

# **Legitimacy in the lab – The separate and joint effects of earned roles and earned endowments in third-party redistribution**

David Chavanne, Kevin McCabe and Maria Pia Paganelli

## **Abstract**

The experiment presented here provides evidence that the degree to which a third-party redistributor honors preexisting entitlements is bounded. Using real-effort tasks, the design varies whether roles and endowments are earned or given. Although the presence of earned roles and earned endowments each significantly decreases amounts redistributed away from an endowed stakeholder, redistribution does not decrease further when *both* roles and income are earned. Such outcomes suggest that, although perceptions of legitimacy matter to third parties, these perceptions are not particularly fine-tuned. Rather, third-party redistributors seem to view legitimacy as a binary concept. These results likely have implications for how voters form preferences for political redistribution.

## **1 Introduction**

Economics experiments generally require institutional rules to establish how subjects' initial roles and/or endowments are acquired. Rather than rely upon randomization or arbitrariness, experiments often use real-effort tasks as a means to legitimize either placement in roles<sup>1</sup> or allocation of endowments. Results have shown that subjects are more likely to reap the benefits of their advantageous role when it is earned – rather than assigned randomly or arbitrarily – in experiments involving bargaining (Hoffman and

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<sup>1</sup> The experimental economics literature largely treats the terms “earned roles”, “earned advantageous positions” and “earned property rights” (or simply “earned rights”) synonymously. Implicit in some definitions of “rights” however, is the notion that a “right” implies the right to “action” (Hoffman et al. 1994). Given that the advantageous position in our experiment does not come bundled with a right of action, we avoid potential ambiguities and use the terms “earned roles” and “earned advantageous positions”.

Spitzer 1985), ultimatum and dictator games<sup>2</sup> (Hoffman et al 1994), trust games (Fahr and Irlenbusch 2000) and third-party distribution (Dickinson and Tiefenthaler 2002). A separate set of experiments show that similar benefits accrue to those who earn their endowments in experiments examining bargaining (Borrows and Loomes 1994; Gächter and Riedl 2005), dictator games (Cherry et al. 2002; Frohlich et al. 2004; Konow 2000; Oxoby and Spraggon 2008; Ruffle 1998), public goods games<sup>3</sup> (Kroll et al. 2007), third-party distribution (Konow 2000) and taxation through voting (Clark 1998; Durante and Putterman 2009). These results show that subjects' perceptions regarding the legitimacy of respective entitlements in the experiment affect behavior across a wide assortment of experimental institutions.

Despite the attention given to the effects associated with earned roles and earned income, no single study (to our knowledge) has looked at these phenomena either comparatively or jointly.<sup>4</sup> The experiment presented in this paper compares earned-roles and earned-income effects in an otherwise equivalent task and tests whether their joint existence has consequences beyond their independent effects. The design employs a third-party redistributive task in which a decision maker has the option of redistributing some portion of an endowed stakeholder's money to an unendowed stakeholder. The results show that the presence of earned roles and earned income each significantly decreases amounts redistributed away from the endowed stakeholder relative to a

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<sup>2</sup> Rutstrom and Williams (2000), however, present results from a modified dictator game that show a negligible effect of earned endowments.

<sup>3</sup> Cherry et al. (2005) and Clark (2002) find that the presence of earned endowments does not affect behavior in a public goods game. The difference between the results of Cherry et al. (2005) and Kroll et al. (2007) is attributed to existence of asymmetries among group members in the latter study. Further support of earned endowments affecting behavior in the public goods game is uncovered by Harrison (2007), who re-analyses the data from Clark (2002) and finds results that point to an effect of earned endowments.

<sup>4</sup> Borrows and Loomes (1994) come closest by contrasting their earned-endowment design and results with the earned-role design and results of Hoffman and Spitzer (1985).

treatment in which neither component is earned. The earned-income effect is slightly (yet non-significantly) larger than the earned-roles effect. The results also show that redistribution does not decrease further when *both* roles and income are earned. Such outcomes suggest that, although perceptions of legitimacy matter to third parties, these perceptions are not particularly fine-tuned. Rather, third-party redistributors seem to view legitimacy as a binary concept. If a stakeholder earns some aspect of his advantageous state, then a lower level of redistribution is preferred; if nothing is earned, then preferred redistribution will be greater.

Given the established empirical connection between preferences for redistribution and redistributive policy (Alesina and Angeletos 2005; Alesina et al. 2001), our results likely have implications for how voters form preferences for political redistribution. Fong (2001) provides evidence that individuals' preferred levels of redistribution are closely linked to the degree to which they believe that endogenous (i.e. effort-related) or exogenous (i.e. lucky) factors influence mobility and wealth.<sup>5</sup> The fact that we observe significant separate effects of earned roles and earned income, in conjunction with the lack of an additive effect, implies that one's chosen stance regarding the relative importance of endogenous and exogenous factors may fail to account for multiple dimensions.

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<sup>5</sup> In the lab, the existence of earned (given) roles serves as a proxy for a state of the world in which mobility is endogenous (exogenous); the existence of earned (given) income serves as a proxy for a state of the world in which wealth is endogenously (exogenously) determined.

## 2 Design

### *Treatments*

The decision task in our experiment is similar to those used by Konow (2000) and Dickinson and Tiefenthaler (2004) to the extent that all three experiments empower impartial third parties to make decisions involving other people's money. Our experiment differs in that our third parties *redistribute* money that is prepossessed by one of the two stakeholders; in the other two experiments, resources are distributed out of a jointly owned account. Moreover, Konow's third-party treatments<sup>6</sup> test for the effect of earned endowments, while Dickinson and Tiefenthaler test for the effect of earning an advantageous position (i.e. a higher token-to-payoff ratio). Treatments in our design test for the effects of both earning an advantageous role (that of the endowed stakeholder) and earning the endowment that is subsequently subjected to third-party redistribution.

