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## Do experimental subjects favor their friends?\*

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## Abstract

Ideally we would like experimental subjects to be perfect strangers so that the situation they face at the lab is not just part of a long run interaction. Unfortunately, it is not easy to reach those conditions and experimenters try to mitigate any effects from these out-of-the-lab relationships by, for instance, randomly matching subjects. However, even if this type of procedure is used, it cannot be excluded that a subject may face a friend or an acquaintance. For the dictator game we find evidence that a positive probability of playing with a friend is not relevant to experimental results. However, when subjects are certain to face a friend they give more.

**Keywords:** experimental procedures, friendship effect, dictator game, fairness.

**JEL Class.:** C99, D63, D64.

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# 1 Introduction

This paper deals with the effects of between-subjects social distance in dictator games (DG hereafter). Our first objective is to check an extremely intuitive conjecture: If the average behavior of dictators is to share their endowment with unknown recipients, they should be willing to offer a greater share to a friend. We explore whether there is such a “friendship effect” on giving. The study of this effect continues the path opened by previous work showing that reducing the dictators-recipients social distance in DG increases mean offers (e.g., Bohnet & Frey [1], Hoffman et al. [14], Charness & Gneezy [7]).

However, we go a step further, in the sense that matching friends in a DG would imply a more drastic reduction of the between-subjects social distance than providing family names or physical identification. If there is a causal link between social distance and agents’ taste for fairness, our conjecture is that giving should increase dramatically. Our findings show that this is indeed the case. Mobius et al. [16] deals with a similar topic. After the elicitation of a social network they match dictators with their friends in order to check the presence of a friendship effect. The key difference is that they also give dictators the recipient’s identity.<sup>1</sup> Under that setting they find a positive and significant friendship effect.

The second objective is a methodological concern. In an attempt to guarantee that the situation agents face at the lab is not just part of a long run interaction unknown to the researcher, agents are matched randomly and between-subjects anonymity is preserved in standard DG. Nevertheless, there is a positive probability that a subject is paired with a friend or an acquaintance. Indeed, there is probably no mistake in assuming that the standard recruitment procedure based on a public call does not exclude that groups of friends decide to go together to the laboratory.

On this basis, and given that friendship has a large effect over giving in DG, a reasonable hypothesis is that the possibility of friends being paired together in a random matching procedure may increase dictators’ taste for fairness. If this is so, the presence of friends in the subject pool could be an uncontrolled variable that affects the agents’ decisions and experimental economics should control for it. If this effect is irrelevant, that is definitely

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<sup>1</sup>This information on the recipient’s identity implies that there is no anonymity between subjects and that there is a “large” room for reciprocity.

good news!

This methodological concern is not completely unknown to the experimental literature. Charness et al. [8](p. 2) state:

“In the typical laboratory setting, participants can see each other (...), share common traits (e.g., school, age group, nationality), and may well be friends or acquaintances. Perhaps the willingness to sacrifice money to affect someone else’s material reward is an artifact of the physical and emotional proximity of the experimental subject pools”.

Nevertheless, by comparing dictators’ allocations in a friend-free context with other results in the DG literature, our conclusion is that the presence of friends in the subject pool<sup>2</sup> is irrelevant in DG. Thus, even if experimental protocols do not cancel the positive probability of matching couples of friends in the roles of dictator and recipient, the presence of friendship relations in the subject pool does not seem to contaminate significantly the results in standard DG.

The paper is organized as follows. Section 2 refers to previous experimental works focused on the effects of modifying social distance. Section 3 describes the design and procedures. In section 4, we analyze the strength of the friendship effect, and the fifth section deals with the implications of having just a positive probability of being matched with a friend. Section 6 concludes.

## 2 The recipient is your friend

This paper explores social distance measure by the degree of relationship between subjects.

In recent years, there has been a large number of dictator game papers which analyze several aspect of social distance (including both procedures and information about the recipient) as determinants of giving.

Seminal papers on this regard focused on whether and how the *experimenters-subjects* social distance may affect altruistic behavior. Hoffman *et al.* [13] and [14], Bolton et al. [2] and Frohlich et al. [12], among others, are good examples of this literature.

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<sup>2</sup>Excluding the case where all the recipients are dictators friends.

