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What did you do before? Moral (in)consistency in pro-environmental choice

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Abstract: Rather than just examining moral licensing and cleansing at an aggregate level, we investigate experimentally the moral dynamics at an individual level. We also propose a formal definition of moral consistency or inconsistency (i.e., moral licensing and/or moral cleansing). We found that half our sample present inconsistent pro-environmental behaviour, independently of the way behavior is elicited (positive or negative framing). Men seem to behave more consistently over time, but when they compensate, they license (respectively cleanse) in a higher (respectively lesser) extent than women. We suggest that policies can improve their performances by avoiding a ‘one size fits all approach’ and take into account this heterogeneity of moral dynamics.

Key words: cleansing; dictator game; licensing; moral in(consistency); taking game.

JEL codes: C91, D03.

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What did you do before? Moral (in)consistency in pro-environmental choice

1. Introduction

Traditionally, moral behavior and social preferences have been considered as exogenous and consistent over time (Narloch et al, 2012, Carpenter and Seki, 2010). Despite some limits, this working assumption allowed valuable advances in economic science. Nevertheless, an increasing literature supports that significant portions of people at the aggregate level exhibit moral inconsistency, implying that their moral behavior and social preferences are influenced by past behavior (e.g., Khan and Dhar, 2006; Mazar and Zhong, 2010; Clot et al., 2016; see Blanken et al., 2015 for a meta study and Mullen and Monin, 2016 for a comprehensive review). For instance, anecdotal evidence (e.g., Woodyard, 2009) and several experimental studies (Blanken et al. 2015) found that *ceteris paribus* performing or even imagining a good (bad) deed makes participants more likely to perform a bad (good) deed thereafter, frequently described as moral licensing (cleansing). Defining and understanding whether people are morally consistent or inconsistent over time is valuable, notably because it allows to understand some puzzling behavioral results (e.g., backfiring policies), avoid a ‘one size fits all’ approach and design more effective policies.

Rather than just examining whether people are morally consistent or inconsistent at the aggregate level (Brañas-Garza et al., 2013), we use well-crafted combinations of two symmetric games (i.e. dictator and taking games) with an environmental non-governmental organization to investigate the individual moral profiles of participants. We also introduce a formal definition of moral consistency and moral inconsistency. Unlike previous studies (e.g., Brosig and Koch, 2017), we consider individual data within a restricted time frame in order to detect the dynamics of moral (in)consistency and also control for opportunity cost by incentivizing randomly only one decision among the two requested decisions. Interestingly, we found that aggregate data can occult a significant level of individual heterogeneity where some individuals behave in a morally consistent way over time while others behave in a morally inconsistent way.

The remainder of the paper is organized as follows. The next section proposes an economic model of decision making considering the paradox of moral self-regulation. This model allows to reach formal definitions of moral consistency and inconsistency. Section 3 describes the experimental strategy and Section 4 provides the main results and discusses them. Section 5 suggests some policy implications and concludes.

2. Theoretical framework

We present an economic model of decision making considering the paradox of moral self-regulation (Sachdeva et al. 2009). The model investigates on the consistency of prosocial behavior of individuals who choose their participation level in a prosocial project (in our experiment, it represents a donation to an environmental non-governmental organization (ENGO), but the model might have broader interpretations). Each participant has to decide the amount x s/he wants to dedicate to the concerned project. The choice set X , can be discrete or continuous. We suppose that individuals might be motivated to contribute to the public project for the sake of the environment or warm-glow motives¹ (Andreoni, 1990). A contribution of x to the prosocial project entails a monetary cost $c(x)$, with $c' > 0$ and $c'' = 0$, and a (moral) benefit $v(x)$, with $v'(x) > 0$ and $v''(x) < 0$.

Then individual i 's utility function can be written: $u_i = v(x_i) - c(x_i)$

And individual i 's optimal decision equals x_i^* such that $v'(x_i) = c'(x_i)$. This means that the marginal benefit of donating equals its marginal cost, knowing that the marginal cost is supposed to be constant, whereas the marginal benefit is decreasing (see Figure 1).

