EconomEtica

Centro interuniversitario per l'etica economica
e la responsabilità sociale di impresa
promosso dalla Fondazione Italiana Accenture

N.63 September 2017

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Thou shalt not steal. Taking aversion with legal property claims

Working papers

Thou shalt not steal.
Taking aversion with legal property claims*

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Some recent experimental literature on the taking game (a variation of the dictator game) suggests that human subjects may generally be *taking averse*, implying that the moral cost of taking exceeds the moral cost of not giving. In our experiment, our subjects could decide to take tangible objects (lottery scratchcards) brought from outside the lab and thus legally owned by other subjects. This legal treatment was compared with a more standard one where subjects earned their scratchcards inside the lab. Evidence is provided of a (weak) taking aversion that is greater when property is established inside the lab via an effort task than when it is pre-existing and legally enforceable outside the lab.

Keywords: property rights, dictator game, bully game, taking game, taking aversion, stealing, anonymity, effort, scratchcards.

JEL codes: C91, D23, K11, P14, P26

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* A previous version of the paper was circulated with the title: "Thou shalt not steal (from hard-working people). An experiment on respect for property claims". We are grateful to Benito Arrunada, Gary Charness, Marco Fabbri, Stephan Luchini, Simone Sepe, Lorenzo Sacconi, Karl Schlag and James Tremewan for helpful discussion. We thank participants to presentations in the following conferences: Italian Society of Law & Economics (2013 in Lugano), European Association of Law & Economics (2014 Aix-Marseille), Italian Economists Society (Trento in 2014), Siena-Toronto-Tel-Aviv L&W workshop (Naples 2014) International Society of New Institutional Economics (2015 in Harvard) and to seminar participants at the University of Paris X Nanterre (2014), at the University of Bozen (2014), at the University of Vienna (2014) at LUMSA University (2015). We want to personally thank Daniela di Cagno for granting us access to LUISS CESARE lab where the experiment was conducted and to Jeff Butler for allowing us to use the EIEF lab where early pilot sessions were conducted.. We thanks the Free University of Bolzano for financial support. The usual disclaimers apply.

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1. Introduction

As Sir William Blackstone (1830) put it, a property right, "is void without the total exclusion of the right of any other individual in the universe". Although economists and legal scholars use the concept of property rights in different ways (see Merrill and Smith, 2001; Munzer, 2013; Hodgson, 2014), they all emphasize that the key to a well-functioning property institution is that non-owners do not interfere with owners' enjoyment of the property. Can non-owners respect others' property? There are three main mechanisms at work. The first way is via *third*-party enforcement; legal institutions such as property law and criminal law deter non-consensual taking from the owner. In fact, theft is considered a crime in most societies[1]. Social norms and stigma also fall in this category[2]. The second way non-owners respect others' property is via *second*-party enforcement; in a Hobbesian state of nature, aggressive behavior on the part of the owner may induce all non-owners to defer to the owner[3]. The third way is to induce non-owner

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[1] Notwithstanding Proudhon's claim that "property is theft" (1840), communist countries also enforced severe laws against theft of public property. See, for instance, the 1932 decree of the central government of the USSR "On the protection of the property of state enterprises, collective farms, and cooperatives, and on the consolidation of public (socialist) property" Sobranie Zakonov (Collection of Laws) 1932, N° 62 reproduced in Danilov et al. (2006).

[2] In fact, theft is condemned in virtually all cultures and religions. The biblical commandment from which the title of this paper is derived tells to Christians and Jews not to steal. Most other religions have a similar stance. Hinduism mandates punishment against thieves (Laws of Manu 9.263); Islam deters theft by dictating hand's cutting (Quran 5:38); and Buddhism dictates the that thieves be cast out (Sutta Nipata 119-21) from the community. For Taoists, stealing is like "satisfying one's hunger with putrid food or one's thirst with poison wine" as it leads to death (Treatise on Response and Retribution 5).

[3] Second-party enforcement is particularly relevant in understanding the emergence of property-like behaviour in the animal kingdom described by the dynamics of the Hawk and Dove game. In the Hawk and Dove game evolutionary biologists (Smith, 1982) modelled the idea that property rights may emerge as the result of evolutionary stable strategies to coordinate access to scarce resources. In this context, the "Bourgeois Strategy" that consist of defending aggressively when one is an owner and deferring to the opponent when one is an intruder, has been observed in

can be induced to respect property via *first*-party enforcement; values and norms that exist in society may get people to restrain themselves from violating the property of others. Disentangling the effects of first-party (self)enforcement from second- and third-party enforcement has always proven difficult because laws and social norms (Ellickson, 1991; Kandori, 1992; Posner, 2000; Zasu, 2007) support the interiorized respect for property (Eswaran and Neary, 2014). Isolating the existence of first-party enforcement and investigating the determinants of the decision to steal is the goal of the present paper.

This research work is located within a recent experimental body of literature that studies *first*-party enforcement of property in isolation and that provides evidence of the existence of *taking aversion,* a behavioral trait that induces subjects to resist taking even when it is advantageous. In particular, Korenok, Millner, and Razzolini (2014, 2016) show in their experiments that subjects are willing to sacrifice over 30% of their endowment to avoid taking. These experiments use money endowed by the experimenter either as "manna from heaven" or through an effort task and therefore this design leaves the question of whose property the subjects are really averse to taking unanswered (is it the experimenter's or is it the other subject's money?). The small but growing body of literature on taking aversion prompts several research questions that our paper tries to address: Is taking aversion affected by knowing that the potential victim legally owns the endowment outside the lab? Can taking aversion also be observed in lab situations that have more ecological

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many animal species (Sherratt and Mesterton-Gibbons, 2015) and in humans. In fact, a bourgeois strategy can be seen throughout human history when landowners defend their land with their lives rather than surrender to invaders. Pape (2003) states that suicide attacks are very often carried out by subjects who are trying to displace occupying invaders.

validity[4] and that more closely resemble an actual taking? And is the type of asset used relevant?

Our lab experiment is a variation of the dictator game we call the "Free-Form Dictator" first introduced by List (2007) and Bardsley (2008). In the standard game, dictators have an endowment, x, and can give up to x to the passive player. In the free-form variation, both players have the same endowment, x, and the dictator has a symmetric action set; the dictator can give up to x or take up to x. Our implementation of the free-form design ncludes some particular features, all meant to resemble as closely as possible a real situation of petty larceny. We review these features in detail in section 3.2. In our implementation, we use neither tokens nor money but lottery scratchcards (small cards sold for instantaneous gambling) that have to be physically placed in or taken from other's envelopes/wallets. Neither role-reversal nor repeated interactions occur, and the anonymity protocol is strongly emphasized. The most relevant aspects of our free-form dictator game concern the source of legitimacy of the property claim over the scratchcards we use as our source of treatment variation; we compare two "effortful" treatments where scratchcards are given to subjects as payment for their effort task carried out in the lab to two "legal" treatments where subjects are required to bring their own scratchcards from home in order to participate in the experiment.

