# Moral self-licensing and social dilemmas: an experimental analysis from a taking game in Madagascar

Sophie Clot, Gilles Grolleau, Lisette L. Ibanez

LAMETA
Laboratoire Montpelliérain
d'Economie Théorique et Appliquée
UMR
Unité Mixte de Recherche

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Sophie CLOT,
Gilles GROLLEAU
Lisette IBANEZ,

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Unite de Formation et de Recherche d'Economie
Avenue Raymond DUGRAND C.S. 79606
3 4 9 6 0 MONTPELLIER Cedex 2

E-mail : lameta@lameta.univ-montp1.fr
web : www.lameta.univ-montp1.fr

# Moral self-licensing and social dilemmas:

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Sophie Clot [a, *], Gilles Grolleau [a, b] and Lisette Ibanez [c]

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**Summary**

This paper explores whether previous good deeds may license non-cooperative behavior such as damaging a social surplus for private benefits in Madagascar. We designed a two steps framed experiment, with one control and three treatments. In the first step, the three treatments consist in a task that enables subjects to earn moral credit, whereas the control group just has a neutral task (i.e. unscrambling sentences). The three treatments differ in the framing of the "moral boosting" task. In the second step, subjects are given the possibility to take an amount from a fund allocated to their University. We show that participants in the license condition adopt higher anti-social behavior than participants in control. First, the number of participants who decide to take money from the University's fund increases under the license condition, and second, the average amount taken is significantly higher than in the control condition, even when only takers are considered. The framing of the preceding task seems to have little impact on self-licensing. However, a low degree of implication encourages greater morally dubious behavior. Finally, we found that license effect exists both for men and women, while the increase of anti-social behavior after a good deed is more pronounced for men.

**Key words:** Behavior, licensing effect, cooperation, Africa, Madagascar.

**JEL codes**: C91, D03.

[a] Montpellier SupAgro, LAMETA, UMR 1135, 2, place Pierre Viala, F-34060 Montpellier, France
[b] LESSAC, Burgundy School of Business, 29, rue Sambin BP 50608, 21006 Dijon, France
[c] Institut National de la Recherche Agronomique, LAMETA, UMR 1135, Montpellier, France

[*] Corresponding author. Tel.: + 33 499 612 058. E-mail address: clot@supagro.inra.fr (S. Clot).

*"Good and evil are not fixed, stable entities, but are continually trading places. A good may be transformed into an evil in the next second. And vice versa."* — Haruki Murakami, 1Q84

## 1. INTRODUCTION

Growing literature on moral self-licensing opens new directions to understand the forces underlying individuals' moral behavior. Traditionally, moral behavior and social preferences have been given as exogenous and consistent over time (Narloch et al, 2012; Carpenter and Seki, 2010; Castillo and Saysel, 2005; Henrich, 2000). But recent researches demonstrate how an initial virtuous act might impact future decisions, by decreasing the willingness to act pro-socially in subsequent circumstances and vice versa. (Khan and Dhar, 2006; Sachdeva et al., 2009; Mazar and Zhong, 2010; Chiou and al., 2011)

For example, evidence shows that Prius Hybrid drivers are more likely to break crosswalk laws and get fines, green buyers are more likely to steal, people who wrote positive stories about themselves are more likely to act selfishly, etc. (Woodyard, 2009; Mazar and Zhong, 2010, Sachdeva et al., 2009) Several contributions from marketing and psychology attribute these types of behaviors to a "self-licensing effect", a situation wherein a good deed might excuse subsequent dubious behavior (Khan and Dhar 2006; Sachdeva et al., 2009).

In this work, we run an experiment to test the prediction of the 'moral credit model' (i.e. good deeds establish moral credits like deposits in a bank account that can be 'withdrawn' to 'purchase' the right to perform bad deeds) in a developing country context crossed with a social dilemma situation where people have to consider both private and public benefits.

If studies on social surplus creation and pro-social preferences have proliferated those last decades, much less is known about the motives underpinning surplus destruction's behavior (Cox et al 2013). We thus offer a new approach to study anti-social behavior by mobilizing recent work in psychology (Khan and Dhar, 2006; Sachdeva et al., 2009; Mazar and Zhong, 2010; Chiou and al., 2011), which also receive recent echo from moral behavior's model developed in the economic sphere (Bénabou and Tirole, 2010). A second originality of our paper is to test the moral credit model in a developing country context. Indeed, all researches on licensing effect have been run in Western countries, where a WEIRD[1] effect can be suspected (Heinrich et al., 2010). Indeed, Heinrich et al. (2010) argue that using samples drawn entirely from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies to study human nature can be misleading. The reminder of this paper is as follows. A literature overview is exposed in section 2. We then present the experimental design and procedures that were used to test our predictions in section 3. Section 4 presents the result. We conclude and discuss in section 5.

[1] WEIRD effect : Western, Educated, Industrialized, Rich, Democratic

## 2. BEHAVIORAL HYPOTHESES

An emerging literature suggests that policies designed to create Pareto-Superior outcome may in fact impact individual behaviour in counterintuitive ways (Cardenas et al 2000, Vollan 2008, Narloch et al 2012).

