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**Mikael Knutsson
Peter Martinsson
Conny Wollbrant**

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Do people avoid opportunities to donate?*

A natural field experiment on recycling and charitable giving

Mikael Knutsson

Department of Psychology, University of Gothenburg, Sweden

Peter Martinsson

Department of Economics, University of Gothenburg, Sweden

Conny Wollbrant^A

Department of Economics, University of Gothenburg, Sweden

Abstract: We use a natural field experiment to investigate the hypothesis that generosity is partly involuntary, by examining whether individuals tend to avoid opportunities to act generously. In Sweden, new recycling machines for bottles and cans with an option of donating the returned deposit to charity were gradually introduced in one of the largest store chains. We find a substantial decline in recycling the month these new machines were introduced and a further decline in the following months. These results indicate that individuals avoid opportunities to act generously and corroborate findings from both lab and field studies supporting the claim that generous behavior is partly involuntary.

Keywords: Generosity; Donations; Natural field experiment; Avoidance behavior.

JEL classification: C93, D01, D03, D64.

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^A Corresponding author: Conny Wollbrant, Department of Economics, University of Gothenburg, Box 640, 405 30 Gothenburg, Sweden; e-mail: Conny.Wollbrant@economics.gu.se; Ph: +46 31 786 2615; Fax: +46 31 786 1043.

1 Introduction

Evidence of generous behavior towards others exists in a variety of situations in our daily lives, ranging from donating to charities to doing voluntary work and simply helping others. Recent empirical studies, however, have highlighted that generosity may be both voluntary and involuntary (Dana *et al.*, 2006; Broberg *et al.*, 2007; Andreoni *et al.*, 2011; DellaVigna *et al.*, 2012). For example, rather than voluntarily donating or helping others for the pleasure of doing so, one might donate or help due to social pressure and thus the action is at least partly involuntary.¹ In such instances, observed generous behavior comes at a cost for the individual, and presumably, she would be willing to pay in order to avoid interactions where she expects she would behave generously.

In a laboratory setting, Dana *et al.* (2006) investigate the issue of voluntary vs. involuntary generosity by using a modified dictator game. In a standard dictator game, the subject assigned the role of dictator (sender) is asked to split a monetary endowment between herself and another subject (receiver). Commonly, dictators donate on average 20% of their endowment to the recipient (e.g., Camerer, 2003; Cárdenas and Carpenter, 2008). In the modified dictator game by Dana *et al.* (2006), dictators were allowed to opt out of the dictator game; while performing a non-related task, half of the subjects were randomly assigned the role of dictator. The dictators got the information about a standard dictator game and made allocation decisions. After their answers had been collected, they were informed about the opt-out possibility. However, this possibility came at a cost; if a dictator decided to opt out, she received a fixed payment corresponding to a reduction of the endowment by 10 percent. Importantly, dictators were informed that the receivers they had been matched with would not

¹ This “involuntary” terminology is consistent with the literature (e.g., Broberg *et al.*, 2007) and is intended to reflect that individuals prefer to avoid the opportunity to behave generously. Once presented with such an opportunity, however, people act generously. Anticipating this, individuals take measures to avoid such opportunities, giving rise to the “involuntary” interpretation of generous behavior and the associated terminology.

be told about the dictator game if they decided to opt out. Thus, to avoid a situation with a possibility to act generously, the dictator could pay a price, while the design ensures that the recipient does not form expectations about the dictator's allocation decision. The authors found that 28% of subjects chose the opt-out option.