Another stream of work studied *between-subjects* social distance. For instance, Eckel and Grossman [9] informed the dictator who the recipient was: the local Red Cross. Bohnet and Frey [1] had (among other treatments) dictators who could identify their recipients. In Charness & Gneezy [7] subjects knew the family name<sup>3</sup> of their counterparts. In the same vein, Burnham [5] gave dictators recipients photographs. Frohlich et al. [12] conducted a DG in just one room<sup>4</sup> –but under double-blind conditions– as a way to reduce dictators-recipients social distance.

All the above experiments showed that the smaller the social distance the larger giving. However, in an attempt to study the opposite effect, Johannesson and Persson [15] use as recipients randomly selected Swedish citizens who did not know they were participating in an economics experiment. They show that this larger social distance has not a significant effect on results.

In sum, social distance may be affected by informing dictators about recipient’s attributes. Making dictators play with a friend is a means to minimize such distance. Mobius et al. [16] analyze DG within social networks: dictators know they are matched with a particular friend and, as a consequence, giving increases. Our paper continues this line of research.

### 3 Design and procedures

The experiment was conducted at the University of Granada (Spain) in January 2006. Subjects were first-year undergraduate Economics students. The possibility to participate in an economics experiment was announced in class to first year students. Since we needed a list of friends for each subject, it was more likely to find it within the same class. However, participation was voluntary. Students wishing to participate were invited to go to a nearby room.

We were extremely careful in preserving subjects–experimenter distance. To do so the experiment: *i*) was conducted by assistants who did not have any contact with the students before or after the experiment, *ii*) instructions

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<sup>3</sup>Name is not a trivial information. Fershtman and Gneezy [10] conducted a DG with Israeli Jewish students (dictators) who were informed about the recipients’ name. Names were a source of ethnic information however, results indicated that there is no clear systematic “taste for ethnic discrimination”.

<sup>4</sup>Instead of a room A for dictators and a room B for recipients, they placed all of them within the same room.

(see appendix) indicated that the experiment was coordinated by a professor of the Universidad del País Vasco (1000 kms. far from Granada) and *iii*) we used double-blind procedures.

To analyze the strength of the friendship effect we use two treatments of a DG: dictators played either with a friend ( $T_f$  hereafter) or with a classmate who had not been included in their list of friends ( $T_s$  hereafter). To obtain the list of friends for each participant in the experiment, subjects were asked to write down the name of classmate friends on the answer sheet (see appendix).

Up to this moment, no information about the type of decisions they would take afterwards had been provided. However, since we were interested in subjects revealing close friends, the instructions stated that they might have the chance to benefit one of the friends in their list, and that the more friends were listed, the lower the chances of helping a particular individual would be.

We use this *benefit-your-friend* incentive device in order to get a true mapping of personal relationships. Although our mechanism is not as sophisticated as Mobius et al. [16] we got a 50.1% of correspondence<sup>5</sup> (between links) vs. their 37.7%.

Our experiment tries to determine whether friendship affects dictators' taste for generosity. Note, however, that the degree of friendship elicited does not necessarily coincide with the highest level possible: the best friends of our subjects could be outside the first year class list. Furthermore, no measure of friendship strength is provided (for such a measure see Brañas-Garza et al. [4] and Mobius et al. [16]). Nevertheless, this is the kind of friendship level we can expect to find in **most experiments run at laboratories**.

All the participants were assigned the role of dictators, either in  $T_f$  or in  $T_s$  and were placed in the same room. In  $T_f$  subjects were informed that the recipient would be randomly chosen from their list of friends. In  $T_s$  they were informed that they would be matched to a recipient randomly selected from the entire class list, excluding the friends that they had named. Dictators did not provide their names<sup>6</sup> and all of them were also potential recipients.

During the experiment, instructions were read aloud. Subjects were allowed to ask questions in private. They were not allowed to communicate

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<sup>5</sup>Part of the non-corresponded links were due to the fact that some students in the class list were absent and could not correspond.

<sup>6</sup>However we can trace them. Under the current data protection laws we have to ask subjects to fill an informed consent form. With this form they give us permission to use their choices for research purposes. Obviously forms are signed.

between them. First, participants revealed their list of friends. Second, they played a DG.

At the beginning subjects received two  $11.5 \times 22.3$  cms. ( $4.5 \times 8.8$ . inch.) envelopes included within the hand-out package. One of them was empty and the other contained ten 50 eurocents coins.<sup>7</sup> Subjects were informed that their decision task was to divide the whole endowment of ten coins between them and another subject in whatever way they wished. Then, they read on the instruction sheet whether their recipient would be a friend in their list ( $T_f$ ) or someone from the entire friend-free class list ( $T_s$ ).