A possible explanation for this paradox comes from the divergence between standard economic theory and empirical evidence. For instance, standard economic theory tends to depict individuals as Homo Oeconomicus, following their self-interests and free ride on others. However, ample evidence from behavioral economics demonstrates that individuals have pro-social preferences and may succeed in overcoming social dilemmas under some circumstances (Ostrom 2000, Velez et al 2009, Cardenas 2004).

Since then, individuals have been increasingly described as a combination of self-interest and social preferences, tending to strike a balance between self and group interests. In this literature, social preferences are still considered as endogenous (Narloch et al, 2012, Carpenter and Seki, 2010; Castillo and Saysel, 2005; Henrich, 2000) and therefore determined by socio-economic and cultural characteristics while potentially crowded out by exogenous mediator such as external regulation (Cardenas et al, 2000) and external rewards (Vollan, 2008; Narloch et al, 2012).

In parallel, the idea of a licensing effect has rised recently from the marketing and psychological literature, arguing that social preferences might not be treated as fixed preferences.

'Moral self-licensing' refers to a situation where being 'good' leads to more self-indulgent option afterwards (the reverse situation would be better referred as moral cleansing). Khan and Dhar (2006) proposed to define moral self-licensing as a non conscious effect that operates by providing a moral boost in the self-concept, which increases the preference for a relative immoral action subsequently by dampening the negative self attributions associated with such behavior. In other words, this describes a process of moral accounting where good deeds are assimilated as moral credit and bad deed as moral debit.

We review hereinafter a few studies that have explored the self-licensing effect. Sachdeva et al (2009) demonstrated how self-licensing could impact negatively pro-social preferences. In their experiment, participants who wrote a positive story about themselves were significantly less generous and keep more for themselves in a dictator game than those participants who just wrote a neutral story. In another study about green consumers, Mazar and Zong (2010) reported that consumers from a green store shared less money than consumers from a conventional store. Those consumers were also more likely to adopt dubious behavior such as cheating and stealing. This study supports the existence of a self-regulation process, but also brings evidence that licensing may lead up to moral transgressions. Effron and Monin (2010) studied the impact of self-licensing on transgression as well, but under a tierce person judgment: one actor's good deed (e.g. sheltering hurricane's victims) makes participants more forgiving of the actor's subsequent transgression (e.g. sexual harassment). More precisely, the author demonstrated that the indulged transgression could be a clear transgression (i.e. blatant) if the domains to which belong the two succeeding actions are

different, but the effect might still happen when domains are the same, if the transgression is more ambiguous (e.g. behavior that might or might not represent sexual harassment). In the environmental domain, Panzone et al (2012) reported that consumers are less sustainable in the food market once they have shown their environmental sensitivity in another domain. Tiefenbeck et al (2013) showed that residents who received weekly feedback on their water consumption lowered their water use (6% on average), but at the same time increased their electricity consumption by 5.6% compared with control subjects. In another vein, Clot et al (2013) studied the impact of financially rewarding good deeds on self-licensing. The authors found that prefacing the dictator game with an unpaid good deed seems to establish a 'moral rectitude' which licenses subsequent selfish behavior, whereas a paid good deed dampens the effect.

In parallel, daily facts reporting self interest overcoming group interest illustrate further this moral paradox: a former director of a nonprofit psychotherapy organization stole more than $2.5 million from the group and used the money to pay off loans, credit cards and other expenses (Times - February 2, 2012), a property manager for a low-income co-op in the Bowery stole more than $260,000 from the building (Times - January 26, 2012), or even a Church worker who embezzled more than $1 million over seven years from the Roman Catholic Archdiocese (Times - January 30, 2012) , etc.

Both experimental evidence and daily facts support our main hypothesis, which is that people who previously established their moral credentials are then more likely to embezzle founds for private ends.

**Hypotheses:** Given a situation of arbitration between private and public benefits, doing something good for 'others' (and costly for oneself) might change individual's preferences of doing something bad for 'others' (and good for oneself) later on.

If the idea of a moral regulation process is not entirely new (i.e. transgression-compliance effect from Carlsmith and Gross, 1969), the recent expansion of the related literature (mostly in psychology and marketing) associated to an emerging consistency with economic model (Bénabou and Tirole, 2010), increases significantly the relevance of this effect for economic research. In line with these recent advances, we test to what extent moral licensing may encourage anti-social behavior such as damaging a social surplus for private benefits. To capture anti-social behavior, we used a 'taking game'[2] (Bardsley, 2008), which closely relates to a dictator game except that it manipulates the endowment's allocation. The receiver has the money, and the dictator decides how much he takes from it. In our work, we implement a slightly different version of this game, where instead of having one receiver played by an anonymous student, we have only one receiver, represented by a public institution. In sum, participants have the opportunity to take a part of an amount initially endowed to their belonging institution. A more detailed description of our design follows in the next section.

## 3. EXPERIMENTAL DESIGN

[2] Similar games could also be found in the literature under different labels such as the 'gangster game' (Eichenberger and Oberholzer-Gee, 1998) or 'appropriation game' (Cox et al 2013).

In our experiment, we address the question of how previous good deeds may license non-cooperative behavior such as taking from a social surplus. Neither punishment nor repressive measures are part of the design to avoid the interference of risk issues and to focus our attention on anti-social preferences only.

