

# **Gender differences in Socially Responsible Consumption.**

## **An Experimental Investigation**

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### **Abstract\***

We report on a simple experimental study designed to investigate the different gender attitudes towards socially responsible consumption. We use the Vote-with-the-Wallet Game, (VWG), a version of a repeated multiplayer prisoner's dilemma that mimics the characteristics of the choice between a conventional and a socially responsible product. More precisely we test the effect of three factors: two different frames and an ex-post redistribution mechanism that transfers resources from purely self-interested consumers to responsible ones. We find that women remain significantly more cooperative (choosing more often the responsible good) when the redistribution mechanism is interrupted and are significantly less satisfied about the behaviour of the other players in that treatment.

**Keywords:** Responsible Consumption, Gender Differences, Social Preferences, Lab Experiment.

**JEL Classification:** C92, C72, D03.

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## 1. Introduction

Consumer research has established that women and men tend to have different consumption patterns (Costa 1994; Horowitz and Mohun, 1998; Grover et al., 1999; Warde, 1997). In the OECD countries, for instance, women make more than 80 percent of household purchasing decisions and are more likely to buy basic goods (such as food, clothing and household items). Men, on the other hand, spend more than 80 percent of the household income and are more likely to buy more expensive goods (houses, cars, electronics, etc.) (OECD, 2008). Together with income, age and household size, gender is a key factor in determining consumer choices.

In this paper we consider a further element that may produce gender differences in consumption styles, that is, the sensitivity to social and/or environmental issues, and, as a consequence, a higher or lower willingness to pay more for socially and/or environmentally responsible good.

We study this phenomenon with a lab experiment by means of the “Vote-with-the-Wallet Game” (VWG) (Becchetti and Sallustri, 2015). As we will explain below in detail our experiment is similar to an (all-or-nothing) Voluntary Contribution Mechanism, even though with some distinctive characteristics. Moreover, the parametric intervals considered in our design are such that our game is a multi-person “hybrid contribution-prisoners’ dilemma” (Arce and Sandler, 2005) that stylizes the increasingly frequent situation in which consumers face the choice between a socially responsible product and an alternative more conventional one. What typically defines this case is a trade-off: the first product generally costs more (i.e. fair trade products are generally sold at premium due to the extra costs incurred by producers that incorporate the additional responsible characteristics in their productive process) but consumers (when adequately informed) know that, by “voting with the wallet” for it, they may contribute to a public good (generated by the same characteristics of the product plus a demand-driven stimulus on a more socially and/or environmentally responsible corporate stance) in proportion to the market share of consumers that make the same choice.

We as well investigate in the experiment the effect of a redistribution mechanism studied by Becchetti, Pelligra and Salustri (2015). This mechanism mimics a policy intervention intended to subsidize the responsible choice as it takes away part of the gains from the “defectors” (buyers of the conventional product) and gives them to the “cooperators” (buyers of the responsible products). We introduce this treatment in the experiment because these kinds of policies are becoming more and more relevant as instruments to foster socially and environmentally consumption patterns. They have been recently introduced in around 63 countries under the form of environmental feed-in tariffs (redistributing away from consumers using conventional energy sources to consumers installing solar panels) but can be applied in similar ways to other fields (Couture and Gagnon, 2010). Becchetti et

al. (2015) find that such a policy significantly increases the share of cooperative choices in equilibrium.

The questions that we tackle in this paper, whether gender differences matter in the VWG and for the redistribution policy, are therefore of foremost importance. They, in fact, may provide an answer on whether women or men have different preferences for the responsible consumption (in absolute or conditionally to the different contexts of the experiment) and/or which of the two sexes is more potentially reactive to campaigns or policies in favour of social and environmental sustainability.

This paper also contributes to the large experimental literature that has, in these years, gathered robust evidence about gender differences mainly in three areas of investigation: attitude towards risk, response to incentives and competition and, finally, other-regarding behaviour. We know now that women tend to be more risk-averse and less sensitive to material incentives and to a competitive environment. With regard to social preferences we cannot in general affirm that men and women are different in term of generosity or cooperativeness. Evidence on this point is, in fact, mixed. What can be said with a good degree of confidence is that women's social preferences are more malleable than men's, namely, that women's behaviour shows a higher sensitivity to the contextual conditions of the experiment (see Croson and Gneezy, 2009, for a comprehensive survey).

The social preference literature studies when and how people's choices are affected by other individuals' well-being. Most experiments in this area consider participants' behaviour in simple economic games such as the dictator game, the ultimatum game, the trust game and the prisoner's dilemma. In experiments with the dictator game, for instance, women tend to give more than men (Eckel and Grossman, 1998); however, when the same game is used in a less anonymous design, as in Bolton and Katok (1995) this difference disappears. Summarising findings from dictator games, Croson and Gneezy (2009) conclude that men are more concerned with efficient allocations while women are more averse to inequality.