Across all of the experiment's treatments, a third-party decision maker is paired with a sender and a receiver. The sender acquires money and the decision maker is given the opportunity to send any portion of the sender's money to the receiver. Differences between treatments stem from how senders' and receivers' roles are assigned (earned- or given-roles) and how senders' initial endowments are acquired (earned- or given-income).

Roles are assigned either randomly or by performance on a quiz. In earned-roles treatments, all non-decision makers took a current-events quiz that was made up of

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<sup>6</sup> Konow (2000) uses third-party decision making to provide a normative standard to which behavior in a standard dictator game can be compared.

questions pertaining to the 2008 US presidential election and general international affairs.<sup>7</sup> All subjects were told that those who ranked in the top half of the distribution of scores would be senders and those who ranked in the bottom half of the distribution would be receivers. In given-roles treatments, all roles were determined by the random selection of identification letters prior to the experiment.

Senders acquire their income either randomly or through work. In earned-income treatments, senders are given seven minutes to work on a word-search task, earning \$2 for each word that they find.<sup>8</sup> In given-income treatments, senders receive an amount of money that is written on a randomly drawn ticket. The distribution of amounts in treatments with tickets mimics a distribution from a treatment with earned income.<sup>9</sup>

With both roles and income being associated with either a given or earned process, the design can be characterized by a 2 x 2 matrix with the following four treatments: givenR-givenI, givenR-earnedI, earnedR-givenI and earnedR-earnedI, where \*R (\*I) denotes the type of process that determines roles (income).

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<sup>7</sup> Hoffman et al. (1994) and Dickinson and Tiefenthaler (2002) also use knowledge quizzes to assign roles. Other real-effort tasks that have been used to determine roles include games of strategy (Hoffman and Spitzer 1985) and physical labor (Fahr and Irlenbusch 2000).

<sup>8</sup> Our word-search task follows that used by Burrows and Loomes (1994) to determine initial endowments in a bargaining game. Other real-effort tasks that have been used to determine endowments include knowledge quizzes (Cherry et al. 2002; Clark, 1998; Dickinson and Tiefenthaler, 2002; Durante and Putterman 2009; Gächter and Reidl 2005; Oxoby and Spraggon 2008); Ruffle, 1998, physical labor (Konow, 2000), correction of spelling errors (Frohlich et al. 2004) and games of strategy (Durante and Putterman 2009; Rutstrom and Williams 2000).

<sup>9</sup> Senders' earnings from the word search range from \$4 to \$36. Median earnings from the word search are \$17.

### *Events and Procedures*

All subjects were recruited via an online database made up of undergraduate and graduate students at George Mason University. Sessions required fourteen subjects. All participants signed a consent form, received a show-up fee of \$7.50 or \$7.00 and drew a slip of paper from a container.

In given-roles treatments, the main instructions (see Appendix A) immediately followed the drawing of slips. Instructions explained the procedures and told subjects that those who drew A-D would be senders, those who drew E-H would be decision makers and those who drew I, J, K or N would be receivers; two people who drew Ms would be monitors. After the instructions were read both silently and aloud, all senders and receivers left the lab and were brought by experimenters to different rooms. Decision makers remained in the lab.

In earned-roles treatments, eight slips were labeled with a “Q,” four were labeled with a “D,” and two were labeled with an “M.” A preliminary set of instructions (see Appendix B) then told all participants that the eight people with “Qs” would take a quiz, and “the four Qs who score highest will earn an opportunity to make money.” The four people who drew Ds and the two people who drew Ms were told to wait silently while the others took the quiz. After the quiz, the main instructions were read both silently and aloud. The eight subjects who took the quiz then left the lab, were sorted into senders and receivers based on performance, and were brought by experimenters to different rooms. Decision makers remained in the lab.

Across all treatments, monitors were used in order to create double-blind procedures similar to Hoffman et al. (1996). All materials used throughout the experiment were coded with an identification letter and silently passed out and collected by one of the monitors. Thus, the monitors knew the mapping from subject to ID, while the experimenters knew the mapping from ID to decisions. Nobody, however, knew the mapping from subjects to decisions. All subjects were also told that the monitors were responsible for ensuring that experimenters followed the instructions.

Once decision makers, senders and receivers were divided, separate procedures took place in each room. In the senders' room, the amount of money that each sender would receive was determined first. In given-income treatments, each sender drew a slip of paper with an amount of money written on it. In earned-income treatments, each sender worked on the word search (see Appendix C). Following the stakes-determining task, senders were given envelopes that contained their money; the monitor then collected all of this money. Senders then took a questionnaire (see Appendix D) that tested for comprehension of the instructions. Expectations, conditional on the amount of money that they either earned or were given, were elicited with the following question:

You earned/have been given \$X.  
How much do you expect your paired Decision Maker to have you send to your paired Receiver? \$ \_\_\_\_\_

In the lab, decision makers were first given questionnaires to test for comprehension.<sup>10</sup> They then earned money by working on the word search.<sup>11</sup> Once the

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<sup>10</sup> All decision makers were given two questionnaires sequentially (the first one is included in Appendix D). After the first questionnaire, an experimenter corrected any mistakes. A monitor then returned the original questionnaire and passed out a second one. If mistakes were made on this second questionnaire, the subject's decision was excluded from the analysis. All references made to "correct" or "incorrect" questionnaires refer to this second-chance questionnaire.

senders' stakes were determined, the appropriate sender's amount was written on each decision form. Each form was then given to the appropriate decision maker, who made his or her decision, placed the form in an envelope, and gave the envelope to a monitor. After the envelopes with the decision forms were brought to the receivers' room, decision makers were paid and dismissed.