Moreover, we run a game that involved no strategic behavior (payoffs are independent from other participants decisions), no risk aversion (decision are independent and entirely anonymous, with no punishment) in order to only measure the temptation to misappropriate a common fund for private benefits. We designed a two steps framed field experiment for students, with one control and three treatments. In the first step, the three treatments consist in a task that enables subjects to earn moral credit, whereas the control group just has a neutral task (i.e. unscrambling sentences). In the second step, subjects are given the possibility to take an amount from a fund allocated to their University.

(a) *Qualitative background*

Pretests were conducted in order to correctly design the first step of the experiment, which consisted in defining what kind of activity the students valued to be a "good deed" in the Madagascar context (through informal interviews) and verifying whether the "good deed" really induces a moral boost (using a self-assessment scale).

First, two different good deeds were selected from informal interviews. The first one refers to the state of the University's surroundings. Indeed, the campus is settled on the hills of Antananarivo and enjoys very pleasant green settings. Each department's surroundings are most of the time well maintained, even though, there are always litters and papers flying around. Students are concerned by the appearance of their department and proposed the cleaning of their department's surroundings as a good deed. The second good deed that emerged from discussions relates to assistance, through the realization of a guidebook dedicated to newly arrived students. In fact, many students are coming from rural areas and are therefore unfamiliar with the campus and its environment. They would highly benefit from a book hosting all kind of useful information about the campus.

Next, a pretest to validate the selection of those two good deeds was run on a focus group of 53 students from the University of Antananarivo. Based on a method used in Khan and Dhar (2006), which aims at measuring self-assessment, we asked subjects to indicate the extent to which they agree or disagree on a scale from 1 to 7 (1="Strongly disagree", 7="Strongly agree") with the following four statements "I am compassionate", "I am sympathetic", "I am generous" and "I am helpful". Khan and Dhar (2006) used these items because they exhibited a high degree of reliability in terms of coefficient alpha (Cronbach's $\alpha$ = 0.84). Students were randomly assigned to a license or a control condition. In the license condition, subjects were asked to imagine they engage into volunteering, and allowed them to choose one of the two good deeds. Results of the self-assessment scale show that participants evaluated themselves significantly more positively on the four attributes if they had imagined performing a good deed (license group) than if they had not (control group) (see table 1), regardless of the chosen good deed.

Table 1. *Mean self-assessment in license and control conditions.*

| I am… | Licence (N=37) | | Control (N=16) | | Ranksum test[3] |
|---|---|---|---|---|---|
| Compassionate | 5.216216 | (0.2743683) | 4.1875 | (0.3442232) | z = -2.251, p = 0.0244 |
| Sympathetic | 5.459459 | (0.264503) | 4.375 | (0.4643544) | z = -1.956, p = 0.0505 |
| Generous | 5.447368 | (0.2376311) | 4.3125 | (0.3619248) | z = -2.382, p = 0.0172 |
| Helpful | 5.351351 | (0.2853169 | 4.375 | (0.4552929) | z = -1.860, p = 0.0628 |

Note: The standard error of the mean is in brackets.

(b) *Experimental procedure*

A total of 367 subjects from Antananarivo's University participated in the (paper-pencil) experiment[4]. All participants were unfamiliar with experimental games. We conducted 3 sessions. In all aspects, we carefully followed identical procedures in each session based on a written protocol to minimize context's biases (See the Appendix for detailed instructions). Participants were randomly assigned to 4 groups (one control and three treatments). Within each session, subjects were allowed to talk only to administrators and there was 1 administrator for each 20 participants. Students were placed as in exam conditions to ensure that decisions are made in private. Sessions were run among 3 different departments of the university to minimize discussion and contamination between sessions. Questionnaires were anonymous and identified by a unique number. The instructions stated that there are no right or wrong answers and that the experimenter aims to collect sincere answers. Also, participant's professors were not involved in the experiments' administration to not influence individuals' decisions.

Table 2. *Game design*

| Groups | Stage 1 | Stage 2 | Stage 3 | Money at stake (MGA) |
|---|---|---|---|---|
| *Control* | Neutral task | Filler task | Taking game | 30,000 |
| *License condition* | | | | |
| Treatment 1 | Good deed | | | |
| Treatment 2 | Good deed, with option to refuse | | | |
| Treatment 3 | Good deed, with option to select the level of participation | | | |

The experiment design includes three stages, which are illustrated in table 2. In the first stage, the purpose of treatments 1, 2 and 3 is to induce a moral boost ('license condition') by referring to a situation where the participant is given the opportunity to establish an altruistic self-concept. In the control condition, this part is replaced by a dummy task, which consists in unscrambling four sentences. This way, questionnaire length becomes similar among all groups, not to arouse suspicion among participants. This method was also used in Khan and Dhar (2006) who proved that unscrambling sentences do not affect individual's self-concept.

[3] Non parametrical Ranksum tests were used due to the small sample size.

[4] We made sure that none of the students who had participated to either of the two focus groups took part in the experiment.

