Do haves count have-nots' work? evidence from the dictator game experiments*

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Abstract

Conducting the dictator game experiments and regarding the dictator and the recipient as have and have-not, respectively, we examined the condition when haves donate their endowment to have-nots. To make this condition clear, we introduced the property rights of the dictator and the effect of work by the recipient and conducted four treatments; the standard dictator game treatment, the treatment under which the dictator was given the endowment according to the work performance and the recipient did nothing, the treatment under which the dictator was exogenously given endowment and the recipient worked to promote the dictator's other regarding behavior, and the treatment under which the dictator was given the endowment according to the work performance and the recipient worked to promote the dictator's other-regarding behavior. Then we investigated the relationship between the dictator 's property rights and the recipient 's influential behavior. In the first result, the dictator exogenously given property rights sent higher amount of money than those who endogenously got the endowment, irrespective of the influential behavior of the recipient. This indicates that property rights make the dictator hard-nosed. In the second result, the dictator exogenously given property rights sent higher amount of money to the recipient doing the influential behavior than to the recipient doing nothing but when the dictator endogenously got the endowment, the amount of money given to the recipient doing the influential behavior was as large as the amount given to the recipient doing nothing. This indicates that the dictator has a lexicographic preference ordering.

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1 Introduction

In this papar, we add a prior working stage in which subjects engage in a work to a dictator game experiments and compare a standard dictator game experiment. This paper differs from many studies, where subjects do a task to earn themselves endowments before playing a standard dictator game, by the presence of treatments where recipients work. If there is no earning procedure, the experiments have a artificial feature of helicopter money. However, if only dictators work, additional asymmetry causes in the dictator game experiment. This paper not only aggregate such studies but also clarify an aspect of dictators' preferences.

Since Kahneman, Knetsch and Thaler (1986),[1] many dictator game experiments have been conducted to check dictators' other-regarding behavior. In typical dictator game experiments, the experimenter gives every dictator an amount of money as their endowments. Dictators decide to give their recipients a part of their endowments (may be equal to zero). Recipients' rewards are money amounts sent from dictators and dictators' rewards are the rest of their endowments. In classical economic theory, the dictator sends nothing since the recipient do nothing. [2]

In most dictator game experiments, however, dictators send recipients positive amounts which are smaller than those in ultimatum game experiments (see Forsythe, Horowitz, Savin and Sefton (1994)). Many researchers interpret these positive gifts in dictator game experiments as reciprocal behavior of dictators (see Hoffman, McCabe, Shachat and Smith (1994)). The avarage money amounts are dependnt on experimental environments in dictator game experiments. Camerer (2003) summarizes outcomes of dictator game experiments by saying that dictators send 13-50% of their endowments. There are many studies to search variables decreasing the average offer rate. Hoffman et al. (1994) experiments dictator games by using a double blind method. In Hoffman et al. (1994), all subjects solve quizes. The experimenter assigns high scorers dictators and assigns low scorers recipients.

[1] The dictator game was designed to explain the reason for a high percentage of the offer in the ultimatum game (see Güth, Schmittberger and Schwarze (1982)). In typical ultimatum game experiments, proposers offer an average of 40-50% of the money endowment (see Camerer (2003)), although the proposer should make (nearly) zero offer and the responder should accept any offer if all players maximizes their monetary payoffs. This result indicates the possibilities that responders may reject small offers and that proposers may be afraid of low offers rejected. The dictator game removes responder's ability to reject offers. A positive offer in the dictator game experiments may indicate proposers' altruistic behavior.

[2] In this sentence, we assume that the dictator maximize his money amounts.

To get a high score may give validity for getting endowments.[3] Hoffman et al. (1994) shows that the average donation rate is higher than the one when assigning roles at random. The blindness decreases the donation rate. Cherry (2001) examines the dictator game in which dictators earn endowments by dealing lotteries. Cherry (2001) shows that the average offer rate in the dictator game with the earning stage is smaller than that without the earning stage. Cherry, Frykblom and Shogren (2002) compares two treatments. In a treament, dictators solve 17 problems selected from GMAT, and the expeimenter gives high scorers 40 dollars and gives low scorers 10 dollars as endowments. Cherry et al. (2002) shows that dictators solving problems gives recipients lower money amounts.