Results from trust game experiments are inconclusive as they show either no difference between trusting behaviour of men and women and find conflicting results for trustworthy and reciprocal behaviour (Croson and Buchan 1999; Cox and Deck 2006; Bohnet 2007 among others), or that woman trust less (Eckel and Wilson 2004; Chaudhuri and Gangadharan 2007; Garbarino and Slonim 2009). At the same, Cox and Deck (2006), Eckel and Wilson (2004), Bohnet (2007) find no gender differences on trustworthiness and reciprocity, while Croson and Buchan (1999), Chaudhuri and Gangadharan (2007), Snijders and Keren and Buchan et al. (2008) find that men are more concerned reciprocal behaviour than women.

The most widely discussed game in experimental psychology and economics is certainly the

prisoner's dilemma. Since the early studies based on this game (Rapoport and Chammah, 1965; Kahn, Hottes, and Davis, 1971; Sibley, Senn and Epanchin 1968; Tedeschi, Hiester and Gahagan 1969; Dawes, McTavish, and Shaklee 1977; Orbell, Dawes and Schwartz-Shea 1994) the evidence about the difference in the degree of cooperativeness between men and women has been mixed. The prisoner's dilemma has been investigated also in its multi-person version known as the public good game. Again the findings from this game are inconclusive: Brown-Kruse and Hummels (1993), Sell and Wilson (1991) and Solow and Kirkwood (2002) find higher levels of contribution for men. On the contrary Seguino, Stevens and Lutz (1996) find that women contribute more, whereas Sell et al., (1993), Cadsby and Maynes (1998) and Andreoni and Ragan Petrie (2008) find no significant differences in the levels of contribution by men and women. Summarizing we can affirm that the literature on gender differences in experiments does not find clear-cut differences in preferences related to altruism and cooperation but it highlights a higher sensitivity of women to the contextual factors of the experiment.

This paper contributes to this literature as we focus on the VWG, a variant of the multi-person prisoner's dilemma never studied before experimentally (the companion paper by Becchetti, Pelligra and Salustri, (2015), is the only exception). By introducing different frames, we as well asses the conjecture about the differential context-sensitivity of genders that Croson and Gneezy (2009) use to accommodate the evidence they discuss in their review.

The three main findings of our paper are: i) women are significantly more likely to maintain the cooperative behaviour (choice of the responsible product) after the redistributive mechanism is interrupted; ii) they are significantly less satisfied about the behaviour of other players in the game; iii) the introduction of two frames, with different specifications of the socially responsible activities of the buyer, has no differential effect on men and women. In particular, we find that such frames convince men to keep up with the levels of cooperation of women after the end of redistribution mechanisms.

The paper is divided into four sections (introduction and conclusions included). The second section outlines the theoretical framework. The third section describes the experimental design and the hypotheses to be tested. The fourth section presents empirical findings. The fifth section concludes.

## **2. The “Vote-with-the-Wallet” Game.**

The Vote-with-the-Wallet Game (VWG), introduced first by Becchetti and Salustri (2015), is a specific multi-person “hybrid contribution-prisoners’ dilemma” (Arce and Sandler, 2005). In its

simplest form, the two-player variant, player's utility conditional to the choice of consuming the responsible product ( $vR$ ) or the conventional product ( $vC$ ) can be written as

$$U_i(S) = \begin{cases} \beta + \alpha - \gamma & \text{if } S = (vR, vR) \\ \frac{1}{2}\beta + \alpha - \gamma & \text{if } S = (vR, vC) \\ \frac{1}{2}\beta & \text{if } S = (vC, vR) \\ 0 & \text{if } S = (vC, vC) \end{cases}$$

where  $S := (S^i, S^{-i}) \in \{vC, vR\}^2$  indicates the strategy profile.