In the license condition, we asked participants to imagine that they could volunteer doing University service (they had the choice between options: either 'cleaning buildings' surroundings to improve the image of their department ' or 'design a guide book for new students'). All treatments under the license condition faced a similar description of these two activities, but with different answering options. In treatment 1, subjects were given the possibility to choose one of the two community services. In treatment 2, subjects also had the opportunity to opt out of the task (Khan and Dhar, 2006[5]). In treatment 3, the community service was with no opt-out clause as in treatment 1, but subjects had to indicate the time they want to dedicate to the task (1 hour, 2 hours, 3 hours, half day or a full day). Those three treatments have in common to include a prior licensing task, but they vary the way subject can signal their good will.

In the second stage, subjects were asked to describe the impact the decision had on their selves to ensure their involvement in the task and control for the induced self-boost (i.e. filler task). It also minimizes the possibility that participants will draw a connection between the licensing activity (stage 1) and the taking game (stage 3). After completing stages 1 and 2, participants turned to the next sheet of the questionnaire. In the third stage of the experiment, they are told that an institution grants their University for infrastructure improvement (no specific information is given on the total amount granted). Participants are told that they have the possibility to take money out of this public fund up to a certain amount of money. A choice table is given, specifying for each possibility, the distribution between the amount taken and the remaining amount for the University. The instructions state in capital and bold letters that decisions are real and confidential. It is also clearly mentioned that any sum taken would reduce from the same amount the grant intended to the University. Two checkboxes were proposed: "I do take in the kitty", followed by a free space to specify the amount (multiple of 1000, up to a limit of 30,000 Ariary), versus "I do not take in the kitty". After the time elapsed, questionnaires were collected and a lottery determined participants actually being paid. There was one winning number for every 10 participants[6]. The amount at stake (30,000 Ariary) is the equivalent of 15 meals (2000 Ariary is the average price for a meal proposed in one of the many popular restaurant located nearby the Campus).

(c) *Control variables*

Demographic and more general questions were left to the end, in order not to influence the decisions during the experiment (referred as a stereotype bias; Lepore and Brown, 1997). Basic data on resources, gender, origin, and religion were collected. Also, additional questions assessing risk and positional attitudes were included to control for any potential cross effect with licensing.

Experimental literature suggests that women behave less selfishly than men (Eckel and Grossman, 1996) and are less competitive (Gneezy, 2003). Thus, we expect women to appropriate less money than men. We distinguished participant's origin in two different sub groups: those coming from the capital city

[5] Khan and Dhar (2006) used both manipulation options (with and without opt-out clause) in two different experiments. They found licensing effect in both experiments, but no direct comparison of the degree of licensing could be deducted.

[6] This payment method called 'Random Incentivized System' has been studied by Armantier (2006), who compared results between sure and random gain, finding no significant difference.

Antananarivo and those coming from rural areas. In fact, coming from a rural area in general is associated with harder living conditions and lower incomes. We also expect people from rural area ('strangers') to be less concerned about the local public good and to have a greater willingness to take from the common pot (Habyarimana et al., 2007). Participants who are members of a religion that emphasizes the equality of human beings should play more fairly and cooperatively. Christianity has a strong emphasis on sharing, with certain Protestant movements being particularly critical of amassing wealth (Hayo and Vollan, 2012). Risk preferences and positional attitudes have been shown to affect cooperation as well (Bougherara et al., 2009, Bougherara et al., 2010). We build an index for risk preferences based on two questions from the survey. First question, participants had to indicate which option they would prefer between a sure gain of 3000 MGA (=0 point) and 80% of probability to earn 4500 MGA (=1 point). In the second question, participants had to choose between a sure gain of 24 000 MGA (=0 point) and a 25% probability to earn 100 000 MGA (= 2 points). The index for risk preferences was then built by adding points earned in both questions. The index varied from highly risk averse with 0 to risk taker with 3. We also measured positional concern, since it might also impact preferences as demonstrated in Solnick and Hemenway, 1998. To asses positional preference, we used a binary option, equal to one when participants indicated they would prefer having a lower monthly salary but higher than others' salary (500 000 MGA / 400 000 MGA) rather than a higher amount equal to others (600 000 MGA / 600 000 MGA).

## 4. RESULTS

The characteristics of our data sample (of 367 subjects) are presented in table 3. The sample is well balanced across conditions, with an average of 51% male subjects, 21.64 years old. 36 subjects did not answer the taking game (the amount to take in the common pot). Results presented later on therefore concern the remaining 331 observations.

Table 3. *Characteristics of participants (Percentage or mean)*

| | Control (n=175) | License (n=192) | Overall (n=367) |
|---|---|---|---|
| *Age* | 21,63 | 21,64 | 21,64 |
| *Male* | 50% | 52% | 51% |
| *Rural* | 27% | 23% | 25% |
| *Ressource* | | | |
| <50 000 Ar/month | 45% | 36% | 41% |
| <100 000 Ar/month ; >50 000Ar/month | 31% | 36% | 33% |
| <100 000 Ar/month | 24% | 28% | 26% |
| *Religion* | | | |
| Catholic | 40% | 43% | 42% |
| Protestant | 55% | 53% | 54% |
| Others [7] | 5% | 4% | 4% |
| *Risk Preferences* | 0.642 | 0.646 | 0.644 |
| *Church attendance* | 4.2 | 3.6 | 3.9 |
| *Positional attitude* | 0.31 | 0.33 | 0.32 |

[7] Others includes: Muslims, Hindus and Jews.

