Take the good with the bad, and the bad with the good? An experiment on pro-environmental compensatory behaviour

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Abstract: To what extent are people subject to moral licensing? Rather than just examining moral licensing and cleansing at an aggregate level, we investigate experimentally the moral dynamics at a disaggregated level. Using a combination of two symmetric games (i.e. Giving and Taking games), we found that aggregate results occult heterogeneity that can be used to improve policy performance. Overall, half of the participants adopts compensatory behaviour. Compensatory behaviour is not necessarily directly related to the first decision, but is mainly explained by individuals' characteristics as well as the framing of the games. Men are, in general, more consistent than women, however when they adopt licensing, the extent of compensation is far more important than for women. Highly environmentally concerned individuals are more generous than less environmentally concerned individuals, and also compensate more frequently. The framing of the donation game impacts first donations, and moreover impacts the type of inconsistency people might adopt. We suggest that policymakers can improve policy performances by avoiding a 'one-size-fits-all management' and tailoring their approaches according to this heterogeneity of moral dynamics.

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

JEL codes: C91, D03.

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1. Introduction

Traditionally, moral behaviour 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, anecdotal evidence (e.g., Woodyard, 2009) as well as an increasing literature supports that significant portions of people at the aggregate level exhibit moral inconsistency, implying that their moral behaviour and social preferences are influenced by (recent) past behaviour (e.g., Khan and Dhar, 2006; Mazar and Zhong, 2010; Clot et al., 2016; Polman and Lu, 2022; see Blanken et al., 2015 for a meta study and Mullen and Monin, 2016 for a comprehensive review). Indeed, individuals may not behave consistently over time when decisions are not morally neutral, and "every deviation from the normal behaviour is subsequently balanced with either a more moral or less moral action" (Branas-Garza et al. 2013). Gneezy et al. (2014) argue that people impose themselves moral constraints and adopt compensatory behaviour to account for past violations of an internalized norm (i.e. conscience accounting) and thus lead either to moral licensing (performing a bad deed after a good one) or moral cleansing (performing a good deed after a bad one).

The meta-analysis on moral licensing by Blanken et al. (2015) showed a small to medium effect size, certainly over-estimated through a publication bias. Moral licensing is observed in various pro-environmental behaviours, such as recycling (Catlin and Wang, 2013; Truelove et al., 2016; Ma et al., 2019), purchasing environmentally friendly products (Mazar and Zhong, 2010; Meijers et al., 2015; Garvey and Bolton, 2017), donating to environmental associations (Meijers et al., 2015; Stikvoort et al., 2016; Clot et al., 2018), or recalling past pro-environmental actions (Gholamzadehmir et al., 2019; Lalot et al., 2022). We observe a lower number of studies on the moral cleansing effect, which show rather mixed evidence. For instance, Gholamzadehmir et al. (2019) and Stikvoort et al. (2016) find that failing to behave pro-environmentally generates cognitive dissonance, which, in turn, increases consequent pro-environmental behaviours, whereas Fanghella & Thøgersen (2022) and Ho et al. (2016) did not find evidence for a moral cleansing effect.

Rather than just examining whether people are morally consistent or inconsistent at the aggregate level (Brañas-Garza et al., 2013), we believe that a measure of the moral licensing or cleansing at the individual level is valuable, and could address important issues. Is the moderate

moral licensing effect, and the weak or non-existing moral cleansing effect a result of heterogeneous compensatory behaviour? Are some individuals more prone to engage in compensatory behaviour after moral or less moral actions? We design a simple and easily replicable lab experiment to complement earlier works, mostly based on *ad hoc* research. While we believe in the relevance of the context in this topic, our primary aim is to better understand the individual dynamics of compensatory behaviour. Indeed, our experimental design allows to track individual decisions over time and to detect which individuals adopt a compensatory approach. The puzzle of replication, or why some studies have found the effect and others not, may be partly due to unobserved individual patterns (Rotella and Barclay, 2020; Urban, Braun Kohlova, and Bahník, 2021). A better understanding of compensatory behaviour at the individual level could also help to refine and enhance policy effectiveness, notably by solving some puzzling behavioural results (e.g., backfiring policies) and tailoring policy design to each relevant subgroup in terms of moral dynamics.