In the receivers' room, receivers waited while senders' determined their stakes and decision makers made their decisions. Once senders' stakes were determined, receivers were given questionnaires that tested their comprehension of the instructions and elicited expectations (conditional on the senders' stakes) with the following question:

Your paired Sender earned/has been given \$X.  
How much do you expect your paired Decision Maker to have the Sender send to you? \$ \_\_\_\_\_

After decision makers made their decisions, all decision forms and money were brought to the receivers' room, where an experimenter determined the payoffs of each sender and receiver and put the proper amount in each subject's envelope. Receivers and senders were then dismissed separately.

Decision forms provided the following information in given-income treatments:

Sender X was given \$xx.  
The receiver with whom s/he is randomly paired was given \$0.  
I choose to have sender X send \$\_\_\_\_\_ to the receiver with whom s/he is randomly paired.

In earned-income treatments, "Sender X has earned \$xx" replaced the first line from above.

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<sup>11</sup> Additional treatments show that decision makers who earn money (with the word search) do not behave differently compared to decision makers who are given money (through random selection).

### 3 Results

24 observations were collected in each of the four treatments. A box plot of decisions in the four treatments is displayed in Figure 1. The bold lines correspond to each treatment's median; the top (bottom) of each box corresponds to the third (first) quartile, while isolated dots correspond to outliers that are either less than the first-quartile or greater than the third-quartile percentage sent. Descriptive statistics are displayed in Table 1.

[Insert Figure 1 about here.]

[Insert Table 1 about here.]

Figure 2 displays the cumulative distribution functions of percentages sent, while Table 2 presents the results of pairwise Wilcoxon rank-sum tests.

[Insert Figure 2 about here.]

[Insert Table 2 about here.]

Redistribution is highest in the givenR-givenI treatment, and a sign test confirms that the median percentage sent in this treatment is not statistically different from  $\frac{1}{2}$  ( $p = 0.22$ ). Moreover, 18 out of the 24 third-party decision makers in the givenR-givenI treatment redistribute half of the sender's income.

As predicted, the existence of earned income and earned roles each decrease redistribution. The median percentage sent in the givenR-earnedI (earnedR-givenI)

treatment is 0.354 (0.405). Visually, the effect of earned roles can be seen by comparing the cumulative distribution functions of the givenR-givenI and earnedR-givenI treatments, which are each marked with triangles in Figure 1. A rank-sum statistic of 2.90 ( $p = .004$ ) allows rejection of the hypothesis that earned roles have no effect. Likewise, the effect of earned income can be seen by comparing the givenR-givenI and givenR-earnedI distributions – both emboldened in Figure 2. A rank-sum statistic of 3.46 ( $p = .0005$ ) allows rejection of the hypothesis that earned income has no effect.

Despite these two separate effects, redistribution does not decrease further if both earning conditions are met. The median percentage sent in the earnedR-earnedI treatment is 0.345. The distribution of percentages sent in the earnedR-earnedI treatment is shown by the lightly-shaded line marked with squares in Figure 2. Rank-sum tests show that redistribution in the earnedR-earnedI treatment is not significantly lower than redistribution in the treatment with only earned income ( $z = 0.00$ ,  $p = 1.00$ ) or the treatment with only earned roles ( $z = 1.139$ ,  $p = .255$ ). Thus, the data do not allow rejection of the two joint hypotheses. Although the existence of earned roles and earned income each separately decreases redistribution, the simultaneous existence of both does not lead to any further decrease.

Figure 3 shows the distribution of percentages redistributed across each of the four treatments. The three treatments in which *something* is earned show substantially more variation than the treatment in which neither roles nor income are earned. Thus, equal division is a focal outcome when first possession is established by illegitimate means; yet, once entitlements are legitimized to any degree, behavior is increasingly heterogeneous.

In addition to collecting choices from decision makers, the experiment elicited ex ante expectations from senders and receivers.<sup>12</sup> Table 3 presents descriptive statistics, sorted by treatment and the source of expectations (senders or receivers). Figure 4 shows the cumulative distribution functions for sender expectations, receiver expectations and actual decisions within each treatment. Table 4 shows the results of rank-sum tests that compare senders' and receivers' expectations.

[Insert Table 3 about here.]

[Insert Figure 4 about here.]

[Insert Table 4 about here.]

Within all treatments, senders expect less redistribution than receivers; the difference is significant in three treatments and approaches significance in the fourth. Perhaps surprisingly, expectations of neither senders nor receivers vary significantly across treatments. Stakeholders, therefore, do not anticipate the extent to which earned roles and earned income influence decision makers. Figure 4 and the last column in Table 3 show that actual decisions and senders' expectations closely align in treatments in which there is at least one earned component (and decisions are significantly different from receivers' expectations); actual decisions and receivers' expectations closely align in the treatment in which there is no earned component (and decisions are significantly different from senders' expectations). These results suggest that, regardless of the actual

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<sup>12</sup> Expectations from senders and receivers who answered the questionnaire incorrectly or submitted invalid responses were dropped from the analysis. Results do not substantively change when expectations from erroneous questionnaires are included.

treatment, senders expect their initial entitlement to be perceived as being legitimate, while receivers expect it to be perceived as being illegitimate.

#### 4 Discussion

A deeper understanding of redistributive preferences can shed light on existing – and potentially guide future – redistributive policies. The results presented here suggest that these preferences may not be the product of an additive process that weighs independently significant factors that contribute to perceptions of endogenous determination in income and mobility.