This set-up supposes that people value the action of giving consistently over time. However, prosocial preferences might depend on a previous prosocial orientated decision. Branas-Garza et al. (2013) show that "self-regulation is not a long memory process, since only the previous period matters". In other words, moral motivations depend on social actions performed previously. We formalize this point by supposing that v is function of $v(x_{i,t-1})$ $v(x_{i,t} | x_{i,t-1})$. We assume, for simplicity, that a single decision is made at each period, and that there is no anticipation of the impact of decisions at time t may have on intrinsic

¹ We focus on individual behavior and do not consider any strategic interaction, such as reciprocity, social comparison or other. Thus, we suppose x_i to be independent of x_j .

motivations at time $t+1$. Indeed, Khan and Dhar (2006) define moral 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 behaviour".

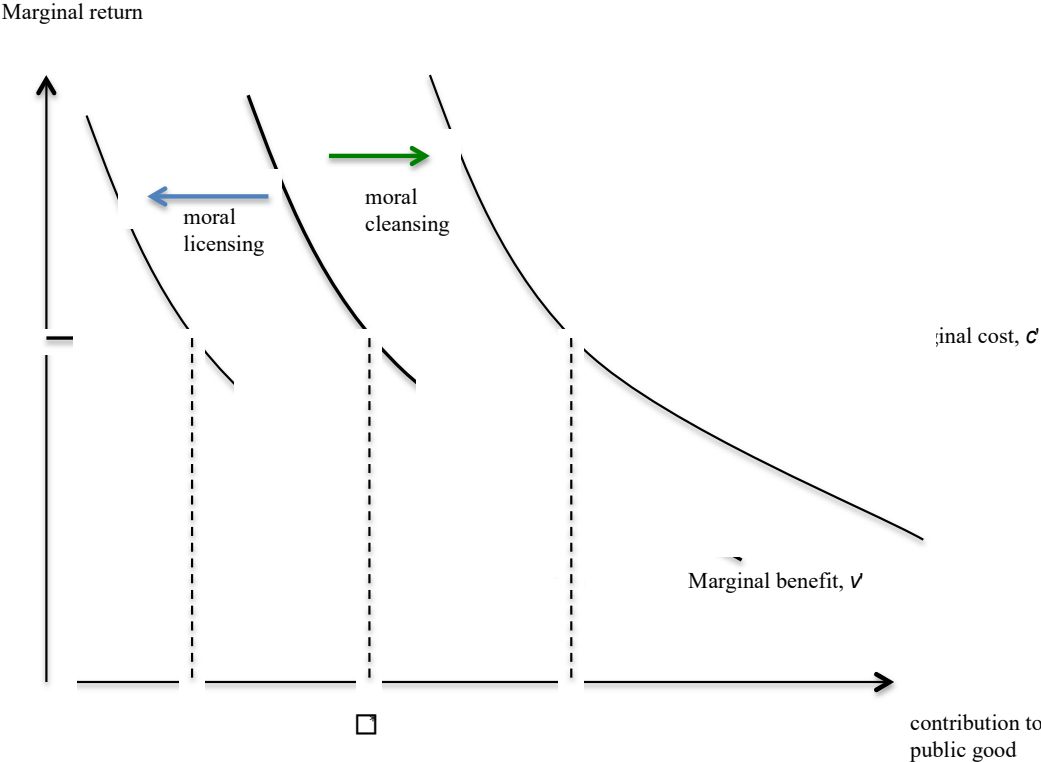
Under these assumptions, the optimal decision of individual i is determined as follows,

$$\frac{\partial \pi_{i,t}}{\partial c_{i,t}} = \frac{\partial \pi_{i,t}}{\partial c_{i,t-1}} \cdot \frac{\partial \pi_{i,t-1}}{\partial c_{i,t}} - \pi' = 0$$

$$\frac{\partial \pi_{i,t}}{\partial c_{i,t-1}} \cdot \frac{\partial \pi_{i,t-1}}{\partial c_{i,t}} = \pi' \cdot \frac{\partial \pi_{i,t-1}}{\partial c_{i,t}} = \pi'$$

Intrinsic motivations are dependent of previous pro-sociality and, thus moral self -esteem (Branas-Garza et al. 2013). We suppose that $\pi(\pi_{i,t} | \pi_{i,t-1})$ is decreasing with $\pi_{i,t-1}$. This means that intrinsic motivations of individual i are reduced at period t when he has contributed a large amount to the public project at period $t-1$. And inversely, intrinsic motivations are amplified at period t for small contributions at period $t-1$.