**Finding 1:** Non-cooperative behavior increases under self-licensing.

Our first main result shows that participants in the license condition were more inclined to take in the kitty than participants in control. First, the number of participants who decide to take money from the University's fund increases under the license condition (71.74% in the control group versus 81.66%, in the license group). So subjects that declared they would engage in a good deed for their University's department first, were 9.92 points more inclined to take in the University's kitty subsequently. This difference is statistically significant using a binomial test (p|k|=0.00043). Second, among those participants who decided to take in the kitty, participants in the license group took significantly more than participants from the control group (8.92 points more, t=-2.2308, p|t|=0,0266). Altogether, participants in the license group took on average 45.22% more than participants in the control group (which represents an average amount of 4309 Ariary). The taken amount is on average 9,528.926 Ariary (over the 30,000.00 available in the kitty) for control (SEM[8]= 906.2132) versus 13,838.1 Ariary for license (SEM=704.3868), with significant difference at 1% level (t=-3.7304, p|t|=0.0002). Figures 1, 2 & 3 illustrate those findings.

The good deed selected, on aggregated or non-aggregated levels, didn't change significantly non-cooperative behavior. Grouping all treatments, 44% selected the cleaning activity and 54.67% went for the guidebook. In the voluntary treatment only 3 subjects (over 76) declined to adopt a community service. People who selected the cleaning activity took on average 14,388.89 from University's kitty, which is not statistically different from those who selected the guidebook activity, who take on average 13,269.57.

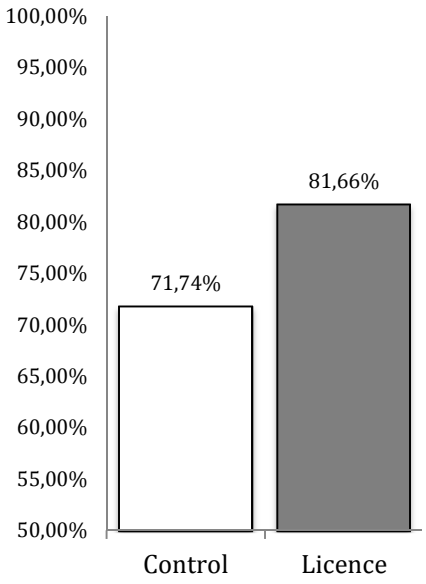


Figure 1. *Share of takers within the two scenarios*.