Although we can only speculate as to why redistribution does not decrease when both roles and income are earned relative to when only one is earned, two possibilities emerge. First, it is possible that third parties feel obliged to provide a disadvantaged stakeholder with a token payoff, since these subjects expended effort in arriving to the experiment and devoted their time within the experiment. Perhaps redistribution would decrease if, *ceteris paribus*, the disadvantaged stakeholders did not have to come to the lab and wait while others made money and/or decisions.<sup>13</sup> Second, instead of accounting for *all* relevant factors, third-party redistributors may rely on heuristics when the task of determining relative legitimacy becomes sufficiently complex. Rather than decomposing all elements that contribute to relative legitimacy, third-party redistributors may view it as a binary concept – if a stakeholder earns some aspect of his advantageous state, then the rule is to redistribute less of his money; if nothing is earned, then the rule is to

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<sup>13</sup> Although, it should be noted, it may be impossible to implement such a manipulation while holding all else constant. Having people outside of the lab serve as receivers would, by itself, lead to increased social distance; it could also generate doubt among subjects that the receivers even exist.

redistribute more. This explanation corresponds with the finding of Fong (2001), who uses Gallup Poll data to show that preferences for redistributive policies are significantly affected by whether respondents feel that wealth and mobility are caused by circumstances that are within individuals' control. Our results extend this point by suggesting that it may take only two dimensions to elicit reliance on a heuristic in forming redistributive preferences. Merely knowing that *something* is earned – either income or an advantageous role – appears to be enough to generate decreased levels of preferred redistribution.<sup>14</sup>

The substantial heterogeneity within the three treatments in which something is earned suggests that no clear-cut norm governs redistribution when entitlements are legitimized. In contrast, the focal nature of equal division in the givenR-givenI treatment suggests that equality serves as a “default” strategy (Konow 2009) in the absence of legitimate initial entitlements. Further work can attempt to shed light on the heterogeneity that characterizes redistribution in the presence of legitimized entitlements, either by identifying person-specific factors that govern preferences or by changing the context so that consensus emerges. In light of Konow's (2005) finding that increased information leads to increased consensus regarding fairness, design manipulations that allow third parties to draw more straightforward conclusions regarding their stakeholders' effort and performance (either absolute or relative to others) may be one method for reducing heterogeneity.

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<sup>14</sup> It should also be noted that third parties, rather than acting out of homegrown preferences over outcomes, may instead be trying to anticipate the expectations of stakeholders and act in accordance with the stakeholders' subjective beliefs. (The authors thank James Konow for raising this point in correspondence.) If this phenomenon accurately characterizes the third parties' behavior, however, it simply pushes the issue to be explained (the failure to weigh legitimacy along multiple dimensions) from the Decision Makers onto the Senders.

It remains to be seen whether our results are robust to third-party redistribution in a general sense or whether they are the product of this specific design. Given that, with *any* type of earned entitlement, we find a median percentage redistributed between 35 and 40 percent, it is possible that this range represents a replicable lower-bound on third-party redistribution. Such boundaries have emerged across a wealth of standard<sup>15</sup> ultimatum games (30-40 percent, Camerer and Thaler 1995) and dictator games (roughly 20 percent, Camerer 2003); further work can determine if a systematic outcome also characterizes third-party redistribution. Alternatively, perhaps the very existence of a lower-bound is robust, but specific design features dictate where the boundary lies. In a different third-party-redistribution experiment (say with different methods of legitimizing entitlements), perhaps there is a lower-bound at a percentage above or below the 35-40 percent range. Given the prevalence and relevance of redistributive preferences, it is worth examining the extent to which either (or neither) of these possibilities for robustness holds.

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<sup>15</sup> “Standard” here denotes experiments that are run in the U.S. with neither double-blind conditions nor earned entitlements.

Figure 1: Box Plots

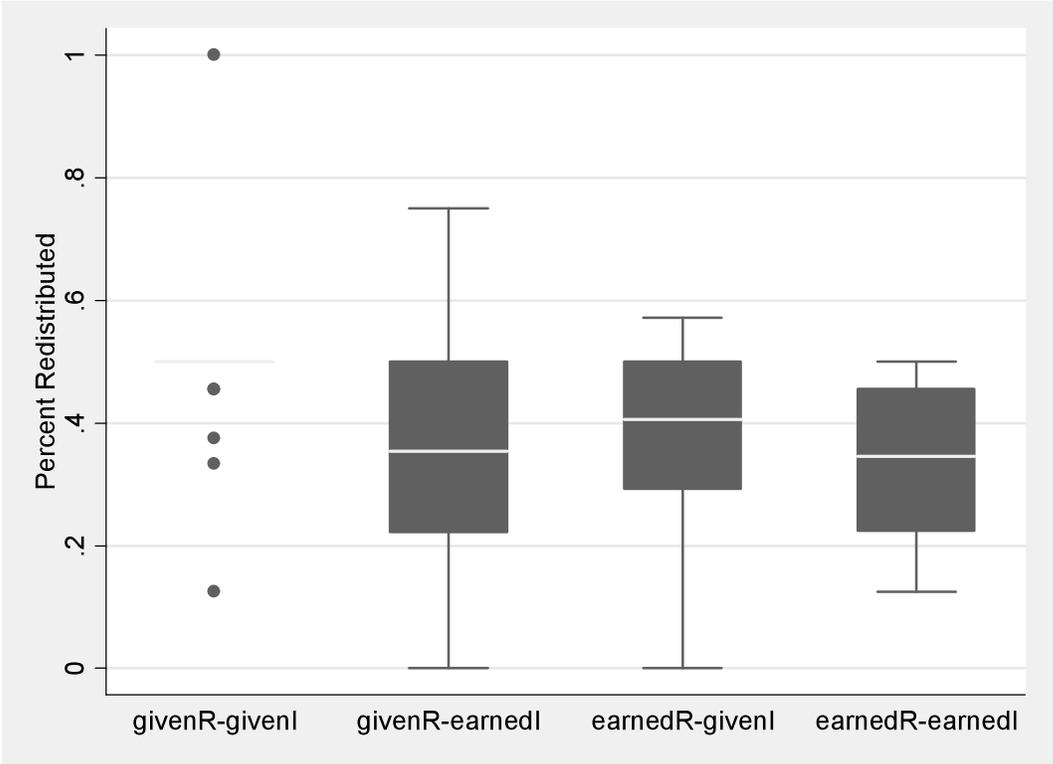


Table 1: Descriptive Statistics

	Mean Percent Sent to Receiver	Standard Deviation	Median Percent Sent to Receiver	Frequency of Even Splits
givenR-givenI (n = 24)	0.489	0.138	0.500	18
earnedR-givenI (n = 24)	0.373	0.143	0.405	8
givenR-earnedI (n = 24)	0.324	0.198	0.354	6
earnedR-earnedI (n = 24)	0.336	0.125	0.345	6