Figure 1. Moral compensation in public good provision



Under these assumptions, each individual self-regulates its pro-social behaviour in order to optimize his/her utility. We distinguish three possible patterns (represented graphically in Figure 1):

1/ Consistent behaviour, $\frac{u_{i,t} - u_{i,t-1}}{u_{i,t}} = 1$

2/ Moral licensing behaviour: $\frac{u_{i,t} - u_{i,t-1}}{u_{i,t}} > 1$

3/ Moral cleansing behaviour: $\frac{u_{i,t} - u_{i,t-1}}{u_{i,t}} < 1$

In our experiment, we study the existence of these three specific patterns when individuals have to make sequential pro-social decisions, and whether we observe heterogeneity in prosocial compensation.

3. Experimental design

Our experiment consists of a repeated modified dictator game. In the modified dictator game, the recipient is a previously chosen environmental non-governmental organization (ENGO). All subjects play the role of the dictator and have to decide the allocation of 10€ between themselves and the recipient (i.e. ENGO). This charity game has been implemented in Clot et al. (2016) to elicit pro-environmental behavior. In our experiment, the charity game is played twice, but the participant is only informed of the reiteration once the first round finished. In this set up, we exclude all anticipations of future pro-environmental behavior, when deciding to donate to an Environmental NGO. Any donation above zero implies intrinsic valuation of giving, and is interpreted as an adequate proxy for pro-environmental preferences.

We consider two symmetric variations of the charity game: the giving game and the taking game. In the giving game the participant is endowed with 10 euros and given the opportunity to donate any amount (integer between zero and ten) to the ENGO. In the taking game, the endowment of 10 euros is allocated to the ENGO, and the dictator is given the opportunity to take any amount (integer between zero and ten) from the ENGO.

The experiment consists of eight sessions (2 for each treatment, see Table 1) conducted at the Laboratoire d'Economie Expérimentale de Montpellier (LEEM) in Montpellier, France between January and March 2016. Twenty subjects were randomly distributed to each session

(with a session including only 16 participants), for a total of 156, invited via the ORSEE software. Most subjects (79%) were students, and 74% have already participated in an economic experiment. We ensured, however, that none had previously participated in an experiment with similar parameters. The sessions lasted less than an hour, including reading instructions and payment. Subjects earned an average of 13 euros².

Each session is composed of three parts. In the first part, participants chose the ENGO they want to be paired with, without benefiting from any information about the rest of the experiment. Four options corresponding to the most important and well-known environmental associations in France were given: World Wildlife Fund³ (WWF), la Fondation Nicolas Hulot⁴, Greenpeace⁵ and France Nature Environnement⁶. In the second part, participants play one of the variations of the charity game. Participants receive the instructions regarding the third part, only once the second part was ended. The third part consists also of one of the variations of the charity game. At the end of the experiment, only one part of the experiment (either the second or third part) is randomly chosen for payment. This design allows us to avoid the problem whether subjects are influenced by the endowment effect (Cubitt et al., 1998).

Table 1. Experimental treatments

	T1	T2	T3	T4
Part 1	Choice of ENGO	Choice of ENGO	Choice of ENGO	Choice of ENGO
Part 2	Giving Game	Giving Game	Taking Game	Taking Game
Part 3	Giving Game	Taking Game	Giving Game	Taking Game

Socio-economic and demographic variables are also collected at the end of the experiment. Moreover, in order to apprehend intrinsic motivations related to environmental behavior, participants filled in the 15-item questionnaire based on the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000). The NEP scale describes an individual's environmental concern based on the extent to which he agrees or disagrees with various statements on environmental

² The total donations to ENGOs in this experiment are 984€, with the following breakdown: 196€ for la Fondation Nicolas Hulot, 297€ for Greenpeace, 399€ for WWF and 92€ for France Nature Environnement.