On the other hand, there are studies for searching variables increasing the average donation rate. Yamamori, Kato, Kawagoe and Matsui (2008) experiments a dictator game where recipients deliver themselves demands to dictators. Endowments are exogenously given. Yamamori et al. (2008) shows that recipient's voice increases the average offer rate.

The research question is following; does the recipient's work enhance the other-regarding behavior of the dictator? How powerful the impact is? Is the impact higher than the property right effect of the dictator? Many existing studies pay attention to the property right effect. In these framework, dictators might think that recipients do nothing. Yamamori et al. (2008) deal with the recipient's behavior but the recipients do not work.

In this paper, we add a working stage to a standard dictator game. There are three types of working stages where dictators and/or recipients solves a calculation test. When only dictators do a task, dictators not only get property rights to get endowments but also may think that recipients do not work. In our setting, recipients work without any monetary reward. We can regard dictators as workers with high productivity and recipients as workers with low productivity. Wage levels, or (variable) endowments from the experimenter, is partly determined their productivities[4]. To assign roles to subjects as to their scores cuts off randomness from the normal dictator game. We eliminate these effects. This paper not only aggregate above studies but also clarify an aspect of dictators' preferences.

This paper is organized as follows: In Section 2, we explain the details of our ex-

[3] In Hoffman and Spitzer (1985), all subjects acquire a right to be a dictator or a recipient.

[4] We neglect the difference between zero reward and low rewards. Heyman and Ariely (2004) investigates the difference. Because of our financial limitations, we cannot give recipients low but enough rewards to get high scores.

periment. Section 3 is devoted to the description of the outcome of our experiment. In Section 4, we compare between the outcome and above studies. Section 5 concludes the paper.

2 Experiment

Authers test the following two hypotheses.

Hypothesis One : When the recipient's behavior is fixed, the work by the dictator will decrease their donation.

Hypothesis Two : When the dictator's behavior is fixed, recipient's work will increases their donation.

Each hypotheses are not consistent with classical economic theory. That is, selfish subjects donete nothing.

2.1 Experiment Design

The entire experiment consisted of four treatments. One of them was the standard dictator game. Others were treatments divided into a working stage and a standard dictator game stage. The working stage was immediately followed by the dictator game stage. Each subject was randomly assigned the role of either dictator or recipient at the beginning of the treatment. Four treatments were identified with two factors. A factor is whether dictators worked or not. Another factor is whether recipients worked or not. During the working stage, all subjects were required to complete a calculation test comprising 100 addition and subtraction problems involving two- or three-digit numbers. Subjects were given 15 minutes to complete the calculation test.[5]

A treatment that both dictators and recipients didn't work was referred to as treatment DG. A treatment that only dictators worked was referred to as treatment DGDE. A treatment that only recipients worked was referred to as treatment DGRE. A treatment that both dictators and recipients worked was referred to as treatment DGBE. (Table 1)

Dictator's behavior\Recipient's behavior	do not work	work
do not work	DG	DGRE
work	DGDE	DGBE

Table 1: Experimental Profile

[5]After calculating, subjects entered their answers to computer console. In a treatment that both dictators and recipients worked, all subjects completed the same calculation test in each round.

In the treatments DG and DGRE, the dictators were given JPY1200[6] at the beginning of each round. The recipients were informed that the dictator paired with him or her was given JPY1200 as an endowment of the dictator game. In the treatment DGDE and DGBE, the dictators were given money corresponding to their own scores on the calculation test (as shown in Table 2) as an endowment of the dictator game. The recipients were informed of the amount of money given to the dictator paired with him or her. However, the recipients were not informed of the scores of the dictator paired with him or her.

Score	Amount of Money
79 or lower	JPY150
Between 80 and 89	JPY300
90	JPY450
91	JPY600
92	JPY750
93	JPY900
94	JPY1050
95	JPY1100
96 or higher	JPY1200

Table 2: Relation between the Amount of Money and Score

In the treatments DGBE and DGRE, the dictators were informed of the score of the recipient paired with him or her, according to the score categories in Table 2.[7] For example, if the score of a recipient is 97, a dictator is informed that the score of the recipient paired with him or her is 96 or higher.

In treatment DGRE, during the working stage, the dictator held steady. Recipients were informed that the dictator held steady.