To more directly explore the hypothesis that involuntary generosity is driven by the receiver's expectations, Dana *et al.* (2006) conducted a second study. Besides replicating their first aforementioned study, they conducted a second dictator game with another sample of the subjects and they refer this game as the "private condition." In this study, the receiver would not be told from where the money originated, compared to the other experiment where they obtained complete information about the origin of the money if the sender decided not to opt-out. In the replication study, the proportion of subjects opting out when the receiver did not know the origin of the money was now only 4% (private condition) compared to 43% when the recipient was informed of the dictator game, replicating the result obtained in the first study (28%) with complete information. These results indicate that donations are at least partly involuntarily since the proportion of subjects opting-out decreased significantly when information about the origin of the money would not be revealed to the receiver. In a follow-up study, Broberg *et al.* (2007) conducted a study similar to the first study by Dana *et al.* (2006). Instead of having a fixed cost of opting out, they used the Becker-DeGroot-Marschak mechanism to determine the reservation price, and found that the reservation price averaged a reduction of 18% of the endowment. In addition, Lazear *et al.* (2012) found that 33-41% chose the opt-out option in a dictator game similar to that of Dana *et al.* (2006) with complete information. Taken together, these results support the idea that people dislike letting down the expectations of others as they are willing to incur costs to avoid giver-receiver interactions.

Consistent results are attained by Andreoni and Bernheim (2009), who in another type of modified dictator game informed dictators that their chosen amount would be given to the receiver only with a certain probability, while otherwise an amount randomly chosen from a pre-specified distribution would be given to the receiver. Their results show a significant link between the amount given and the probability that the amount chosen by the dictator would actually be given to the receiver. These results too indicate a link between the expectations of the receiver and the generous behavior of the dictator, and are consistent with the interpretation that generosity is to some extent involuntary.² If people are aware of these effects on their own behavior, prospective givers might take measures to avoid giver-receiver interactions.

Two recent field experiments have focused on generous behavior and the possibility that generous acts may be involuntary. Andreoni *et al.* (2011) conducted a charity collection experiment at a supermarket where collectors were standing at some but not all exits of the supermarket. This is similar to the study by Dana *et al.* (2006) as subjects at a cost, i.e., choosing another exit, can avoid passing the collector, thinking the collector will not know that the individual has avoided the interaction (opted out). By observing people as they exit, Andreoni *et al.* (2011) find that people take alternative and longer routes when exiting a supermarket to avoid being asked to donate to charity. Moreover, they find that donation rates increase for those who are asked, which may be the reason for avoiding the interaction.³ DellaVigna *et al.* (2012) use a door-to-door experiment where the residents are informed via a flyer delivered the day before a solicitor's visit about the time of solicitation. Their design

² It is harder for the receiver to blame the dictator if she does not know with certainty the cause of her potentially low donation, and consequently, the dictator perhaps does not have to feel as guilty; see, e.g., Battigalli and Dufwenberg (2007; 2009) regarding guilt and belief-dependent motivation.

³ This finding is consistent with experimental results. Dictator games involving communication between the dictators and the receivers have shown that communication is powerful enough to increase giving (e.g., Andreoni and Rao, 2011). Hoffman *et al.* (1996) also show that donations tend to decrease with social distance.

allows the household members to avoid the solicitor if they wish to do so. Indeed, they find that when solicitation was accompanied by the flyer, people opened the door less than without the flyers, leading to a reduction in donations compared to when solicitors turned up unannounced. Moreover, when residents are given a flyer with a “do-not-disturb” option, giving is further reduced, indicating that people are aware they will have a hard time saying no when face-to-face with the solicitor, or at least find the interaction uncomfortable, and then take measures to avoid it. Thus, the tendencies to avoid the giver-receiver interaction in these field experiments are consistent with the findings from dictator games with an option to opt out.

This paper investigates opt-out behavior in a natural field experiment. In particular, we investigate how the recycling of beverage containers with a deposit was affected when recycling machines with the option to donate the refund to a charity rather than obtaining cash was introduced in Sweden. Since 1984, a deposit system for cans and bottles has been in place in the country. The deposit system initially included only aluminum cans, but has successively been extended to also include glass and PET bottles of different sizes.⁴ Cans, glass and PET bottles can be deposited at most grocery stores and supermarkets in recycling machines. Since the mid-2000s, an additional button has gradually been added to the recycling machines providing an opportunity to donate the returned deposit to charity.⁵ Thus, in stores with machines equipped with this button, individuals face a choice of whether or not to donate each time they recycle their cans and bottles. It should be noted that apart from the donation option, the main features of the machines remain the same.

