals one, to
around 10% or less when endowments are equal and inequality is zero. As predicted by
the Inequality Aversion Prediction, the median pass rate falls to zero when endowments
are equal; that is, 74% of the dictators choose to pass nothing when inequality is zero.

<table>
<thead>
<tr>
<th>Er</th>
<th>Dictators’ Endowment Ed=$6</th>
<th>Dictators’ Endowment Ed=$12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Er=$0</td>
<td>Er=$2</td>
</tr>
<tr>
<td>Inequality</td>
<td>1</td>
<td>0.67</td>
</tr>
<tr>
<td>Positive Pass, %</td>
<td>79</td>
<td>82</td>
</tr>
<tr>
<td>Mean Pass, $</td>
<td>1.97</td>
<td>1.47</td>
</tr>
<tr>
<td>Median Pass, $</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Standard Deviation, $</td>
<td>1.31</td>
<td>0.86</td>
</tr>
<tr>
<td>Mean Pass / Ed, %</td>
<td>33</td>
<td>25</td>
</tr>
<tr>
<td>Median Pass / Ed, %</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Standard Deviation, %</td>
<td>22</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 2: Summary Statistics

Figures 1 and 2 report the mean and median pass rates. Both decline as the
recipient’s endowment rises and inequality falls from 1 to 0. The percentage of dictators
who pass a positive amount is relatively constant, falling only when the endowments are
equal and inequality is reduced to zero, as predicted by the Inequality Aversion
Prediction. Moreover, the mean and median pass rates do not differ much as the dictator’s
endowment rises from $6 to $12 when the level of inequality is held constant.
The trends observed in the data are statistically significant. Holding the dictator’s endowment constant, the amount passed by a dictator falls as the recipient’s endowment
rises. That is, the difference between the amounts passed when the recipient’s endowment is small and when the endowment is large is negative. Let $P_{i,Ed}$ denote the amount passed when inequality is $i$ ($i = \{1, 0.67, 0.33, 0\}$) and the dictator’s endowment is $E_d$ ($E_d = \{6, 12\}$). Table 3 shows the median difference in amounts passed and the proportion of negative differences for each value of $E_d$ across each pair of inequality values. For example, the first row reports that the median difference equals -$1 and the percentage of negative differences is 59% when inequality falls from 1 to 0.67 and $Ed = 6$. That is, when the dictator’s endowment is $6$ and the recipient’s endowment rises from $0$ to $2$, the median decrease in the amount passed equals $1$ and 59% of the dictators decreases the amount passed. The first row, similarly, reports that the median difference equals -$2 and the percentage of negative differences is 65% when inequality falls from 1 to 0.67 and $Ed = 12$. Of the 24 statistics reported in Table 3, 22 are significant at no less than the 10% level and 16 are significant at the 1% level. This supports the first part of the Normal Other-Regarding Prediction.

<table>
<thead>
<tr>
<th>Difference</th>
<th>$Ed=6$</th>
<th>$Ed=12$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Proportion $&lt;0$ (%)</td>
</tr>
<tr>
<td>$P_{0.67,Ed} - P_{1,Ed}$</td>
<td>-1**</td>
<td>59*</td>
</tr>
<tr>
<td>$P_{0.33,Ed} - P_{1,Ed}$</td>
<td>-1.5***</td>
<td>68***</td>
</tr>
<tr>
<td>$P_{0,Ed} - P_{1,Ed}$</td>
<td>-2***</td>
<td>71***</td>
</tr>
<tr>
<td>$P_{0.33,Ed} - P_{0.67,Ed}$</td>
<td>-1***</td>
<td>65**</td>
</tr>
<tr>
<td>$P_{0,Ed} - P_{0.67,Ed}$</td>
<td>-1***</td>
<td>71***</td>
</tr>
<tr>
<td>$P_{0,Ed} - P_{0.33,Ed}$</td>
<td>0</td>
<td>47</td>
</tr>
</tbody>
</table>

Table 3: Median Decrease in Amount Passed as the Recipient Endowment Increases

Note: ***, **, and * indicates one-tailed significance at the 1%, 5%, and 10% levels, respectively. The test for the median is the Wilcoxon signed-rank test with the null hypothesis $0$. The test for the proportion is Binomial with null hypothesis of equal probability of successes and failures.

