Working Papers 154

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Novembre 2016

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Alma Mater Studiorum - Università di Bologna
Scuola di Economia Management e Statistica
sede di Forlì

The Impact of Cash Mobs in the Vote with the Wallet Game: Experimental Results.

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– This draft: 19 October 2016 –

Abstract

We simulate in a randomised lab experiment the effect of Cash Mobs on consumers' behaviour in an original variant of the multiplayer Prisoner's dilemma called Vote-with-the-Wallet Game (VWG). The effect is modelled in a sequential game with/without an environmental frame in which a subset of players (cash-mobbers) is given the opportunity to reveal publicly (in aggregate without disclosing individual identities) their cooperation decision. We find that the treatment has a positive gross effect, that is, the share of cooperators is significantly higher in treated sessions and this is mainly due to the higher share of cooperators among cash-mobbers. Our results suggest that cash mobs-like mechanisms can help to solve social dilemmas with entirely private solutions (not based on punishment but on positive action) without costs for government budgets.

Keywords: vote with the wallet, prisoner's dilemma, randomised experiment

JEL Classification: C72 (Noncooperative games), C73 (Repeated games), C91 (Laboratory, Individual behavior), M14 (Corporate culture, Social responsibility).

1 Introduction

Vote with the wallet and cash mobs are two increasingly relevant emerging features of contemporary consumer markets. With vote with the wallet we mean the consumers' willingness to pay for socially and environmentally responsible features of goods sold that may eventually lead some of them to prefer a product advertising itself as 'responsible' vis-à-vis a conventional product, even in presence of an adverse price differential. With cash mobs we instead refer to a new practice where groups of people gather at local selling places and 'vote with the wallet' by buying a given product and making their decisions visible to the general public. In this sense cash mobs are flash mobs combined with a shopping action.[1] Our research consists of creating an experimental setting that aims to reproduce the main stylized features of a cash

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[1]The Collins dictionary defines cash mob 'a group of people coordinated to meet and spend money at a local, independent business at a particular time'.

mob in a vote-with-the-wallet framework (that is, an experimental setting where players are asked to choose between a 'responsible' and a conventional product). By doing so we as well create an original game theoretic framework. In the rest of the introduction we therefore discuss the external relevance (current and future potential importance of cash mobs and of the vote with the wallet game on environmental sustainability in our economies) and internal relevance (originality and interest of the game and the experimental setting per se and relationship with the existing game theoretic literature) of our research.

Not much effort is needed to explain why 'green' vote with the wallet choices are becoming increasingly important in the current economic scenario. Urban pollution, climate change and environmental degradation are in general considered among the main challenges that the human race has to tackle in the next future. In the 2015 Paris meeting the vast majority of the world sovereign states (196 countries) acknowledged the problem and agreed on the target of limiting global warming to less than 2 degrees Celsius vis-à-vis the pre industrial level. The governments that signed the declaration agreed as well to pursue the effort of limiting further the increase to 1.5 degrees, an endeavour that would imply zero net emissions in the second half of this century.[2]

In this framework there is perception from the general public that the vote with the wallet represents an important tool to tackle the problem on the private side in order to complement what done on the institutional side. No wonder therefore that in its 2014 survey on globally conscious consumers KPMG reports an increase of around 10 percent in all continents with respect to the 2011 survey of the share of consumers who declare themselves willing to pay extra money for products of companies committed to social and environmental sustainability (a share ranging from 40 to 64 percent around the different continents).[3] As is well known however the contingent claim literature tells us that willingness to pay tends to be upward biased with respect to actual consumer choices (Mitchell and Carson, 1989). In order to have a more precise idea of the phenomenon is therefore important to look at actual market shares and vote with the wallet mechanisms and to examine consumer behavior in actual experiments where the responsible/conventional product alternative involves monetary gains/losses.

The growth in importance of the vote with the wallet on environmental sustainability is also witnessed by the fact that in the financial investment industry a group of funds totalling around 10 billion dollars of assets under management have signed the Montreal's pledge, an agreement by which they commit to measure the carbon footprint of their portfolios (and eventually to vote with the wallet by modifying their portfolio composition to reduce their carbon footprint) in order to push listed companies toward environmental sustainability. On the consumer side the

[2]"Paris Agreement". United Nations Treaty Collection. Retrieved from https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en.

[3]KPMG (2015) Currents of Change, Survey of Corporate Responsibility Reporting, retrieved from at https://www.kpmg.com/CN/en/IssuesAndInsights/ArticlesPublications/Documents/kpmg-survey-of-corporate-responsibility-reporting-2015-O-201511.pdf.

reported willingness to pay for green products translates into a significant growth of purchased organic and environmental friendly products and is another sign of the increasing attention to the problem on the demand side.[4]

Cash mobs are a relatively recent emerging phenomenon. The first cash mob in the US was organized in Buffalo in August 2011, where Chris Smith, a blogger and engineer arranged a meeting of more than 100 people to purchase in a City Wine merchant. The initiative was described as a 'reverse Groupon' with the goal of making a 'chance for business owners to begin building a longer-term relationship with customers'. In Italy organisations aiming to attract the interest of the public opinion on the social costs of gambling created a specific form of cash mob called 'slotmobs' where participants gathered to buy at local cafeterias who did not have slot machines inside, with more than 200 cashmobs organised in Italy in the last two years.[5] One of the most important worldwide 'virtual' cash mobs organised so far was the World FairTrade Challenge where the leading world fairtrade organisations asked consumers around the world to make their support to fair trade explicit and visible by buying fair trade coffee online. The outcome was the equivalent of 1,8 million of coffee cups consumed between the 15th and 17th of May.[6]

Based on the above mentioned literature our research aims to model in an original game theoretic setting the vote with the wallet game and test whether the environmental frame and the introduction of the opportunity of cash mobbing have significant effects on the share of players buying the non conventional responsible product.

In our experiment we try to reproduce as faithfully as possible in the baseline treatment the (vote with the wallet) alternative faced by consumers today when they have to decide whether purchasing a conventional product or a relatively more environmentally responsible substitute (an alternative arising, even involuntarily, in most everyday choices such as, for instance, between organic/non organic food in the same supermarket shelves, more or less environmental friendly textile products and more or less energy saving household appliances). The choice reveals to be a variant of the Prisoner's dilemma since we conveniently model that the responsible product is more expensive but its purchase generates a positive externality (a pecuniary externality in the experiment) for all the other players. As a consequence, the strategy set where all players decide to buy the conventional product is the Nash equilibrium of the game originating from the crossing of players' dominant strategies. This strategy set is however Pareto dominated by the alternative in which all players decide to buy the responsible product. The baseline game is

[4]US organic product sales reached 43.3 billion dollars in 2015 growing by 11 percent from the previous year, well above the food market growth rate of 3 percent according to the Organic Trade Association's 2015 Organic Trade Survey https://www.ota.com/news/press-releases/19031.

[5]http://www.nexteconomia.org/project/cash-mob-etico/slot-mob/.