The parameter  $\beta \in [0, +\infty)$  measures the externality arising from the consumption choice that induces corporations to a more social, environmental and fiscally responsible stance, the intensity of the effect depending on the share of players choosing the ( $vR$ ) strategy. The parameter  $\alpha \in [0, +\infty)$  measures the positive effect generated by the ( $vR$ ) strategy, in case of players' nonzero other-regarding preferences. The parameter  $\gamma \in [0, +\infty)$  measures the cost differential between the  $vR$  strategy (buying the SR product) and the  $vC$  strategy (buying the equivalent non SR product). Players are assumed as being not income constrained in the game.<sup>1</sup>

As shown by Becchetti and Salustri (2015), with  $G = (N, (S^i)_{i \in N}, (U_i)_{i \in N})$ ,  $N = \{1, 2\}$  and  $S^i = \{vR, vC\}$ , the unique NE of the game is ( $vC, vC$ ) if  $\frac{1}{2}\beta + \alpha < \gamma$  and ( $vR, vR$ ) otherwise, and we are in the PD area for intermediate values of  $\gamma$  where  $\frac{1}{2}\beta + \alpha < \gamma < \beta + \alpha$ . In this parametric interval the unique NE - ( $vC, vC$ ) - is Pareto dominated by the strategy pair ( $vR, vR$ ).

In the multiplayer version of the game  $n > 2$ ,  $G_n = (N, (S^i)_{i \in N}, (U_i)_{i \in N})$ ,  $N = \{1, \dots, n\}$ , and  $S^i = \{vR, vC\}$  for each  $i \in N$ . The payoff function now becomes

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n}\beta + \alpha - \gamma & \text{if } S^i = vR \\ \frac{j}{n}\beta & \text{if } S^i = vC \end{cases}$$

where  $j$  measures the number of players choosing the  $vR$  strategy in  $S^{-i}$ . The multiplayer game has ( $vC, vC$ ) as a unique NE if  $\frac{1}{n}\beta + \alpha < \gamma$  and “( $vR, vR$ ) otherwise”. What has to be noted is that a higher number of players clearly makes the PD region larger since the parametric interval of  $\gamma$  in which we

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<sup>1</sup> Said in other terms this implies that only players without income constraints (income at least equal or above the full cost of the responsible product) can participate to the game.

are in presence of a PD is  $\left(\frac{1}{n}\beta + \alpha, \alpha + \beta\right)$ . This implies that, in global consumer and investor markets, the PD problem of the VWG is highly relevant.

### 3. Experimental design.

In this work, we analyse data gathered in Becchetti, Pelligra and Salustri (2015). They investigate players' choices in a VWG with or without a redistribution mechanism that transfers money from defectors to cooperators. Each treatment considers two sequences, of 10 rounds each, of the VWG with and without redistribution, respectively. In each round a group of 10 players chooses between two goods named A and B: the first costs 10 tokens, the second 5 tokens. In each round players are given an endowment of 20 tokens. This version of the game is specifically designed to reproduce the main characteristics of the VWG, including the positive externality in purchasing the responsible but more expensive good. For this reason, there is a benefit of 3 tokens for each participant whenever a player chooses the more expensive good A (see Table A1 in the Appendix). The share of players choosing each good is the only information revealed to all players at the end of each round. The “redistribution phase” consists of a 10-round variant of the VWG where all players choosing product B are taxed of 2.5 tokens that are conveyed to a common fund. The collected points are then redistributed before the following round among players who have previously chosen the good A (see tables A3 and A4 in the Appendix). It comes along that the purchase of good A becomes the dominant strategy in the redistribution phase, whatever the number of cooperative players.

By applying the theoretical framework described in section 2 to the parametric case of our game without redistribution we find that  $n = 10$ ,  $\beta = 30$ ,  $\gamma = 5$ , and  $\alpha = 0$  for simplicity. As a consequence, the payoff function becomes<sup>2</sup>

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n}\beta - \gamma & \text{if } S^i = vR \\ \frac{j}{n}\beta & \text{if } S^i = vC \end{cases}$$

$$= \begin{cases} \frac{j+1}{10}30 - 5 & \text{if } S^i = vR \\ \frac{j}{10}30 & \text{if } S^i = vC \end{cases}$$

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<sup>2</sup> Note that in our utility function we do not have the endowment since the parameters are expressed as differentials between the choice of the responsible product and the choice of the conventional product.

with  $j$  being the number of players choosing the  $vR$  strategy in  $S^i$ . The multiplayer game has  $(vC, vC)$  as a unique (inefficient) NE since  $\frac{1}{n}\beta + \alpha < \gamma < \beta + \alpha$  (i.e.  $3 < 5 < 30$ ).