³ <https://www.wwf.fr/>

⁴ <http://www.fondation-nature-homme.org/>

⁵ <https://www.greenpeace.fr/>

⁶ <https://www.fne.asso.fr/>

issues, which have been grouped under different categories¹, such as: reality of limits to growth (questions 1, 6, 11 - *lim_growth*), anti-anthropocentrism (2, 7,12 - *antianthropo*), fragility of nature's balance (3, 8, 13 - *frag_nat_bal*), rejection of the idea that humans are exempt from the constraints of nature (4, 9, 14 - *rej_exemptio*), and possibility of an ecocrisis (5, 10, 15 - *poss_ecocrisis*).

4. Results

We collected 156 observations. Participants' characteristics are provided in Table 2. The sample is well balanced across the 4 treatment groups.

Table 2. Sample descriptive data

	T1	T2	T3	T4	Total	Kruskal-Wallis test (p)
Number of observations	40	40	36	40	156	
<i>Gender (% of male)</i>	57.5	47.5	38.9	45	47	0.5596
<i>Age (average)</i>	23.88	25.38	24.64	26.85	25.19	0.3533
<i>Student (%)</i>	85	75	83	73	79	0.723

Data shows that, consistently with other findings (Eckel and Grossman (1996), Engel (2011)), participants give more in the charity game (where the recipient is a ENGO) than in standard Dictator game (where the recipient is an anonymous player)⁷.

Also, valence (i.e. whether charity game is framed as a giving or a taking game) does not significantly impact generosity (as in Gartner and Sandberg, 2017). We show that donations in the first round do not differ significantly ($t=-0.4247$, $p=0.67$) whether the game is framed as

¹ There is a broad consensus within the environmental psychology literature regarding the use of the NEP as a valid and reliable scale for measuring levels of ecological beliefs and behaviours (Cordano et al., 2003), as long as the 15-item version of the scale is used (Harcroft and Milfont, 2010).

⁷ We compare donations to the charity (giving game) in the first round with donations to anonymous recipients (standard dictator game) (Clot *et al.*, 2018). We observe that participants are more generous in dictator games when the recipient is a charity (3.7€) than when the recipient is an anonymous player (2.625€); (Two-sample t-test: $t=1.7035$; $p\text{-value}=0.0911$). Both experiments have been carried out in Montpellier, under similar conditions.

passive selfishness (giving game: M=3.93, SD=3.59) or active selfishness (taking game; M=3.7, SD=3.28).

Table 3. Average donations across treatments (in €)

	T1	T2	T3	T4	Total	Kruskal- Wallis test (p)
<hr/>						
<i>Average donation (€)</i>						
<hr/>						
<i>Average donation (€)</i>	3.88	3.53	3.78	4.08	3.81	0.9859
1st Round						
<hr/>						
<i>Average donation (€)</i>	2.93	4.23	3.36	3.1	3.40	0.2592
2nd Round						
<hr/>						
<i>P-Value</i>	0.1223	0.4913	0.4603	0.2896	0.1773	

In Table 3, we present dynamics of pro-environmental behaviour at the aggregate level.

At the aggregate level and without reaching statistical significance, donations decrease from round 1 to round 2, except for treatment 2 (Give/Take scenario) where donations increase.