To avoid any doubts about recipients getting the money (see Frohlich et al. [12]), the commitment to pay recipients in private the day after (and the place) was announced publicly.

To divide the pie in practice, subjects were asked to put the money that they wish to donate in the empty envelope, seal it, leave it on the table and leave the room. The rest of the money was for them to keep. Participants were able to take their decision confidentially given the space left between subjects.

The total amount of money collected, from donations, was given to the recipients the day after the experiment, once all the random-matching process was over.

The sample comprises 53 subjects: 27 participated in treatment  $T_s$  and 26 in  $T_f$ . On average, dictators earned 5.45 euros<sup>8</sup> (including 2 euros show-up fee) for a 20 minutes session. Recipients, without any task or effort received 1.5 euros on average.

To simplify the exposition and the comparison with other related papers our results are presented in terms of the number of coins.

## 4 The friendship effect

Table 1 shows some data on the number of friends listed by subjects. As outstanding features note, first, that decision makers listed 2.79 friends on average. Second, almost half of the subjects included 2 or 3 (the modal value) friends in their list, and about 6% listed 6 friends or more. Third, the

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<sup>7</sup>The smallest bill in euros is a 5 euros bill, so we used coins to allow for a wider range of allocations.

<sup>8</sup>US\$ 7.

maximum number of friends revealed was 7. Finally the level of correspondence among links (50.1%) indicates that the *benefit-your-friend* device was successful in eliciting the true social network.

**Table 1: NUMBER OF FRIENDS**

$n$	Mean	Frequency						
		0	1	2	3	4	5	6+
49	2.79	5	8	11	13	5	8	3
		(9%)	(15%)	(21%)	(25%)	(9%)	(15%)	(6%)

The 53 participants were randomly assigned between treatments: 26 to  $T_f$  and 27 to  $T_s$ . Four of those five subjects who did not list any friend were in treatment  $T_f$ .<sup>9</sup> The distributions of subjects' offers in  $T_f$  and  $T_s$  are shown in Table 2. On average, dictators offered 2.48 when the recipient was a classmate, whereas they gave 3.68 when the recipient was a listed friend. Thus, *reducing between-subjects social distance by matching friends yields an increase of almost 50% in the amount given.*

Furthermore, the frequency distributions are inverted, in the sense that 68% of the subjects offered 4 or more in  $T_f$ , whereas 70% gave 3 or less in  $T_s$ . Hence, we can conclude that giving in *DG* is *definitely sensitive to the friendship effect.*

**Table 2: GIVING IN  $T_f$  AND  $T_s$**

$T$	$n$	Mean	Frequency						
			0	1	2	3	4	5	6
$T_f$	22	3.68	3	0	2	2	5	9	1
			(14%)	(0%)	(9%)	(9%)	(23%)	(45%)	(4%)
$T_s$	27	2.48	5	2	6	6	5	3	0
			(19%)	(7%)	(22%)	(22%)	(19%)	(11%)	(0%)

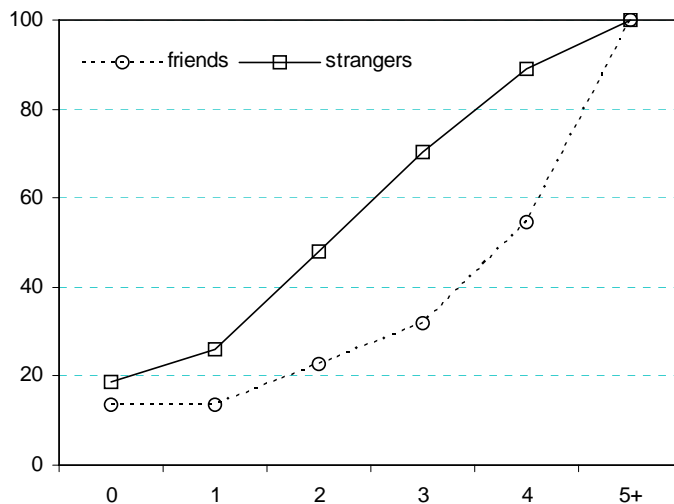
Both the Mann-Whitney ( $Z = -2.590$ ;  $p = 0.01$ ) and the Kolmogorov-Smirnov ( $Z = 1.342$ ;  $p = 0.05$ ) tests reject the null hypothesis that the

<sup>9</sup>Since these 4 dictators could not be matched to a friend, their decisions have been excluded from the data set. Two of these subjects gave 1 coin; one of them gave 3; and the last one gave 4 coins.



distributions of dictators' giving in  $T_f$  and  $T_s$  are drawn from the same population. Figure 1 shows that the cumulative distribution function of giving in  $T_s$  stochastically dominates that in  $T_f$ .