In each treatment, the working stage and the dictator game stage were repeated thrice in the same order. The dictator-recipient pairs were changed randomly in each round. The role of the subjects remained unchanged for the duration of each treatment. This information was provided to the dictators and recipients.

[6]When the experiments were done, JPY1 ≅ USD0.009.

[7]The recipients were explained that their score was informed to the dictator paired with them according to the score categories in Table 2. Since their score was not related to the monetary reward, they did not know the relationship between the score and "amount of money".

2.2 Overview

The experiment was performed at the Kyoto Experimental Economics Laboratory of Kyoto Sangyo University from October 2007 to February 2008. The dictators were 108 undergraduate students of Kyoto Sangyo University. The profile of the dictators is shown in the table 3. The same number of the subjects were assigned the role of recipient. All the subjects participated in only one treatment. None of the subjects had previously participated in a dictator game experiment, though some had participated in another experiment. Each treatment took approximately from two to three hours to complete. The amount of money rewarded to the subjects ranged from JPY0 to JPY3600.[8] A copy of z-Tree (Fischbacher (2007)), licensed to Kazuhito Ogawa, was used as the application software for the experiment.

	faculty of economics	other faculties	man	woman
DG	7 (people)	21	23	5
DGRE	8	10	15	3
DGDE	7	18	17	8
DGBE	7	18	18	7
	first year	university sophomore	junior year	senior class student
DG	6	4	10	8
DGRE	6	7	1	4
DGDE	4	3	5	13
DGBE	2	8	5	10

Table 3: The profile of the dictators.

The following details the interaction between two type of subjects. They were assigned their role randomly. The dictators and recipients gathered in different places. Next, the dictators were led to the room 1 and the recipients were led to the room 2, which was next to the room 1. The room 1 was divided by partitions into front and rear sections. The dictators sat down in predetermined places in the front section of the room 1. The working stages for both dictators and recipients began at the same time. After calculating, the recipients moved into the room 1, where they entered the answers of their calculations into the computer. Note that they entered the room 1 from the rear door and sat down in predetermined places in the rear section. Then, the dictators and the recipients did

[8] In each treatment, only recipients participate a different experiment for avoiding extremely-low monetary reward. In particular, the amount of money rewarded to the recipients was over JPY2000. It is because that the experiment ensured to all subjects an appropriate minimum income as opportunity cost. Dictators were not informed the above that.

dictator game stage. After the end of the dictator game stage, the recipients moved back into the room 2. The dictators and recipients were dismissed at dipfferent times. The aim of these procedures was to limit the contact between the dictators and recipients as much as possible.

3 Experimental Result

3.1 Over All Result

Table 4 indicates the average donation rate, standard deviation, and the number of subjects in each treatment.[9] Some of the dictators were excluded since the *ex post* interview revealed that they did not understand the experimental settings.[10]

Treatment	dicator's behavior	recipient's behavior	Number of Data	Round One	Round Two	Round Three
DG	do not work	do not work	28	0.184 (0.23)*	0.120 (0.19)	0.205 (0.30)
DGRE	do not work	work	18	0.297 (0.25)	0.245 (0.30)	0.284 (0.26)
DGDE	work	do not work	25	0.138 (0.17)	0.099 (0.17)	0.097 (0.16)
DGBE	work	work	25	0.111 (0.16)	0.118 (0.17)	0.099 (0.15)

* Numbers in the parentheses are standard deviation.

Table 4: The evolution of the donation rate in each treatment.

Table 5 represents the average donation rate throughout rounds in each treatment. This table indicates that the donation rates is the highest in the *DGRE*, the second highest in the *DG*. The donation rates in the *DGDE* and *DGBE* are almost the same and the smallest. This indicates that dictators donate most when they do not work but their recipient work and that they donate little when they work and ignore their recipent's work.

3.2 Hypothesis One

We statistically investigate the Hypothesis One: When the recipient's behavior is fixed, the work by the dictator will decrease their donation. For this purpose, we conduct the Logit

[9] In the first round of the one session in the treatment DGDE, as the result of the calculation test, thirteen dictators were assigned the endowment was equal to the one in the Table 2 multiplied by 2/3. From the rounds two to three, they were assigned the endowment exactly shown in the Table 2. Twelve dictators in the other session completed the test which assigned the endowment according to the Table 2. We compared the donation rate between two sessions and the result indicated that there was not significantly different. Therefore, we pooled these two results.