Our results suggest that, once shielded by the social and legal consequences of their action, subjects largely engage in taking. However, the taking is far from maximal; the effort-based claim to the entitlement trumps the formal legal claim in inducing the (admittedly limited) respect for property that can be observed. Our results are in line with the Lockean theory of

[4] Frechette (2015) distinguishes between ecological validity and external validity; the former relates to the degree to which tasks and situations in the lab resemble actual tasks and the latter relates to the degree to which conclusions from a lab experiment can be generalized to the field.

property that connects the legitimacy of the entitlement with the labor expended on its production and seem to be less supportive of other theories, such as Nozick's theory that bases the legitimacy of a claim on the procedural fairness reflected by the legal standing of the claim.

2. Literature review

As stated before, our experiment is based on the "free form" dictator game design originally introduced by List (2007) and Bardsley (2008), which has been used in several other experiments (see, for instance, Krupka and Weber, 2013; Korenok, Millner, and Razzolini, 2014; Khadjavi, 2015). The original two papers show that the behavior of the dictator is dependent on the choice-set, and final allocations by dictators in give-only treatments differ (are more generous) from allocations in give-and-take treatments. Cappelen et al. (2013) use a large sample from the general population to confirm the robustness of the choice-set effect. Krupka and Weber (2013) also have a free-form dictator treatment (they call it the bully game) which they compare to a standard dictator with giving only. They find that an equal split (5,5) is much higher in the bully game (37%) than in the standard dictator game (17%). These original studies do not focus on property rights but use the choice-set effect to undermine previous results based on the pro-social behavior observed in standard giving-only dictator games or to study what constitutes a social norm. Subsequent follow-ups compare dictator games where only taking is possible with standard treatments where only giving is possible. Several studies take this approach (Swope et al., 2008; Oxoby and Spraggon, 2008; Jakiela, 2011; Visser and Roelofs, 2011) and consistently find that more endowment is allocated to the passive players in the taking treatments than in the

giving treatments[5]. Korenok, Millner, and Razzolini (2016) allow dictators to choose between a giving treatment and a taking treatment and find that over 85% of the dictators prefer a giving game and are willing to pay 30% of their endowment to avoid taking. Korenok, Millner, and Razzolini (2014) bridge the gap between the free-form dictator design and the giving-only and taking-only design. They construct nine treatments where the minimum payoff to the recipient is either \$0, \$5, \$10, or \$20. In all scenarios, the sum of dictator's and recipient's payoffs is \$20, and the dictator can either only give, only take, or give and take, depending on the treatment. The authors conclude that "*Giving is not equivalent to not taking in isomorphically equivalent scenarios"* and that "*on average, the payoff to recipients increases with the introduction of the taking option*".

Another important result of the literature on the dictator game that is relevant for our study concerns the role of earning the endowment. Giving is more common when the surplus is generated by chance or is distributed as "manna from Heaven" and is less common when it is generated by individual effort. Cherry (2001), Cherry, Frykblom and Shogren (2002) and Oxoby and Sparragon (2008) show that dictators give close to nothing in give-only games when the endowment is earned. For our purpose, the result becomes more interesting when the possibility of taking is also introduced. As in List (2007) and some subsequent papers, people were less prone to give when they earned the endowment. However, earning the endowment had another effect; people were also less prone to take. This is an interesting result (albeit overlooked by

[5] However, Korenok, Millner, and Razzolini (2016) also review several studies with different results; they conjecture that these diverging results might be due to different experimental design choices. Among those studies, we should mention Dreber et al (2013), which was conducted both among a large population of students and on Mechanical Turk; a crowdsourcing market place.

List) result as previous studies on the dictator game with earned entitlements as Cherry, Frykblom and Shogren (2002) conjecture that earned endowment crowds out other-regarding behaviour, and self-interested game-theoretic behaviour becomes the norm. However, in the List (2007) free-form design, such crowding out would imply dictators take the maximum amount ($5). Instead, respect for property (taking 0$) emerges as the norm. The crowding-out hypothesis must thus be rejected and this makes the result interesting in our eyes. Oxoby and Sparragon (2008) take this result even further. Similar to the give-only treatment mentioned before where dictators that have earned their endowment give nothing, they have a taking game where the endowment is earned only by the recipient. In this last treatment, dictators refrain from taking to a large extent and sometimes refrain altogether. Korenok, Millner, and Razzolini (2017) study the feelings of ownership in scenarios with a taking/giving dictator with earned endowments and find that earning the endowment and possessing it increases the dictator's feelings of ownership and they therefore allocate less to the recipient.

Taking-only dictator games are also the basis of another set of experiments focusing on detection mechanisms (see Harbaugh et al. 2011; Bruttel and Friehe, 2010; Rizzolli and Stanca, 2012 and also Khadjavi, 2015). Pecenka and Kundhlande (2013) use a take-only dictator to study the impact of race and identity on taking behavior. Yezer et al. (1996) run a lost letter lab-in-the-field experiment in which letters containing $10 notes and a fictitious owner address are randomly left in classes before lessons, and the authors determine the return rate.

Finally, we shall mention the existence of a related experimental body of literature focusing on property rights (Kimbrough, Smith, and Wilson, 2008, 2010; Crockett, Smith, and Wilson, 2009; Wilson, Jaworski, Schurter, and Smyth, 2012; Jaworski and Wilson, 2013). In contrast with our paper and the literature on the dictator game cited above, these rather complex experiments focus

on the strategic interaction of players and study the conditions under which property rights, specialization, and trade develop.

3. Experimental design

In this experiment, we have used a novel design that tries to reproduce a genuine property situation as closely as possible in the lab. Subjects own five scratchcards, and our treatment variation concerns the origin of the entitlement: is either from *outside the lab* as individuals bring their own scratchcards from home (we call these treatments LEGAL), or it is generated *inside the lab* as subjects earn their endowment of five scratchcards via an effort task (we call these treatments EFFORTFUL). We first illustrate the procedure (the original instructions are in Appendix A) and then highlight the main features of this design.

In all treatments, subjects start with five scratchcards , each with a value of of €1,[6] similar to thse depicted in figure 2B in Appendix B. In the EFFORTFUL treatments, the scratchcards are given to subjects by the experimenter as payment, and in the LEGAL treatments they are brought from outside the lab.

The first dimension of our treatment manipulation concerns thus the source of legitimacy of the entitlement. In the LEGAL treatments individuals bring their own scratchcards from home. When the experiment begins, they have personally exchanged €€ of their wealth for five

[6] These scratchcards are produced and sold by Lottomatica in hundreds of thousands of bars and shops all over the country. There are many type of scratchcards and they vary according to their underlying game. However, they are all characterized by a rather homogeneous average expected value of the scratchcard and relative maximum win. At the time of the experiment, these were the ones available on the market: *Sette e mezzo* (maximum win €7000, expected value €0,54) *Portafortuna* (maximum win €10.000, expected value €0,59), *Tris e Vinci* (maximum win €10.000, expected value €0,60) *Mini Cruciverba d'Oro* (maximum win €10.000, expected value €0,57)

scratchcards. This wealth can have different origins; it can be the result of past salaries, inheritance, found treasure, or even stolen property. Indeed, all methods of property acquisition can originate the entitlement claim. What matters is that once the subjects come to the lab, they have a legal claim over the scratchcards.

In the EFFORTFUL treatments subjects earn their five scratchcards via an effort task conducted in the lab right before the allocation decision must be made; this procedure establishes the entitlement to property.