The average donation in the second round in treatment 1 (Give/Give scenario) differs significantly from the average donation in treatment 2 (Give/Take scenario), i.e. 2.92€ vs 4.22€ (with $z=-1.776$, $pvalue=0.0757$). This result suggests that one may be less likely to be actively selfish (select a positive amount in the taking scenario) after having been passively selfish (select a null amount in the giving scenario). One possible interpretation comes from the cognitive dissonance theory, which suggests that taking after giving could be more difficult than taking after taking, because the two succeeding actions are either dissonant or consonant. If we consider only treatments for which we observe a decrease in donations (Treatments 1, 3 and 4), the average donation in round 2 is significantly lower than average donation in round 1 i.e. 3.12€ vs. 3.91€ (with $z=1.901$, $p-value=0.0573$).

One of the main issues of this research is to investigate on the dynamics of pro-environmental behaviour at the individual level.

Comparing donations in round 1 and 2 at the individual level, we find that **50% of the sample express consistent preferences** (see Table 4). Interestingly, this pattern is **robust for the 4 treatments**. The other half is spread across negative inconsistency (moral licensing) and positive inconsistency (moral cleansing).

Table 4. Dynamics of pro-environmental behaviour at the individual level

	T1	T2	T3	T4	Total	Kruskal-Wallis test (p)
<i>Consistency</i> (% of sample)	50	47.5	52.5	50	50	0.9405
<i>Licensing</i> (% of sample)	37.5	20	27.5	33.3	29.49	0.0867
<i>Cleansing</i> (% of sample)	12.5	32.5	20	16.7	20.51	0.0127

The **framing of the charity game does not impact moral consistency** (i.e. the percentage of participants exhibiting consistency is the same across the 4 treatments), but it does impact the type of inconsistency (licensing versus cleansing).

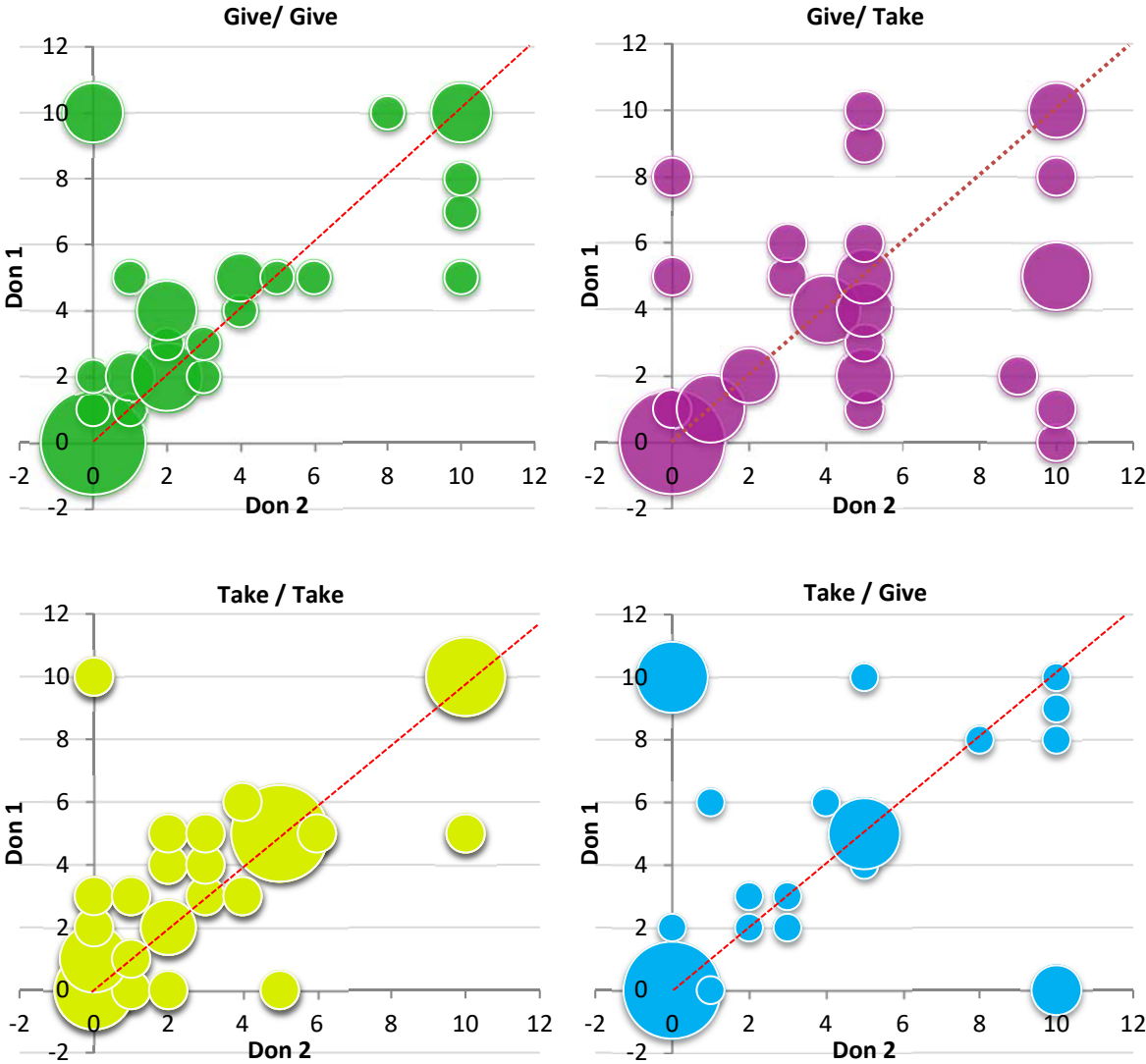
More individuals engage in moral licensing in the Give/Give scenario than in the Give/Take one (37.5% vs 20%; $z=2.438$, $p\text{-value}=0.0148$). In other words, framing the charity as a taking game, when following the giving game, may act as a moderator of the licensing effect. A possible explanation is that this specific combination (Give/Take) is more likely to be associated to cognitive dissonance, by combining two opposite actions. Moreover, cognitive dissonance can play differently according to the departure point, i.e. a giving frame or a taking frame. Participants might feel a higher “degree of commitment” when the game is framed as a taking game: "more commitment arouses more dissonance" (Ruiz and Tanaka, 2001).