[10] Following is the most popular reason for exclusion: The dictator believes that her recipient does the same decision making as her. Although the experimenter repeatedly informed that the recipient did not donate money to the dictator, from 5% to 10% of the dicators did not understand this caution.

Dictator's behavior\Recipient's behavior	do not work	work
do not work	0.169	0.275
work	0.111	0.101

Table 5: Average donation rate throughout rounds.

and Tobit analyses. [11] We do not apply the Kolmogorov-Smirnov test, which is usually applied to check the distribution difference, since we do not only have the donation result but also the profile of the subjects (gender, grade, and faculty) and we should take the repetition effect into account.

For both analyses, we definite some variables. $Prob(Donation)$ is the donation dummy and the dependent variable in the Logit analysis. When the dictator donate more than JPY zero, it is 1. Otherwise, it is 0. The *Donation rate* is the dependent variable in the Tobit analysis. *Dic* is the dictator work dummy. When the dictator works, it is 1. Otherwise, it is 0. *Rec* is the recipient work dummy. When the partner ecipient works, it is 1. Otherwise, it is 0. *Faculty* is the faculty dummy. When the dictator belongs to the faculty of economics, it is 1. Otherwise, it is 0. *Gender* is the gender dummy. When the dictator is male, it is 1. Otherwise, it is 0. *Grade* is the grade of the dictator. *Round* is the playing round.

The hypothesis one consists of two parts. First is the case that the recipient does nothing (DG and DGDE). Second is the case that the recipient makes effort (DGBE and DGRE).

We apply two analyses for first and second parts. If the coefficient of *Dic* is negative and significant between two parts, the hypothesis is fully supported.

The result of the Logit analysis is in the Tables 6 and 7. Table 6 indicates that the coefficient of *Dic* is negative and significant at 5% level, which means that the dictator's work decreases the donation probability when the recipient does not work. The table also indicates that the donation probability of the male dictator will be smaller than that of the female dictator and that the donation possibility of the senior dictator will be larger than that of the junior dictator. The former is the same result as Eckel and Grossman (1998).

The Table 7 indicates that *Dic* is negative and significant at 0.1% level. This indicates

[11] We used "R" and the "AER" package (Kleiber and Zeileis (2008)) for statistical analysis

that the dictator's work decrease the donation probability when the recipient works. This table also indicates that the possibility of the senior dictator will be larger than that of the junior dictator.

From the Logit analysis, when the dictator works, she decreases her donation probability significantly irrespective of her recipient's work.

	Estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	0.6673	0.6996	0.954	0.3402
Dic	-0.8170	0.3587	-2.278	0.0227
Faculty	0.6472	0.4260	1.519	0.1286
Round	-0.2555	0.2076	-1.231	0.2184
Gender	-1.0654	0.4382	-2.432	0.0150
Grade	0.4182	0.1594	2.623	0.0087
AIC	212.87			

Table 6: The Logit analysis: DGDE vs. DG

	Estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	3.33042	0.88544	3.761	0.000169
Dic	-1.17403	0.45287	-2.592	0.009530
Faculty	0.35792	0.43764	0.818	0.413452
Round	-0.24631	0.24960	-0.987	0.323749
Gender	0.01316	0.51361	0.026	0.979551
Grade	-0.67783	0.20442	-3.316	0.000914
AIC	155.71			

Table 7: The Logit analysis: DGBE vs. DGRE

Since the donation rate is censored by 0 and 1, it is natural to conduct the Tobit analysis to our experimental data. The results of the Tobit analysis is shown in the Tables 8 and 9.

Table 8 indicates that the coefficient of *Dic* is negative and significant at 5% level and that the coefficient of *Grade* is positive and significant at 5% level. The first result means that when the dictator makes effort and the recipient does nothing, the donation rate decreases. The second result means that the senior dictator donate more than the junior dictator.

Table 9 indicates that the coefficient of *Dic* is negative and significant at 0.1% level and that the coefficient of *Grade* is negative and significant at 5%level. First result means that given the recipient's effort, the dictator's effort decreases the donation. Second result means that the senior dictator donates less than the junior dictator.

Summing up, *Dic* is significant between two analyses. Therefore, we assert that the hypothesis one is significantly supported by the Logit and tobit analyses.