In this paper, we use well-crafted combinations of two symmetric games (i.e. dictator and taking games) with an environmental non-governmental organization as the beneficiary to investigate the individual moral profiles of participants. 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 (Cubitt et al, 1998). 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 presents the hypotheses that are tested in our experiment. The experimental design is described in section 3. Section 4 provides the main results and discusses them. Section 5 suggests some policy implications and concludes.

2. Hypotheses development

Our contribution adopts an exploratory stance. In what follows, we propose some tentative hypotheses that will be tested thanks to our experimental design. First, we contend that moral compensation observed at an aggregate level (e.g., Khand and Dhar, 2006; Sachdeva et al., 2009 for experiments implying donation decisions) could occult substantial variations at the individual level. Indeed, aggregate data can hide substantial variations at the individual level that cancel each other, when data are examined in an aggregated form. Consequently, we formulate the following hypothesis:

Hypothesis 1: Moral compensation behaviour is more likely to occur at the individual level than the global level.

Intrinsic motivations are dependent of previous pro-sociality and, thus moral self-esteem (Branas-Garza et al. 2013). Branas-Garza et al. (2013) show that "self-regulation is not a long memory process, since only the previous period matters". We expect that the act of donating will boost the moral self, or inversely the act of donating less than a given norm will provoke guilt feelings (Gholamzadehmir, Sparks, & Farsides, 2019; Stikvoort, Lindahl, & Daw, 2016). For sake of convenience, we define high(low) donators as those who give more (less) than the average donation.

Hypothesis 2: High donators in round 1 will be more prone to license (by giving less in round 2), and inversely, low donators in round 1 will be more prone to cleanse (by giving more in round 2).

Framing will also impact moral compensation behaviour. Indeed, valence affects the willingness to donate and causes different feelings (Zhang and Ortmann, 2012). Given than taking from someone is generally considered as more painful than giving to the same individual (Korenok et al., 2014) even if the objective outcome remains fixed, we hypothesize that people will be more generous in the Taking Game compared to the Giving Game.

Hypothesis 3: People are expected to be more generous in the Taking Game. The Taking Game, when played second, will also tend to reduce moral licensing.

Highly environmentally concerned individuals are more connected to the environmental cause and therefore expected be higher donators in round 1. Moreover, as acting inconsistently triggers cognitive dissonance, especially when the behaviours are perceived as connected to the same super-ordinate goal (Thøgersen, 2004), donations by highly environmentally concerned

individuals are less likely to fall.

Hypothesis 4: Highly environmentally concerned individuals donate more to ENGOs and are more consistent over time than lowly environmentally concerned individuals

As commonly accepted in the literature, we expect women to behave more pro-socially (Eckel and Grossman, 1998; Engel, 2011) and pro-environmentally than men (Brough et al., 2016; Mohai, 1997). As we expect men to be less generous, we also expect that their intrinsic motivations will be less altered over time.

Hypothesis 5: Men donate less than women but are more consistent over time.

3. Experimental design

Our experimental protocol was designed to test the preceding hypotheses, and consists of a repeated modified dictator game. In all the versions of the dictator game, the recipient is a previously chosen environmental non-governmental organization (ENGO). All subjects play the role of dictators 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 behaviour. 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 behaviour, 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. Twenty subjects were randomly assigned to each session (with a session including only 16 participants), for a total of 156 participants, 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, knowing that the net minimum hourly wage in France is about €8.

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 NGOs in France were given: *World Wildlife Fund* (WWF)[1], *Fondation Nicolas Hulot*[2], *Greenpeace*[3] and *France Nature Environnement*[4]. 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. Participants are told that at the end of the experiment, only one part of the experiment (either the second or third part) will be randomly chosen for payment. This design allows us to avoid the endowment effect problem (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	Taking Game	Giving 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 behaviour, 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 s/he agrees or disagrees with various statements on environmental issues on a 5 point Likert scale. We will consider a dummy for highly environmentally concerned individuals. We suppose that highly environmentally concerned individuals, on average, agree or strongly agree on all 15 statements, i.e. have an average NEP above 4.