Moreover, the degree of compensation is more pronounced in the case where the two charity games are framed in a opposite way (i.e Give/Take and Take/Give scenarios)..

Figure 1 illustrates this individual compensation in pro social behaviour. Circle’s size varies with the number of observations. The red line represents consistency: observations along this line represent individuals giving the same amount in round 1 and 2. Moral licensing is characterised by observations in the upper-left part of the graph, while moral cleansing is visible in the opposite side of the graph. For the give/give and the take/take scenarios

(treatments 1 and 4), the majority of the data is scattered along the consistency line, which is not the case for the two other treatments where the two charity games are framed in an opposite way.

Figure 1 – Scatter plot of individual donations in round 1 and round 2



Another interesting result of our research concerns the gender effect.

In line with existing literature on pro social behaviour (Eckel and Grossman, 1998; Engel, 2011⁸), we observe that women behave more pro-environmentally than men (see Table 5). All together, women give significantly more than men in the first round (4.3€ vs 3.27€) as well as in the second round (4.10€ vs 2.62€).

⁸ The meta-regression run in Engel study indicates a 0.212 coefficient for gender, significant at the 1% level.

Table 5. Average donations by gender (in €)

	Framing		P-value	Round		P-value
	Giving	Taking		1	2	
<i>Women</i>	4.10	4.29	0.8243	4.30	4.10	0.4305
<i>Men</i>	2.76	3.15	0.6558	3.27	2.62	0.2899
<i>P-Value</i>	0.0031	0.0316		0.016	0.0083	

Also, women give significantly more than men in the giving scenario (4.24€ vs 2.53€). For the taking scenario, the difference is not significant. Even if there is no statistical evidence, Table 5 also suggests that *men are sensitive to framing* (higher generosity in the Taking game), and, in total, license from round 1 to round 2. Also framing the charity in a negative way (i.e. Taking game) mitigates the gender difference in pro-environmental behaviour.