[6]http://www.fairtrade.net/new/latest-news/single-view/article/world-fairtrade-challenge-more-than-18-million-coffee-lovers-join-the-worlds-largest-coffee.html.

blind with respect to the characteristics of the two alternative products (beyond price and the pecuniary externality attached to the more expensive product). Conversely, in the green frame variant of the baseline treatment the responsible product is explicitly defined as environmentally responsible. In a second variant (baseline plus conformity design) players are informed about the previous choice of players being in the same situation in the baseline treatment, but in other sessions and not in their session so that the information does not affect directly their payoffs.[7] Common experimental characteristics of the three above described treatments are the communication to all players of the number (but not the identity) of cooperators in the previous round (of the same session for baseline and baseline plus green frame treatments, and of the corresponding baseline session for baseline plus conformity treatment) and the demand on the expected number of cooperators (choosers of the responsible product) in the ongoing round that we formulate to each player before she/he chooses the product (for full details on the experiment design see section 3 and the Appendix). The introduction of the cash mob treatments is performed by applying the same change to the three above described (baseline, baseline plus green frame, baseline plus conformity) treatments. What happens here is that a subset of players is informed by the experimenter about the opportunity of committing ex ante to buy the responsible product and revealing their choice to the other players in the session. The cash mob treatment therefore transforms the vote with the wallet game from a simultaneous into a sequential game since the total number of responsible choices from this subset of players (but not their identity) is communicated to the remaining players in the session before they move. In the cash mob treatment we introduce in this way a mechanism that stylizes the main features of a cash mob applied to responsible products: i) the opportunity for a limited group of consumers (who are first movers) to purchase the responsible product in advance and disclose publicly their decision; ii) the information received by the other players (who are second movers) about the number of cash mobbers before they enter into action.

The characteristic of our experimental setting is interesting also because any additional player choosing the cooperative products (as any cash mobber who reveals herself/himself as such): i) does not change the payoff differential between choosing the responsible versus the conventional product since the latter is invariant in the number of players choosing the responsible product; ii) does change the absolute payoffs of the two strategies (cooperating and free riding) raising both of them. Given these two features we provide two possible rationales when non cash mobbers change their choice after observing an increase in the number of cash mobbers: i) a decrease in the share of non cash mobbers' cooperative choices due to a free riding effect; ii) an increase in the share of non cash mobbers' cooperative choices due to a positive reciprocity effect. We interpret this second finding in terms of reciprocity because the increase in the num-

[7] Conformity can be defined as the degree to which an individual in a group modifies her/his behavior to fit the views of the society. As such, conformity is more related to culture and social norms (see Moscovici, 1985 and Cialdini and Trost, 1998 among others) and captures something different from conditional cooperation (Carpenter, 2004; Fischbacher et al., 2001; Fischbacher and Gächter, 2010).

ber of cash mobbers raises the value of free riding and does not modify the payoff differential between cooperating and free riding. Hence, the decision to cooperate is likely to be triggered by a positive reciprocity argument in the utility function (the desire to reciprocate/imitate the positive social action of the cash mobber) unless we assume an implausibly strong effect of the change in absolute payoffs on convex preferences (i.e. players who decided not to cooperate with a lower number of cash mobbers decide to do so because the absolute payoff of the cooperation strategy is in any case larger with a higher number of cooperators).[8]

Our game is original and may be put in relation to different subfields of research in the literature. In the Prisoner's dilemma perspective the game can be defined as a 'hybrid contribution-prisoners' dilemma' (Arce and Sandler, 2005) where both the classical 'cooperation' and 'defection' strategies require an action.[9] In the corporate social responsibility (CSR) perspective our experiment opens up a new promising direction for the related literature. An important field in this area of research is represented by experimental settings that simulate the interplay of demand and supply in presence of non CSR and CSR products generally identifying an equilibrium price premium for the latter (Cason and Gangadharan, 2002; Rode et al., 2008, and Vasileiou and Georgantzis, 2015). A qualifying difference of our approach with respect to these contributions is that we want to investigate the demand side of the CSR phenomenon and therefore isolate consumers behavior from the concurring dynamics of supply of CSR and non CSR products.

Last but not least, many contributions in the literature of social dilemmas that are close to what represented in the vote with the wallet game (such as Prisoner's dilemmas and voluntary contribution mechanism experiments) wonder which policy measures may increase the degree of cooperation by moving players' decision away from the Pareto dominated Nash equilibrium. Just to quote some qualifying examples Fehr and Gacther (2000) examine the role of private punishment, Masclet et al. (2003) and Noussair and Tucke (2005) the role of nonpecuniary sanctions, Nikiforakis and Normann (2008) the effectiveness of punishment, Anderson and Putterman (2006) and Carpenter (2007) the price of punishment, while Falkinger et al. (2000) and Becchetti et al. (2015) look at the impact of feed-in tariff-like mechanisms introducing balanced budget systems of subsidies (taxes) that affect the payoff differential between defection and cooperation strategies.

In this respect our approach is original since it looks at a private voluntary solution (not based on punishment but on a positive action) with zero costs for the government budget, where the effect originates from the sequential information scheme due to the cash mob opportunity.

[8] We indirectly control for this second effect in the econometric estimates that follow by introducing the presence of the expected number of cooperators among regressors.

[9] According to the Arce and Sandler (2005) taxonomy we have four categories (provision, commons, altruism, selfish) of Prisoner's Dilemmas depending on the structure of private/public benefits and costs to players and to the action/inaction characteristics of the choices related to the two ('cooperation' and 'defection') strategies.

For its characteristics our game cannot be considered as being part of the cheap talk pre-play communication literature (since players who decide to cash mob commit to an action that has consequences on their payoffs) while it is more akin to the information chain literature (Steiger and Zultan, 2014) for its sequential structure where information on other players' choices plays an important role. However in this last branch of the literature any player can know only the decision of a previous player while our structure is clearly different mimicking the effect of a cash mob. In this sense our paper falls in the strand of the literature concerning the role of social information for individual choices, with particular focus on the choice of social cooperation. As considered by Shang and Croson (2009) in the slightly different perspective of the provision of public goods what other people do can be seen as a substitute or a complement of one's own choice respectively crowding out (partially or totally) the marginal contribution of the decision maker. Several empirical studies tried to test these two competing approaches generally failing to find empirical evidence of a crowding out effect but finding mixed results on the (positive/negative) direction of the relationship between other's and individual choices,[10] whereas in an experimental context a general positive relation has been detected.[11] As pointed out by Shang and Croson (2009) the way social information is introduced in the empirical study is particularly important and its added value is the possibility to address the role of social information through its manipulation in a semi-natural experimental context. In this respect our framework represents a further innovation for the novelty of the game (vote with the wallet) and of the information mechanism aimed to mimic a phenomenon of growing relevance in contemporary markets.

The cash mob vote with the wallet experimental setting developed in the paper produces interesting findings together with more established ones. We document, as it is customary in the related literature, the presence of conditional cooperation and reciprocity, the positive gross effect of the cash mob treatment on cooperation and a positive effect of the green frame per se. Implications of our results are discussed in the final section.

2 The Vote with the Wallet Game

Following Becchetti and Salustri (2015), we consider n players who may choose between a responsible product (i.e., vote responsibly, or vR) and a conventional product (i.e., vote conventionally, or vC). The responsible product has an extra cost of γ vis-á-vis the conventional product (with the cost of the conventional product conveniently normalised to zero), its choice produces a positive externality that gives a benefit β to all individuals multiplied for the number of the responsible voters and a nonpecuniary effect α that can be nonzero and positive if the purchaser has other-regarding preferences. Each individual $i = 1, \ldots, n$ obtains an utility equal

[10] See among others Altonji et al. (1997) and Wolff (2001).
[11] See Keser and Van Winden (2000) and Bardsley (2000).

to

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

where j is the number of responsible voters among the i's co-players.
Note that, in order to avoid unnecessary complexity, we assume that all players share the same preferences toward the public good and cost differential components by implicitly assuming a one-to-one mapping in their utility function.

The vote with the wallet game is described by $VWG = (N, (s^i)_{i\in N}, (g^i)_{i\in N})$, where $N = \{1, \ldots, n\}$ is the set of players, $s^i = \{vR, vC\}$ is the set of strategies, and g^i is the utility function described in (1).