⁴ The abbreviation PET refers to bottles made of the recyclable material polyethylene terephthalate.

⁵ See Figure A1 in the appendix for an image of the donation and return deposit buttons.

Individuals who would like to opt out from the donation opportunity can decide to either not recycle at all or bring their cans and bottles to another store where the machines do not have a donation button. This situation, therefore, closely resembles that which has been tested in the laboratory through the modified dictator games described earlier, as individuals, after the introduction of the donation option, can at some cost avoid the situation where they have an opportunity to behave generously. Again, not all chains have recycling machines with donation possibilities, and those chains that do have introduced them gradually, making it possible to avoid the machines equipped with donation buttons and recycle elsewhere. This provides an opportunity to investigate whether people actively avoid the donation opportunity by comparing the recycled amount before and after the button was introduced.

2 Natural field experimental

In Sweden, there is a required deposit on beverage cans and bottles. There are three broad types of containers – aluminum cans, PET bottles, and glass bottles – and they are all included in the deposit system. A deposit, the size of which varies depending on the type of container, is paid by the consumer at the time of purchase and then refunded when the container is returned to a recycling machine at a grocery store. The overall return rate of containers is about 90% (Returpack, 2012).

At the beginning of 2006, Kooperativa Förbundet (KF), which is one of the largest grocery retail chains in Sweden, began to replace old recycling machines without any possibility to donate with new machines with donation possibilities. Donations made in these machines benefit the organizations Viskogen (“Our forest”) and Kooperation utan gränser

(“Cooperation without borders/limits”).⁶ At the end of each month, the total amount donated in all KF stores is split equally between these two organizations.

KF is a cooperative that is owned by its members (currently about 3 million out of the 9 million people living in Sweden), yet the stores are open to anybody.⁷ Many of the decisions within KF are decentralized to its 44 consumer societies, including the introduction of recycling machines with a possibility to donate. Each consumer society covers substantially different geographical areas of Sweden and the number of stores in a society varies from 1 to 73. The decision to adopt a machine with a donation option is made by the board of the consumer society, which consists of the store owners.⁸ Once a society has decided to introduce recycling machines with a donation option, the replacement at store level takes place when an older machine breaks or is no longer worthwhile to maintain, i.e., the introduction is exogenous. From 2006 when the first machines with donation possibilities were introduced to 2010, the fraction of stores with the new type of machines steadily increased from 26% to 76%.⁹

The objective of this paper is to investigate the effect of introducing a recycling machine with a donation option on recycling behavior. We analyze how much the monetary value of the amount recycled has changed from before to after the introduction of the new machines. Since recycling is cyclical and depends on time of the year, and machines are introduced at different times of the year, we chose to 12-month difference the monthly monetary values of the

⁶ The charities are Viskogen, which focuses on forestry projects in Africa (see Viskogen, 2012), and Kooperation utan gränser, which focusses on rural development projects in Africa and Latin America (see Kooperation utan gränser, 2012).

⁷ The benefits of being a member are weekly discounts on certain products and dividends from profit in relation to amount purchased.

⁸ It is possible that if a consumer society consists of very few stores, adoption of new machines can depend on preferences of individual store owners. It should, however, be noted that our results do not depend on inclusion or exclusion of these stores.

⁹ Note that a few stores in our sample were either bought, opened, or closed during the time period surrounding the introduction of the button (12 months) required for our analysis.