Figure 2: Cumulative Distribution Functions

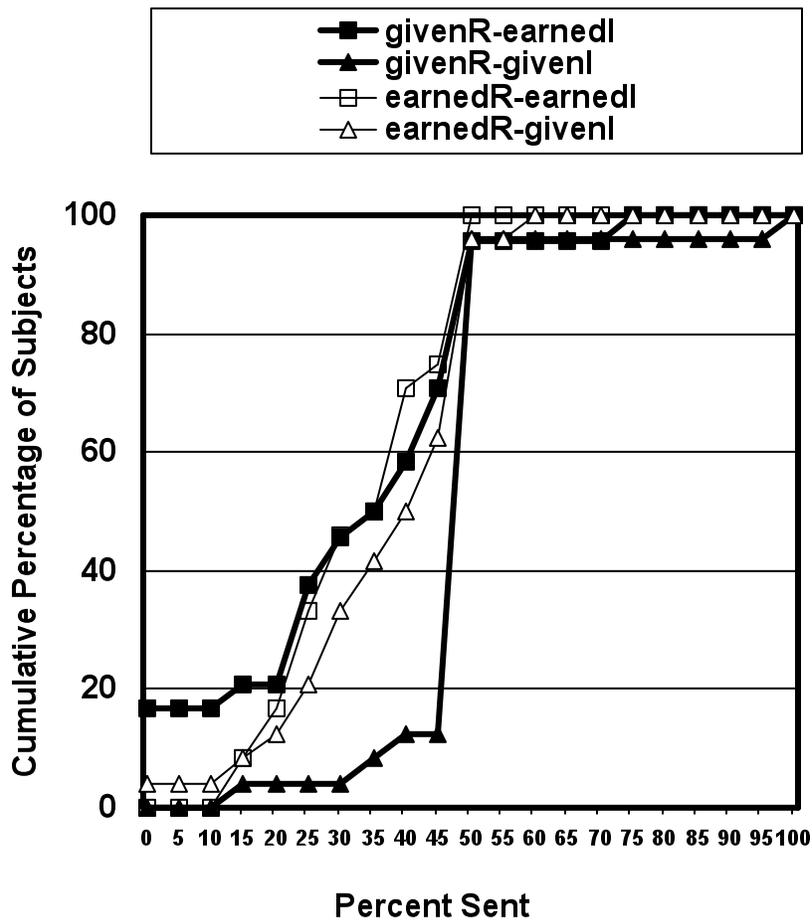


Table 2: Pairwise Wilcoxon Rank-Sum Tests

W Statistic (Probability significance level)	givenR- givenI	givenR- earnedI	earnedR- earnedI
earnedR-givenI	2.90 (0.004)	0.992 (0.321)	1.139 (0.255)
givenR-givenI	*	3.462 (0.0005)	3.891 (0.0001)
givenR-earnedI	*	*	0.000 (1.000)

Figure 3: Decision Maker Choices across the Four Treatments Sorted by Percentages