The second dimension of our treatment manipulation concerns the show-up fee, which varies between €5 and €10. This manipulation was carried out to keep track of one important feature of our design. In the LEGAL treatments, subjects pay €5 of their own money to buy the scratchcards necessary to participate in the experiment. Therefore, they would start with a negative show-up fee of €5. Therefore, if we confront LEGAL&10 with EFFORTFUL&5, we can assess the effect of the source of property, keeping the net show-up fee constant. The effect

Table 1. Matrix of treatments

	€10	**€5**
LEGAL	*LEGAL10* they bring the scratchcards, they are paid €10	*LEGAL5* they bring the scratchcards, they are paid €5
EFFORTFUL	*EFFORTFUL10* they gain the scratchcards, they are paid €10	*EFFORTFUL5* they gain the scratchcards, they are paid €5

of the manipulation of the show-up fee can be assessed by comparing LEGAL&10 vs. LEGAL&5 and EFFORTFUL&10 vs. EFFORTFUL&5 (Table 1).

The experiment was run at the CESARE Lab at LUISS University in Rome from November 2013 to May 2014. Recruitment was conducted via ORSEE (Greiner, 2015). Email invitationsl contained the request for subjects to bring five scratchcards with specified characteristics. The

same invitation email was sent out for all treatments, however, once the EFFORTFUL sessions were filled, we communicated to these subjects that the scratchcards were no longer necessary and that they could sell them to us in case they had already bought them[7].

3.1 Procedures

Subjects gather in front of the lab where a person associated with the laboratory but with no direct relation with the experimenters, identifies subjects and sends them one by one into the lab. In the LEGAL treatments, this person also checks whether subjects have brought the scratchcards with them. Once in the lab, each subject i) is directly paid the show-up fee of €5 [€10], ii) must pick a colored envelope from a bag, iii) must put his/her scratchcards inside the envelope, and iv) is assigned a seat in random order. The envelope can be either orange or blue and contains five pieces of paper (same size and consistency of the scratchcards), five stickers, and an allocation table as in Figure 1.

Figure 1. The allocation table

Ticket Number			
1 4253647			
2 4325566			
3 4435365			
4 46756907			
5 43525895			
B	T5WQ4Y	A	57PKGK
		1 4325347	
		2 5363456	
		3 6457457	
		4 97098985	
		5 12324134	

[7] This was done to avoid sample selection biases resulting from sending out different invitation emails. Furthermore, note that there is no difference in the percentage of show-ups in the different treatments and this confirms that no sample selection bias took place even after we sent out the second email communicating that the scratchcards were no longer necessary.

On individual desks, the subjects find paper instructions, a pen, and a privacy box, as shown in Figure 1B of Appendix B. The privacy box offers more privacy when subjects make their allocative decisions later in the experiment.

Once all subjects are seated in the lab, the instructions are read aloud once, and the experiment begins. In the EFFORTFUL treatments, the experiment begins with subjects performing a slider task, following Gill and Prowse (2012). They must set 200 sliders in less than 35 minutes and earn one scratchcard for every 40 sliders completed. In the LEGAL treatments, this phase is skipped, as subjects start the experiment with their own scratchcards. The subjects invent a six-digit code that identifies them throughout the experiment. They write this code on the five stickers and attach a sticker to each of their scratchcards. The subjects also write the scratchcards' serial numbers on the upper left quadrant of the allocation table, as in Figure 1. Next, the experimenter tosses a coin to assign either role A (active dictator) or role B (passive player) to either holders of the blue or orange envelopes. All the envelopes of those with role B are then collected, and each role B subject is randomly assigned to a role A subject (A subjects henceforth). The A subjects take the allocation table out of the envelopes of the B subjects, and they write their own scratchcard codes in the table's lower right quadrant (see Figure 1) together with their own invented code. The scratchcards and the paper placeholders are taken out of the envelope inside the privacy box. At this point, each A subject has to decide whether to give and/or to take, if any, scratchcards out of B's envelope. Note that the scratchcards can be given as well as taken at the same time (in other words, they can be exchanged). Each scratchcard taken from/placed in B's envelope must be replaced with a paper placeholder (or another A's scratchcard) so that, in the end, B's envelope will contain exactly 10 pieces of paper (either scratchcards and/or paper placeholders). The subjects are required to mark which scratchcards are taken and which are given on the allocation table, which must also be inserted into B's

envelope. Once this is done, the A subjects close B's envelopes and the experimenter place them in a black bag. After shuffling the content, the experimenter inspects the B subjects' envelopes one by one, keeps the allocation tables (which constitute the experimental observation) and puts the pieces of papers (either scratchcards and/or paper placeholders) into a white envelope and writes each B subject's code on the corresponding envelopes. In the meantime, all A subjects put their 10 scratchcards and/or paper placeholders into a white envelope on which they write their invented code. All white envelopes are then put on a table outside the lab where they are picked up by the subjects at the end of the experiment.

With this, the core part of the experiment is over; all subjects remove the privacy boxes from the tables and turn on the computer where they fill in an incentivized questionnaire that includes:

- An incentivized elicitation of B's beliefs about A's action.
- An incentivized elicitation of A's beliefs about B's beliefs about A's action[8].
- A Becker-DeGroot-Marschak (BDM) procedure to elicit evaluations of the scratchcard[9].
- An incentivized elicitation of A's beliefs about B's evaluation[10].
- A Trolley dilemma to identify deontological types[11].

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[8] Each subject B was asked to guess how many scratchcards the subject A with whom he/she was matched had taken from the envelope. Each subject A was asked to guess how many scratchcards the subject B with whom he/she was matched thought he/she had taken. Subjects' payment for their beliefs about other's choices and beliefs is equal to $€1 - 0.10|x|$, where x is the difference between the actual value (number of scratchcards) and the stated one.

[9] Subjects were endowed with €1.50 and could offer a price for a single scratchcard ranging from 0 to €1.50.

[10] Subjects' payment for their beliefs about other's bids and beliefs is equal to $€1 - 0.10|x|$where x is the distance between the actual value and the stated one.

[11] Subjects were asked to answer the following two questions: 1) Scenario A: "A trolley is running out of control down a track. In its path are five people who have been tied to the track. Fortunately, you can flip a switch, which will lead the trolley down a different track to safety. Unfortunately, there is a single person tied to that track. Should you flip the switch?" 2) Scenario

- An incentivized Social Value Orientation (SVO) survey to determine subjects' attitudes regarding pro-sociality (see Murphy et al., 2011).

The subjects are then paid for the incentivized questionnaire (no inference on their decision to take/give can be made from this payment) and once they exit the lab they pick up their envelope containing (if any) the scratchcards.

3.2 Features of our design.

Symmetric action set. The experimental design is based on a free-form dictator game first used by List (2007) and Bardsley (2008) to determine the choice-set effect of giving-only dictator games. Although the focus of our paper is on taking behavior, we feared that the taking-only design might have created a choice-set effect analogous to the one originally illustrated by List and Bardsley.