The game VWG has a unique Nash Equilibrium (NE), that is, mutual responsible voting (i.e., each player votes responsibly) if $\gamma < \frac{1}{n}\beta + \alpha - \gamma$ and mutual conventional voting otherwise. We note that, if $\frac{1}{n}\beta + \alpha < \gamma < \beta + \alpha$, we are in a Prisoner's dilemma since mutual conventional voting is a NE but is Pareto dominated by the strategy set where all players buy the responsible product.

3 The Experiment

3.1 Design

Our experiment aims to investigate players' behaviour in the VWG game with and without the cash mob treatment. The experiment design is composed by different finitely repeated versions of the VWW game. In the baseline treatment (B) a group of 10 players chooses repeatedly, independently, and anonymously between two goods, namely product A and product B, for 10 rounds. The number of rounds is not revealed to avoid typical endgame effects. Each player receives an endowment of 15 tokens each round and has to decide whether buying product A or product B, which cost 10 tokens and 5 tokens respectively. Regardless of the individual choice, each player receives a benefit of 3 tokens for each player buying product A. In this way we give a monetary counterpart to the positive externality created by the purchase of the responsible product in the VWG model described in the previous section. At the end of each round the number of players who have chosen product A is revealed but their identity is kept anonymous.

Given the above mentioned game characteristics, in each period the payoff function of player i choosing product k, for $i = 1, \ldots, 10$ and $k \in \{A, B\}$, is represented by

$$\pi^{ik} = 15 - c_k + 3 \cdot \sum_{i=1}^{10} ProductA_i$$

where c_k is the cost of choosing product k, which is 10 if $k = A$ and 5 if $k = B$, and $ProductA_i$

is a dummy variable equal to 1 if player i chooses product A.

With reference to our vote-with-the-wallet theoretical benchmark described in the section 2 the experiment gives in this way a monetary value to the public good component of the responsible product (product A) and reproduces as well the cost differential (the 5 token difference) between the responsible and the conventional product. It does not model explicitly the third nonpecuniary component (α) of the utility function in the vote with the wallet model since such component is assumed to be player specific and crucially determining individual decisions. More specifically, if nothing else matters in player's choice, an α component with a utility value of more (less) than 5 tokens implies the choice of the responsible (conventional) product. As a consequence, the payoff structure described above entails a free-riding problem because the purchase of product B is a dominant strategy for each player when $\alpha < 6$.

In order to test whether players have correctly understood the game, following Fishbacher and Gachter (2010), we ask at the beginning of the experiment session four control questions and we do not start the game until each participant has answered correctly.

The sequence of decisions for each round in the baseline treatment involves the following three steps: i) before each play, players are asked to indicate their *beliefs* about the number of players who choose product A in that period (as in Fischbacher and Gacther, 2010). In order to provide an incentive for correct beliefs, the player(s) with the most accurate belief in the randomly selected round is (are) paid 3 tokens; ii) players make their choice; iii) the experimenter gives information about the share of players choosing product A.

In addiction to the baseline treatment we introduce two slightly different versions, the *baseline plus green* (BLg) frame and the *baseline plus conformity* (BLc) treatment. In the BLg frame Product A is explicitly identified as a green product, that is, a product with "less environmental impact or less detrimental to human health" than Product B.[12] In the BLc treatment, we inform players, before they make their choice, about what other players have chosen in a previous session with the same treatment in order to test whether reactions change when information on choices does not affect directly players' payoffs.

For each of the three (i.e., BL, BLg, and BLc) treatments we consider a cash mob version of the VWG game (CM, CMg, and CMc respectively). The cash mob version differs from the corresponding baseline version since, at the beginning of each round, five randomly selected players are informed that they will take their decision before the other participants and that the number of cooperators (i.e., choosers of Product A) among them will be communicated (without revealing individual identities) to the rest of session players before the latter make

[12]We follow a standard green product definition retrieved from http://www.isustainableearth.com/green-products/what-is-a-green-product.

their choice. After that, the remaining players play the game with this additional information about the number of cooperative choices of the five randomly selected players. The sequence of events in each round in the cash mob treatments therefore works as follows: i) players are asked to indicate their beliefs about the number of players who will choose Product A in that period; ii) a subset of five randomly selected players are informed about the possibility of cash-mobbing and can decide whether to commit or not to buy Product A; iii) the share of those who commit is revealed to the other players (in order to incentivise the formulation of correct beliefs, we pay 3 tokens more the player(s) with the most accurate belief); iv) the remaining players make their choice; v) the experimenter gives information about the share of players choosing Product A.

Given the six above described treatments (the baseline versions BL, BLg, and BLc, and the three corresponding cash mob variants, CM, CMg, and CMc) a complete session is composed by a combination of two of them for a total of 20 rounds. Considering the sequence of treatments (cash mob in the first or in the second 10 rounds) we have six different combinations of the three baseline treatments with their cash mob variants (see Table 1). At the end of the session each player fills a questionnaire providing additional information on socio-demographic characteristics.

All experiments were programmed and conducted in a computer laboratory at The London School of Economics and Political Science lab with the experiment software z-Tree (Fischbacher, 2007). In each session, participants were randomly allocated to seats and took decisions in a complete anonymity. The average earning was £16.87 per participant. Each session lasted approximatively 60 minutes.

3.2 Hypothesis testing

We test several empirical hypotheses by comparing subjects' behaviour in the different treatments of the game. More formally, let $V_{i,t,T}$ be the strategy chosen by player $i \in \{1, \ldots, 10\}$ in round $t \in \{1, \ldots, 20\}$ and treatment T, where $T \in \{BL, BLg, BLc, CM, CMg, CMc\}$.

Hypothesis 1: (no cash mob effect)

$$\begin{aligned} H_0 &: E[V_{i,t\,BL}] = E[V_{i,t\,CM}] \\ H_A &: E[V_{i,t\,BL}] \neq E[V_{i,t\,CM}] \end{aligned}$$

Under the null of hypothesis 1 the introduction of the opportunity of cash mobbing does not affect the share of cooperative (Product A) choices that are not significantly different in the B and CM treatments.

Hypothesis 2: (no cash mob effect under green frame)

$$\begin{aligned} H_0 : E[V_{i,t\,BLg}] &= E[V_{i,t\,CMg}] \\ H_A : E[V_{i,t\,BLg}] &\neq E[V_{i,t\,CMg}] \end{aligned}$$

The second hypothesis is closely related to hypothesis 1 and tests whether the introduction of the opportunity of cash mobbing significantly affects cooperative choices when we explicitly define Product A as a green product.

Hypothesis 3: (no green frame effect)

$$\begin{aligned} H_0 : E[V_{i,t\,BL}] &= E[V_{i,t\,BLg}] \\ H_A : E[V_{i,t\,BL}] &\neq E[V_{i,t\,BLg}] \end{aligned}$$

The third hypothesis tests whether the green frame significantly affects per se the cooperative choices vis-á-vis the baseline treatment.

Hypothesis 4: (no green frame effect under the cash mob treatment)

$$\begin{aligned} H_0 : E[V_{i,t\,CM}] &= E[V_{i,t\,CMg}] \\ H_A : E[V_{i,t\,CM}] &\neq E[V_{i,t\,CMg}] \end{aligned}$$

The fourth hypothesis tests whether the green frame applied to the cash mob treatment generates a significantly different share of cooperative choices.