Moreover, the median decrease in the amount passed is significantly smaller than the increase in the recipient’s endowment, as reported in Table 4. Table 4 shows the medians of the slopes with respect to changes in the recipient’s endowment. The slope is calculated by dividing the differences in amounts passed by the differences in the
corresponding recipient’s endowments. For example, the first row in Table 4 reports that, when the dictator’s endowment equals $6 and inequality decreases from 1 to 0.67, the median slope is -0.5 and 88% of the slopes exceed -1. That is, when the dictator’s endowment equals $6 and the recipient’s endowment increases from $0 to $2, the median slope is -0.5 and 88% of the dictators decrease the amount passed by less than $2. The first row also reports that when the dictator’s endowment is $12 and inequality decreases from 1 to 0.67, the median slope is again -0.5 and 85% of the slopes exceed -1. All 24 statistics are significant at the 1% level. This supports the second part of the Normal Other-Regarding Prediction.

\[
\text{Slope} = \frac{\Delta P}{\Delta i Ed}
\]

<table>
<thead>
<tr>
<th>Slope expression</th>
<th>$Ed=6$</th>
<th>Proportion $&gt;-1$ (%)</th>
<th>$Ed=12$</th>
<th>Proportion $&gt;-1$ (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{(P_{0.67,Ed} - P_{1,Ed})}{0.33 Ed})</td>
<td>-0.5***</td>
<td>88***</td>
<td>-0.5***</td>
<td>85***</td>
</tr>
<tr>
<td>(\frac{(P_{0.33,Ed} - P_{1,Ed})}{0.67 Ed})</td>
<td>-0.38***</td>
<td>97***</td>
<td>-0.25***</td>
<td>94***</td>
</tr>
<tr>
<td>(\frac{(P_{0,Ed} - P_{1,Ed})}{Ed})</td>
<td>-0.33***</td>
<td>97***</td>
<td>-0.25***</td>
<td>97***</td>
</tr>
<tr>
<td>(\frac{(P_{0.33,Ed} - P_{0.67,Ed})}{0.33 Ed})</td>
<td>-0.5***</td>
<td>91***</td>
<td>-0.25***</td>
<td>91***</td>
</tr>
<tr>
<td>(\frac{(P_{0,Ed} - P_{0.67,Ed})}{0.67 Ed})</td>
<td>-0.25***</td>
<td>97***</td>
<td>-0.25***</td>
<td>97***</td>
</tr>
<tr>
<td>(\frac{(P_{0,Ed} - P_{0.33,Ed})}{0.33 Ed})</td>
<td>0***</td>
<td>88***</td>
<td>-0.25***</td>
<td>91***</td>
</tr>
</tbody>
</table>

Table 4: Median Ratio of the Decrease in Amount Passed over the Increase in Recipient’s Endowment

Note: ***, **, and * indicates one-tailed significance at the 1%, 5%, and 10% levels, respectively. The test for the median is the Wilcoxon signed-rank test with the null hypothesis 0. The test for the proportion is Binomial with null hypothesis of equal probability of successes and failures.

These findings supporting normal other-regarding preferences complement the findings of Andreoni and Miller and eliminate a possible alternative explanation of their results. Andreoni and Miller vary the cost of giving by subsidizing or taxing the amount passed and, therefore, \(\pi_R = sP\), where \(s\) denotes the rate of subsidization or taxation. This design is unable to distinguish between the revealed preferences for \(\pi_R\) and \(sP\). Our

\[i = \frac{E_d - E_r}{E_d}, \quad Er = Ed (1 - i) \quad \text{and} \quad \Delta Er = -Ed \Delta i.\] For instance, if \(Ed=6\) and \(i\) decreases from 1 to 0.67, then \(Er\) increases by $2 from $0 to $2.

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6 Since \(i = \frac{E_d - E_r}{E_d}\), \(Er = Ed (1 - i)\) and \(\Delta Er = -Ed \Delta i\). For instance, if \(Ed=6\) and \(i\) decreases from 1 to 0.67, then \(Er\) increases by $2 from $0 to $2.
results indicate that it is the recipient’s payoff that motivates giving, not a pure warm-glow like effect resulting from the net impact of the dictator’s gift on the recipient.

A test for the Inequality Averse Prediction requires checking the range over which the amount passed realizes. Such range is bounded by 0 and one-half of the difference between the two endowments. When inequality is at its maximum level, this range is wide and, therefore, the prediction is not particularly informative. For example, in the case when $Ed = $12 and $Er = $0 (i.e., the standard dictator game), all dictators’ choices satisfy this prediction. On the other hand, in our design when inequality is reduced to zero, the predicted range reduces to one point, $P = $0. The data show that 76% of the dictators with $6 endowment and 74% of the dictators with $12 endowment pass zero in this case.