3.3 Hypothesis Two

Applying the Logit and Tobit analyses, we investigate the validity of the hypothesis two, "When the recipient makes effort, the donation of the dictator increases". The variables used for the statistical analysis are the same as used in the section 3.2.

The hypothesis two consists of two parts. First is the case that the dictator works for earning her endowment (DGDE vs. DGBE). Second is the case that the dictator is given her endowment without work (DG vs DGRE).

Let us investigate the hypothesis two with the Logit analysis. Tables 10 and 11 show the results. Table 10 indicates that no variable is significant: The average donation rate under DGBE is indistinguishable from tha rate under DGDE. This means that the dictator ignores her recipient's work when she works for earning the endowment.

Table 11 indicates that *Rec* is positive significant at 6% level. This means that the dictator increase the donation when her recipient works. *Faculty* is significant, too. This means that the dicator who belongs to the faculty of economics donates more than those who belong to other faculties.[12] *gender* is negative and significant at 5% level. This means that the male dictator donates less than the female dictator.

Tables 12 and 13 show the result of the Tobit analysis. Table 12 indicates that no

variable	estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	0.01438	0.11153	0.129	0.8974
Dic	-0.12414	0.05658	-2.194	0.0282
Game	-0.01852	0.03273	-0.566	0.5714
gender	-0.02249	0.06773	-0.332	0.7398
faculty	-0.07168	0.06648	-1.078	0.2809
grade	0.05438 0.02560 2.124	0.0337		
Log(scale)	-1.16716	0.08169	-14.287	$p < 2e-16$
scale	0.3113			
Log-likelihood	-73.93 (DF=7)			
Wald-statistic	10.48 (DF=5)	$p = 0.063$		

Table 8: The Tobit analysis: DG vs. DGDE. There are 67 Left-censored, 90 uncensored, and 2 right-censored observations.

[12]Since 1980's, some studies have investigated whether studying economics discourages (or inhibits) cooperation (Yezer A. and Poppen (1996) and Seguino S. and Lutz (1996)). Current consensus is that studying econmics does not necessarily discourage or inhibit cooperation.

variable except *Intercept* is significant. This means that the dictator ignores the work of her recipient when she works.

Table 13 indicates that *Rec* is positive and significant at 1% level. This means that the donation probability increases when she does not work and her recipient works.

Summing up, the hypothesis two is not fully supported. When the dictator works, she ignores the work of her recipient, while she does not work, she increases the donation rate when her recipient works.

3.4 Focusing on the pairs of high scores

The analysis in the sections 3.2 and 3.3 ignores the performance of the dictators (and recipients) in the calculation test. In reality, the performance of the test may affect the donation rate of the dictator. For example, if the score of the dictator is low uner the treatments where the dictators make effort, her endowment is small, too. This may decrease her donation rate. If the score of the recipient is low under the treatments where the recipients make effort, the donation rate of her dictator may be low. Especially under the treatment DGBE, if the dictator's score is high but her recipient's one is low, she may give a little money to her recipient. The result of Hoffman et al. (1994) supports this prediction.

To focus on the pairs of high scores, we investigate two hypotheses by using the data which is restricted by the following conditions. For the average scores in the calculation tests, see Appendix A.

- When the dictator works, the score of the dictator is equal to or greater than 96 in

variable	estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	0.447866	0.111490	4.017	5.89e-05
Dic	-0.237546	0.063397	-3.747	0.000179
Game	-0.029234	0.034976	-0.836	0.403260
gender	0.001535	0.071596	0.021	0.982899
faculty	-0.023518	0.060972	-0.386	0.699706
grade	-0.065354	0.028961	-2.257	0.024031
Log(scale)	-1.210110	0.086721	-13.954	$p < 2e-16$
scale	0.2982			
Log-likelihood	-51.36 (Df=7)			
Wald-statistic	28.56 (DF=5)	$p < 0.001$		

Table 9: The Tobit analysis: DGBE vs. DGRE. There are 52 Left-censored, 77 uncensored, and 0 right-censored observations.

	Estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	1.6053	0.7450	2.155	0.0312
Rec	-0.2829	0.3355	-0.843	0.3990
gender	-0.4631	0.3731	-1.241	0.2145
grade	-0.1496	0.1579	-0.947	0.3435
Game	-0.3319	0.2056	-1.614	0.1065
faculty	-0.2959	0.3883	-0.762	0.4460
AIC	213.23			

Table 10: The Logit analysis: DGBE vs. DGDE

	Estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	1.1717	0.8187	1.431	0.1524
Rec	0.8453	0.4429	1.909	0.0563
faculty	1.0632	0.4664	2.279	0.0226
Game	-0.1139	0.2390	-0.477	0.6336
gender	-1.4494	0.6471	-2.240	0.0251
grade	0.2096	0.1955	1.072	0.2838
AIC	167.19			

Table 11: The Logit analysis: DG vs. DGRE

all three rounds.

- When the recipient works, the score of the recipient is equal to or more than 96 in all three rounds.
- When the both work, the scores of the dictator and her recipient are equal to or more than 96 in all three rounds.

The score equal to or more than 96 is worth the perfect score, since the dictator is not informed of the exact score but informed the score according to the Table A-1. With this

variable	estimate	Std. Error	z value	$Pr(>\|z\|)$
Intercept	0.24122	0.11045	2.184	0.0290
Rec	-0.03906	0.05035	-0.776	0.4379
Game	-0.04583	0.03055	-1.500	0.1336
gender	-0.02808	0.05488	-0.512	0.6089
faculty	-0.08702	0.05912	-1.472	0.1411
grade	-0.03237	0.02422	-1.337	0.1813
Log(scale)	-1.30058	0.09212	-14.119	$p < 2e-16$
scale	0.2724			
Log-likelihood	-59.4 (Df=7)			
Wald-statistic	6.396 (DF=5)	$p = 0.270$		

Table 12: The Tobit analysis: DGBE vs. DGDE. There are 77 Left-censored, 73 uncensored, and 0 right-censored observations.

data, we can investigate the donation rate given the score of the subjects. Let us call this data "high scored data".

The high scored data is summarized in the Table 14. [13]

This table indicates that the donation rate in the three treatments except the treatment DG is higher in the high scored data than in the data in the previous subsections. Especially the rate under the treatment DGBE increases sharply.

With the high scored data, we conduct the Logit and Tobit analyses. With high scored data, the work of the dictator decreases the donation rate whether her recipient works or not. The work of the recipient increases the donation rate only if the dictator does not work. When the dictator works, she ignores the work of her recipient. These results are in line with the ones in the sections 3.2 and 3.3.

4 Discussion

In this section, we compare our results with the related existing literatures and interpret the results given in Section 3. Some literatures can be thought that it compare the treatment DG with DGDE, others can be thought that it compare the treatment DG with DGRE. However, other than this study, there is no literature analyzing these treatments comprehensively. The analisys provides new insight into the other-regarding behavior.

First, we compare our result with Cherry (2001) and Cherry et al. (2002). They compared the standard dictator game with the dictator game with earning stage. In

variable	estimate	Std. Error	z value	$Pr(>\|z\|)$
(Intercept)	0.037449	0.116494	0.321	0.74786
Rec	0.184698	0.064262	2.874	0.00405
Game	0.001623	0.035987	0.045	0.96402
gender	-0.065368	0.084436	-0.774	0.43883
faculty	-0.041613	0.065251	-0.638	0.52364
grade	0.039248	0.029006	1.353	0.17603
Log(scale)	-1.108658	0.078267	-14.165	p$< 2e-16$
scale	0.33			
Log-likelihood	-67.57 (Df=7)			
Wald-statistic	8.692 (DF=5)	$p = 0.122$		

Table 13: The Tobit analysis: DG vs. DGRE. There are 42 Left-censored, 94 uncensored, and 2 right-censored observations.

[13]The number of the dictators under the treatment DGBE is much smaller in the high scored data than in the data in the sections 3.2 and 3.3. The reason is that more than half the pairs failed to get a mark equal to or more than 96.

Treatment	dictator's behavior	recipient's behavior	Number of Data	Round One	Round Two	Round Three
DG	do not work	do not work	28	0.184 (0.23)*	0.120 (0.19)	0.205 (0.30)
DGRE	do not work	work	13	0.306 (0.27)	0.244 (0.27)	0.300 (0.33)
DGDE	work	do not work	23	0.142 (0.18)	0.106 (0.17)	0.102 (0.16)
DGBE	work	work	10	0.158 (0.21)	0.146 (0.19)	0.121 (0.18)

* Numbers in the parentheses are standard deviation.