[1] https://www.worldwildlife.org
[2] https://www.fnh.org
[3] https://www.greenpeace.fr
[4] https://fne.asso.fr

4. Results

We collected 296 observations[5]. Participants' characteristics are provided in Table 2 for both gender and their concern for environmental issues. The sample is rather well-balanced across the 4 treatment groups.

Table 2. Sample descriptive data

	T1	T2	T3	T4	Total	Kruskal-Wallis test (p)
Number of observations	77	74	69	76	296	
Gender (% of male)	53.25	48.65	39.13	36.84	44.59	0.1393
NEP high (% >=4)	29.87	33.78	30.43	34.21	32.09	0.9159

In Table 3, we present dynamics of pro-environmental behaviour at the aggregate level. 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 the standard Dictator game (where the recipient is an anonymous player)[i].

Table 3. Average donations across treatments (in €), with (s.e), N=296

	T1 (GG)	T2 (GT)	T3 (TT)	T4 (TG)	Total	Kruskal-Wallis test (p)
Average donation (€)	2.74 (2.84)	3.55 (2.95)	3.77 (3.17)	3.19 (2.79)	3.3 (2.95)	0.1259
Average donation (€) Round 1	3.09 (3.19)	3.08 (3.01)	4.03 (3.47)	3.6 (3.57)	3.44 (3.32)	0.3511
Average donation (€) Round 2	2.39 (2.99)	4.01 (3.62)	3. 51 (3.58)	2.76 (3.24)	3.15 (3.4)	0.0261
P-Value equal donations Rounds 1 and 2	0.0139	0.0117	0.1659	0.0607	0.1247	

In order to test our first hypothesis, we compare average donations of the entire sample at the first round with average donations of the entire sample at the second round. We don't find a significant licensing effect (-0.29, p-value=0.1247). However, looking more specifically at moral dynamics within the four treatments, we observe a significant licensing effect in T1, where participants play the Giving Game twice (-0.7, p-value=0.0139), and in T4, where participants play a Taking Game in the 1st round and a Giving Game in the 2nd round (-0036, p-value=0.0607). A significant moral cleansing behaviour is observed in the case where participants play a Taking game after the Giving game (+0.93, p-value=0.0117).

[5] Data is available in the following repository:

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 rounds 1 and 2 at the individual level, we find that around 50% of the sample express consistent preferences (see Table 4). Interestingly, this pattern is robust for the 4 treatments (i.e. the proportion of individuals who are consistent are similar for the 4 treatments). The other half is spread across negative inconsistency (moral licensing) and positive inconsistency (moral cleansing). Licensing occurs for about one third of the sample in T1, T3 and T4, while cleansing represents 12.99%, 17.39% and 13.16% respectively. What happens in T2 stands as an exception (except for the proportion of consistent behaviour) with less licensing (14.86%) than cleansing (35.14%). If we consider only treatments for which we observe a licensing effect, i.e. 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).

While T3 shows no significant moral licensing (Table 3), 31.88% of the T3 sample exhibit a moral licensing behaviour. These individuals gave on average €4.72 in the first round versus €1.36 in the second round. The 17.39% belonging to the cleansing group increase their donation from an average of €2.08 in round 1 to €5.25 in round 2. The relatively higher portion of cleansing behaviour in this treatment resulted in a less perceptible moral licensing effect at the agregate level although it still concerns a significant proportion of participants.

Table 4. Dynamics of pro-environmental behaviour at the individual level (N=296)

	T1 (GG)	T2 (GT)	T3 (TT)	T4 (TG)	Total	Kruskal-Wallis test (p)
Consistency (% of sample)	55.84	50	50.72	55.26	53.04	0.8461
Licensing (% of sample)	31.17	14.86	31.88	31.58	27.36	0.0517
Cleansing (% of sample)	12.99	35.14	17.39	13.16	19.60	0.0013

Result 1: An analysis of compensatory behaviour at the aggregate level hides substantial variations at the individual level. We observe significant compensatory behaviour in 3 over 4 treatments. Moral licensing takes place in 3 treatments (T1, T3 and T4), although not significant in T3. T2 leads to moral cleansing. About half of the sample exhibit compensatory behaviour, in each treatment.