Hypothesis 5: (no conformity effect)

$$\begin{aligned} H_0 : E[V_{i,t\,BL}] &= E[V_{i,t\,BLc}] \\ H_A : E[V_{i,t\,BL}] &\neq E[V_{i,t\,BLc}] \end{aligned}$$

The fifth hypothesis measures whether the share of cooperative choices is different in the conformity treatment where the information on previous round cooperative choices comes from a different session with corresponding treatment and therefore does not affect players' payoffs.

Hypothesis 6: (non conformity effect under the cash mob treatment)

$$\begin{aligned} H_0 : E[V_{i,t\,CM}] &= E[V_{i,t\,CMc}] \\ H_A : E[V_{i,t\,CM}] &\neq E[V_{i,t\,CMc}] \end{aligned}$$

The sixth hypothesis verifies whether the conformity treatment applied to the cash mob treatment generates a significantly different share of cooperative choices.

4 Descriptive statistics and hypothesis testing

We start our empirical analysis with summary descriptive findings. As shown in Table 2 our sample is gender balanced (51.7 percent of females) and the average number of cooperators per session round in the overall experiment is 4.3 showing significant departure from the Nash Equilibrium. Almost half of the participants who have the possibility of revealing their choices actually decide to reveal their cooperative choice. Almost half of sample participants (53.3 percent) are in the 22–29 age cohort. The distribution of surprises on expectations on the number of cooperators is asymmetric and slightly skewed toward positive surprises (21.3 percent cases of more cooperators than expected).

In order to test our hypotheses we start by looking at our experimental evidence from a static point of view (i.e., without taking into consideration that the same players play for different rounds and that dynamics across rounds matters). We do so since the first result we are interested in is checking whether the share of cooperative choices is significantly different in aggregate (that is, considering all player choices) across different treatments.

The first three lines of Table 3 show that cash mob treatments have significantly higher shares of cooperative choices than the corresponding non cash mob treatments in the three different versions of the experiment (BL, BLg, and BLc). The nulls of hypotheses 1 and 2 are therefore rejected. The difference is statistically significant and the cooperation gap (the distance between the shares of cooperative choices in the two compared treatments) is larger under the green frame. More specifically, the distance of 7.5 points (33.2 versus 39.7 percent of cooperative choices) in the BL versus CM treatments turns into a more than 12 point distance (41.5 versus 53.7 percent) in the BLg versus CMg treatments. This difference in distances seems to indicate that the green frame acts as a stronger motivator for players' cooperative choices in the cash mob treatments. We may call the difference measured in the first three table rows the *gross cash mob effect* since we include in the comparison both those who have the opportunity of cash mobbing (i.e., revealing ex ante their cooperative choice) and those who have not.

In rows 4 and 5 we find that both the green frame and the conformity treatment rise significantly the share of cooperators (41.5 versus 33.2 and 42 versus 33.5, respectively) in the baseline treatments. The nulls of hypotheses 3 and 5 are therefore rejected. In rows 6 to 9 we find that the cash mob has stronger impact in green frame and conformity treatments than in baseline treatments both when cash mobbers are included and when they are not. These findings lead to the rejection of hypotheses 4 and 6 and document that, when combined with a conformity or a green frame effect, the cash mob effect is stronger.

In the lines that follow we measure again the gross cash mob effect by considering separately the different sequences, that is, those with cash mobs in the first 10 rounds and those with cash

mobs in the second 10 rounds. We find that in general the significance of the gross cash mob effect is confirmed with the exception of sequences BL–CM and BLc–CMc. This implies that the gross cash mob effect is always significant in presence of the green frame.

Data from the gross cash mob effect in the rows commented above include, in cash mob treatments, also choices of the subset of players who are given the possibility of participating to cash mobs by revealing ex ante their choices. These players are actually treated heterogeneously with respect to standard vote with the wallet players since the latter do not have the possibility of cash mobbing. In order to provide a more homogeneous comparison we limit the cash mob treatment choices to those of individuals who do not have the opportunity of participating to cash mobs. We call *net cash mob effect* the effect obtained by comparing the share of cooperative choices in the baseline treatment with that of non cash mobbers in cash mob treatment. This test allows us to understand more clearly whether the reaction to cash mob decisions is under the sign of reciprocity (free riding) that is, cash mobs increase (reduce) cooperation of those who play after and do not have the opportunity of becoming cash mobbers. Results are in this case inconclusive and do not reject the null. We find in all cases slight and not significant differences in the shares of cooperating choices between non cash mobbers in cash mob treatments and all other players in the corresponding non cash mob treatments. Therefore, static tests indicate that the cash mob treatment produces an increase in cooperative choices (positive gross effect) mainly determined by the higher level of cooperating choices of cash mobbers.

5 Descriptive dynamics and econometric findings

A limit of static tests is that of not properly treating choices that are correlated with each other (i.e., choices of the same player in different rounds). The use of static tests on a single (first or last) round sacrifices too many degrees of freedom to solve the problem. A better solution is an econometric specification where it is possible to use all observations while correcting at the same time for dynamic effects.

Before doing so we start by inspecting the dynamics of players' choices by looking at how the number of cooperative choices evolves across rounds and we do it so separately for any different treatment–sequence where baseline–cash mob and cash mob–baseline treatments are presented separately (Figures 1(a)–(f)). We find that in general cash mob treatments have significantly higher shares of cooperators. In addition to it, a comparison between baseline and green frame treatments shows that the share of cooperators tends to be larger in the latter.

These graphs allow us to focus on discontinuities after the introduction of new treatments. The discontinuities are clearly more pronounced when the cash mob treatment is introduced after the green frame treatment (with cooperative choices raising from around 43 to around

60 percent, Figure 1(c)) and after the conformity treatment (raising from around 37 to around 60 percent, Figures 1(e)), and when the cash mob treatment is interrupted in the conformity treatment (from around 53 to around 40 percent, Figure 1(f)).

Our baseline econometric specification taking into account the dynamics of the game (Table 4 and Table 5) is

$$\begin{aligned}
\mathsf{PrA}_{i,t} \;=\; & \beta_0 + \beta_1 \mathsf{Cash\ Mob}_t + \beta_2 \mathsf{Green}_t + \beta_3 \mathsf{Conformity}_t + \sum_j \delta_j \mathsf{DRound}_j \\
& + \sum_l \gamma_l \mathsf{No.\ Cooperators}_{t-1,l} + \sum_m \zeta_m \mathsf{Belief}_{i,t,m} + \sum_n \xi_n \mathsf{Surprise}_{i,t-1,n} \\
& + \beta_4 \mathsf{PrA}_{i,t-1} + \sum_h \eta_h (\mathsf{Surprise}_{i,t,h} * \mathsf{PrA}_{i,t-1}) \\
& + \sum_k \theta_k \mathsf{Sociodem}_{i,k} + \varepsilon_{i,t}
\end{aligned}$$