Based on the above features our game has characteristics similar to those of a Voluntary Contribution Mechanism (VCM) with some original qualifications. The standard VCM has a fixed return for all participants for any euro/token invested by a given participant. In our case it is not exactly the same. One of the two choices implies a monetary disbursement that does not create any externality for the other players. We may establish an equivalence with the VCM if we however consider only the difference in costs between the two choices and calculate the rate of return for each euro “invested” when choosing the responsible product (5 euro extra expenditure that produces a benefit of 3 euros). Second, differently from standard VCMs, players have a dichotomous choice (they have to choose between the responsible or the conventional product) and not an endowment from which they can typically contribute with many different choices ranging from zero up to the maximum of their total endowment. On this last point we explicitly avoid that players can use all their endowment in order to have stronger external consistency with what happens in most of consumption choices where savings are nonnegative and not all the budget is used. In this respect our VWG is close to a small subset of “all-or-nothing” VCMs (see among others van de Kragt et al., 1983; Rapoport and Eshed-Levy, 1989 and Cadsby and Maines, 1999) that, due to the lack of a free offer, are however regarded in this literature as having weaker external consistence with characteristics of voluntary contributions in the economic reality (Cadsby and Maines, 1999).

It is as well easy to see that the experiment's payoffs structure involves the typical free-riding problem of the prisoner's dilemma, because the dominant strategy in the baseline treatment is represented by purchasing the cheaper but less responsible good B whatever the share of players choosing good A (see Table A2 in the Appendix).

The experiment consists of two more treatments where the game is framed. The two goods are itemized as two “electricity supply contracts” provided by a “socially responsible company” (good A) and a second unspecified company (good B). In the two frames, social responsibility is presented as concerning two different “areas of commitment”. Frame 1 sees the company's dedication to the local development of the economy, while Frame 2 describes the company's “pledge” to fund social innovations initiatives and projects on a national scale<sup>3</sup>. The idea behind these two versions of the game is to differentiate the possible indirect impact that players may have from the socially responsible activities of the company. The larger the distance, the lower the potential benefit for the

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<sup>3</sup> See Experimental instructions in the Appendix 2 for a precise description of the frames.

player. Each of the three treatments, baseline, frame 1 and frame 2 has been replicated by inverting the order of the phases, with the redistribution phase at the end or at the beginning (see Table A5 in the Appendix).

The main findings of the companion paper of Becchetti et al. (2015) who analyze revealed choices in the experiment are: i) the non-zero but declining share of cooperators in the base (framed and non-framed) treatments; ii) the upward jump in the share of cooperators once the redistribution mechanism is introduced; iii) the positive effect of the frame on the share of cooperative choices in non-redistribution treatments.

### 3.1. Hypothesis testing.

We use the standard assumption of purely self-regarding preferences being common knowledge as a theoretical benchmark to fund our null hypothesis Based on this assumption, we can formulate the following predictions on our treatments:

- i) zero choices of the responsible product under framed/not framed base treatments
- ii) 100 percent of choices of the responsible product in redistribution treatments where this strategy becomes the dominant strategy
- iii) absence of gender differences under both i) and ii)

More formally, the third prediction on the gender difference (the specific focus of our paper) can be formulated as follows. Let  $C(i,t)$  indicate the strategy selected by the  $i$ -th player in round  $t$  of game  $G$ , with  $C \in \{\nu R, \nu C\}$  where  $\nu R$  (consuming the responsible product) is the purchase of good A, while  $\nu C$  (consuming the conventional product) is the purchase of good B, and  $G \in \{\text{Base, Base Frame 1, Base Frame 2, Redistribution, Redistribution Frame 1, Redistribution Frame 2}\}$  indicates the specific treatment considered.

The null hypothesis tested is

$$H_0: E[C_{f,t}(G)] = E[C_{m,t}(G)]$$

where  $f$  are women and  $m$  men. That is, our null states that that there are no gender differences in the share of cooperators in the specific treatment  $G$ .

### 3.2. Procedures.



The experimental sessions took place at the University of Cagliari (Italy), in June 2015. We recruited 180 participants (90 females and 90 males), mainly students, from a wide range of disciplines. At their arrival in the lab, participants, ten per session, were randomly assigned, to a computer. General instructions were read aloud and subjects were informed that the experiment consisted of two phases, but they received the specific instructions only for phase one. Questions about the structure of the game, the procedures and the payment rules were then answered privately. Once each participant completed the ten rounds of phase one, subjects were given phase two instructions, which were read aloud. When the second phase ended all the participants completed a post-experimental questionnaire about their socio-demographic characteristics, general values and their attitude about corporate social and environmental responsibility (see Appendix 3).

Each participant received the equivalent in cash (conversion rate 2 tokens = 1 euro) of the payoff obtained in one round randomly chosen among the twenty played plus 5 tokens as show-up fee. The sessions lasted approximately one hour and earnings averaged about 16 euros. The experiment was computerized using the software z-Tree platform (Fischbacher, 2007).