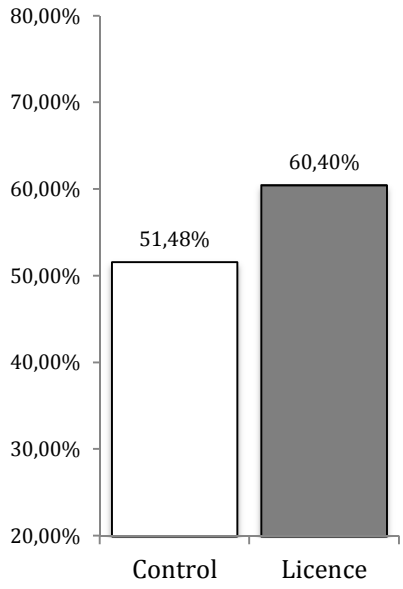


Figure 2. *Share of taken amount among takers within the two scenarios.*

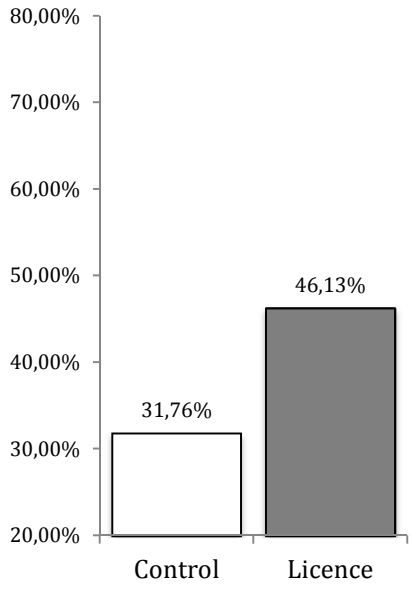


Figure 3. *Share of taken amount within the two scenarios.*

[8] Standard Error of the Mean

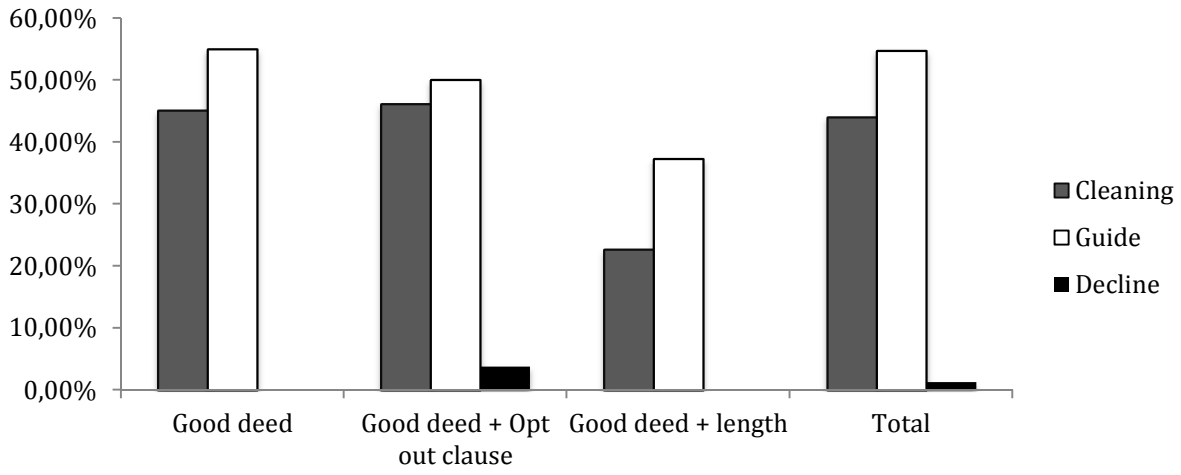


Figure 3. *Subjects' choice in stage 1 for treatments 1, 2 and 3.*

In the following result, we consider the way the good deed is implemented, and how its impacts the licensing effect.

**Finding 2.** Antisocial behavior through self-licensing is independent on the opt-out clause of the performed good deed. However, lower implications into good deeds lead to higher antisocial behavior.

Looking at the different treatments designed to manipulate the licensing effect, we find that treatment 2 (good deed with opt out clause) and treatment 3 (good deed with voluntary degree of implication) led to slightly greater licensing than T2 (good deed with no options). Subjects in treatment 2 took approximately 1,000.00 Ariary less than in the two other treatments, but this difference is not significant. In addition, all treatments are significantly different from control, using both parametric and non-parametric test. Tests are summarized in table 4 and Figure 4 reviews the average of taken amount for each treatment.

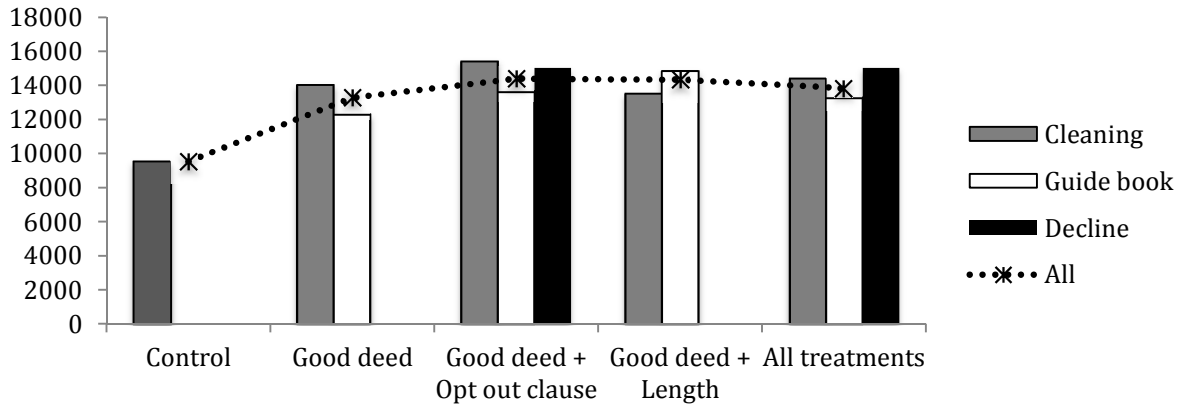


Figure 4. *Mean of taken amount across Treatments 1, 2 & 3 and choices.*

Table 4. *Difference in means between treatments 1, 2 & 3 and control (Student test and Wilcoxon test)*

| Control n=175 | T1 (Good deed), n=73 | P-value | | T2 (Good deed + Opt out clause), n=76 | P-value | | T3 (Good deed+ Length), n=43 | P-value | |
|---|---|---|---|---|---|---|---|---|---|
| | | t-test | wilcoxon | | t-test | wilcoxon | | t-test | wilcoxon |
| 9528.926 | 13277.23 | 0.0083 | 0.0145 | 14378.79 | 0.0015 | 0.0006 | 14325.58 | 0.0066 | 0.0031 |

Looking closer at treatment 3, we found that the degree of implication impacts significantly the licensing effect. Similarly to previous results, it seems that the licensing effect not only depends on the previous good deed but also on intrinsic motivations in relation to this good deed (Clot et al, 2011). The previous authors showed that intrinsically and extrinsically motivated individuals react in opposite ways to engaging in a good deed in terms of licensing. In other terms, in an economy with both intrinsically and extrinsically motivated people, motivation's nature plays the role of a mediator, leading to heterogeneous licensing effect. Even if we didn't measure the intrinsic motivations of participants, we observe that individuals differ in the way they want to perform the good deed. As time is costly, we might expect intrinsic motivations are higher for individuals that decide to invest more time into volunteering in favor of the University. Interestingly, the licensing effect seems to be stronger for individuals who declared they would dedicate less time for the common task. All together, subjects that participated more than a half-day took 11,821 Ariary, which is significantly less, at the 5% level[9] (z= 2.5482, p|z|=0.0147) than people who chose to participate less than a half-day, who took 19,000 Ariary. While participants who selected less than a ½ day took significantly more than participants in control (z= 3.477, p|z|=0.0005), participants who selected more than a ½ day did not take significantly more than control (z=-1.422, p|z|=0.1549). Figure 5 shows the average of amount taken, depending on the length dedicated to the University duty, corresponding to treatment 3.