Anonymity. Granting robust anonymity to the dictator allows to isolate the genuine respect for property out of all reputational, social, and legal concerns that might otherwise affect the decision to give/take. In fact, our protocol follows some of the intuitions first developed in Hoffman, McCabe, and Smith (1996). Subjects, recruited online via ORSEE (Greiner, 2015), were identified before entering the lab by a person who later did not take part in the experimental procedure. Once in the lab, subjects had to invent a six-digit code that was later used to match their decisions with the questionnaires collected on the computers and to identify payments. The experimenter paid only for the incentivized questionnaires; the show-up fee and the remuneration

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B: As before, a trolley is hurtling down a track towards five people. You are on a bridge under which it will pass, and you can stop it by dropping a heavy weight in front of it. As it happens, there is a very fat man next to you and your only way to stop the trolley is to push him over the bridge and onto the track, killing him to save five. Should you proceed? See Edmonds et al. (2014) for a review of the literature on the trolley dilemma.

for the effort task, paid in scratchcards, were handed to subjects before the allocative decision by the dictator. Subjects' decision about final allocations manipulation were made inside a cardboard box (see Figure 1B in Appendix B). Receipts were signed at a distance from experimenters' sight and were cast into a box together with all other receipts.

Tangibility. In most lab experiments involving the free-form-dictator game (with the exception of Jakiela, 2011), the allocative decision is usually made with a computer software; subjects take virtual tokens that are later converted into money and then are paid in cash only at the end of the experiment. To us, this seemed rather different from the reality of many property situations involving movable and tangible objects. In reality, potential thieves have to make their allocative decisions manipulating someone else's tangible property with their own hands. For this reason, in our protocol dictators physically open victims' envelopes containing their scratchcards and, in case they decide to take them, to physically remove and slide them into their own envelopes. On the role of tangibility, Reinstein and Riener (2012) show that, in a charitable giving experiment, subjects make fewer altruistic allocations if cash is used instead of virtual experimental currency units and Uhlmann and Zhu (2013) show that subjects are less likely to recommend stolen or lost money be returned when it is virtual as opposed to when it was cash. Along similar lines, Korenok, Millner, and Razzolini (2017) show that dictators' feelings of ownership increase when the dictator touches and possesses the endowment and invests the self in the target by earning the endowment. Dreber et al. (2013) use a similar design choice in the first experiment of their study by having dictators directly swap cash among theirs and the passive players' envelopes.

Saliency of taking choice. Multiple decisions (dictators making allocative decisions multiple times in a limited time span) and role reversal (subjects being both dictators and recipients at the same time) are common in many other experiments using the dictator/taking game. Both features seem to be at odds with a genuine property situation, where the chance to respect somebody

else's property is taken only once and very rarely under the threat that someone else is making the very same decision about the dictator's property. For this reason, we implemented a one-shot design where half of the subjects in the lab acted as dictators and the other half were passive players[12]. This choice made our design quite expensive, as two subjects must go through the experiment for each observation collected.

Medium of transfer. In previous experiments, people had to make their allocative decision over tokens that were later exchanged for money. However, money represents a peculiar form of property, as it is just designed to facilitate the transfer of wealth among parties. When one thinks about an archetypal property situation, it usually involves some form of moveable property different from cash. For this reason, we decided to use scratchcards instead. Each subject puts a sticker with his/her own invented code on each scratchcard to anonymously mark their scratchcards. Furthermore, as in any lab experiment, the subjects were paid for their presence in the lab. This payment was in cash and was based both on a fixed show-up fee and on the results of an incentivized questionnaire. These payments were given at the end of the experiment. Another advantage of using scratchcards was to keep the allocative decision as separate as possible from the compensation in cash obtained at the end of the experiment.

Legitimacy of ownership. Our main experimental manipulation concerns the origin of property. Previous experiments used manna-from-heaven endowments and sometimes endowments built through some real effort task in the lab. While we kept the latter choice for our EFFORTFUL treatments, we had, to our knowledge for the first time, subjects bring their own property from

[12] However, Korenok, Millner, and Razzolini (2013) do not find differences in dictators' givings between outcomes with and without role reversal.

outside the lab. In this way, we can compare whether property is more respected when its origin is rooted in recently spent effort in the lab (EFFORTFUL treatments) vs. when the origin is older and possibly coming from very different sources of property (LEGAL treatment).

4. Results

We conducted 10 sessions with 226 subjects (see Table 2). Of these, 51% were male, the average age was 21.7 years, 98% were Italian, and on average they took part in 2.19 experiments in the past. In the EFFORTFUL sessions, all subjects completed the task within the 35-minute time limit.

Table 2: Sessions

Treatment	Date	Sessions	Subjects (Observations)
LEGAL10	Nov 28, 2013	3	70 (35)
EFFORTFUL5	Feb 27, 2014	3	62 (31)
LEGAL5	April 14, 2014	2	46 (23)
EFFORTFUL10	May 29, 2014	2	48 (24)

4.1 Choices of A subjects.

A subjects had the possibility to choose whether to give some/all scratchcards to B subjects, to take some/all scratchcards from B, or to keep their 5 scratchcards. Figure 2 reports the distribution of subjects A's net payoffs (number of scratchcards in As' envelope after their choice). Some descriptive statistics are shown in Table 3.

Figure 2. A subjects' net payoff (scratchcards) across treatments

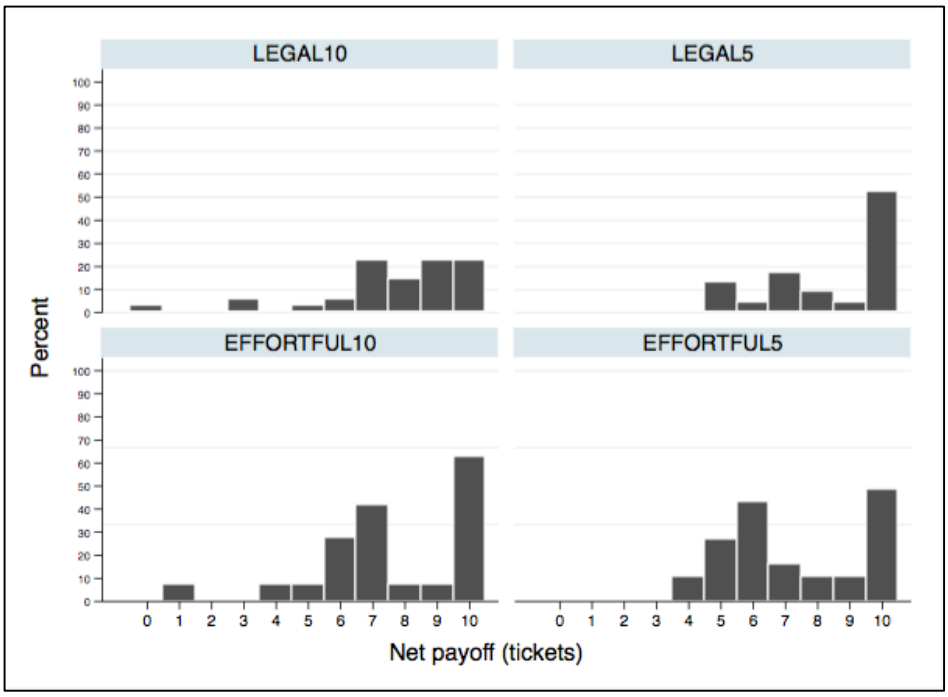


Table 3: Treatments statistics

Treatment	Obs	As' mean final payoff (scratch cards)	As' median final payoff	Std. Dev.	Min-max	% of net donors
LEGAL10	35	7.74	8	2.27	0-10	8.6
LEGAL5	23	8.43	10	1.90	5-10	0
EFFORTFUL 5	31	7.29	7	2.11	4-10	6.5
EFFORTFUL10	24	7.62	7	2.37	1-10	8.3