## **4. Results**

### **4.1. Empirical findings**

Our findings document that the first two predictions on zero responsible choices in base treatments and 100 percent responsible choices in redistribution treatments are both rejected. Our third null hypothesis of lack of gender differences is rejected only in one case, that is, in the base-treatment where the share of non-cooperative choices is 69.68 percent for women and 79.31 percent for men ( $\chi^2$  7.29, p-value 0.007). In all other treatments (Frame 1, Frame 2 and the redistribution treatments under Base, Frame 1 and Frame 2) we detect no significant gender differences. Note that this is actually two findings in one. First, women cooperate significantly more in the base treatment (the treatment without redistribution mechanism). Second, the introduction of responsibility frames in the base treatment bridges the gender gap, with men reaching the same level of cooperative choices than women.

To examine more in depth this finding consider that, as is clear from our design, the aggregate players' choices in the Base treatment actually correspond to two different sequences of Base-Redistribution designs. In the first case players play 10 rounds under the Base treatment and the following 10 rounds (from the 11<sup>th</sup> to the 20<sup>th</sup>) under the Redistribution treatment. In the second case the sequence is inverted. When we decompose the gender result in Base treatments between the Base-Redistribution and the Redistribution-Base sequences we find that the gender effect is concentrated on the second

case with 85.3 percent non-cooperative choices of men against 67.3 percent non-cooperative choices of women ( $\chi^2$  13.45, p-value 0.000). Hence, we conclude that women are more likely to keep the cooperative strategy after the redistribution mechanism is removed.

**Table 1. Hypothesis testing**

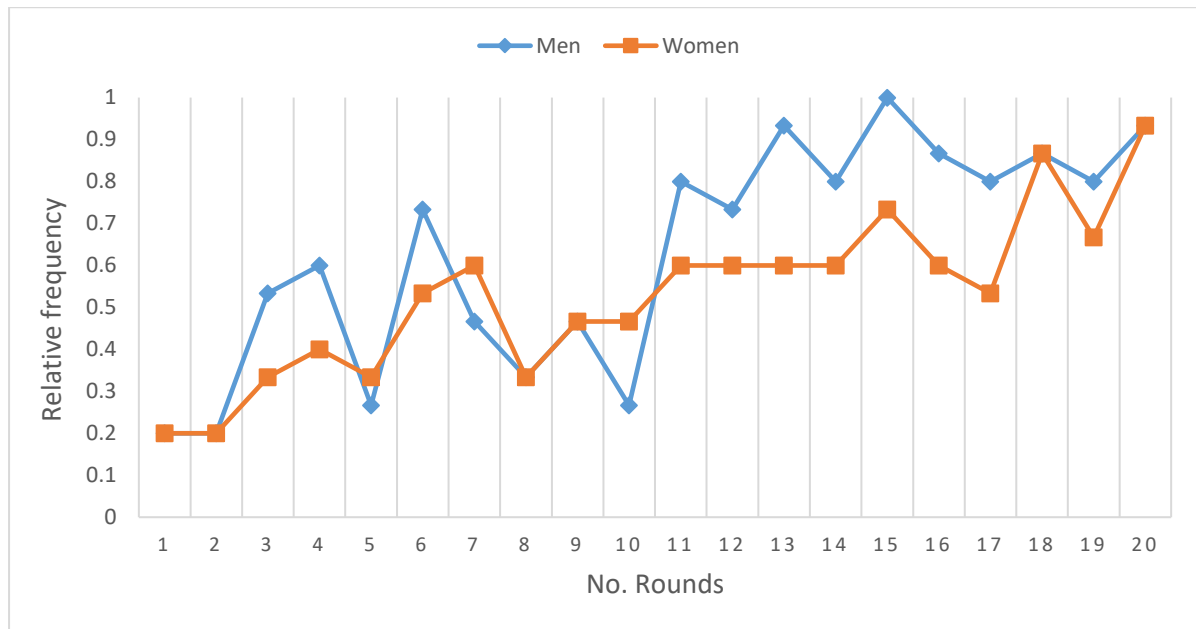
Treatment (men) vs (women)	Obs.	Share of non- cooperative choices (%) (1) vs (2)	$\chi^2$	P- value
Base	600	79.31 vs 69.98	7.28	0.007
Base Frame 1	600	56.9 vs 60.71	0.908	0.341
Base Frame 2	600	53.4 vs 54.51	0.068	0.793
Redistribution	600	39.1 vs 41.43	0.428	0.513
Base (after Redistribution)	300	85.3 vs 67.3	13.45	0.000
Base (before Redistribution)	300	72.86 vs 77.31	0.036	0.85
Frame 1 (after) Redistribution	300	41.9 vs 28.8	4.88	0.027
Frame 2 (after) Redistribution	300	26.7 vs 38	1.59	0.20
Redistribution (after) Frame 1	300	36.9 vs 28.57	0.596	0.44
Redistribution (after) Frame 2	300	35.6 vs 35.62	1.41	0.23