Table 5. Probit model on Dynamic Behaviour Category with Donation in Round 1 as a continuous endogenous regressor

	(1) Consistent		(2) Licensing		(3) Cleansing	
Donation (Round 1)	0.0772	(0.41)	0.319***	(4.37)	-0.284***	(-5.03)
Unmixed games	-0.0308	(-0.20)	0.181	(0.90)	-0.0792	(-0.45)
Framing (Taking game Round 2)	-0.127	(-0.89)	-0.298*	(-1.71)	0.320	(1.61)
Genre	0.416***	(2.78)	-0.137	(-0.57)	-0.291*	(-1.94)
NEP ≥ 4	-0.417*	(-1.90)	-0.217	(-0.83)	0.454***	(2.88)
Constant	-0.168	(-0.27)	-1.447***	(-8.42)	0.317	(0.65)
Corr.Coeff (don1)	-0.550	(-0.79)	-0.803	(-1.12)	1.145*	(1.70)
Observations	296		296		296	

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In table 5, we examine the probability to be consistent (i.e. keeping the same amount of donations between round 1 and round 2), to license (i.e. donating less in round 2 than round 1) and to cleanse (i.e. donating more in round 2 than round 1) using the instrumental variables probit model with donations in round 1 to be endogenous (Amemiya, 1978). Results show that women as well as individuals with high environmental concerns are more likely to be inconsistent. The probability of engaging in inconsistent behaviour (both licensing and cleansing) depends on the donation level in round 1. More precisely, the more (less) individuals give in round 1 the more likely they are to decrease (increase) their donation in round 2, in line with H2. As an illustration, 87.5% of the individuals belonging to the moral licensing category in treatment 1 gave more than the average of the consistent group in round 1.

Result 2: The higher (resp. lower) donations in round 1, the more participants are likely to decrease (resp. increase) their donation in round 2.

Interestingly, when looking at the role of framing, we observe that the average donation in the second round differs significantly from treatment 1 (Give/Give scenario) compared to treatment 2 (Give/Take scenario), i.e. €2.39 vs €4.01 (with z=-2.744, p-value=0.0061[6]). 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).

[6] Kruskal-Wallis tests are used to test statistical significance all throughout the manuscript.

Overall, when the game is framed as a Taking game, donations in round 1 are higher than when the game is framed as a Giving game (€3.81 vs €3.08; z=2.291, p-value=0.13). The same pattern occurs in round 2 (€3.76 vs €2.57, z=7.932, p-value=0.0039)