where $\mathsf{PrA}_{i,t}$ is a dummy taking value 1 if the i-th player chooses Product A at round t and zero otherwise; $\mathsf{Cash\ Mob}_t$ is a $(0/1)$ dummy equal to 1 in cash mob treatments; Green_t and $\mathsf{Conformity}_t$ are $(0/1)$ dummies taking value 1 in green framed and conformity treatments respectively. Dummies for each round are included in DRound (with the first round being the omitted benchmark). We control for the number of responsible buyers in the previous round ($\mathsf{No.\ Cooperators}_{t-1,l}$) with a separate $(0/1)$ dummy for each possible number from 1 to 10 (0 is the omitted benchmark) to pick up nonlinear effects. $\mathsf{Belief}_{i,t,m}$ represents the expectation of the individual i at time t on the number of responsible buyers (cooperators). We include in the estimate a dummy for each possible number of expected responsible buyers (from 0 to 10) here as well in order to capture nonlinear effects. $\mathsf{Surprise}_{i,t-1}$ captures the difference between $\mathsf{Belief}_{i,t-1,h}$ and the actual number of responsible buyers at $t-1$, and takes three categorical values. We use two dummies, one when the variable is greater than $+1$ (representing the *negative* surprise since the player expects a number of responsible buyers higher than what is actually the case) and one when it is lower than -1 (representing the *positive* surprise since the player expects a number lower than what is actually the case); the intermediate values $-1, 0, +1$ represent cases in which there is no surprise (*none*) or the surprise is limited and are the omitted benchmark. We as well control for the previous round player's choice, namely $\mathsf{PrA}_{i,t-1}$, and for the interaction between $\mathsf{Surprise}_{i,t,h}$ and $\mathsf{PrA}_{i,t-1}$ in order to test for asymmetries in the reaction to expectation errors conditional on the previous cooperative/non cooperative choice. Among socio-demographic controls ($\mathsf{Sociodem}_{i,k}$) we include male gender, four age classes (22–29, 30–39. 40–49, and 50+, with 18–21 being the omitted benchmark) and dummies for players' geographical origin.

In Tables 4 and 5 we propose pooled and panel fixed effect estimates for four different specifications where we progressively add controls. In the first specification we do not control for the previous round number of cooperators and for expectation errors. In the second specification we

introduce the number of cooperators. The third specification is augmented with the variables measuring the error in expectations about the number of cooperators and the fourth is the fully augmented specification described above accounting for asymmetric effects in expectation errors conditionally on the previous player's cooperative/non cooperative choice.

Findings from pooled estimates show that the cash mob effect is positive and significant in all of the four specifications. Since cash mobbers are not excluded from the estimate what we are measuring here is the gross cash mob effect. In terms of marginal impact the gross cash mob effect raises by around 10 percent the share of cooperators in the first simpler pooled specification (Table 4, column 1), while by around 5-6 percent when we add the previous number of cooperators and expectation errors as controls (Table 4, columns 2-4). Econometric findings show as well that the green frame has a positive and significant effect on cooperation ranging between 21 percent (in the simpler specification in column 1) to 12 percent (in the fully augmented specification in column 4). The conformity effect is positive but weakly significant. The rationale for this finding may be that, when information on the (disappointing) share of cooperators does not affect directly players' payoff, it produces lower negative reciprocity reactions thereby slightly raising the level of cooperation in the game.

Results from column 1 specification show that game dynamics matters indicating a pattern of decaying cooperation, well-known in prisoner dilemmas when the number of cooperators is revealed at the end of each round. This pattern is consistent with the hypothesis of conditional cooperation: due to a negative reciprocity reaction, some of the previous period cooperators may decide not to cooperate anymore if they realise that some of the players did not cooperate. As already said above, in our game the difference in payoffs between the two player's strategies (voting/not voting with the wallet) is invariant in the number of cooperators. This implies that the negative effect of the number of non cooperators on the probability of cooperating is only due to negative reciprocity (if we regard as negligible the convexity effects of equal changes in payoff strategies on the utility function). More specifically on this point we find that the effect ranges from a 9 percent fall in the second round to an 11 fall in the last round with irregular variations across rounds (Table 4, column 1).

In our second specification (Table 4, column 2) we use more efficiently the information available by introducing coefficients that capture the effect of player's expectations on the number of cooperators in each round. Coefficients on expectations have the expected pattern since the probability of player's cooperation grows (even though non linearly) in the number of expected cooperators. This is a much clearer proof of conditional cooperation and reciprocity than in the previous specification and, as expected, the effects of the expectation dummies makes that of round dummies no more significant. The effect is extremely strong and concentrated when the expected number of cooperators is highest (between 7 and 9).

In our third and fourth specifications we test whether, in addition to the previously reported effects, players' choices are also influenced by their expectation errors. As explained above we create an omitted benchmark of low expectation error (correct guess on the number of cooperators or error of one unit in both directions) and introduce two dummies for larger positive or negative errors (column 3). We then introduce an additional interacted factor where the large error dummy is multiplied for the cooperative choice (column 4). Our findings show that a 'large' positive error (at least two cooperators more than what forecasted) produces a free-riding reaction and therefore a negative effect on the cooperative choice (Table 3, column 3). In the last specification we test whether the free-riding surprise effect is asymmetric and find that this is the case since the positive and significant coefficient of past cooperators in presence of negative surprises shows that they do not react as negatively as the other players to the positive surprise (Table 3, column 4). Note as well that the introduction of the expectation surprise variables does not eliminate the previously described effects of pure expectations since dummies picking up the effect of the number of expected cooperators display the same previously examined significance pattern after controlling for expectation surprises.

In Table 5 we re-estimate the model using fixed effects in order to control for time (round) invariant idiosyncratic traits of players (Table 4). In this case we are aware to capture only within (across round) effects while losing sight of all between effects. The green frame effect cannot therefore be captured in fixed effect estimates since it is clearly a between effect (it does not vary across rounds for the same individual). On the contrary, the cash mob effect varies across rounds for the same individual and can be measured. Our results show that the cash mob effect remains strongly positive and significant with magnitude larger than that observed in pooled estimates (from 16 to 11 percent). The effects related to the number of rounds and prediction errors remain significant as in the pooled estimates, consistently with the fact that they are within effects. More specifically, period effects get larger while asymmetry of error effects is confirmed in its significance.

With a further econometric specification we aim to test the impact of the net cash mob effect. We therefore exclude cash mobbers from the sample and estimate a specification including among regressors the number of cash mobbers (from one to five) who reveal themselves as such and test the effect of this variable on cooperation of the sample of non cash mobbers only in cash mob treatments. Our findings show that the growth in the number of players who become cash mobbers produces a positive effect on the probability of choosing the cooperative choice in the subsample of the other players who do not have the opportunity to cash mob in the pooled estimates (Table 5) but not in the panel fixed effect estimates (Table 6). The impact ranges from a 15 percent higher probability of a cooperative choices, when only two cash mobbers reveal themselves as such, to a 33 percent higher probability when five cash mobbers decide to

cash mob.[13] Note that this finding does not contradict what found in static tests. The number of non cash mobbers choosing the responsible product may grow in the revealed number of cash mobbers while having in aggregate a non significant net cash mob effect (that is, a share of cooperators among non cash mobbers in cash mob treatments not significantly different from the number of cooperators in the corresponding non cash mob treatments). This is exactly what we find in our last estimates (Tables 7 and 8) where we measure with a unique dummy the net effect of cash mobs by using the cash mob treatment dummy and by excluding respondents in cash mob treatments who are given the opportunity to cash mob in a given round.

6 Conclusions

The solution of social dilemmas with mechanisms that solve the non cooperation trap and help players to coordinate and move away from the Pareto dominated Nash equilibrium has been one of the most thoroughly investigated fields in game theory. In particular, most of the research focus revolved around the role of private costly punishment strategies, tax/subsidy schemes, and pre-play communication. In this experiment we investigate this classic problem by devising an original type of social dilemma called 'vote-with-the-wallet' game both combined and not combined with a green environmentally responsible frame after discussing and documenting its growing economic relevance. In our experimental setting we devise an original (cash-mob like) mechanism aimed to solve the dilemma with an elicited voluntary (non punishment based) action of a subset of players. We document that the cash mob mechanism has a significant 'gross' effect (but an insignificant net effect) in raising cooperative choices of cash mob players since such choices end up being higher in cash mob treatments. We as well show that the green frame and conformity treatments help to increase the impact of cash mobs.