returned deposits. This is then estimated in relation to the month when the new machine was introduced, controlling for store effect, calendar month, and year. Thus, we estimate the following model:

$$\Delta y_{it} = \sum_{t=-5}^{t=6} \beta_t T_{it} + \sum_{j=2007}^{j=2011} \delta_j Year_{ij} + \sum_{k=2}^{k=12} \theta_k Month_{ik} + \alpha_i + u_{it}, t \neq -1,$$

where Δy_{it} is the change in month t from the introduction of the new machine compared to the amount recycled in month t the year before. We control for time-invariant effects by introducing dummies for store (α_i) and for time-variant effects by introducing dummies for year ($Year_j$) and calendar month ($Month_k$) effects using a fixed effect model approach. T_{it} is a dummy variable indicating the time t from when the button was introduced in store i . It is used to measure the behavioral effect before and after introducing the machine. We choose to use a dummy variable approach for flexibility reasons since it does not require imposition of a specific time trend as would, for example, assuming a linear time effect. The months we included range from -5 (five months before the donation option was introduced) to 6 (six months after). The reference month in the regression is the month before the donation option was introduced, i.e., $t = -1$. Thus, by choosing this month as reference, we can easily test whether there was any change or adjustment before the introduction, as well as the immediate effect of introducing the machine. It should be noted that we do not know when during a month the new machine was installed, and hence when any potential behavioral effect began. Thus, we might expect a weak effect on behavior during the first month. We test the following explicit hypotheses:

Hypothesis 1: No change in monthly recycling behavior after the introduction of the donation option:

$$\beta_{t=1} = 0, \beta_{t=2} = 0, \beta_{t=3} = 0, \beta_{t=4} = 0, \beta_{t=5} = 0, \beta_{t=6} = 0.$$

Hypothesis 2: No overall change in monthly recycling behavior after the introduction of the donation option:

$$\beta_{t=1} = \beta_{t=2} = \beta_{t=3} = \beta_{t=4} = \beta_{t=5} = \beta_{t=6} = 0.$$

Hypothesis 3: No change in monthly recycling behavior between the months after the introduction of the donation option:

$$\beta_{t=j} = \beta_{t=k}, j = 1, \dots, 6, k = 1, \dots, 6, \forall j \neq k.$$

The data on amount recycled is reported for three different types of containers: i) 0.33 liter aluminum cans (*Cans*), for which the deposit was SEK 0.5 for the studied period; (ii) 0.5 liter PET bottles with a deposit of SEK 1 (*PET 1*), and; (iii) 1.5 liter PET bottles with a deposit of SEK 2 (*PET 2*).¹⁰ In total, we have complete recycling data for all stores in the grocery retail chain for the 12 months surrounding the time of introduction of a machine and the year before for 183 stores for *Cans*, 186 for *PET1*, and 188 for *PET2* during the period 2005-2010.¹¹

3 Results

To investigate the effect of introducing a machine with a donation option on recycling, we ran a fixed effects regression model as described above both for the pooled data of all container types and for each container type (*Cans*, *PET1* and *PET2*) separately, with 12-month-differenced monetary deposit value as dependent variable. Table 1 presents our main regression results.

¹⁰ Recycled glass bottles are handled by a separate recycling machine and company, and this data is not available to us.

¹¹ The data was obtained from COOP and Returpack, which is the recycling company responsible for the recycling at KF.

Table 1 about here

In the regression models, the reference month is the month before the machine was introduced. The first model in Table 1 shows differences in the total monetary amount recycled for all containers. We find that the months before the introduction of the new machine do not significantly differ from the reference month, i.e., the month just before the introduction of the new machine, at the 5% significance level. In the overall test of whether all months before the introduction are the same, we cannot reject the hypothesis at the 5% level, indicating that people do not seem to change their behavior before the machine is actually introduced. However, for the month when the new machine is introduced as well as for each of the months thereafter, we can reject Hypothesis 1, i.e., no change in recycling behavior, at the 1% significance level. We can also reject Hypothesis 2, i.e., no overall change in recycling behavior after the introduction, at the 1% level. Table 2 shows the p -values of tests corresponding to Hypothesis 3 of no pairwise monthly effect on recycling behavior after the introduction of the machine. We find no significant effects between consecutive months at the 5% level, but we do find support for pairwise differences for non-consecutive months at the 5% level in approximately half of the cases. In sum, there seems to be an immediate change in behavior following an introduction of the donation option and an additional decline over time.