Table 14: The evolution of the donation rate under each treatment (high scored dictators)

Cherry (2001), dictators earned endowment for the dictator game by dealing lotteries, then the bargaining was played. In Cherry et al. (2002), dictators earned endowment by taking questions taken from the Graduate Management Admission Test in the earning stage. These are corresponding to our comparison between treatment DG and DGDE.[14] These studies concluded that addition of the earning stage decreased the dictator's donation to the recipient. This result is corresponding to our result that when the recipient's behavior is fixed, the dictators' work decreases their donation. However, our result holds even in the case where the recipients work before the bargaining. This is followed by the comparioson between the treatment DGRE and DGBE. In this sence, our result is more general.

Second, we compare our result with Yamamori et al. (2008) considering the voice after the manner of Hirschman (1970). Yamamori et al. (2008) compared the standard dictator game with the dictator game with the recipient's voice before the bargaining. This study is corresponding to our comparison between treatment DG and DGRE, even though their treatment with voice is different from our treatment DGRE in that our recipients didn't ask dictators for a certain amount of money directly but simply showed the result of work. Yamamori et al. (2008) provided the result that the recipient's voice increased the dictator's donation to the recipient in the subsequent dictator game. This result is consistent with our result that dictators not engaged in working stage count recipents' work, that is recipents' work increases the dictator's donation to the recipient. However, from the comparison between treatment DGDE and DGBE, it cannot be said that dictators engaged in working stage count recipents' work. Whether dictators count recipients' work depends on wheter dictators work or not.

[14]Dealing lotteries in Cherry (2001) is different from the work we suppose. It is closer to gamble than work. It's just conceivable that dictators with money by gamble donate more, as they say "lightly come, lightly go."

Next, we interpret the results given in Section 3 comprehensively. The result that when the recipient's behavior is fixed, the dictators' work will decrease their donation implies dictators think that their own work counts. Meanwhile, dictators think that others' work counts only if they don't work from the rest of the result. These imply that dictators think their own work is more important than others work, or the dictators' way to count work is lexicographic order in the sence that dictators count their own work preferentially.

Another interpretation of our results is presented. Cherry (2001) used the concept of mental accounting to explain its result that addition of the earning stage decreased the dictator's donation to the recipient. By the concept of mental accounting, people possess different marginal propensities to consume for each types of money from different sources. (Thaler (1985), Thaler (1990)).Moreover, Battalio, Kagel and Jiranyakul (1990) and Thaler and Johnson (1990) provide the evidence to suggest that people accept more risk when acting over unearned money. We try to apply the concept of mental account for our case. Dictators with unearned money spend more money to recipients with work than to recipients without work. Stated another way, they prfer the case where recipients work to the case where recipinets don't work. Meanwhile, Dictators with earned money don't chage their act between the case where recipients work and the case where recipinets don't work. That is, both cases are indifference for them. These imply that people possess different preference order depending on the way to get money.

5 Conclusion

In this papar, we add a prior working stage in which subjects engage in the calculation test to a dictator game experiments and compare a standard dictator game experiment. This paper differs from many studies, where subjects do a task to earn themselves endowments before playing a standard dictator game, by the presence of treatments where recipients work.The results are summarized as follows:

- The donation is smaller when the dictator works than when she or he does not work.
- The dictator without work increases the donation more when her or his recipient works than when her or his recipient does not work.
- The dictator with work doesn't count the work of her or his recipient.

Results show that the preference ordering of the dictator is lexicographic. This conclusion cannnot be attained by the framework of existing studies.

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Appendix A: Average scores of the calculation tests

Table 15 indicates the average scores of the dictators under DGDE and DGBE, the number of the dictators who got a mark equal to or more than 96, the average scores of the recipients under DGRE and DGBE, and the number of the recipients who got a mark equal to or more than 96.

The average scores of the dictators.				
Treatment	the number of the dictators	1	2	3
DGDE	25	98.9 (25)*	98.4 (23)	99.2 (25)
DGBE	25	97.4 (23)	98.2 (22)	98.4 (23)
The average scores of the recipients				
Treatment	the number of the recipients	1	2	3
DGRE	19	98.1 (16)**	98.2 (16)	98.4 (19)
DGBE	25	97.4 (18)	97.0 (19)	95.4 (19)

* Numbers in the parentheses are the number of the dictators with the score equal to or more than 96.
** Numbers in the parentheses are the number of the recipients with the score equal to or more than 96.