What emerges quite clearly is that in every treatment, the majority of the A subjects take some scratchcards from the envelopes (the net payoffs allocated to themselves is greater than five scratchcards). Considering all the treatments, 67.2% (76 subjects) take some scratchcards and give nothing, while only 3.5% (4 subjects) give some scratchcards while taking nothing. This is in line with Cherry et al. (2002) and the literature on earned endowments cited above. Furthermore, 28 subjects (24.7%) both take and give scratchcards (in our design, it was possible to exchange scratchcards), but on average the difference between the scratchcards taken and the scratchcards given is €1.10. The remaining five subject (4.4%) neither give nor take scratchcards

and keep their initial endowment of five scratchcards (see Figure 1C in Appendix C for detailed data on individual choices).

On average 2.73 scratchcards are taken by each subject A, that is to say, 56% of the maximum potential taking. As a comparison, in List's effort treatments (2007, Treatment 4) only 20% of all potential taking takes place and in Cappelen et al. (2013, Treatment 4) the mean taking is 24%.

Result 1*: Dictators allocate a large amount of scratchcards to themselves (56% of the maximum).*

Even if the amount subjects allocate to themselves is larger than the one observed in other free-form dictator games, it is still short of the theoretical payoff-maximizing prediction of 100% taking. This result should be considered in light of the different design characteristics of our experimental protocol, such as the double-blind anonymity highlighted above. One could also speculate that this result may also be driven by some cultural traits specific to the homogenous nationality of all players only further research could rule out this possibility.

4.2 Treatment effects

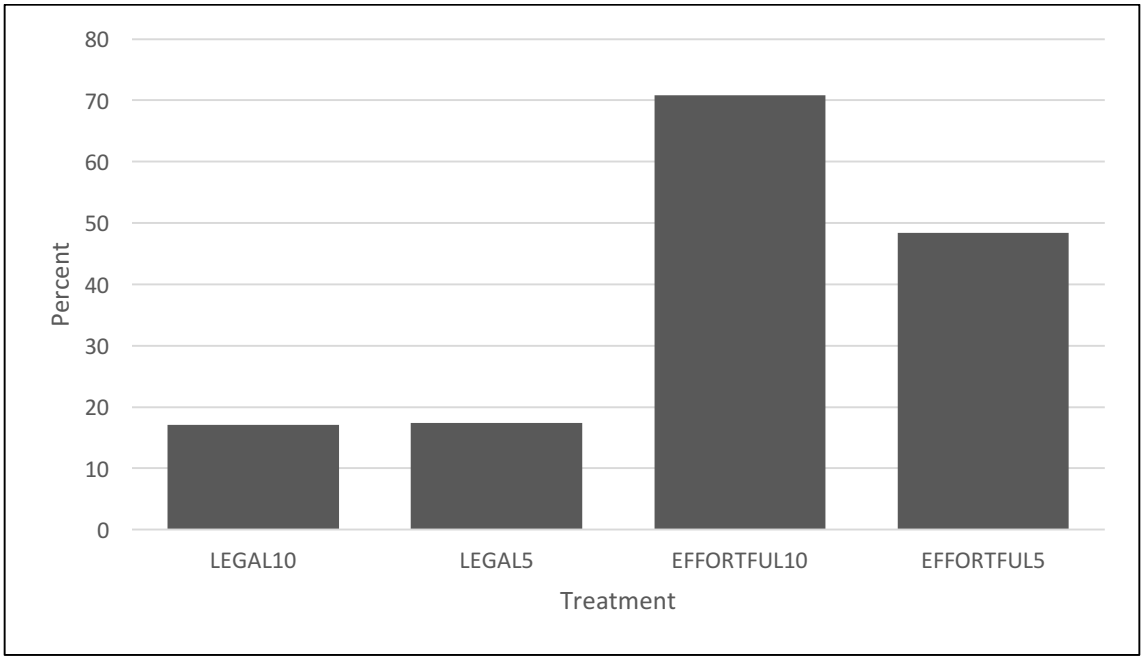
The treatment effect we wanted to test concerns the origin of the property entitlement.

As opposed to List (2007), Cappelen et al. (2013), and Oxoby and Sparragon (2008), none of our treatments use "Manna from Heaven". Instead, we compare claims over entitlement that are legally determined outside the lab (LEGAL) with claims established through an effort task inside the lab (EFFORTFUL). As shown in Table 3, subjects in the LEGAL treatments take more, on average, than those in the EFFORTFUL treatments, even if using the Mann-Whitney test we can conclude that only the difference between LEGAL5 and EFFORTFUL5 is statistically significant ($z=2.01$; p-value = 0.04).

Looking at the distributions of net payoff across treatments, one can observe that the two EFFORTFUL treatments' distributions are both bimodal, with a peak on €10 and another peak around €5. When we focus on the proportion of subjects who have a high respect for property and in particular on the decision to take at maximum one scratchcard (Figure 3)[13], we observe that this proportion is higher in the EFFORTFUL treatments. We find a statistically significant difference when we compare LEGAL10 with EFFORTFUL5 (two-tailed test of proportions using a dummy variable that takes a value of 1 if the net payoff is not greater than 6 and 0 otherwise: z=2.72; p-value=0.006) and LEGAL5 with EFFORTFUL5 (z=2.36; p-value=0.01). The manipulation of the show-up fee seems to affect subjects' choices only in the two EFFORTFUL treatments, leading to an increase in the proportion of subjects who respect property, even if the difference between the two treatments is only weakly statistically significant (two-tailed test of proportions: z=1.44; p-value=0.15).