In the remaining part of Table 1, we present the same analyses separated by cans and the two types of PET bottles. As in the case of total amount recycled, we can for each of the three container types reject Hypothesis 1, i.e., no change in recycling behavior, at the 1% significance level, but we cannot reject hypothesis 2, i.e., no overall change in recycling behavior during the next five months after introduction, at the 5% level. In the pair-wise tests

of Hypothesis 3, the results are similar to the case of total amount recycled (see Tables A1-A3 in Appendix). As in the case of total amount recycled, there seems to be an immediate change in behavior following introduction of the donation option and an additional decline over time.

Table 2 about here

4 Conclusions

Using a natural field experiment, we investigated the hypothesis that generous behavior is in part involuntary. We analyzed the effect of the introduction of a donation option on recycling machines, where the returned deposit can be donated to charity. On machines that have the donation option installed, individuals face a choice of whether or not to donate every time they recycle cans and bottles. We find that the recycled amount is significantly lower already in the month when the button was installed and that there is a further decrease over time.

Our results are consistent with those from the experimental laboratory where subjects have been willing to incur a cost in order to avoid playing the dictator game (Broberg *et al.*, 2007; Dana *et al.*, 2006). Our results are also in line with the field experimental findings by Andreoni *et al.* (2011), who find that asking people to donate increases donations but, aware of this, people take longer alternative routes when exiting a supermarket in order to avoid being asked to donate to charity. Similarly, DellaVigna *et al.* (2012) show that receiving a flyer from solicitors explaining that they will visit the next day makes people open their doors less and also that solicitor flyers with a “do-not-disturb” option further reduces giving. A body of evidence collected across a number of environments demonstrates that at least some individuals are reluctant givers, supporting the claim that generosity is in part involuntary.

Given the growing body of evidence from a number of studies, it is pertinent to ask how this avoidance behavior ought to be interpreted. Dana *et al.* (2006) argue that generosity is driven by a desire not to let down the expectations of the recipient. DellaVigna *et al.* (2012) support this interpretation and suggest that people might feel pressured to donate. These interpretations, in turn, find support in Andreoni and Rao (2011), who find that giver-receiver communication alone is sufficient to increase donations from the dictator to the recipient. They suggest that the act of asking for a certain donation might stimulate empathy or internal pressure in the dictator, but might also serve to signal expectations. Finally, in the case of collecting donations in the field, Andreoni *et al.* (2011) suggest that avoidance may reflect a lack of altruism or a self-control strategy used to avoid the empathetic impulse to donate.

The results from our paper corroborate and validate results previously found in lab and field experiments. Our results lend support to the interpretation of generous behavior as partly being involuntary, and show that these motivations may have long-term effects on generous behavior. Further research is needed to investigate the psychological mechanisms that might lead to avoidance behavior, for example the effect of various degrees of public exposure in giver-receiver interactions.

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Table 1. 12-month-differenced values of recycled commodities in SEK in the months surrounding introduction of the donation option on recycling machines.

Model specification:	(1)	(2)	(3)	(4)
Sample:	Pooled	Cans	PET 1	PET 2
Dependent variable:	Differenced value of deposits (SEK)	Differenced value of deposits (SEK)	Differenced value of deposits (SEK)	Differenced value of deposits (SEK)
<i>Before introduction</i>				
$t = -5$	3026.1 (1.29)	2625.0 (1.40)	381.8 (1.18)	21.09 (0.09)
$t = -4$	2836.9 (1.52)	2165.8 (1.43)	427.8* (1.72)	245.5 (1.45)
$t = -3$	543.5 (0.36)	621.9 (0.52)	145.2 (0.72)	-161.7 (-1.02)
$t = -2$	800.3 (0.54)	576.4 (0.54)	313.1 (1.41)	2.185 (0.01)
<i>After introduction</i>				
$t = 0$	-5167.0*** (-3.93)	-3845.9*** (-3.84)	-642.1*** (-3.35)	-643.9*** (-3.52)
$t = 1$	-5254.9*** (-3.35)	-4427.1*** (-3.52)	-608.1*** (-2.81)	-341.1** (-2.33)
$t = 2$	-6645.5*** (-3.37)	-5322.5*** (-3.36)	-833.7*** (-3.03)	-468.5*** (-2.69)
$t = 3$	-8535.1*** (-3.43)	-6906.1*** (-3.44)	-1122.0*** (-3.20)	-689.4*** (-2.98)
$t = 4$	-11509.5*** (-3.78)	-9183.6*** (-3.75)	-1451.2*** (-3.42)	-933.2*** (-3.55)
$t = 5$	-9993.1*** (-2.77)	-8138.1*** (-2.81)	-1212.5** (-2.47)	-643.3** (-2.16)
$t = 6$	-12303.1*** (-2.92)	-9852.2*** (-2.91)	-1584.3*** (-2.78)	-927.7*** (-2.74)
Calendar month	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Store	Yes	Yes	Yes	Yes
N	2196	2232	2256	2256
R^2	0.078	0.069	0.075	0.102