**Figure 1: FRIENDSHIP AND GIVING**



Therefore:

**Result 1.-** Friendship increases donations.

A step further could be to explore the role of social networking (that the whole spectrum of social relations) on giving. A sensible conjecture is that giving is not completely unrelated to agent's social capital. That is, the level of generosity they show would seem to be correlated with the number of friends they name (*degree-out* in network theory terminology). A regression analysis, with constant and controlling by treatment, indicates that the number of friends is a positive and significant, for  $\alpha = 10\%$ , determinant of giving (see Brañas-Garza and Espinosa [3] and Brañas-Garza et al. [4] for details).

## 5 Should experimenters be concerned about the friendship effect?

Result 1 provides support to the idea that subjects' taste for altruism is sensitive to social distance. In particular, when social distance is as small as that between two friends, subjects give more in DG.

Furthermore, this evidence has been obtained for the type of friendship characterizing relationships between undergraduate students. This friendship relation is likely **to be similar to those observed between students who come together to the lab.**

As a result of the strength of this effect, we could ask whether, in a standard DG, decisions may be influenced by dictators knowing that there is a positive probability of being matched with a friend. If this were the case, there would be an uncontrolled friendship-effect affecting giving.

In a regular DG no mechanism is used to elicit the social mapping so that we may not exclude previous interactions (links) among players.<sup>10</sup> However participant in  $T_s$  knew that their recipients were randomly selected from a friend-free pool; that is, dictators were certain about the fact that they were not going to be matched to a friend.

To check whether the friendship-effect is important in practice –where the probability of being matched to a friend is never equal to one– the results obtained in  $T_s$  are compared to those of a standard DG. The idea is to compare the results in a DG where the dictators' friends were excluded in the matching process with those DGs where this variable was not controlled for.

In particular, the comparison can be made between our  $T_s$  and a number of well-known DG's: Forsythe *et al.* [11] (FHSS hereafter); Hoffman *et al.* [14] (HMSS) and Frohlich *et al.* [12] (FOM).

There are some interesting features regarding each DG. For instance, FHSS uses two monetary sizes: a US\$10 stake (labelled FHSS) and a US\$5 (FHSS-5); Frohlich *et al.* [12] uses single and double rooms (FOM and FOM-2 respectively) whereas Hoffman *et al.* [14] is the benchmark regarding strict conditions, in the sense that subjects are not induced to behave socially.<sup>11</sup>

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<sup>10</sup>Indeed, the use of “public calls” as recruitment procedures is likely to result in a subject pool containing groups of friends.

<sup>11</sup>Frohlich *et al.* [12] motivated their paper saying that conditions –in HMSS experiment– were so strict that people did not believe even that recipients existed.

Table 3 shows the distributions of dictators' offers in  $T_s$  and the referred papers.

**Table 3:**  $T_s$  AND OTHER DGs

	$T_s$	FHSS	FHSS-5	HMSS	FOM	FOM-2
0	5	5	16	23	6	8
1	2	4	0	7	2	4
2	6	3	13	2	2	1
3	6	7	2	1	0	2
4	5	0	4	0	0	5
5+	3	5	10	3	7	2
$n$	27	24	45	36	17	22
MEAN	2.4	2.3	2.2	0.8	2.4	2.7
MEDIAN	3	2.5	2	0	2	1
MODE	2 – 3	3	0	0	0 – 5	0
ST. DEV.	1.62	1.78	2.04	1.47	2.40	3.13
MAX	5	5	6	5	6	10

The first conclusion stemming from the experimental data is that, with the remarkable exception of HMSS, mean offers in all the treatments take very similar values.<sup>12</sup>

A battery of Mann-Whitney tests supports that  $T_s$  is not different from FMSS ( $Z = -0.34$ ;  $p = 0.72$ ), FMSS-5 ( $Z = -0.73$ ;  $p = 0.46$ ), FOM ( $Z = -0.06$ ;  $p = 0.95$ ) and FOM-2 ( $Z = -0.25$ ;  $p = 0.79$ ) but differs from HMSS ( $Z = -4.0$ ;  $p = 0.00$ ). Hence, there are no differences among samples except for the last one.