Redistributed

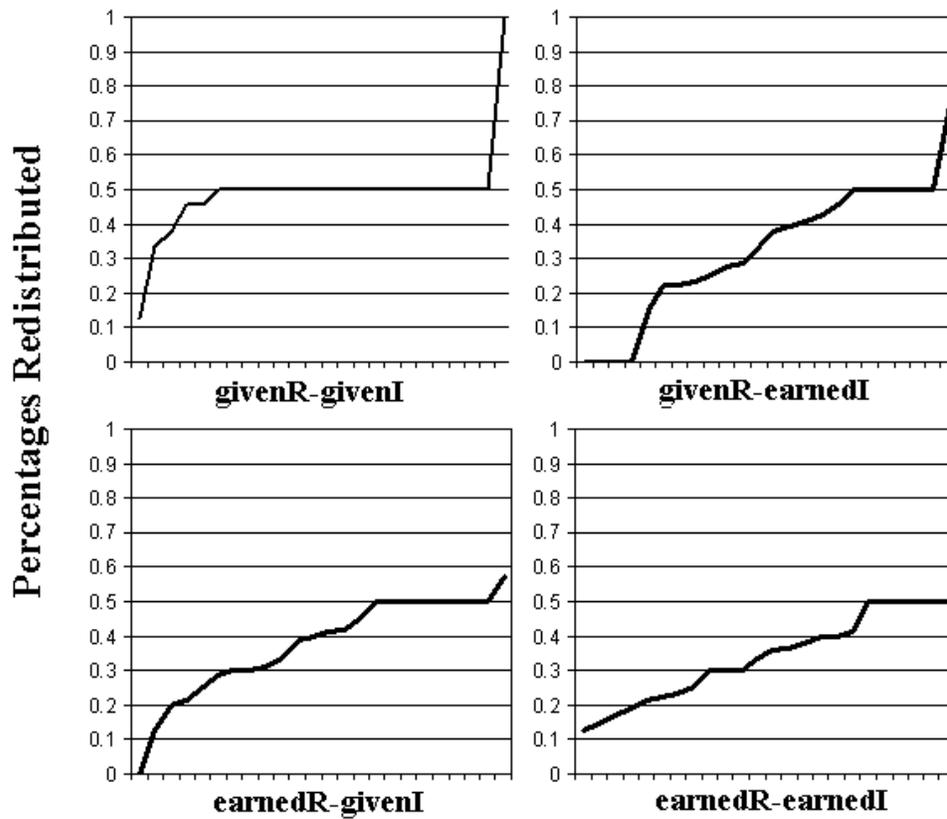


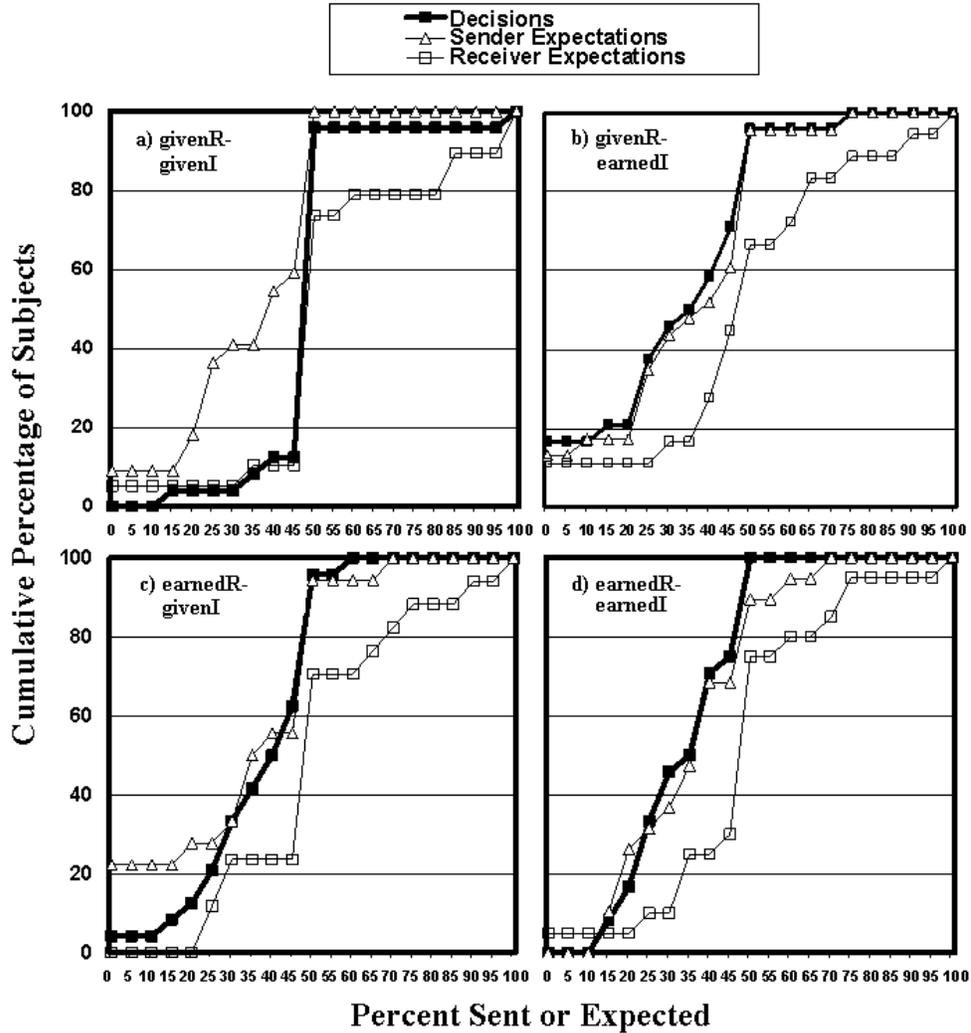
Table 3: Descriptive Statistics for Expectations

	Mean	Median	Standard Deviation	Pairwise Wilcoxon w/Percentage Redistributed
<b>givenR-givenI</b>				
Sender Percentage Expected (n = 22)	0.345	0.380	0.165	W = 2.967 (0.003)
Receiver Percentage Expected (n = 19)	0.551	0.500	0.230	W = 1.351 (0.177)
<b>earnedR-givenI</b>				
Sender Percentage Expected (n = 18)	0.329	0.356	0.213	W = .519 (0.604)
Receiver Percentage Expected (n = 17)	0.527	0.500	0.206	W = 2.374 (0.018)
<b>givenR-earnedI</b>				
Sender Percentage Expected (n = 23)	0.343	0.375	0.195	W = 0.486 (0.627)
Receiver Percentage Expected (n = 18)	0.484	0.500	0.246	W = 2.294 (0.022)
<b>earnedR-earnedI</b>				
Sender Percentage Expected (n = 19)	0.360	0.375	0.154	W = 0.443 (0.657)
Receiver Percentage Expected (n = 20)	0.499	0.500	0.206	W = 3.008 (0.003)

Table 4: Pairwise Wilcoxon Comparisons of Senders' and Receivers' Expected Percentages Sent in each Treatment

	W Statistic (Probability significance level)
givenR-givenI	3.241 (0.001)
givenR-earnedI	1.905 (0.057)
earnedR-givenI	2.356 (0.019)
earnedR-earnedI	2.340 (0.019)

Figure 4: Cumulative Distribution Functions of Expectations and Percentages Sent



## Appendix A: Main Instructions

Welcome to today's experiment. Now that we have started it is important that you do not talk or look around at other peoples' desks. Your decisions are private and we respect that privacy. If at any time you have a clarifying question, raise your hand and someone will come over to help you. However, we cannot give advice on what decisions you should make. That's up to you. You're the one making the money.

Read the instructions carefully. At the end of the instructions you will be given a questionnaire to test your understanding of them.

You have drawn an ID letter. For privacy, you will only be known by this ID letter during the experiment.

### **GIVEN ROLES:**

[In this experiment, there are three roles: Sender, Decision Maker and Receiver. Four of you have been randomly selected to be Senders, four have been randomly selected to be Decision Makers and four have been randomly selected to be Receivers. Each Decision Maker will be randomly matched with a Sender and each Sender will be randomly matched with a Receiver. Senders, Decision Makers and Receivers will not know with whom they are paired. To preserve privacy, Senders, Decision Makers and Receivers will be sitting in different rooms.

If you have drawn the letter A, B, C, or D, you will be a Sender.

If you have drawn the letter E, F, G, or H, you will be a Decision Maker.