Our findings have several implications and stimulate further reflections. The main implication is that cash mob-like mechanisms may enhance cooperation reducing the negative consequences of the traditional mechanisms examined so far in the literature (such as costs for government budget or psychological and monetary costs on the punisher and the punished implied by private/public punishment devices) but only if the number of cash mobbers potentially involved is high with respect to non cash mobbers due to the difference between net and gross effects.

Cash mobs may be new forms of civic actions that are likely to become more frequent in the future. Our results open in turn new questions. What are the costs of organising and operating cash mobs? What are the best ways to elicit voluntary private effort in organising cash mobs that can reduce social dilemmas? How the mixed findings related to the positive gross effect and the inconclusive net effect may suggest ways to improve the impact of cash mobs using proper frames to implement their effects? Further research along this line may help to find

[13]The omitted benchmark here is '0 or 1 cash mobber' in order to balance the observations between the benchmark and the other variables.

answers to these new questions.

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Table and figures

Table 1: Treatments and sessions.

Treatment	Phase 1 (10 rounds)	Phase 2 (10 rounds)	Phase 3	Subjects
BL – CM	Baseline	Cash Mob	Questionnaire	30
CM – BL	Cash Mob	Baseline	Questionnaire	30
BLg – CMg	Green	Cash Mob Green	Questionnaire	30
CMg – BLg	Cash Mob Green	Baseline Green	Questionnaire	30
BLc – CMc	Baseline (conformity)	Cash Mob (conformity)	Questionnaire	30
CMc – BLc	Cash Mob (conformity)	Baseline (conformity)	Questionnaire	30

Table 2: Descriptive statistics.

Variable	Obs.	Mean (%)	Std. Dev.
No. cooperators	3600	4.3	1.7
Surprise			
None	2271	63.1	
Positive	766	21.3	
Negative	563	15.6	
Reveal	900	51.1	
Female	180	51.7	
Age class			
18–21	42	23.3	
22–29	96	53.3	
30–39	26	14.4	
40–49	7	3.9	
50+	9	5.0	
Region			
UK/Ireland	36	29.0	
EU	16	12.9	
Asia/Pacific/Australia	55	44.4	
US/Canada	7	5.7	
Middle East/Africa	2	1.6	
Central/South America	8	6.5	

Table 3: Hypothesis testing.

Treatment **(1) vs (2)**	**Observations**	**Share of cooperators (%) (1) vs (2)**	χ^2	**P-value**
BL vs CM (aggregate)	1200	33.2 vs 39.7	5.474	0.019
BLg vs CMg (aggregate)	1200	41.5 vs 53.7	17.805	0.000
BLc vs CMc (aggregate)	1200	42.0 vs 50.7	9.062	0.003
BL vs BLg	1200	33.2 vs 41.5	8.905	0.003
BL vs BLc	1200	33.2 vs 42.0	9.979	0.002
CM vs CMg	1200	39.7 vs 53.7	23.625	0.000
CM vs CMg (no CMbers)	600	31.0 vs 42.7	8.775	0.003
CM vs CMc	1200	39.7 vs 50.7	14.657	0.000
CM vs CMc (no CMbers)	600	31.0 vs 40.7	6.096	0.014
BL vs CM	600	33.0 vs 36.7	0.888	0.346
CM vs BL	600	42.7 vs 33.3	5.546	0.019
BLg vs CMg	600	45.0 vs 55.7	6.827	0.009
CMg vs BLg	600	51.7 vs 38.0	11.327	0.001
BLc vs CMc	600	44.0 vs 44.3	0.007	0.934
CMc vs BLc	600	57.0 vs 40.0	17.356	0.000
BL all vs CM no CMbers (aggregate)	900	33.2 vs 31.0	0.428	0.513
BL all vs CM CMbers (aggregate)	900	33.2 vs 48.3	19.483	0.000
CM no CMbers vs CM CMbers (aggregate)	600	31.0 vs 48.3	18.831	0.000
BL all vs CM no CMbers	450	33.0 vs 26.0	2.305	0.129
BL all vs CM CMbers	450	33.0 vs 47.3	8.740	0.003
CM no CMbers vs CM CMbers	300	26.0 vs 47.3	14.699	0.000
CM no CMbers vs BL all	450	33.3 vs 36.0	0.316	0.574
CM CMbers vs BL all	450	33.3 vs 49.3	10.795	0.001
CM CMbers vs CM no CMbers	300	36.0 vs 49.3	5.451	0.020
BLg all vs CMg no CMbers (aggregate)	900	41.5 vs 42.7	0.112	0.738
BLg all vs CMg CMbers (aggregate)	900	41.5 vs 64.7	42.046	0.000
CMg no CMbers vs CMg CMbers (aggregate)	600	42.7 vs 64.7	29.197	0.000
BLg all vs CMg no CMbers	450	45.0 vs 43.3	0.113	0.737
BLg all vs CMg CMbers	450	45.0 vs 68.0	21.220	0.000
CMg no CMbers vs CMg CMbers	300	43.3 vs 68.0	18.491	0.000
CMg no CMbers vs BLg all	450	38.0 vs 42.0	0.671	0.413
CMg CMbers vs BLg all	450	38.0 vs 61.3	21.934	0.000
CMg CMbers vs CMg no CMbers	300	42.0 vs 61.3	11.229	0.001
BLc all vs CMc no CMbers (aggregate)	900	42.0 vs 40.7	0.146	0.702
BLc all vs CMc CMbers (aggregate)	900	42.0 vs 60.7	27.911	0.000
CMc no CMbers vs CMc CMbers (aggregate)	600	40.7 vs 60.7	24.004	0.000
BLc all vs CMc no CMbers	450	44.0 vs 33.3	4.724	0.030
BLc all vs CMc CMbers	450	44.0 vs 55.3	5.148	0.023
CMc no CMbers vs CMc CMbers	300	33.3 vs 55.3	14.709	0.000
CMc no CMbers vs BLc all	450	40.0 vs 48.0	2.616	0.106
CMc CMbers vs BLc all	450	40.0 vs 66.0	27.059	0.000
CMc CMbers vs CMc no CMbers	300	48.0 vs 66.0	9.914	0.002

Legend: (aggregate) includes both sequences of the two treatments in alternating order, i.e. BL vs CM and CM vs BL (first row), BLg vs CMg and CMg vs BLg (second row), BLc vs CMc and CMc vs BLc (third row).

Table 4: The impact of Cash Mob on the responsible choice (Pooled, margins).

Variables	(1) PrA	(2) PrA	(3) PrA	(4) PrA
Cash Mob	0.100***	0.0596**	0.0559**	0.0484**
	(0.0283)	(0.0242)	(0.0246)	(0.0210)