Notes. t statistics in parentheses; * = $p < 0.10$, ** = $p < 0.05$, *** = $p < 0.01$; Robust standard errors.

Table 2. P -values for pairwise tests of equality of coefficients based on regression (1): All containers.

	$t=0$	$t=1$	$t=2$	$t=3$	$t=4$	$t=5$
$t=1$	0.9494					
$t=2$	0.3045	0.2142				
$t=3$	0.0845	0.0152	0.0698			
$t=4$	0.0075	0.0012	0.0004	0.0097		
$t=5$	0.1053	0.0515	0.0724	0.3246	0.1698	
$t=6$	0.0454	0.0186	0.0126	0.0593	0.6002	0.0278

Appendix**Table A1.** *P*-values for pairwise tests equality of coefficients based on regression (2): Cans.

	<i>t</i> =0	<i>t</i> =1	<i>t</i> =2	<i>t</i> =3	<i>t</i> =4	<i>t</i> =5
<i>t</i> =1	0.5645					
<i>t</i> =2	0.1818	0.2830				
<i>t</i> =3	0.0459	0.0183	0.0463			
<i>t</i> =4	0.0045	0.0016	0.0003	0.0077		
<i>t</i> =5	0.0684	0.0541	0.0556	0.2857	0.2013	
<i>t</i> =6	0.0339	0.0230	0.0208	0.0608	0.5630	0.0281

Table A2. *P*-values for pairwise tests equality of coefficients based on regression (3): PET1.

	<i>t</i> =0	<i>t</i> =1	<i>t</i> =2	<i>t</i> =3	<i>t</i> =4	<i>t</i> =5
<i>t</i> =1	0.8732					
<i>t</i> =2	0.3935	0.1849				
<i>t</i> =3	0.0891	0.0114	0.0880			
<i>t</i> =4	0.0183	0.0020	0.0026	0.0613		
<i>t</i> =5	0.1780	0.0709	0.1595	0.6730	0.1553	
<i>t</i> =6	0.0581	0.0158	0.0271	0.0943	0.5358	0.0160

Table A3. *P*-values for pairwise tests equality of coefficients based on regression (4): PET2.

	<i>t</i> =0	<i>t</i> =1	<i>t</i> =2	<i>t</i> =3	<i>t</i> =4	<i>t</i> =5
<i>t</i> =1	0.1221					
<i>t</i> =2	0.2670	0.4024				
<i>t</i> =3	0.8319	0.0374	0.1116			
<i>t</i> =4	0.1834	0.0040	0.0019	0.1057		
<i>t</i> =5	0.9984	0.2014	0.3481	0.7848	0.0765	
<i>t</i> =6	0.3669	0.0289	0.0402	0.2204	0.9762	0.0627

Figure A1. Photo of the recycling machine with the deposit return option (Pantknappen) and the donation option (Biståndsknappen).



Note: The left-hand button “Pantknappen” is the deposit return option. The text below reads: “Press here to receive your deposit receipt.” The right hand button “Biståndsknappen” is the donation option, which reads: “Press here and help families in poor countries with your deposit.”