If you have drawn the letter I, K, L, or N, you will be a Receiver.]

### **EARNED ROLES:**

[Four of you have been randomly selected to be Decision Makers. If you drew a D earlier, you will be a Decision Maker.

Two of you have been randomly selected to be Monitors. If you drew an M, you will be a Monitor for today's experiment. The Monitors' role is to ensure that the instructions are followed as stated.

Of the remaining eight individuals, four will be Senders and four will be Receivers. The four who scored highest on the quiz have earned the right to be Senders; the four who scored lowest will be Receivers.]

Please keep your ticket as you will need to show it to get your payoff.

If you have drawn the letter M, you will be the Monitor for today's experiment. The monitor's role is to insure the instructions are followed as stated.

### **Sender's Task**

#### **GIVEN ENDOWMENTS:**

[If you are a Sender, you will draw a ticket from a basket. Please make sure that you write your ID letter on the appropriate line. Each ticket will have an amount, in dollars, written on it. You will be given the amount of money that is written on your ticket. After everyone makes their draws, someone will collect the tickets and bring your money back to you in an envelope. The money will be given to you in \$1 bills. Once you get the envelope and examine its contents, you will then put all of the \$1 bills in a basket.]

#### **EARNED ENDOWMENTS:**

[If you are a Sender, you will be given a word-search task. Please make sure that you write your ID letter on the appropriate line. You will have 7 minutes to find as many words as you can. You will earn \$2 for every word that you find. At the end of the 7 minutes, someone will collect the word-search sheets and bring your money back to you in an envelope. The money will be given to you in \$1 bills. Once you get the envelope and examine its contents, you will then put all of the \$1 bills in a basket.]

### **Decision Maker's Decision Task**

If you are a Decision Maker, you will be asked to make only one decision: to choose how many of the \$1 bills, if any, you want the Sender to send to the Receiver with whom she/he is randomly paired. You will make this decision by filling out a form that will be given to you in an envelope. After you make your decision, you will put the form back in the envelope. Once all decisions are made, the envelopes will be collected.

### **Decision Maker's Payoff**

If you are a Decision Maker, you will be given a word-search task prior to making your decision. Please make sure that you write your ID letter on the appropriate line. You will have 7 minutes to find as many words as you can. You will earn \$2 for every word that you find.

Your payoff =  $\$2 * (\text{number of words you find})$

At the end of the 7 minutes, someone will collect the word-search sheets. Your payoff will be paid to you at the conclusion of the experiment; it will not be affected by the decision that you make.

### **Receiver's Payoff**

If you are a Receiver, you will receive an envelope containing the amount of money that the Decision Maker had the Sender send to you.

Your payoff = amount sent

For example, if the Decision Maker has the Sender send \$4, then you will receive an envelope containing \$4.

Your payoff = \$4

Or if the Decision Maker has the Sender send \$16, then you will receive an envelope containing \$16.

Your payoff = \$16

### **Sender's Payoff**

GIVEN ENDOWMENTS:

[If you are a Sender, you will be given back the money that is left over after your paired Receiver receives her/his payoff.

Your payoff = amount on the ticket – amount sent

For example, if your ticket says that you are to be given \$20, and if the Decision Maker has you send \$4, you will have \$16 left over. Your total payoff will equal the \$16 left over.

Your payoff = \$16

Or, if your ticket says that you are to be given \$20, and if the Decision Maker has you send \$16, you will have \$4 left over. Your total payoff will equal the \$4 left over.

Your payoff = \$4]

EARNED ENDOWMENTS:

[If you are a Sender, you will be given back the money that is left over after your paired Receiver receives her/his payoff.

Your payoff = \$2\*(number of words you find) – amount sent

For example, if you find 10 words and earn \$2\*10=\$20, and if the Decision Maker has you send \$4, you will have \$16 left over. Your total payoff will equal the \$16 left over.

Your payoff = \$16

Or, if you find 10 words and earn  $\$2 \times 10 = \$20$ , and if the Decision Maker has you send \$16, you will have \$4 left over. Your total payoff will equal the \$4 left over.

Your payoff = \$4]

Your payoff in this experiment will be completely private. The person who collects the envelopes from the Decision Makers will not see the decisions written on the forms. The envelopes will be given to another experimenter. Using the rules above, this experimenter will put the payoff of each Sender and Receiver into envelopes and return the envelopes to the monitor. The monitor will then ask you for your ID letter. When you present your ticket with your ID letter, you will receive the envelope with your payoff.

This process guarantees that all envelopes will be opened and all money will be handled by someone who sees an ID letter, but not a name, so that nobody is able to match a decision with the identity of either the Senders, Decision Makers or Receivers.

You should not talk to anyone about how much money you, or they, get. Note that these procedures guarantee that no other person will be aware of your payoff.

If you have questions at any time during the experiment, please quietly raise your hand and someone will come over to assist you. Please do not talk with any other participants during the experiment.

## Appendix B: Preliminary instructions in treatments with earned roles

Welcome to today's experiment. Now that we have started it is important that you do not talk or look around at other people's desks. Your decisions are private and we respect that privacy. If at any time you have a clarifying question, raise your hand and someone will come over to help you. However, we cannot give advice on what decisions you should make. That's up to you. You're the one making the money.

You have just drawn a slip of paper. Your slip will either have a Q, a D or an M written on it. There are 8 Q's, 4 D's and 2 M's. For identification purposes, the letters have a subscript number (Q<sub>1</sub>, Q<sub>2</sub>, D<sub>1</sub>, D<sub>2</sub>, etc.). To protect your privacy, you will only be known by ID letters during the experiment.

If you received a Q, you will take a quiz made up of two types of questions. Some questions will ask you about the 2008 U.S. presidential election, while others will ask you about general international affairs. Your performance on the quiz will determine your role in the experiment. Specifically, the four Q's who score highest will earn an opportunity to make money.