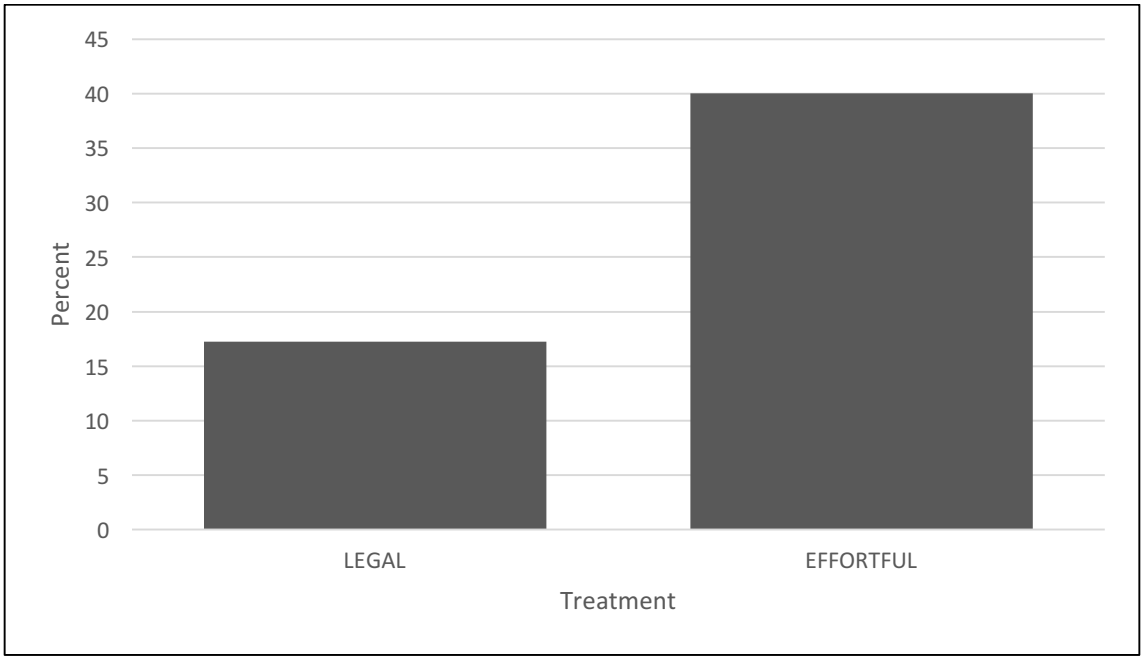
Figure 3. Proportion of subjects respecting property (take a maximum of one ticket)

[13] A subject can end up with a surplus of one scratchcard (he/she takes one scratchcard from B) either by giving nothing and taking one scratchcard from B or giving n scratchcards and taking n+1 scratchcards.



If we focus on pooled data, ignoring for the moment the manipulation of the show-up fee, we find that the proportion of those who respect property increases from 17.2% to 40% when moving from LEGAL to EFFORTFUL treatments (Figure 4), and this difference is statistically significant (test of proportions: z=2.38; p-value=0.007).

Figure 4. Source of property and proportion of subjects respecting it (taking a maximum of one ticket)



Result 2*: The proportion of subjects who respect property is higher in the EFFORTFUL treatments.*

This result is in agreement with the Lockean tradition that sees labor as the root of property rights. Following Locke, individual effort makes private property legitimate and moral, and individual property rights are promoted only insofar as they promote workmanship and the role of labor in advancing society's welfare (Henry, 1999).

4.3 Beliefs and social norms relating to the respect for property

Once the A subjects had made their choices about the allocation of scratchcards, the experiment was over and we collected several measures via some well-known incentivized techniques. These include the elicitation first- and second order beliefs. Together, first- and second-order beliefs cast light on the dominant social norm (see, for example, Bicchieri, 2006). For each pair of subjects, subject B was asked to guess A's decision about the amount of scratchcards allocated to him/her (B's first-order belief). Then subject A was asked to guess B's beliefs about his/her (A's) choice (A's second-order belief). Table 4 reports the mean of both subjects' beliefs

(expressed in terms of A's final net payoff). The second order beliefs are highly correlated with their actual choices.[14]

Table 4: Choices and beliefs.

Treatment	Obs	Mean final payoff (scratchcards)	Mean of As' second-order beliefs (st. dev.)	Mean of Bs' first-order beliefs (st. dev.).
LEGAL10	35	7.74	8.45 (1.76)	8.40 (1.01)
LEGAL 5	23	8.43	8.21 (2.02)	7.87 (1.89)
EFFORTFUL 5	31	7.29	8.13 (1.82)	7.54 (2.14)
EFFORTFUL10	24	7.62	8.29 (1.98)	7.41 (1.69)

The data on beliefs of the B subjects are particularly interesting, as B subjects seems to be aware of the fact that, in general, respect for property is low. Bs seem to anticipate also what happened in their particular treatment. In fact, on average, expectations about the A subjects' choices are not statistically different from actual choices. In addition, the Bs' expectations are not different, on average, from the A subjects' second-order expectations, with the exception of the treatment EFFORTFUL10 in which subjects B's expect that the A subjects would take less (2.41 scratchcards) than what the A subjects think they will expect (3.29 scratchcards) (Mann-Whitney test: $z=2.11$, $p=0.03$). All this suggests the emergence of a shared social norm according to which, in general, taking is admitted, and more taking is admitted when subjects do not earn their scratchcards in the lab. We can then put forward our third result.

[14] The only exception is treatment LEGAL5 in which the Spearman rho=0.38 and =0.10.

Result 3: *A general expectation of low respect for property characterizes all the treatments. More takings are expected in LEGAL treatments.*

In addition to studying subjects' beliefs, we ran a BDM procedure to elicit subjects' evaluations of the scratchcards, and for each pair of subjects, subject A was asked to guess the bid of subject B. Neither A's nor B's average willingness to pay (WTP) nor A's beliefs about B's willingness to pay differ across treatments. This confirms good randomization of the sample. However, the A subjects' WTP is correlated with their beliefs about the B's WTP in all the treatments except in EFFORTFUL5 (Spearman's rho=0.16, p-value=0.45).

Table 5: Willingness to pay for the scratchcard and beliefs (standard deviation in parenthesis)

Treatment	Obs	As' mean WTP for the scratchcard (€)	Bs' mean WTP for the scratchcard (€)	As' mean expectation about Bs' WTP (€)
LEGAL10	35	0.79 (0.52)	0.71 (0.47)	0.75 0.38)
LEGAL 5	23	0.60 (0.45)	0.69 (0.64)	0.75 (0.28)
EFFORTFUL 5	31	0.62 (0.46)	0.67 (0.55)	0.69 (0.56)
EFFORTFUL10	24	0.60 (0.42)	0.57 (0.47)	0.78 (0.29)

As will be made clear by the regression analysis below, the respect for property rooted in the recognition of others' effort, when existing, is independent on neither of subjects' own evaluation of the entitlement they could potentially take nor of their beliefs about the evaluations of others.

4.4 Social value and ethical orientation

One may wonder whether the existence of respect for property is mainly driven by interiorized social norms or other known moral attitudes. In order to uncover whether respect for property is

linked to some psychological traits, we collected data using well-studied questionnaires in experimental psychology and experimental philosophy, namely, the Social Value Orientation (SVO) incentivized questionnaire to determine subjects' attitudes toward pro-sociality (see Murphy et al., 2011) and two variations of the trolley dilemma used to identify deontological types (Edmonds et al., 2014). We then used these measures as controls in our regression analysis. Depending on subjects' choices in the SVO task, we can categorize them into four types:

Table 6: Distribution of A subjects' social value orientations (percentages)

Treatment	Competitive	Individualistic	Cooperative	Altruistic	TOT
LEGAL10	8.57	88.57	0	2.86	100
EFFORTFUL5	3.23	80.65	6.45	9.68	100
LEGAL5	4.35	86.96	8.70	0	100
EFFORTFUL10	12.50	66.67	16.67	4.17	100

competitive (tries to maximize the difference between own and others payoff); individualist (maximizes own payoff, ignores payoffs of others); cooperative (tries to maximize joint payoffs) and altruistic (tries to maximize others' payoffs). In all the treatments, the vast majority of A subjects belong to the Individualist category (Table 6)[15]. The distributions are not statistically different across treatments[16].