Table 15: The average scores of the calculation tests

Appendix B

Following instruction was for the dictators in DGBE,[15] where the dictator and her recipient worked before the dictator game began.

How to make decision

Your partner is anonymous and sitting in the adjoining room. Your partner changes in every round.

This experiments consists of three rounds. In EACH round, following is what you should do.

- The experimenter hands out the question sheet. There are one hundred addition and subtraction questions in the sheet. You have twenty minutes to answer the questions. When the calcuration time is over, the experimenter asks you to enter your answers to the computer console.
- While you answer the questions, your partner do the same questions. After your partner finish answering, she walks in your room through the rear door, sits down, and enter her answers to the computer console.
- After finishing entering your answers and her answers, your computer console displays your score and her score. Notice that her score displays according to the table A-1. For example, her score is 97, your computer console displays "Your partner's score is greater or equal to 96".
- The computer console displays your endowment, which is assigned according to your score (see table A-1).**YOUR ENDOWMENT ONLY DEPENDS ON YOUR RESULT. YOUR PARTNER'S RESULT DOES NOT AFFECT YOUR ENDOWMENT.**

[15]The instruction is originally written in Japanese.

- Assume that you have JPY x as the endowment. You face with the situation that you donate your endowment to your anonymous partner. You must choose how much you donate to her.
- You can donate from JPY 0 to JPY x to her.
- If you donate JPY y to her, you enter y to your computer console and push the"OK" button.
- Your partner's reward is JPY y. Your reward is JPY $x - y$.
- **CAUTION**
  - Although your partner also answers the same questions, she is not given any money from the experimenter. Therefore, she does not have the endowment to donate to you.
  - Your partner knows your endowment but does not know your score.
  - Your partner knows that you make some effrot to earn money. However, sher does not know what kind of effort you make. Therefore, she does not know your score and the table A-1.

The experiment lasts three rounds. Your partner randomly changes in each round. After a round is over, your partner goes back to the adjoining room.

Score	Amount of Money
79 or lower	JPY150
Between 80 and 89	JPY300
90	JPY450
91	JPY600
92	JPY750
93	JPY900
94	JPY1050
95	JPY1100
96 or higher	JPY1200

Table A-1: Relation between the Amount of Money and Score

Monetary Reward

Your monetary reward is the sum of the rest of your endowment in three rounds. That is, if you earn your endowment E_i in the ith round and donate d_i to your partner, the rest of your endowment in this round is $E_i - d_i$. Therefore, your reward is $\sum_{i=1}^{3}(E_i - d_i)$.

Appendix C

Following instruction was for the recipients in DGBE.

How to make decision

In this experiment, you play the game as the role B. Your role is unchanged throughout the experiment. Your anonymous partner is in the adjoining room. Your partner is different from round to round.

This experiment consists of three rounds. Following is your decision in each round.

- The experimenter hands out the calculation test. There are one hundred addition and subtraction problems involving two- or three-digit numbers in the sheet. You complete the test within twenty minutes. After the time is over, you stop to answer.
- You enter the adjoining room from the rear door. Then you enter your answers to the comuter console.
- Your partner knows that you complete the calculation test. Your score is informed to your partner according to the table B-1. If your score is 97, then your partner looks at the message "Your partner's score is equal to or higher than 96".
- You are NOT informed of your own scores.
- Your score does NOT affect your monetary reward.
- On the other hand, while you complete the test, your partner make some effort to earn her own endowment.
- You are informed of your partner's endowment as the result of her effort.
- **Your score, which is informed of your partner DOES NOT affect your partner's endowment.**
- You make a quick short note of the endowment of your partner.
- The computer console displays your donation from your partner.

  You make a quick short note of the donation and push "OK" button.
- Your reward in this round is the donation.

Monetary Reward

Your monetary reward is sum of your donation in three rounds. If your donation in round one, round two, and round three are JPY x, JPY y, and JPY z, respectively, your total reward is JPY $x + y + z$.

Classification of the Score
79 or lower
Between 80 and 89
90
91
92
93
94
95
96 or higher

Table B-1: Classification of the Score