Finally, the data do not support the Warm Glow Prediction. No dictator keeps the amount passed constant as the recipient’s endowment is changed.

5. Classification of Dictators

Our data allows us, in the spirit of Andreoni and Miller (2002), to classify dictators according to whether their choices are consistent with the theoretical predictions corresponding to various utility functions. From our discussion, we have seen that no dictators behave according to the Warm Glow prediction. As noticed earlier, Prediction 1 and 2 intersect, as inequality aversion can realize with normal or not normal other-regarding preferences Also, as Andreoni and Miller (2002) discuss, often dictators choose to pass an amount that guarantees equal final payoffs. This behavior is consistent with both the inequality aversion and normal other-regarding models. Finally, we cannot exclude that some dictators may have completely selfish preferences.

Therefore, we can identify six possible classifications of our subjects: normal other-regarding, normal inequality averse, non-normal inequality averse, equal final

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7 Our experiment is not designed to test impure altruism. Impure altruism occurs when dictators have both other-regarding and warm glow preferences, so that $U = U(D, R, P)$. The predicted effects of an increase in $Er$ under the impure altruism resemble the predictions under other-regarding preferences.
payoffs, selfish, and not elsewhere classified. The formal classification rules are provided in Appendix A.  

The behavior of dictators is heterogeneous as Figure 3 shows. 12% of the dictators are classified as selfish, as they choose a zero pass in all 8 decisions. 24% split payoffs equally; 21% are normal inequality averse, but do not split payoffs equally; 9% are normal other-regarding, but do not equal payoff nor normal inequality averse; 9% are non-normal inequality averse. Thus, the total percentage of dictators with normal inequality averse preferences is 45% = 21% + 24%; the total percentage of dictators with inequality averse preferences is 53% = 45% + 9% (61% of the non-selfish dictators); and the total percentage of dictators with normal other regarding preferences is also 53% = 45% + 9%. We are unable to classify the remaining 25% of dictators.

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**Figure 3: Classification of Dictators**

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8 Our classification corresponds to the strong classification used by Andreoni and Miller (2002). Any deviation from the behavior described in a rule eliminates the dictator from that category.

9 The percentage does not equal 54% because of rounding.

10 The percentage does not equal 54% because of rounding.
6. Summary

We have designed an experiment to identify more clearly the motivation underlying dictators’ behavior, by giving an endowment to the recipient as well as the dictator. Variations in the recipients’ endowments systematically and predictably affect dictators’ giving. Normal other-regarding preferences accurately predict the median trends and individual behavior for 53% of our dictators. As recipients’ endowments increase, the amount passed falls, and this decrease is smaller than the size of the endowment’s increase. Similarly, the inequality averse utility model accurately predicts the behavior of 53% of all dictators and 83% of the normal other-regarding dictators. These dictators pass nothing when the two endowments are equal. The percentage of dictators passing a positive amount decreases from 75%, when their endowments exceeded the recipients’ endowments, to 25% when both endowments are equal. Finally, 24% of the dictators show a behavior consistent with extreme inequality aversion: dictators simply equalize final payoffs. We fail to find support for the warm glow utility model.

In the traditional dictator game, the recipient’s endowment is zero and inequality is at its maximum. We conclude that most dictators pass positive amounts in this setting because of the implicit extreme inequality present in the design. The dictator is given a positive endowment, while the recipient’s endowment is zero. This paper shows that a majority of dictators stop giving when the endowments are equal and inequality is reduced to zero. So, as the title of the paper suggests, dictators are generous, but the majority of them are generous only with the less fortunate.
Appendix A

**Selfish Rule:** If a dictator passes zero in all eight choices

\[ P_{1,Ed} = P_{0.67,Ed} = P_{0.33,Ed} = P_{0,Ed} = 0, \text{ with } Ed = \{6\text{-}12\} \]

then the dictator is classified as having selfish preferences.

**Normal Other-Regarding Rule:** A dictator has other regarding preferences if, holding her endowment constant, the pass rate decreases monotonically as the recipient’s endowment rises, and the decrease is smaller than the reduction in inequality. Also, holding the recipient’s endowment constant, the pass rate rises monotonically as the dictator’s endowment rises, and the increase is smaller than the increase in the endowment. Since the dictator’s choice set in the experiment is not continuous, this rule is formalized as follows:

\[ P_{1,Ed} > P_{0,Ed}, \quad 0 \geq \frac{P_{i,0.33,Ed} - P_{i,Ed}}{Er_{i,0.33,Ed} - Er_{i,Ed}} \geq -1, \text{ with } i = \{1, 0.67, 0.33\}. \quad Ed = \{6\text{-}12\} \]

\[ 0 < (P_{1,512} - P_{1,50}) < 6 \text{ and } 0 < (P_{0.33,512} - P_{0.67,50}) < 6. \]