Notes: for the definition of different treatments see Appendix 2:

When we look at the dynamics of men and women's choices in the redistribution+base design we clearly find evidence of what we tested (Figure 1). The averages of non-cooperative choices for the two sexes overlap until the 10th round while there is a clear-cut difference after the removal of the redistribution mechanism (11<sup>th</sup> round) which lasts until the 18<sup>th</sup> round. More specifically, the men's change in the share of non-cooperative choice is much sharper as soon as the elimination of the

redistribution mechanism is announced. This can be interpreted in two ways: i) since the shift in design makes the non-cooperative choice the dominant strategy, men are more rational to adapt to is soon; ii) women are more resilient to the cooperative choice in the attempt to avoid the coordination failure implied by the prisoner's dilemma of the game.

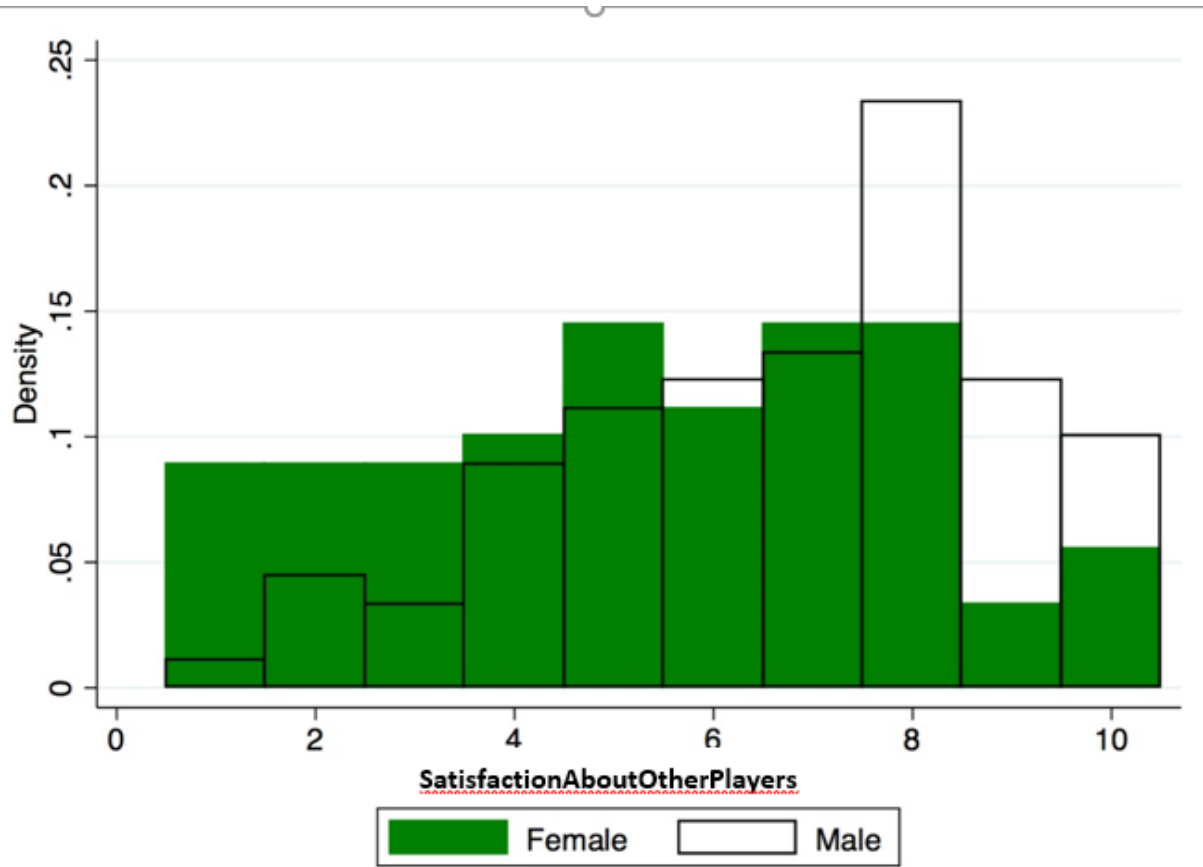
**Figure 1. Dynamics of gendered non-cooperative choices in the Redistribution-Base design**



#### 4.2. Satisfaction about the game

With our ex post survey we ask participants to the experiment about their satisfaction for the behaviour of their mates in the game. And find here another relevant difference between women and men (see Figure 2). The gender difference in the distribution of satisfaction for other players' experiment is clear-cut. When looking at the right tail we find that less than 9 percent of women express a level of satisfaction above 7 against more than 45 percent of men. The difference on the left tail is strong as well: more than 36 percent of women express a satisfaction below 5, while this is the case for slightly less than 29 percent for men.