Using the answers to the two trolley dilemmas, we classify a subject's ethical attitude as consequentialist if she or he decided to pull the lever in the first dilemma and to "push the fat man" in the second dilemma (see Table 7). In all the treatments, the vast majority of A subject can be classified as consequentialist; we do not observe any statistical difference among treatments with regard to the proportion of consequentialist subjects.

[15] The distributions of B subjects social value orientation follow the same pattern.
[16] The only weakly statistically difference is observed between EFFORTFUL10 and LEGAL10 (Pearson's Chi squared (3 d.f.)=6.28, p-value=0.09).

Table 7: Percentage of consequentialist subjects A

Treatment	%
LEGAL10	75.71
EFFORTFUL5	76.09
LEGAL5	80.65
EFFORTFUL10	81.05

4.5 Regression analysis

To further investigate the determinants of A subjects' choices we estimate a probit regression model, considering only the choices made by A subjects, where the dependent variable takes value of one if the subjects take a maximum of one scratchcard (net payoff not greater than six) and zero otherwise. The main regressors are the three dummies EFFORTFUL5 (equal to 1 if the subjects is in the EFFORTFUL5 treatment and 0 otherwise), LEGAL5 (equal to 1 if the subject is in the LEGAL5 treatment), and LEGAL10 (equal to 1 if the subject is in the LEGAL10 treatment).

We control also for the effect of second-order beliefs (variable A'S BELIEFS), scratchcard evaluations (BDM), beliefs about subject B's evaluation (A'S BELIEFS BDM), and social and ethical orientation (INDIVIDUALIST[17] and CONSEQUENTIALIST). The control variables are GENDER, AGE, EXP (experience with experiments), and MAJOR. The results are reported in Table 8.

The results of the estimation confirm the significant effect of the task when the show-up fee is equal to €5; the probability of taking less than two scratchcards increases when moving from LEGAL5 to EFFORTFUL5 (difference between the β_{E5} and β_{L5}). The estimation also confirms

[17] In the following regression, this is a dummy variable. The results are the same if we use the standard continuous absolute SVO measures.

also the significant difference between EFFORTFUL5 and LEGAL10 (β_{E5}). The correlation between A's second-order beliefs and his/her choice is also confirmed (variable A'S BELIEFS).

Table 8. Determinants of A subjects' choices (Only Asubjects are considered.)

	Probit
EFFORTFUL5 (β_{E5})	1.01**
	(0.43)
LEGAL5 (β_{L5})	-0.21
	(0.46)
EFFORTFUL10 (β_{E10})	0.28
	(0.45)
As' BELIEFS	0.20**
	(0.09)
BDM	0.08
	(0.37)
As' BELIEFS BDM	0.44
	(0.44)
INDIVIDUALIST	0.53
	(0.81)
CONSEQUENTIALIST	-0.04
	(0.92)
COOPERATIVE	1.20
	(0.95)
GENDER	-0.08
	(0.33)
AGE	-0.007
	(0.07)
MAJOR	0.04
	(0.34)
N. OF EXPERIMENTS	-0.12
	(0.08)
Constant	0.02
	(1.77)
B_{E5}-β_{L5}	1.22***
	(0.45)
B_{E5}-β_{E10}	0.72
	(0.11)
B_{L5}-β_{E10}	-0.50
	(0.48)

Log-likelihood= -47.64; Chi squared (13) =24.46**; Number of Obs= 99. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Coming to the assessment of the impact of i) Subjects beliefs (As' BELIEFS, BDM and As' BELIEFS BDM); ii) As' social value (INDIVIDUALIST) and iii) As' ethical orientations (CONSEQUENTIALIST), we can observe that none of the coefficients except A'S BELIEFS is

significant[18]. This highlights that respect for property determined by the effortful claim on the entitlement is a novel behavioral trait that our experiment uncovers and that is unrelated to social preferences or deontological preferences.

5. Discussion and conclusions

We have gone to a great length to reproduce a situation of petty crime in the lab that really tests the existence of taking aversion. In our free-form-dictator game, an active subject is matched with a passive player and each is endowed with five scratchcards. Under full anonymity (even from the experimenter), the dictator can decide whether to i) defer to the opponent and leave the allocation of scratchcards unchanged or ii) alter the de facto allocation by giving some or all of his/her own scratchcards to the passive player or iii) alter the de facto allocation by taking some or all the passive player's scratchcards. Furthermore, scratchcards can also be exchanged; there is no third-party enforcement, such as a legal or social sanction. The absence of any strategic interaction rules out other more subtle second-party mechanisms of endogenous enforcement. What is left is only (if any) first-party aversion to taking. Our implementation of the dictator game is peculiar because we do not use tokens or money but scratchcards that must be physically taken from or placed in other's envelopes/wallets; furthermore, in our LEGAL treatments, the scratchcards have been procured directly by subjects outside the lab. Our experiment tests whether the respect for property often observed in reality is grounded in people's moral attitudes or whether it is simply the result of social and legal institutions. In our experiment, subjects

[18] We have also checked for the existence of differences in the way in which the choices of A subjects are affected by second-other beliefs, ethical and social orientation across treatments by introducing interactions between treatment variables and variables A's BELIEFS, INDIVIDUAL, COOPERATIVE and CONSEQUENTIALIST respectively. No significant differences have been observed.

shielded from the consequences of their actions largely engage in taking although very often they choose not to take the maximum possible amount. Furthermore, we have learned that respect for others' property grows with the recognition of effort; some dictators defer to the opponent and avoid taking, but only when they witnessed the opponent's effort that has generated the endowment at stake. This limited respect for others' property is all of what we find of the "innate sense of property" hypothesized by Eswaran and Neary (2014) and Gintis (2007) and of the taking aversion highlighted by Korenok, Millner, and Razzolini (2016). The question of what drives subjects to respect property seems to be driven mainly by whether the source of the endowment is based on others' effort. The decision to respect property does not seem to be related to any other variable we can control for, including subjects' second-order beliefs, their evaluation of the scratchcard, their social value orientations scores and deontological attitudes.

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Appendix A. Instructions

Introduction

This experiment, followed by a questionnaire, will last approximately an hour and a half. The experimental protocol we adopt does not allow us to provide false or misleading information. The experimenters are committed to providing complete anonymity for the duration of the experiment. If in doubt about the experimental procedures, please do not hesitate to ask for clarification. In this experiment, some participants will be asked to make some decisions. These decisions will remain completely anonymous, meaning that neither the participants nor the experimentalists will be able to discover the names of the people who made the decisions. The interaction between the participants is managed through the use of a personal code that will be created by you in the course of the experiment.

The person who was in charge of welcoming and identifying you outside the lab is not associated with the experiment or with the subsequent data analysis. At the end of the experiment, we ask all participants to complete a questionnaire. The instructions for the questionnaire will be provided at the end of the experiment. Note that the survey is completely independent of the decisions made in the experiment.

The payment for the experiment occurred while entering the lab. There will be no further payments for the experiment. Answering the questionnaire will instead be rewarded with a payment that does not depend in any way on the decisions taken in the experiment, and no compensation will be given for the gains or losses during the experiment.

It is forbidden to communicate with the other participants for the duration of the experiment. Please turn off your mobile phone (not only the ringtone) and keep it off for the duration of the experiment. Those who do not respect these rules will have to leave the laboratory.