**Normal Inequality Aversion Rule:** A dictator is classified as being normal and inequality averse if she is classified as having normal other regarding preferences and never passes more than half of the difference in endowments. Thus, the normal inequality aversion rule is

Normal Other Regarding Rule and \[ P_{i,Ed} \leq \frac{Ed - Er_{i,Ed}}{2}, \]

with \( i = \{1, 0.67, 0.33, 0\} \) and \( Ed = \{6\text{-}12\} \).

**Non-Normal Inequality Aversion Rule:** A dictator has inequality averse preferences that are not normal if her amount passed does not decrease monotonically, and she never passes more than half of the difference in endowments:

\[ P_{i,Ed} \leq \frac{Ed - Er_{i,Ed}}{2}, \text{ with } i = \{1, 0.67, 0.33, 0\} \text{ and} \]
Equal Payoff Rule: A dictator is classified as having equal payoff preferences when:

$$P_{i, Ed} < P_{0.67, Ed} \text{ or } P_{0.67, Ed} < P_{0.33, Ed}, \text{ with } Ed = \{6, 12\}.$$
Bibliography


COVER SHEET

In your packet you have the following materials. Please check to see that all materials are present.

Subject Information Sheet
Instructions
Procedure
Questionnaire

Please fill out the first item now.

WE REQUEST THAT YOU DO NOT DISCUSS YOUR PARTICIPATION IN THIS ACTIVITY WITH ANYONE OUTSIDE THIS ROOM.
SUBJECT INFORMATION SHEET

Subject ID: _____________________________________________

1. Sex: M F

2. Age: ________________

3. Race (check the appropriate category):
   Asian _____ African American _____ Caucasian _____
   Hispanic _____ Native American _____ Other _________________

4. Compared with other students at VCU, my income is
   _____ Much above average
   _____ Above average
   _____ About average
   _____ Below average
   _____ Much below average

5. Class (check the appropriate category):
   Graduate student _____ Senior _____ Junior _____ Sophomore _____ Freshman _____

6. Major ________________________________________________

7. How many economics courses have you taken?
   High school courses ____
   College courses (including any you are currently enrolled in) ____

8. How many brothers and sisters do you have? ____
   Where are you in the birth order? __________
INSTRUCTIONS

This is an experiment about decision making. For agreeing to participate you will receive $3 show-up fee. You may also earn additional money depending on the decisions that you and the other people in the room will make. A research foundation has provided the funds for this experiment.

Any money you earn will be paid privately and in cash at the end of the experiment. Upon leaving the room, you will go to an assistant not involved with the experiment and show her your Record Sheet. She will record your earnings and ask you to complete and sign a receipt. This procedure will help guarantee your privacy, as the assistant was not in the room where the experiment was conducted. The proctors inside the room will never learn how much any specific individual in the room earned.

The entire experiment should be completed within an hour. You may discontinue your participation in the experiment at any time.

You will participate in a simple decision making game. In this game, there are two players: a blue and a green player. The blue player has to decide how much of $Y, a fixed amount of money, to pass to the green player and how much to keep for himself/herself. The blue player may choose any distribution of the $Y. Then, the money is distributed as proposed. In addition to the money passed by the blue player, the green player will also earn $X. Both the $Y and the $X will be announced later in the game.

QUIZ

Please answer the following questions. These are hypothetical problems, designed only to test your understanding of the instructions. The actual game will involve different values for $Y and $X.

Suppose that you are the blue player in this game. You will make TWO decisions about how to distribute $Y between yourself and the green player. At the beginning of each decision, the green player is given $X.

In decision I, you can choose any amounts between 0 and $100 (inclusive) in 1 dollar increments and the proposed amounts must add up to $100. In decision II you can choose any amount between 0 and $50 (inclusive) in 1 dollar increments and the proposed amounts must add up to $50.

Please, indicate your choices for these problems and calculate the hypothetical earnings for both participants.

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y</th>
<th>$X</th>
<th>Proposed Amount Kept by Blue Player</th>
<th>Proposed Amount Passed to Green Player</th>
<th>Blue Player’s Earnings</th>
<th>Green Player’s Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>$100</td>
<td>$20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II.</td>
<td>$50</td>
<td>$10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROCEDURE

The experiments will proceed as follows:

**Sitting arrangement:**
A toss of a die will randomly determine which of you will be the blue player (Even) and which of you will be the green player (Odd). All blue players will be together facing all green players. You will know that your partner is in the group facing you, but you will not be able to identify your partner.