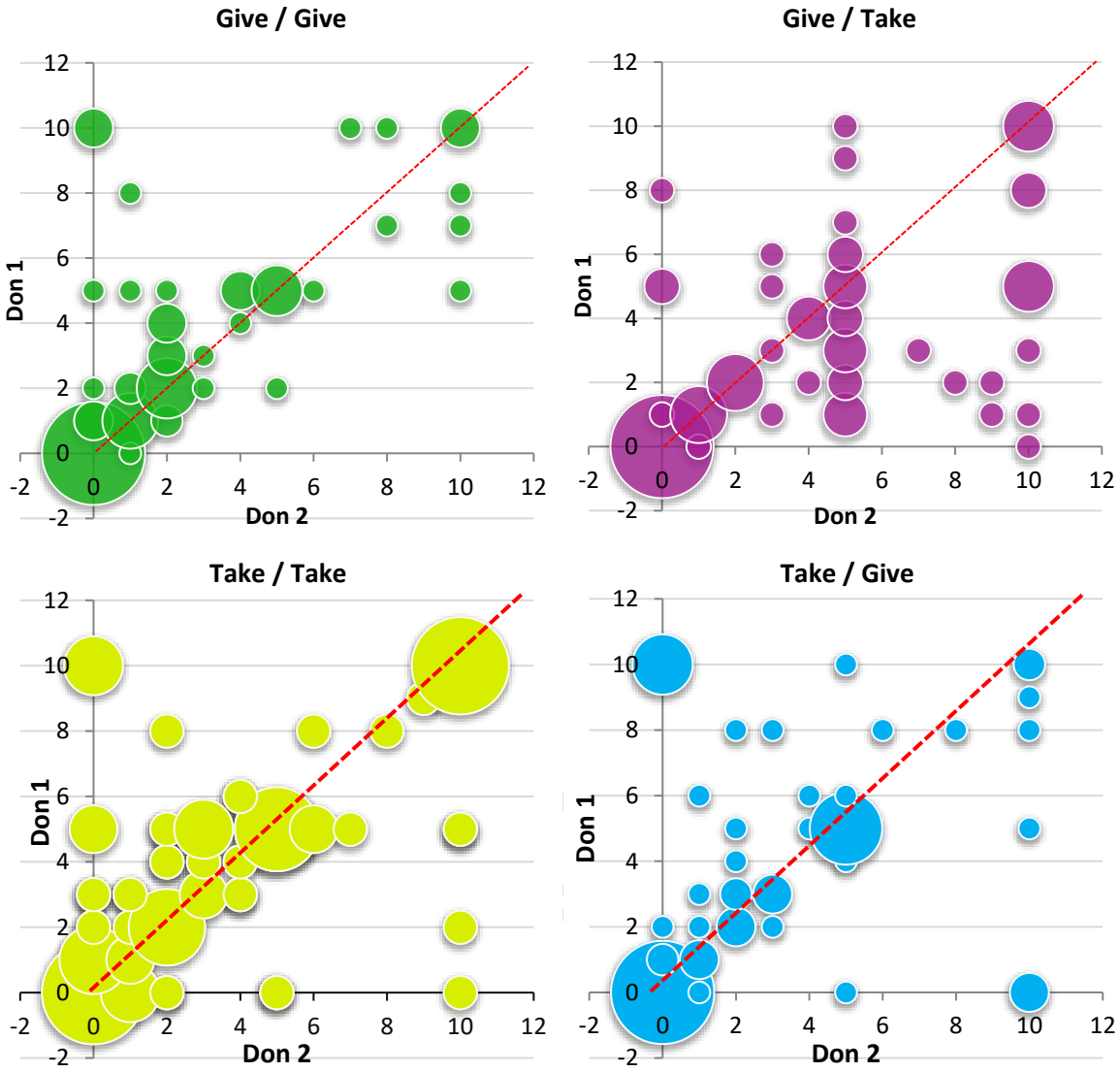
To further validate H3, we observe that licensing behaviour is less likely when the Taking game is played after a Giving game (see table 4).

Moreover, it seems that being actively selfish is more difficult for participants after a Giving game than a Taking game, i.e. 4.01€ vs 3.51€ (z=0.826, p-value=0.4087). A similar tendency is observed for the Giving game in round 2: being passively selfish is more difficult for participants after a Taking game than a Giving game, i.e. 2.76€ vs 2.39€ (t=-0.74, p-value=0.4596). So cognitive dissonance seems to appear when the two succeeding actions are differently framed and subsequently impacts pro-environmental behaviour (Festinger, 1957).

Result 3: The framing of the Charity game does not impact the proportion of individuals exhibiting moral consistency, but it does impact the type of inconsistency (licensing versus cleansing).

Figure 1 illustrates this individual compensation in pro-environmental behaviour. The circle's size varies with the number of observations. The red line represents consistency: obervations 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 3), 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. It also highlights a greater level of moral cleansing in the Give/Take scenario, contrasting with the Take/Give scenario, showing a greater level of moral licensing.

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



Another interesting result of our research relates to the impact of environmental concern (see Table 6a) as well as the gender effect (see Table 6b) on the donated amount.