If you have questions to ask raise your hand at any time. An experimenter will respond privately.

The Experiment

Each participant is paired with another anonymous participant in the lab. One of the two participants will be assigned the role of participant A, and the other will be participant B. Some of you have already taken a red envelope and others have a grey one. After reading the instructions, the experimenter will toss a coin to assign roles A and B. If the toss lands on heads, those participants with red envelopes will be assigned role A and those with the grey envelope will be assigned role B. If the toss lands on tails, the roles will be reversed (whoever has the grey envelope will play A and whoever has the red envelope will play B). On your table you will find a privacy box, a white envelope, and a pen. The colored envelope that you received at the entrance should contain the following things:

- Five scratchcards.
- Five cardboards the same size of the scratchcards.
- The allocation table.
- Five paper stickers.

If any of these items are missing from your envelope, please raise your hand.

You'll have to invent a six-digit (letters and numbers) code and write it on the five stickers, which you will then attach to your five scratchcards. The experimenter will collect the envelopes from those playing role B and deliver them randomly to participants A (one envelope for each participant A). Participant A can then decide whether to give 1-5 scratchcards of his/her own to participant B, to take 1-5 scratchcards from participant B, or to leave things unchanged. If participant A decides to give his/her scratchcards to participant B, he/she must remove the scratchcards from his/her own envelope and put them in B' envelope. If he/she wants to take the scratchcards from B, he/she will have to take them from B's envelope and move them into his/her own envelope. Any scratchcard removed from any envelope must be replaced with an equal number of cardboard pieces.

Once the participants are done with their choices, the experimenter will collect all Bs' envelopes from the As; he/she will open them one by one, take note of the number of scratchcards, and put the content inside a new white envelope indistinguishable from any other and on which he/she will write B's personal code (he or she will read this code on the allocation tale inside the envelope itself). Also, all As will put their scratchcards and pieces of cardboard in a white envelope on which they will write their own invented code. All white envelopes (As' and Bs') will be placed on a table outside the laboratory. Once the experiment is over, all participants leaving the lab will pick up their own white envelopes.

We will go through each step of the experiment. You do not need to memorize the procedure. The experimenter will describe each step, and you can always refer to the instructions. If there are no questions, we can proceed with the experiment.

Phases of the experiment

1. Open the colored envelope and extract its contents (scratchcards, allocation table, and stickers).
2. Invent a six-digit code (uppercase letters and numbers), avoiding obvious sequences and dictionary words. However,it must be a code that you can remember. If you feel like it, you may make note of the code on the paper provided.
3. Write this same code on all five stickers.
4. Stick one sticker on the back of each scratchcard.
5. The experimenter will flip a coin to assign the two roles (A and B).
6. Those playing role A should write: "A" in the first column of the allocation table under their own scratchcards' numbers. Their invented code in the second column, and "B" in the third column.
7. Those playing role B must write "B" in the first column of the allocation table under their own scratchcards' numbers, their invented code in the second column, and "A" in the third column.

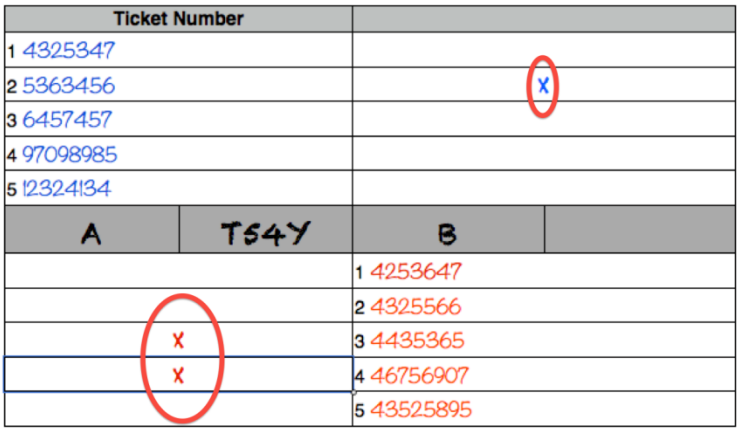
Ticket Number	
1 4325347	
2 5363456	
3 6457457	
4 97098985	
5 12324134	
A T54Y	B

8. Those playing role B must put all the material (table, scratchcards, and pieces of cardboard) in their colored envelope.
9. One of the experimenters collects both the colored and white envelopes from participants B and distributes randomly the colored envelopes to participants A.
10. Participants A have to store their scratchcards and pieces of cardboard in the privacy box to ensure confidentiality when making a later decision.
11. Participants A have to put B's colored envelope in the privacy box; they have to open it and remove its content.
12. Role A participants must write down the number of his/her scratchcards on B's table (NOT B's numbers on A's table) as follows.
13. The participants will have to write their own invented code in the fourth column of the table B.

Ticket Number	
1 4253647	
2 4325566	
3 4435365	
4 46756907	
5 43525895	
B T54Y	A
	1 4325347
	2 5363456
	3 6457457
	4 97098985
	5 12324134

14. The participants must decide whether to give some of their scratchcards (1-5) to B, or take some of B's scratchcards (1-5) or leave things unchanged. Scratchcards taken or given must be replaced with an equal number of pieces of cardboard. If A decides to take a certain number of B's scratchcards, he/she must replace these cards with an equal number of pieces of cardboard in B's envelope. If A decides to give some of his/her own scratchcards to B he must replace these cards with pieces of cardboard in their own envelope. In this way, all the envelopes have the same weight and aspect regardless of their contents. After the envelope is sealed it will be impossible to infer A's choice from the outside. This is the only decision to be made in the experiment. Participants A will

leave the lab with what they put in their envelopes. Participants B will leave the lab with an envelope the contents of which depend on A's choice.

15. Participants must take note of the scratchcards that have been given and/or taken. (In the example below, subject A has decided to give the second scratchcard with serial number 5363456 to subject B and take from him or her the third and fourth scratchcards with serial 4435365 and 46756907).
16. 

17. Once completed, table B's must be replaced in B's colored envelope along with the scratchcards. The envelope must be closed. It will then be removed by the experimenter before being delivered to B.
18. A will put the remaining stuff (table, scratchcards, and/or pieces of cardboard) into the white envelope and write his/her own code on the outside.
19. When the envelopes of all participant Bs are ready, one of the experimenters will collect them.
20. The envelopes are inspected by the experimenter. For each of B's colored envelopes, he/she removes the allocation table, puts the content in a new white envelope, and writes the invented code on the outside.
21. All white envelopes are collected by the experimenter.
22. All white envelopes are placed on a table outside the lab. At the end of the session, participants can collect the envelopes with their own code.

At the end of the experiment, you will be asked to complete a questionnaire and will be given further instructions. Remember that filling in this questionnaire is an independent activity, and it does not come with any kind of compensation related to the number of scratchcards taken or given in the experiment. After completing the questionnaire, you can leave the laboratory and pick up your envelope.

Appendix B.

Figure 1B. The privacy box

Figure 2B. Types of €1 scratchcards that could be used in the experiment

Appendix C. Individual choices.

Figure 1C. Individual choices in each treatment. For each subject (identified by the invented personal code on the vertical axis) we can see both the scratchcards given and those taken.