**Figure 2 Distribution of satisfaction for other players' behaviour for men and women in the vote with the wallet game**



Note: SatisfactionAboutOtherPlayers: average satisfaction with other players' behaviour in the experiment (males vs females)

In order to check whether the observed difference remains significant once we control for relevant observable factors we estimate the following ordered logit base specification (Table 2 column 1)

$$Satisfaction_i = \beta_0 + \beta_1 PlayerNonCoopShare_i + \beta_2 AvgGroupNonCoopShare_i + \beta_3 Male_i + \beta_4 Age_i + \sum \delta_j DIncome_{ij} + \varepsilon_i \quad (1)$$

where *Satisfaction* is a 0-10 variable measuring satisfaction for the behaviour of other players in the game. The two variables measuring what happened in the game are *PlayerNonCoopShare* (the share of cooperative choices of the *i*-th player across the 20 rounds) and *AvgGroupNonCoopShare* (the share of cooperative choices of all the ten players across the 20 rounds). Since our dependent variable in (1) is measured with an ex post questionnaire, our unit of observation in this econometric analysis

is the individual  $i$ . We therefore adopt average values of controls at session level and we clusterize standard errors at session level. Socio-demographic controls such as a male gender dummy, age and five income dummies are added to the estimate.

**Table 2. The gender effect in the determinants of satisfaction about other players' behaviour**

VARIABLES	(1)	(2)	(3)
Male	0.953*** (0.272)	0.929*** (0.273)	
PlayerNonCoopShare	3.216*** (0.631)	4.538*** (1.408)	3.548** (1.738)
AvgGroupNonCoopShare	-3.507** (1.534)	-10.326 (6.658)	-5.482 (8.370)
MaleBaseAfter			2.351** (1.080)
MaleBaseBefore			1.998* (1.082)
MaleFrameOneBefore			0.656 (0.945)
MaleFrameOneAfter			2.886** (1.154)
MaleFrameTwoBefore			2.022* (1.171)
MaleFrameTwoAfter			1.676 (1.054)
Age	-0.007 (0.042)	-0.003 (0.042)	-0.018 (0.044)
DIncome1	-0.290 (0.489)	-0.229 (0.494)	-0.138 (0.498)
DIncome2	-0.232 (0.504)	-0.169 (0.508)	-0.079 (0.515)
DIncome3	-0.529 (0.500)	-0.477 (0.504)	-0.344 (0.510)
DIncome4	-0.778 (0.590)	-0.721 (0.594)	-0.662 (0.593)
Profit		-0.222 (0.211)	-0.048 (0.273)
Constant cut1	-3.499*** (1.331)	-11.759 (7.958)	-5.679 (10.184)
Constant cut2	-2.503* (1.303)	-10.764 (7.953)	-4.678 (10.182)
Constant cut3	-1.956 (1.296)	-10.215 (7.949)	-4.124 (10.179)
Constant cut4	-1.333 (1.292)	-9.590 (7.945)	-3.494 (10.177)

Constant cut5	-0.680 (1.290)	-8.933 (7.941)	-2.834 (10.176)
Constant cut6	-0.134 (1.291)	-8.384 (7.938)	-2.277 (10.176)
Constant cut7	0.556 (1.294)	-7.688 (7.932)	-1.574 (10.174)
Constant cut8	1.772 (1.303)	-6.462 (7.923)	-0.333 (10.169)
Constant cut9	2.618** (1.317)	-5.614 (7.922)	0.522 (10.168)
Observations	180	180	180

Notes: Male: (0/1) dummy for male gender, PlayerNonCoopShare: average share of player's non cooperative choice in the game; AvgGroupNonCoopShare: average share of group's non cooperative choice in the same player's session; MaleBaseAfter: (0/1) dummy for baseline treatment after redistribution treatment interacted with male dummy; MaleBaseBefore: (0/1) dummy for baseline treatment before redistribution treatment interacted with male dummy; MaleFrameOneAfter: (0/1) dummy for frame one treatment after redistribution treatment interacted with male dummy; MaleFrameOneBefore: (0/1) dummy for frame one treatment before redistribution treatment interacted with male dummy; MaleFrameTwoAfter: (0/1) dummy for frame two treatment after redistribution treatment interacted with male dummy; MaleFrameTwoBefore: (0/1) dummy for frame two treatment before redistribution treatment interacted with male dummy; Age: player's age; Dincome: income dummies for different yearly net income brackets (Dincome1 <15,000 euros; Dincome2 15,001-25,000 euros; Dincome3 25,001-35,000 euros; Dincome4 35,001-50,000 euros; omitted benchmark 50,001-90,000 euros); Profit: average player's profit per round.