The Kolmogorov-Smirnov test reports identical results.<sup>13</sup> Thus we can conclude that there are no differences in behavior between dictators facing a sample of stranger recipients and those in the standard DGs –without any control for friends.

<sup>12</sup>In HMSS-5 two subjects gave 6 coins and in FOM-2 two subjects gave the whole endowment, 10 coins.

<sup>13</sup> $T_s$  is not different from FMSS ( $Z = 0.41$ ;  $p = 0.99$ ), FMSS-5 ( $Z = -0.70$ ;  $p = 0.71$ ), FOM ( $Z = 0.97$ ;  $p = 0.30$ ) and FOM-2 ( $Z = 0.99$ ;  $p = 0.27$ ) but differs from HMSS ( $Z = 2.25$ ;  $p = 0.00$ ).

Recall that dictators in  $T_s$  were well aware that they were not going to be paired to a friend but they behaved in a similar way to dictators that were uncertain about whether they would be matched with a friend. Hence, it seems that knowing that there is a positive probability of being matched with a friend does not affect giving in DG.

**Result 2.-** (in DG) Controlling for friendship relationships among subjects is not necessary.

## 6 Concluding remarks

This paper is a contribution to the stream of research that focuses on how between-subjects social distance is related to dictators' decisions. Specifically, it shows how an important modification of the social distance does affect subjects' concern for generosity. Our results indicate that the taste for altruism is substantially increased when friends play the role of recipients.

Our finding that the friendship effect is significant leads to the question of the impact of a positive probability of being matched with a friend, as it is the case in most laboratory experiments. Fortunately, we did not find such an effect: our findings with friend-free subject pools are not significantly different from standard results in the DG literature. This is good news for experimenters!

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## Appendix: Experimental instructions<sup>14</sup>

You are going to participate in an Economics Experiment. For your participation you get the 2 euros that have been placed on your desk. This work is coordinated by a researcher at the University of the Basque Country. She asks you for your cooperation during the experiment. The aim of this experiment is to study how individuals take decisions in certain contexts. Instructions are simple. If you carefully follow them, you could earn an additional amount of money at the end of the experiment; this amount will be paid in private (no one will know how much you have earned). You are allowed to ask questions to the monitors at any moment during the experiment. To call monitors, raise your hand. Any communication between participants is strictly forbidden and would imply the exclusion from the experiment.

Three qualifications are in order before proceeding.

First, the money you will be using DOES NOT belong to the researchers, it has been provided by the Spanish government for scientific purposes.

Second, not all of the participants face the same decision problem; three different experiments are been conducted in this room.

Last, you can check that your name will not be asked –exception made of the consent form, that is a legal requirement. Everything is confidential.

The experiment is divided in different phases that are explained below in detail.

(Phase 1) **Group of friends:** We need you to give us a list of classmate friends. There is a chance that if you list them here they will participate in the experiment with you and could benefit from your decisions. ‘Your list’ will be the basis to randomly select those individuals.

“Please, write down your list of friends below. If you do not list any friend, then, we will randomly select any classmate and you will not have the chance to benefit a friend. The number of marks that appear below does not determine the number of friends you have to list. Feel free to name as many friends as you wish. Remember though that *the higher the number of friends you list, the lower the chances of benefiting a particular friend of yours are.*

YOUR LIST of FRIENDS:

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<sup>14</sup>Original instructions were given in Spanish.

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(Phase 2) **The decision problem:** One of the envelopes on your desk contains ten 0.5 euro coins (real money). This money has been provisionally allocated to you and another subject. You have to decide how to divide those 10 coins between the other subject and you. Any allocation is possible, even that in which you keep everything for yourself and the other subject gets nothing. Your task is to take the decision you wish.

**Who are you going to be matched with?** Your partner will be RANDOMLY selected from the friends you have included in your list (YOUR list).

[In  $T_s$ : **Who are you going to be matched with?** Your partner will be RANDOMLY selected from the class list, excluding your friends (those included in YOUR list)].

You will divide the money in the following way. Since you have two envelopes, put in one of them the amount of money you want to leave for your partner, and in the other one, the amount you want to take with you. You just have to leave on the desk the first envelope. You take with you the other one. Whatever amount of money there is in it, it is something you will be the only one to know.

PLEASE, do not forget to fill in, sign and leave on the table the consent form. It is a legal requirement. Thank you for participating.