**Decisions:**
There will be EIGHT decisions for various combinations of $Y$ and $X$, as indicated in the tables below.

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y$</th>
<th>$X$</th>
<th>Proposed Amount Kept by Blue Player</th>
<th>Proposed Amount Passed to Green Player</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$6</td>
<td>$6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>$6</td>
<td>$4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>$6</td>
<td>$2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>$6</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y$</th>
<th>$X$</th>
<th>Proposed Amount Kept by Blue Player</th>
<th>Proposed Amount Passed to Green Player</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>$12</td>
<td>$12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>$12</td>
<td>$8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>$12</td>
<td>$4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>$12</td>
<td>$0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Blue players will make all the decisions at the same time.

Each blue player will receive a sheet on which to record the eight decisions. Be sure to note carefully the differences between each decision. For each decision, the blue player must indicate the amount kept and the amount passed to the green player. Blue players can choose any amount between $0 and $Y$ (inclusive) in $1$ increments and the amounts must add up to $Y$ (either $6$ or $12$). After making the decisions, the blue player will record them on the Decision Sheet and on his or her Record Sheet.
Record Keeping:
After all blue players have recorded their eight decisions; their Decision Sheets will be collected by the proctors and distributed to their randomly chosen partners.

Upon receipt of the blue player’s decisions, the green player will record the amounts on his or her Record Sheet. Please take care to record the amounts correctly for each combination of $Y$ and $X$.

When all blue players have recorded the amounts, the proctors will collect the Decision Sheets.

Your earnings in this session will be determined as follows:
One of the eight decisions will be chosen at random. We will first toss a regular die to pick A-D or E-I (odd for A-D and even for E-I). Then, we will toss a 4-sided die to select one of the remaining four decisions. The blue player’s earnings will equal the amount of money kept on that decision. The green player’s earnings will equal the sum of the amount passed and $X$ on that decision.

This will be your total earnings for this experiment and the experiment will end here.

If you have any questions, we will be happy to answer them now. Once the games are underway, it is forbidden to ask questions or to make remarks.
BLUE PLAYER RECORD SHEET

Please record for each decision the proposed division. Record your final earnings at the end of the session at the bottom of this page.

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y</th>
<th>$X</th>
<th>Proposed Amount Kept by Blue Player</th>
<th>Proposed Amount Passed to Green Player</th>
<th>Your Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$6</td>
<td>$6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>$6</td>
<td>$4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>$6</td>
<td>$2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>$6</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>$12</td>
<td>$12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>$12</td>
<td>$8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>$12</td>
<td>$4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>$12</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Decision chosen for payment (circle 1): A B C D E F H I

Your earnings:___________
GREEN PLAYER RECORD SHEET

Please record for each decision the proposed division. Record your final earnings at the end of the session at the bottom of this page.

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y</th>
<th>$X</th>
<th>Proposed Amount Kept by Blue Player</th>
<th>Passed to Green Player</th>
<th>Your Earnings Plus $X</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$6</td>
<td>$6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>$6</td>
<td>$4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>$6</td>
<td>$2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>$6</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>$12</td>
<td>$12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>$12</td>
<td>$8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>$12</td>
<td>$4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>$12</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Decision chosen for payment (circle 1):  A  B  C  D  E  F  H  I

Your earnings:_____________
BLUE PLAYER DECISION SHEET

I. You have $Y = 6 to distribute. Please record for each decision the proposed distribution.

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y</th>
<th>$X</th>
<th>Proposed Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kept by Blue Player</td>
</tr>
<tr>
<td>A</td>
<td>$6</td>
<td>$6</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>$6</td>
<td>$4</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>$6</td>
<td>$2</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>$6</td>
<td>$0</td>
<td></td>
</tr>
</tbody>
</table>

II. You have $Y = 12 to distribute. Please record for each decision the proposed distribution.

<table>
<thead>
<tr>
<th>Decision</th>
<th>$Y</th>
<th>$X</th>
<th>Proposed Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kept by Blue Player</td>
</tr>
<tr>
<td>E</td>
<td>$12</td>
<td>$12</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>$12</td>
<td>$8</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>$12</td>
<td>$4</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>$12</td>
<td>$0</td>
<td></td>
</tr>
</tbody>
</table>
QUESTIONNAIRE

Subject ID _________________________________

In this exercise I was (circle one):   Blue Player   Green Player

Please explain your thought process in during this experiment:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