Table 6 a). Average donations by environmental concerns (in €) with Kruskal-Wallis test

	Framing (Round 1)			Round		
	Giving	Taking	P-value	1	2	P-value
NEP<4 (n=201)	2.69	3.23	0.37	2.96	2.84	0.54
NEP>=4 (n=95)	3.94	5.02	0.18	4.47	3.82	0.12
P-Value	0.0248	0.0054		0.0003	0.0469	

Table 6 b). Average donations by gender (in €) with Kruskal-Wallis test

	Framing (Round 1)			Round		
	Giving	Taking	P-value	1	2	P-value
Women (n=164)	3.82	3.83	0.87	3.83	3.65	0.50
Men (n=132)	2.38	3.78	0.105	2.96	2.54	0.102
P-Value	0.0012	0.60		0.0043	0.0037	

Table 7. Pro-environmental compensatory behaviour at the individual level, according to gender and environmental concerns with Kruskal-Wallis test

	Part of sample (in %)			Part of sample (in %)		
	Men	Women	P-value	NEP < 4	NEP>=4	P-value
Consistent	63.6	44.5	0.0011	58.7	41.1	0.0046
Licensing	20.4	32.9	0.0169	23.4	35.8	0.0257
Cleansing	15.9	22.6	0.1525	17.9	23.2	0.2891

In line with H4, we find that individuals with higher environmental concerns give more to the ENGO than individuals with lesser concerns regardless of the type of framing (i.e. Giving or Taking game) or the sequence (round 1 or 2) of the game (see Table 6a). It should also be noted that women have higher concerns towards the environment than men, with 42.1% of women showing high environmental concerns (NEP>4) vs 19.7% for men, significant at the 1% level. Interestingly, we observe that a higher (respectively lower) proportion of participants with low environmental concerns (NEP<4) behave consistently (respectively license) than participants with a high environmental concerns (NEP>4) which is in contradiction to our hypothesis 4.

Result 4: Highly environmentally concerned participants are more likely to adopt compensatory behaviour than less environmentally concerned participants.

In line with existing literature on pro-social behaviour (Eckel and Grossman, 1998; Engel, 2011), we observe that women behave more pro-environmentally than men (see Table 6b). Altogether, women give significantly more than men in the first round (3.83€ vs 2.96€) as well as in the second round (3.65€ vs 2.54€). Also, women give significantly more than men in the giving scenario (3.82€ vs 2.38€). For the taking scenario, average donations are very similar for women and men (3.83€ vs 3.78€). This highlights that men are sensitive to framing, and become more generous when the game is framed as a Taking game. So, framing the Charity game in a negative way (i.e. Taking game) mitigates the gender difference in pro-environmental behaviour.

Regarding the compensatory behaviour according to gender, on average, men have a tendency to licence, and the decrease in their donation between round 1 and 2 is nearly significant (-0.42, p-value=0.102). However, the proportion of participants who adopt consistent behaviour is significantlty higher for men than for women (+19.1%, p-value=0.0011). These results suggest that the intensity of the licensing effet is more pronounced for men compared to women (which is confirmed later on in Table 10). We also observe that licensing is more frequent for women than for men (+12.5%, p-value=0.0169). Therefore, we only partly confirm H5.

Result 5: There are significant gender effects. Women are more pro-environmental (as measured by the amount devoted to the ENGO) and men are more prone to framing effects, as well as licensing. Nevertheless, consistent (resp. licensing) behaviour is more (resp. less) frequently observed for men than women.

An econometric analysis corroborates earlier findings but also highlights determining factors of inconsistency in proenvironmental behaviour. We first run a linear regression (see Table 8) on motivation to donate in round 1. The regression results support the determining role played by environmental concerns in explaining donation levels in Round 1. Framing appears also to have a significant impact on donations in round 1 (increase of €0.658 with significance at the 10% level), which supports H3 that donations in a Taking game are higher than in a Giving game. Surprisingly, in the global analysis considering environmental concerns and framing, gender is not an explanatory factor of donations in round 1.

Table 8. Linear regression on motivations to donate in round 1

	Donation to ENGO	
	Coeff.	SE
Gender	-0.468	(0.39)
NEP >=4	1.395***	(0.41)
Framing (Taking game – Round 1)	0.658*	(0.38)
Constant	2.881***	(0.37)
N	296	
F(3,292)	*6.43*	
R^2	*0.069*	
Prob > chi2	*0.0003*	

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

Table 8 also shows that the probability to cleanse is lower for men than women (which is in line with H5), and, that highly environmentally concerned individuals are more inclined to cleanse than less environmentally concerned individuals.