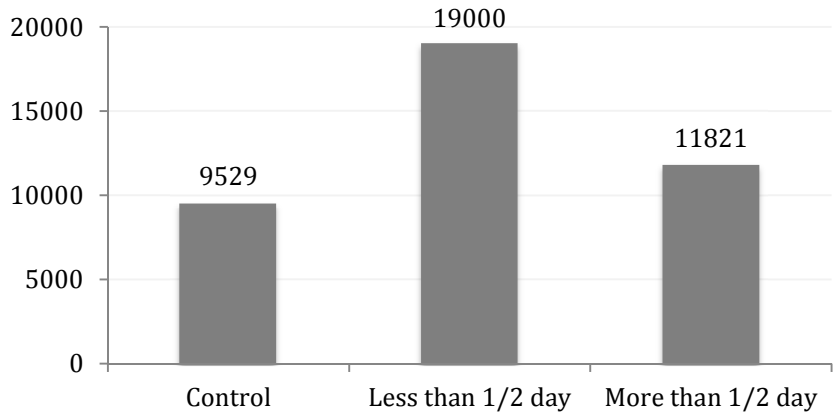


Figure 5. *Average amount taken, by time of investment for the good deed.*

**Finding 3.** In general, men adopt higher anti-social behavior than women. Licensing effect exists both for men and women, even if the increase of anti-social behavior after a good deed is more pronounced for men.

[9] 'Wilcoxon–Mann–Whitney' non-parametric test is preferred when at least one of the two samples involved in the comparison is below 60.

Our data reveals that men take significantly more than women. The average of the taken amount for men is 13,630.95 Ariary versus 10,734.57 for women, significantly different at 1% (t=2.5790, p|t|=0.0103). The gender effect persists in the license condition (15,336.45 vs. 12,107.84, t = 2.3181, p|t|=0.0214) but not in control (10,639.34 vs. 8,400.00, t=1.2383, p|t|=0.2181). We may conclude that men are more subject to licensing effect than women. Controlling for gender, licensing is present for both men and women. In fact, men took more in license condition than in control (15,336.45 vs. 10,639.34, t=-2.6971, p|t|=0.0077) as well as women (12,107.84 vs. 8,400.00, t=-2.5108, p|t|=0.0130)

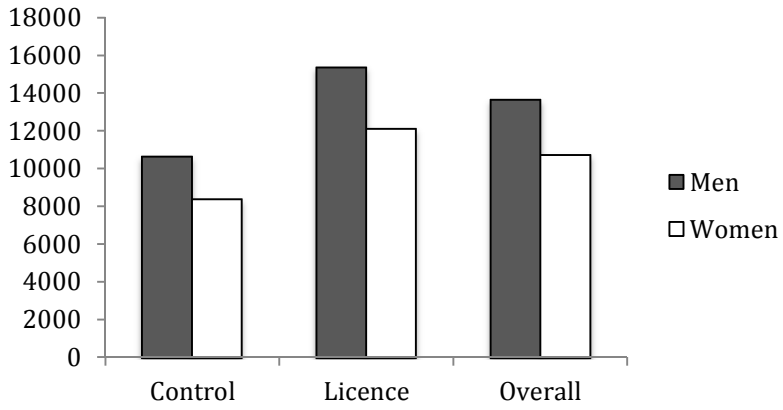


Figure 6. *Average amount taken in control and license conditions, by gender.*

We performed a set of regressions to get further understanding on the determinants of anti-social behavior. First, a linear regression (table 5) of the taken amount (whole sample, control group, license group), and finally a probit model for the binary option 'take versus no take' (table 6).

**Finding 4.** Resource level, origin, religion, risk and positional preferences seem not to affect non-cooperative behavior.

Regression results of taken amount support our preceding findings. In this model, subjects in license condition took on average 4,076 more than others in control with a probability below 1%. The regression also supports the existence of a gender effect with women taking on average 2,847.3 less than men (p<5%). The regression does not support the existence of a relationship between taking behavior and resource level, origin, religion, risk or positional preferences. Given that the licensing effect happens below the radar of consciousness, these results are not too surprising. It leads us to the idea that licensing effect is above all inherent to all individuals and does not depend on socio economic characteristics. The linear regression over the two sub samples (license and control conditions) supports the idea that gender effect plays a role in the license treatment but not in the control, with women taking on average 2,883.7 Ariary less than men (p<5%) in the license condition.

The probit analysis in table 6 demonstrates that license condition plays a role in whether subjects take or not in the University's common pot. Being in the license group increases by a coefficient of 0.09 the probability of taking from to common pot (p<5%). Gender has no effect on the tendency to take, meaning that gender affects rather the amount taken by subjects than the act of taking *per se*.