Results presented in Table 3 show that men are significantly more satisfied about the behaviour of other players than women. Note that in the regression we control for the share of one's own noncooperative choices (*PlayerNonCoopShare*) and for the average share of cooperative choices of other players in the experiment (*AvgGroupNonCoopShare*). In an augmented specification we as well calculate the average level of players' profits in each round (depending on the number of cooperators and on the presence/absence of the redistribution mechanism) (*Profit* variable) and find that the gender effect is robust to the inclusion of such variable (Table 2, column 2).

A likely interpretation linking this finding to that previously shown in section 4.1 is that women are significantly more disappointed than men for the incapacity of experiment mates of reaping the potential gains from a cooperative choice after the monetary incentive (the redistribution mechanism) is removed. This interpretation would be consistent with the observation of the significantly higher propensity to keep the cooperative strategy after the end of the redistribution mechanism.

Marginal effects calculated on the ordered logit estimate tells us that female gender reduces by around 20 percent the probability of declaring a level of satisfaction for other players' behaviour above 7. The econometric effect is smaller than the previously mentioned descriptive effect but still very relevant. Part of the descriptive effect is likely to be absorbed by the significant positive impact on satisfaction of one's own non-cooperative choice. This variable suggests once again that the lack of satisfaction for other players' behaviour is driven by their lack of support for the cooperative behaviour followed by a given player.<sup>4</sup>

In a final robustness check we decompose the gender effect separating each of the six different sequences of the game (Baseline plus Redistribution, Redistribution plus Baseline, Frame 1 plus Redistribution, Redistribution plus Frame 1, Frame 2 plus Redistribution, Redistribution plus Frame 2). Consistently with our interpretation of the nexus between the two results of the paper (that on experiment choices and on stated satisfaction) we find that the two sequences in which the gender effect is strongly significant are those where the redistribution effect comes first and the policy is suspended at the end of the 10<sup>th</sup> round (significance of *MaleBaseAfter* and *MaleFrameOneAfter* dummies in the specification of Table 2, column 3). This occurs both in the redistribution plus base sequence and in the redistribution plus frame one sequence.

It is important to note that gender differences in satisfaction about other players' behaviour do not depend on different game circumstances since the average share of non-cooperative choices is 49.8 percent for men and 48.8 percent for women. As well the ratio between one's own average choices (1 if non-cooperative and zero otherwise) and the average share of other players' non cooperative choices (our coefficient of betrayal aversion) is very close (31.8 against 31.0). This finding seems to show that after the initial different behaviour when the redistribution ceases women adapt to other players' behaviour in a sort of conditional cooperation attitude.

Note that a methodological problem which always emerges when using data that do not come from randomized experiments (hence in our choice of combining data from randomized experiments and stated preferences) is endogeneity. In our case the problem obviously does not apply since we are

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<sup>4</sup> In a sense, since cooperation is a joint endeavour, this disappointment is similar to that of the individuals who come to a social meeting and do not find the other invited participants. With reference to a well-known say, if "it takes two to make tango" and it takes more than two to make the vote with the wallet game". In this perspective, our findings seem to register the disappointment of the mate who is willing to "dance" for the others who do not participate to the game itself.

looking at gender differences and therefore at a variable which cannot be caused by third omitted drivers.

## **5. Conclusions**

The literature on gender differences in experiments does not find clear-cut differences in preferences related to altruism and cooperation. It however concludes that many specific gender differences can be found related to specific game contexts. We analyse a specific game context that is becoming more and more relevant in our days. The game outlines the dilemma of choosing between a more expensive product advertised as incorporating more environmental and social responsibility and a cheaper alternative conventional product of equivalent quality. We model the choice under the form of a hybrid contribution multiplayer prisoner's dilemma which we call "vote with the wallet game". Our findings confirm that gender differences exist conditionally to specific game circumstances. More specifically, women are not more cooperative in absolute terms but are significantly more likely to keep cooperative behaviour even when the incentive to follow it (the redistribution mechanism taxing defectors and subsidizing co-operators) ceases. As far as the game continues however, if they find that other players do not follow they then adapt consistently with the conditional cooperation principle. They however remain significantly more disappointed for the other players' behaviour in the game, and especially so in those treatments where the redistribution mechanism is operated first and then disconnected, that is, in the same treatments in which the gender difference in cooperative choices is significant.



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