Green		0.211***	0.169***	0.153***	0.122***
		(0.0591)	(0.0525)	(0.0472)	(0.0382)
Conformity		0.112**	0.0792*	0.0708*	0.0645*
		(0.0536)	(0.0465)	(0.0417)	(0.0331)
No. Cooperators$_{t-1}$ (Ref. = 0)					
	1		-0.0191	-0.00794	-0.0647
			(0.134)	(0.139)	(0.120)
	2		0.0447	0.0589	-0.0233
			(0.0858)	(0.0912)	(0.0742)
	3		0.0652	0.0812	-0.0362
			(0.114)	(0.115)	(0.0915)
	4		0.129	0.159	-0.00932
			(0.118)	(0.119)	(0.0963)
	5		0.148	0.195*	-0.0253
			(0.113)	(0.114)	(0.0945)
	6		0.164	0.221*	-0.0319
			(0.114)	(0.116)	(0.0955)
	7		0.258**	0.354***	0.0270
			(0.115)	(0.125)	(0.109)
	8		0.249**	0.328***	-0.0125
			(0.126)	(0.123)	(0.104)
	9		0.444***	0.497***	0.0589
			(0.126)	(0.125)	(0.102)
Surprise$_{t-1}$ (Ref. = None)					
	Negative			0.0552	0.0153
				(0.0384)	(0.0307)
	Positive			-0.123***	-0.126***
				(0.0361)	(0.0336)
PrA$_{t-1}$					0.322***
					(0.0248)
Surprise$_{t-1}$*PrA$_{t-1}$ (Ref. = None)					
	Negative				-0.0357
					(0.0471)
	Positive				0.150***
					(0.0472)
Female		-0.0993	-0.0975	-0.0956	-0.0596
		(0.0863)	(0.0858)	(0.0849)	(0.0504)
Period (Ref. = 1)					
	2	-0.0869**	-0.0851**	-0.0852**	-0.0910**
		(0.0350)	(0.0385)	(0.0373)	(0.0430)
	3	-0.0669**	-0.0447	-0.0523*	-0.0451
		(0.0300)	(0.0305)	(0.0312)	(0.0346)
	4	-0.0789***	-0.0602**	-0.0698**	-0.0647**
		(0.0293)	(0.0294)	(0.0311)	(0.0324)
	5	-0.0990**	-0.0818**	-0.0922**	-0.0864**
		(0.0396)	(0.0366)	(0.0397)	(0.0403)
	6	-0.0789**	-0.0530	-0.0609	-0.0514
		(0.0391)	(0.0387)	(0.0434)	(0.0424)
	7	-0.0829**	-0.0582**	-0.0642**	-0.0663**
		(0.0390)	(0.0256)	(0.0310)	(0.0272)
	8	-0.103**	-0.0814*	-0.0861*	-0.0837*
		(0.0446)	(0.0427)	(0.0441)	(0.0457)
	9	-0.128***	-0.0960***	-0.0990***	-0.0966***
		(0.0285)	(0.0236)	(0.0272)	(0.0234)
	10	-0.111***	-0.0735	-0.0771	-0.0704
		(0.0421)	(0.0498)	(0.0495)	(0.0538)
Age class (Ref. = 18–21)					
	22–29	-0.0783	-0.0638	-0.0553	-0.0448*
		(0.0499)	(0.0469)	(0.0445)	(0.0265)
	30–39	-0.212**	-0.180**	-0.171**	-0.125**
		(0.0885)	(0.0842)	(0.0803)	(0.0510)
	40–49	0.0610	0.0658	0.0716	0.0402
		(0.169)	(0.163)	(0.158)	(0.0991)

50+	-0.00231	0.00228	0.00280	-0.0163
	(0.124)	(0.122)	(0.114)	(0.0703)
Region (Ref. = UK)				
EU	-0.0938	-0.0888	-0.0804	-0.0565
	(0.0610)	(0.0610)	(0.0601)	(0.0389)
Asia/Pacific/Australia	-0.0988	-0.0954	-0.0898	-0.0648
	(0.0732)	(0.0694)	(0.0661)	(0.0417)
US/Canada	-0.182	-0.198	-0.197	-0.115
	(0.147)	(0.146)	(0.138)	(0.0827)
Middle East/Africa	0.0210	-0.0134	-0.0340	0.00529
	(0.129)	(0.133)	(0.124)	(0.0960)
Central/South America	0.00486	-0.0290	-0.0411	-0.0144
	(0.111)	(0.112)	(0.105)	(0.0658)
Observations	2,480	2,356	2,356	2,356

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: The impact of Cash Mob on the responsible choice (panel fixed effects, margins).

Variables	(1) PrA	(2) PrA	(3) PrA	(4) PrA
Cash Mob	0.162***	0.121***	0.113***	0.110***
	(0.0249)	(0.0278)	(0.0281)	(0.0280)
No. Cooperators$_{t-1}$ (Ref. = 0)				
1		-0.0748	-0.0821	-0.0710
		(0.136)	(0.135)	(0.136)
2		-0.0120	-0.00493	0.0124
		(0.122)	(0.121)	(0.121)
3		-0.000200	0.00651	0.0311
		(0.119)	(0.119)	(0.119)
4		0.0715	0.0830	0.114
		(0.118)	(0.119)	(0.119)
5		0.0703	0.0839	0.114
		(0.119)	(0.121)	(0.122)
6		0.111	0.129	0.152
		(0.120)	(0.123)	(0.124)
7		0.219*	0.256*	0.265**
		(0.127)	(0.133)	(0.134)
8		0.147	0.175	0.185
		(0.144)	(0.148)	(0.151)
9		0.272	0.292	0.289
		(0.209)	(0.214)	(0.210)
Surprise$_{t-1}$ (Ref. = None)				
Negative			-0.0287	0.00311
			(0.0368)	(0.0482)
Positive			-0.0770*	-0.174***
			(0.0421)	(0.0582)
PrA$_{t-1}$				-0.0105
				(0.0382)
Surprise$_{t-1}$*PrA$_{t-1}$ (Ref. = None)				
Negative				-0.0664
				(0.0678)
Positive				0.209***
				(0.0796)
Period (Ref. = 1)				
2	-0.140***	-0.125*	-0.123*	-0.117*
	(0.0533)	(0.0683)	(0.0679)	(0.0689)
3	-0.108**	-0.0727	-0.0759	-0.0777

	(0.0536)	(0.0679)	(0.0677)	(0.0682)
4	-0.127**	-0.0932	-0.101	-0.0993
	(0.0534)	(0.0679)	(0.0676)	(0.0682)
5	-0.160***	-0.134*	-0.142**	-0.141**
	(0.0531)	(0.0684)	(0.0679)	(0.0688)
6	-0.127**	-0.0852	-0.0883	-0.0854
	(0.0534)	(0.0687)	(0.0683)	(0.0689)
7	-0.134**	-0.0964	-0.0985	-0.0975
	(0.0533)	(0.0683)	(0.0678)	(0.0686)
8	-0.167***	-0.132*	-0.137**	-0.138**
	(0.0530)	(0.0689)	(0.0683)	(0.0694)
9	-0.207***	-0.167**	-0.170**	-0.167**
	(0.0527)	(0.0688)	(0.0682)	(0.0693)
10	-0.180***	-0.128*	-0.133*	-0.128*
	(0.0529)	(0.0691)	(0.0686)	(0.0694)
Observations	2,000	1,881	1,881	1,881

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: The impact of the number of CMbers on the responsible choice of non CMbers (panel, margins).

Variables		(1) PrA
No. Cooperators$_{t-1}$ (non CMbers) (Ref. = 0)		
	1	0.0666
		(0.118)
	2	-0.0220
		(0.129)
	3	0.0586
		(0.128)
	4	0.113
		(0.141)
	5	0.145
		(0.157)
PrA$_{t-1}$		-0.208***
		(0.0646)
Surprise$_{t-1}$ (Ref. = None)		
	Negative	-0.0765
		(0.107)
	Positive	-0.260**
		(0.109)
Surprise$_{t-1}$*PrA$_{t-1}$ (Ref. = None)		
	Negative	-0.0489
		(0.130)
	Positive	0.321**
		(0.128)
No. CMbers (Ref. = 0 or 1)		
	2	0.151**
		(0.0649)
	3	0.226***
		(0.0654)
	4	0.260***
		(0.0787)
	5	0.329**
		(0.150)
Single-period dummies		Yes
Observations		581

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: The net impact of Cash Mob on the responsible choice (Pooled, margins).