Table 6. Compensation of pro-environmental behaviour at the individual level

	Part of sample (in %)		P-value	Average compensation (in €)		P-value
	Men	Women		Men	Women	
<i>Consistent</i>	60.8	40.2	0.0003	0	0	-
<i>Licensing</i>	21.6	36.6	0.0019	5.31	3.3	0.0151
<i>Cleansing</i>	17.6	23.2	0.2217	-2.85	-4.37	0.0145

Looking in more detail at the compensation behaviour, we observe that *men are more consistent over time than women*. Women are more likely to license than men but *the degree of compensation is more important for men*. These results explain the fact that, in total, men license and contribute less in Round 2 than Round 1.

An econometric analysis corroborates earlier findings but also highlights determining factors of inconsistency in proenvironmental behaviour.

We first run a probit regression (see Table 7) on the probability to be consistent (keeping the same amount of donations between round 1 and round 2), while in a second model, we focus on the probability to license (decreasing donations between round 1 and round 2).

Table 7. Probit regression on the probability to be consistent (model 1) or adopt licensing (model2)

	(1)		(2)	
	Consistency		Licensing	
	Coeff.	SE	Coeff.	SE
Gender	0.439*	(-1.99)	-0.344	(-0.90)
Age	-0.0235	(-1.51)	-0.0456	(-1.67)
Donation (Round 1)	-0.116***	(-3.44)	0.227**	(-3.13)
Student	0.103	(-0.32)	-0.386	(-0.72)
Sport	0.429	(-1.81)	-0.788*	(-1.97)
Religion	0.0483	(-0.5)	0.321*	(-2.03)
Anti-anthropocentrism	0.347*	(-2.05)	-0.677*	(-2.01)
Fragility Natural Balance	-0.119	(-0.61)	0.667	(-1.86)
Unmixed treatment	0.0189	(-0.08)	1.080**	(-2.68)
Framing (Taking game – Round 1)	0.218	(-1.01)	0.0137	(-0.04)
Constant	-0.685	(-0.64)	-0.0316	(-0.02)
N	156		78	
<i>Log likelihood</i>	<i>-94.956719</i>		<i>-35.917741</i>	
<i>LR chi2(10)</i>	<i>26.35</i>		<i>33.77</i>	
<i>Prob > chi2</i>	<i>0.0033</i>		<i>0.0002</i>	

t statistics in parentheses - * p<0.05, ** p<0.01, *** p<0.001

The regression results support that men are more likely to be consistent. The probability to engage in moral licensing increases with the amount donated in the first round, and is amplified if the two charity games are framed in an opposite way. Interestingly, participants with higher attachment to religion and/or stronger anti-anthropocentrism⁹ value, are more likely to adopt licensing behaviour. If these results remain robust in additional investigation, they can serve as a relevant basis to discriminate among people.

The degree of inconsistency is analyzed with Tobit regressions for absolute difference in donation (see Table 8). We distinguish those who adopt moral licensing (higher donation in Round 1 than Round 2) and those who adopt moral cleansing (higher donation in Round 2 than Round 1).

⁹ This NEP indicator (Dunlap, 2000) aggregates the 3 following NEP items – ‘Humans have the right to modify the natural environment to suit their needs’; ‘Plants and animals have as much rights as humans to exist’ and ‘Humans were meant to rule over the rest of nature’.

Table 8 - Tobit model for absolute difference in donation between round 1 and round 2

	(1) All sample		(2) Cleansing		(3) Licensing	
Gender	0.434	(-0.83)	-2.380*	(-2.74)	1.893*	(-2.52)
License*Gender	1.645	(-1.79)				
License	3.285***	(-5.67)				
Cleansing*Gender	-2.082*	(-2.20)				
Cleansing	4.576***	(-7.17)				
Donation (Round 1)	0.177**	(-2.97)	-0.284	(-1.91)	0.947***	(-7.42)
Age	0.0557*	(-2.12)	0.172**	(-3.36)	-0.0182	(-0.33)
Student	1.787**	(-3.26)	3.229*	(-2.54)	1.356	(-1.49)
Sport	-0.799*	(-1.98)	-0.314	(-0.36)	-2.098**	(-2.80)
Religion	0.465**	(-2.91)	1.005**	(-2.89)	0.478	(-1.54)
Anti-anthropocentrism	-0.0371	(-0.13)	-2.686**	(-3.52)	0.0145	(-0.03)
Fragility Natural Balance	0.795*	(-2.49)	2.862***	(-3.84)	-0.0848	(-0.14)
Unmixed treatment	-0.880*	(-2.37)	-0.886	(-0.96)	-0.0735	(-0.10)
Constant	-6.823***	(-3.80)	-4.088	(-1.17)	-1.982	(-0.56)
Sigma	2.162***	(-16.31)	1.914***	(-7.3)	1.957***	(-8.02)
N	156		32		46	