In table 9, we present the results of the Cragg Hurdle model (Cragg, 1971), which takes into account bounded values. This allows us to distinguish determinants for explaining the probability to be inconsistent, from determinants explaining the magnitude of the inconsistency.

Table 9. Cragg Hurdle regression

	(1) Model 1		(2) Model 2		(3) Model 3	
Magnitude of inconsistency						
Framing (TG-Round 1)	3.066	(1.38)	2.585	(1.28)	2.585	(1.28)
Framing (TG-Round 2)	0.818	(0.41)	0.972	(0.51)	0.972	(0.51)
Unmixed games	-4.924*	(-1.96)	-4.842**	(-2.09)	-4.842**	(-2.09)
Gender	2.021	(0.94)				
NEP high(≥ 4)	4.212*	(1.80)				
License=1			-4.274	(-1.31)		
Genre=1			-3.108	(-0.94)	4.708*	(1.75)
NEP high(≥ 4)			1.198	(0.41)	5.202*	(1.90)
License=1 $\times$ Genre=1			7.815*	(1.74)		
License=1 $\times$ NEP high(≥ 4)			4.004	(1.03)		
Cleansing=1					4.274	(1.31)
Cleansing=1 $\times$ Genre=1					-7.815*	(-1.74)
Cleansing=1 $\times$ NEP high(≥ 4)					-4.004	(-1.03)
Constant	-5.554	(-1.08)	-1.769	(-0.44)	-6.043	(-1.22)
Probability to be inconsistent						
Framing (TG-Round 1)	-0.0579	(-0.39)	-0.0579	(-0.39)	-0.0579	(-0.39)
Framing (TG-Round 2)	0.128	(0.86)	0.128	(0.86)	0.128	(0.86)
Unmixed games	0.00716	(0.05)	0.00716	(0.05)	0.00716	(0.05)
Gender	-0.421***	(-2.72)	-0.421***	(-2.72)	-0.421***	(-2.72)
NEP high(≥ 4)	0.347**	(2.14)	0.347**	(2.14)	0.347**	(2.14)
Constant	-0.0403	(-0.22)	-0.0403	(-0.22)	-0.0403	(-0.22)
Constant	1.750***	(8.16)	1.697***	(8.52)	1.697***	(8.52)
Observations	296		296		296	

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This model explaining the probability to be inconsistent confirms the determining role of gender and environmental concerns in engaging in compensatory behaviour. Men are more consistent than women, and participants with high environmental concerns compensate more. We can highlight the following results concerning the magnitude of inconsistency. First, the magnitude of inconsistent behaviour is reduced if the dictator games in both rounds are identically framed. Second, individuals with high environmental concerns (NEP score above 4) compensate more but also compensate in a higher extent than individuals with lower concerns for environmental issues. This result is in opposition to H4 but could be explained by H2 (i.e. highly environmentally concerned participants are high donators in the first round). Third, we observe that men license (cleanse) to a higher (lesser) extent than women. Thus, despite the fact

that men are more consistent than women, the average amount of donations for men remains lower than for women for both rounds (see Table 6b). These results are consistent with H5.

5. Policy implications and conclusion

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 distinguish two types of inconsistent behaviour: licensing and cleansing behaviour. Globally, our findings suggest that aggregate results occult heterogeneity at the individual level. We find convincing 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 differently from women: in the case of licensing, they compensate in a higher extent 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. We also find that highly environmentally concerned individuals are higher donators but also less consistent over time than individuals with lower concerns for environmental issues. Framing of the donation game impacts donations, and the type of inconsistency people might adopt.

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 and ethical 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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[i] 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 (3.3€) than when the recipient is an anonymous player (2.625€); (Two-sample t-test: t=1.7035; p-value=0.0911). Both experiments have been carried out in Montpellier, under similar conditions.

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