If you received a D, you will be a Decision Maker in the experiment. If you received an M, you will be a Monitor in the experiment. The people who received D's or M's will wait silently while others take the quiz. Everyone will receive additional instructions after the quiz.

After these instructions have been read aloud, an experimenter will give the quiz to the 8 people who hold Q's.

Appendix C: Word-search Task

l	c	a	o	e	e	p	o	s	t	i	s	c	a	s	u	m	g
h	o	p	l	a	a	a	g	o	n	r	y	s	y	n	y	a	e
e	l	n	a	s	o	g	a	s	t	r	i	c	k	e	s	l	e
p	i	n	n	y	y	h	m	m	t	e	i	l	t	e	l	y	
a	t	k	i	m	c	m	p	y	i	t	n	i	r	c	a	y	u
t	i	i	t	g	y	r	o	n	s	e	t	o	o	h	m	p	a
o	s	n	s	r	n	m	e	t	s	i	e	y	s	o	y	o	f
l	s	e	e	n	a	d	y	a	s	n	m	i	t	l	o	c	a
h	i	s	t	h	a	l	l	m	t	o	t	c	c	e	d	s	i
t	t	i	n	o	t	g	u	e	o	i	e	h	r	c	y	o	n
i	i	o	i	c	i	s	r	c	n	t	t	l	e	y	n	n	y
i	t	l	o	a	t	i	a	o	s	y	c	i	i	s	i	o	d
o	a	o	r	h	t	i	d	y	x	u	r	e	s	t	a	l	s
s	p	g	t	i	c	n	c	e	m	i	m	a	r	o	e	o	s
s	e	y	s	e	e	e	p	y	t	m	i	a	k	t	y	c	o
s	h	i	a	t	l	o	t	e	g	a	s	t	r	o	s	s	l
t	s	i	g	o	l	o	r	e	t	n	e	o	r	t	s	a	g
l	g	i	h	o	t	y	n	r	a	s	a	c	a	o	n	y	g
u	x	c	c	o	g	g	i	m	y	o	m	a	l	a	c	i	a

Apf  
Colitis  
Gastrectomy  
Gastroenterologist  
Hepatitis  
Intramuscular  
Myasthenia  
Myodynia  
Nasogastric  
Salioadenitis

Cholecystectomy  
Colonoscopy  
Gastro  
Gastrointestinal  
Hepato  
Kinesalgia  
Myelitis  
Myoma  
Pancreatitis  
Tendonitis

Cholecysto  
Colopexy  
Gastroenteritis  
Glossdynia  
Ileostomy  
Kinesiology  
Myocele  
Myomalacia  
Phago  
Ugi

## Appendix D: Decision Makers' Questionnaires

(Note: Senders and Receivers receive a questionnaire that uses different numbers and includes only four hypothetical decisions. Senders' and Receivers' questionnaires also elicit expectations of what the decision makers will do.)

This questionnaire will test your understanding of the instructions that you have read. Feel free to refer back to the instructions as you complete it.

### EARNED ROLES-GIVEN ENDOWMENTS:

[(1) Assume that eight individuals drew tickets with the following numbers written on them:

3    8    5    7    6    4    2    9

Out of these numbers, please circle the four that belong to the Senders. Please underline the four numbers that belong to the Receivers.

(2) In the following scenarios, some decisions of a Decision Maker (DM) are listed. As indicated in the instructions, a Decision Maker is paired with a Sender and a Receiver. You must specify the amount of money that the Receiver, Sender and Decision Maker will receive from each Decision-Maker decision. You will do this by filling in the blank columns labeled "Dollars given to Sender", "Receiver's payoff", "Sender's payoff" and "DM's payoff".

Even though each Decision Maker will make only one decision in the experiment, the questionnaire features multiple hypothetical decisions. This is done so that your understanding can be tested in a more thorough manner. For each decision, please specify the payoff of the Sender, Receiver and Decision Maker. Feel free to refer back to the instructions.

### Scenario #1

Dollar amount on Sender's ticket	Dollars given to Sender	DM's decision	Receiver's payoff	Sender's payoff	Dollar amount on DM's ticket	DM's payoff
8		0			10	
10		3			24	
20		7			12	
14		10			14	

### Scenario #2

Dollar amount on Sender's ticket	Dollars given to Sender	DM's decision	Receiver's payoff	Sender's payoff	Dollar amount on DM's ticket	DM's payoff

6		5			14	
24		2			8	
16		7			20	
12		12			4	

Please quietly raise your hand when this questionnaire is completed.]

**GIVEN ROLES-EARNED ENDOWMENTS:**

[This questionnaire will test your understanding of the instructions that you have read. In the following scenarios, some decisions of a Decision Maker (DM) are listed. As indicated in the instructions, a Decision Maker is paired with a Sender and a Receiver. You must specify the amount of money that the Receiver, Sender and Decision Maker will receive from each Decision-Maker decision. You will do this by filling in the blank columns labeled “Dollars earned by Sender”, “Receiver’s payoff”, “Sender’s payoff” and “DM’s payoff”.

Even though each Decision Maker will make only one decision in the experiment, the questionnaire features multiple hypothetical decisions. This is done so that your understanding can be tested in a more thorough manner. For each decision, please specify the payoff of the Sender, Receiver and Decision Maker. Feel free to refer back to the instructions.

**Scenario #1**

Sender’s performance on word-search task	Dollars earned by Sender	DM’s decision	Receiver’s payoff	Sender’s payoff	Dollar amount on DM’s ticket	DM’s payoff
4 words		0			10	
5 words		3			24	
10 words		7			12	
7 words		10			14	

**Scenario #2**

Sender’s performance on word-search task	Dollars earned by Sender	DM’s decision	Receiver’s payoff	Sender’s payoff	Dollar amount on DM’s ticket	DM’s payoff
3 words		5			14	
12 words		2			8	
8 words		7			20	
6 words		12			4	

Please quietly raise your hand when this questionnaire is completed.]

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