t statistics in parentheses - * p<0.05, ** p<0.01, *** p<0.001

The Tobit regression results indicate that men compensate differently than women. In the moral licensing situation, men compensate to a higher extent (i.e. the difference in donations between Round 1 and 2 being more important), whereas in the moral cleansing situation men compensate to a lower extent.

Moreover compensation behaviour is also influenced by other (socio-economic) factors. For example, the higher the level of donations in round 1 the higher the compensation in the licensing group. On the one hand, sporty participants, who engage in licensing behaviour, compensate in a lesser manner than other participants. On the other hand, the degree of cleansing is reinforced for older people, students, and participants that attach value to religion. Anti-anthropocentrism and Fragile Natural Balance¹⁰, the two aggregates coming from NEP scale measures go in opposite directions. The NEP aggregate ‘Fragile Natural Balance’ impacts positively the compensation amount in the moral cleansing case. Individuals scoring

¹⁰ This NEP indicator (Dunlap, 2000) aggregates the 3 following NEP items – ‘When humans interfere with nature, it often produces disastrous consequences’ ; ‘The balance of nature is strong enough to cope with the impacts of modern industrial development’; ‘The balance of nature is very delicate and easily upset’.

high with this aggregate increased significantly their donations between round 1 and round 2. Oppositely, individuals scoring high with the NEP aggregate ‘Anti-anthropocentrism’ decreased significantly their donations between round 1 and round 2. Altogether, these NEP indicators differ in the way humans and nature relation is perceived, which could in turn translate into a different mechanism of moral compensation. However, interpretation at this stage remains very speculative and more research would be needed to explore the underlying mechanism.

5. Policy implications

Rather than just examining moral licensing and cleansing at a group level, we investigated experimentally the moral dynamics at an individual level and suggested the relative proportions of consistent and inconsistent participants in an experimental sample. We proposed a formal definition of moral consistency and inconsistency (i.e., moral licensing and moral cleansing). Our findings suggest that aggregate results can occult heterogeneity at the individual level. We find evidence of consistent pro-environmental behaviour for half of our sample (robust across the 4 treatments), which suggests that the other half does not behave in a consistent way and deserves further consideration. Furthermore, we highlight a gender effect: men, being globally less pro-environmentally orientated than women, behave more often in a more consistent way. However, when men behave inconsistently, they compensate in a different way as women: in the case of licensing, they compensate far more than women, and inversely, in the case of cleansing, they compensate far less. Overall, this leads to a lower global donation in Round 2 compared to the global donation level in Round 1 for men.

Investigating this heterogeneity can inform policy makers to design policies adapted to each subgroup rather than adopting a one-size-fits-all approach. For instance, it can make sense for some individuals to remind them of their previous actions whereas for others it can be more

effective to avoid such a reminder. At the same time, tailored policies can raise discrimination issues.

Our results constitute a first stepping stone. Further research is needed to test the robustness of our results expanding our analysis to other various settings such as using other games, other samples, different behaviours and other countries. Are some domains (e.g., health versus environment) more subject to moral consistency than others? Does cross-contamination across domains constitute an issue, which can make the investigation much more complicated? Moreover, a natural issue concerns whether entities like companies, cities, associations exhibit the same kind of (in)consistent behaviours, which can ultimately decrease or increase the expected consequences of policy interventions.

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