Table 5: OLS regression of taken amount

| | (1) All sample | | (2) Control sample | | (3) License sample | |
|---|---|---|---|---|---|---|
| License condition | 4076.0*** | (3.45) | | | | |
| Gender | -2847.3** | (-2.50) | -2643.5 | (-1.39) | -2883.7** | (-2.00) |
| Resource | 120.2 | (0.16) | 90.11 | (0.08) | 125.8 | (0.13) |
| Rural | -792.7 | (-0.56) | -2497.0 | (-1.07) | 344.7 | (0.19) |
| Catholic | 983.1 | (0.62) | 3701.3 | (1.30) | -704.8 | (-0.36) |
| Protestant | 979.6 | (0.66) | 929.4 | (0.36) | 649.7 | (0.35) |
| Risk taker | 2128.9 | (1.37) | 1672.4 | (0.65) | 2801.7 | (1.42) |
| Positional seeker | 1718.8 | (1.50) | 897.3 | (0.47) | 2340.9 | (1.60) |
| Constant | 9907.6*** | (3.06) | 10311.9** | (2.01) | 13478.7*** | (3.41) |
| Observations | 331 | | 163 | | 168 | |
| *BIC* | 6869.5 | | 2473.8 | | 4419.7 | |
| p | 0.00311 | | 0.574 | | 0.190 | |

$t$ statistics in parentheses

$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

Table 6: Probit model (0=No take / 1=Take)

| | (1) Model 1 | | (2) Model 2 | |
|---|---|---|---|---|
| Licence condition | 0.317** | (2.05) | | |
| Gender | 0.0962 | (0.63) | | |
| Licence condition*Gender | | | 0.0978 | (1.41) |
| Ressource | 0.146 | (1.46) | 0.143 | (1.44) |
| Rural | -0.0547 | (-0.30) | -0.0643 | (-0.35) |
| Catholic | 0.0661 | (0.30) | 0.0750 | (0.34) |
| Protestant | -0.0647 | (-0.32) | -0.0764 | (-0.38) |
| Risk taker | 0.168 | (0.76) | 0.170 | (0.77) |
| Positional seeker | 0.0793 | (0.51) | 0.0789 | (0.51) |
| Constant | -0.0277 | (-0.06) | 0.0640 | (0.16) |
| Observations | 331 | | 331 | |
| *BIC* | 418.1 | | 414.7 | |
| chi2 | 8.120 | | 5.601 | |
| p | 0.422 | | 0.587 | |

$t$ statistics in parentheses

$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

Another important finding of our experiment is related to the global amount of money dedicated to the public good. In our experiment, we found that people took on average 40.88% (12,262.84 Ariary) from the kitty, meaning that they left (or gave) 59.12% for the common infrastructure. When studying pro-social preferences, the most commonly used game is the dictator game, based on the measure of the willingness to donate to a receiver. Meta studies reports that people generally share 30% of the pie (Engel, 2010). Similar games have been played in developing countries, revealing equivalent results (individuals sharing 31% of the pie, Henrich et al., 2005). With people sharing more than half of the pie, the taking game seems to lead to greater donations. Above all, this result proves that manipulating endowments beneficiaries could lead to radically different sharing rules, suggesting further research on how endowment's framing affects people's behavior.

## 5. CONCLUSIONS

We have sought to illustrate that previous good deeds may license non-cooperative behavior such as damaging a social surplus for private benefits in a developing country context.

This work provides additional cues to understand why people may behave anti-socially and how social surplus creation might be threatened under some circumstances. Our results feed the debate on whether social preferences should be considered as exogenous or not. We clearly demonstrate through this experiment, that social preferences and moral behavior also depend on external factors and could therefore vary over time as presented in the moral credit model.

While previous works on moral credit have shown that pro-social behavior might be tempered due to the licensing effect, we provide evidence that licensing effect might also encourage morally dubious behavior and explain social surplus decline. The licensing effect not only decreases the likeliness to be pro-social, but it also increases the likeliness to be anti-social.

Having tested experimentally this effect outside the lab, in a developing country context, this work confers increased external validity to licensing behavior, adding empirical evidence corroborating previous results found in the literature with WEIRD samples.

More specifically, we found that the self-boost manipulation through the opt-out clause had no impact on further licensing effect, which suggests that a very simple signal is enough to induce subsequent anti-social behavior. Meanwhile, the manipulation through the degree of engagement in the good deed seems to enlighten two types of behavior: a low degree of engagement among people with a higher degree of licensing and a high degree of engagement among people with a lower degree of licensing. This could suggest that intrinsic motivation does the trick here, and plays as a mediator to explain heterogeneous licensing as demonstrated in Clot et al (2011). In their work, the authors show that more intrinsically motivated and less intrinsically motivated subjects reacted adversely to two policy scenarios (voluntary vs. mandatory). Licensing effect is more salient when combining less intrinsically (resp., more intrinsically) motivated individuals and voluntary (resp., mandatory) conditions.

Our results also reveal a gender effect as a second mediator of licensing. Men behave less cooperatively than women and licensing effect is present for both, but seems more pronounced for men. Extra socio-economic variables such as resources, origin, religion, risk and positional preferences, that were part of the analysis, have shown no impact on the decision to cooperate nor on the licensing behavior. To some extend, this confers licensing effect properties that makes it robust to individual's socio economic attributes and somewhat generalizable to human's behavior pattern.

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**Contact :**

Stéphane MUSSARD : mussard@lameta.univ-montp1.fr