Variables	(1) PrA	(2) PrA	(3) PrA	(4) PrA
Cash Mob	0.0118	-0.0362*	-0.0363*	-0.0485**
	(0.0286)	(0.0219)	(0.0212)	(0.0197)
Green	0.193***	0.151***	0.141***	0.115***
	(0.0630)	(0.0569)	(0.0527)	(0.0432)
Conformity	0.114**	0.0792*	0.0730	0.0687**
	(0.0556)	(0.0478)	(0.0446)	(0.0344)
No. Cooperators$_{t-1}$ (Ref. = 0)				
1		-0.0544	-0.0415	-0.0918
		(0.122)	(0.126)	(0.110)
2		0.0174	0.0319	-0.0455
		(0.0662)	(0.0724)	(0.0560)
3		0.0507	0.0687	-0.0564
		(0.100)	(0.102)	(0.0749)
4		0.116	0.144	-0.0381
		(0.105)	(0.108)	(0.0825)
5		0.130	0.172	-0.0677
		(0.102)	(0.106)	(0.0815)
6		0.169*	0.221**	-0.0645
		(0.0976)	(0.103)	(0.0802)
7		0.236**	0.308**	-0.0210
		(0.109)	(0.122)	(0.104)
8		0.218*	0.283**	-0.0718
		(0.113)	(0.117)	(0.0936)
9		0.575***	0.612***	0.158
		(0.119)	(0.121)	(0.0963)
Surprise$_{t-1}$ (Ref. = None)				
Negative			0.0588	0.000270
			(0.0381)	(0.0334)
Positive			-0.0702*	-0.0768
			(0.0371)	(0.0486)
PrA$_{t-1}$				0.334***
				(0.0276)
Surprise$_{t-1}$*PrA$_{t-1}$ (Ref. = None)				
Negative				-0.0259
				(0.0531)
Positive				0.149***
				(0.0552)
Single-period dummies	Yes	Yes	Yes	Yes
SocioDem	Yes	Yes	Yes	Yes
Observations	1,879	1,787	1,787	1,787

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

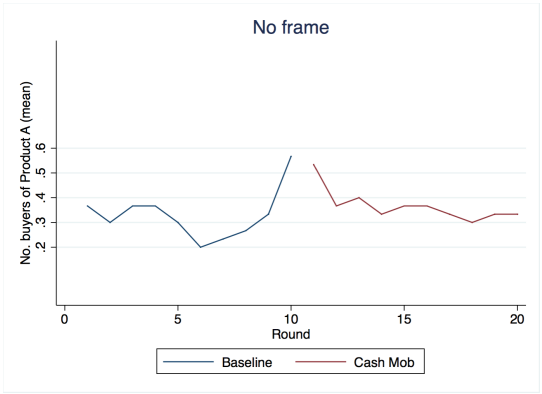
Table 8: The net impact of Cash Mob on the responsible choice (Panel, margins).

Variables	(1) PrA	(2) PrA	(3) PrA	(4) PrA

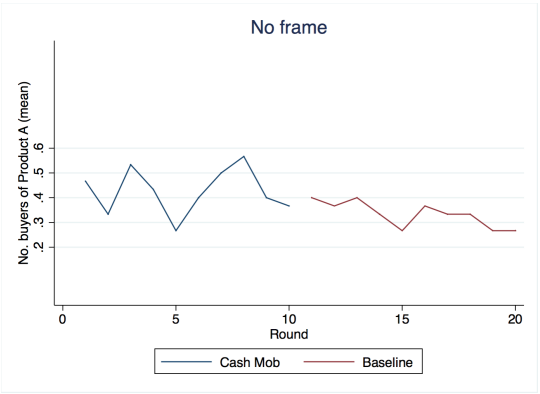
Cash Mob		0.0265	-0.0269	-0.0310	-0.0359
		(0.0304)	(0.0360)	(0.0355)	(0.0355)
No. Cooperators$_{t-1}$ (Ref. = 0)					
	1		-0.106	-0.120	-0.114
			(0.150)	(0.144)	(0.143)
	2		-0.0139	-0.0198	-0.0161
			(0.139)	(0.135)	(0.136)
	3		-0.0114	-0.0202	-0.0186
			(0.135)	(0.132)	(0.134)
	4		0.0677	0.0559	0.0551
			(0.140)	(0.139)	(0.143)
	5		0.0639	0.0470	0.0332
			(0.142)	(0.143)	(0.146)
	6		0.108	0.0909	0.0608
			(0.147)	(0.150)	(0.153)
	7		0.243	0.229	0.186
			(0.165)	(0.175)	(0.178)
	8		0.160	0.142	0.0911
			(0.180)	(0.185)	(0.187)
	9		0.382	0.350	0.323
			(0.314)	(0.315)	(0.317)
Surprise$_{t-1}$ (Ref. = None)					
	Negative			-0.0476	-0.0384
				(0.0411)	(0.0560)
	Positive			-0.0400	-0.134*
				(0.0493)	(0.0698)
PrA$_{t-1}$					0.0318
					(0.0456)
Surprise$_{t-1}$*PrA$_{t-1}$ (Ref. = None)					
	Negative				-0.0365
					(0.0790)
	Positive				0.224**
					(0.0965)
Observations		1,415	1,325	1,325	1,325

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

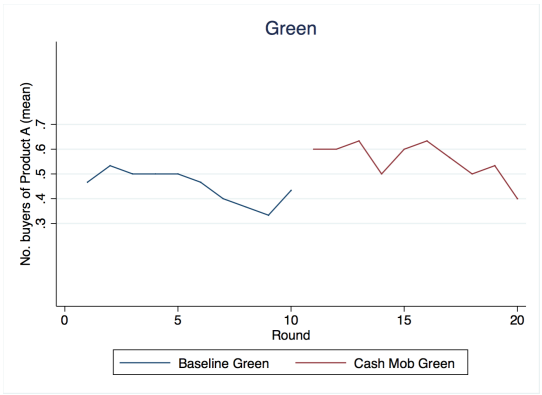
Figure 1: Share of cooperative buyers (by treatment)



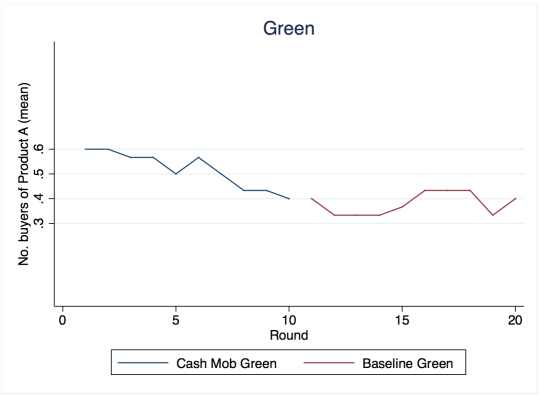
(a) Baseline – Cash Mob



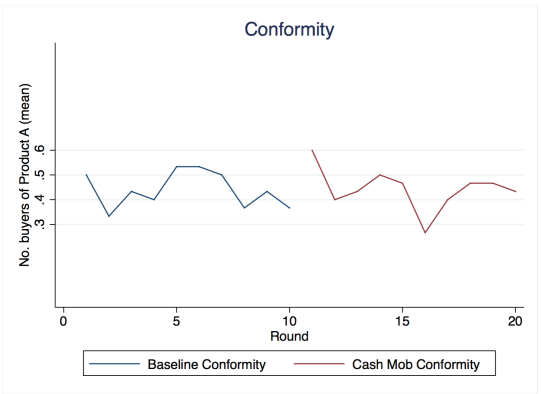
(b) Cash Mob – Baseline



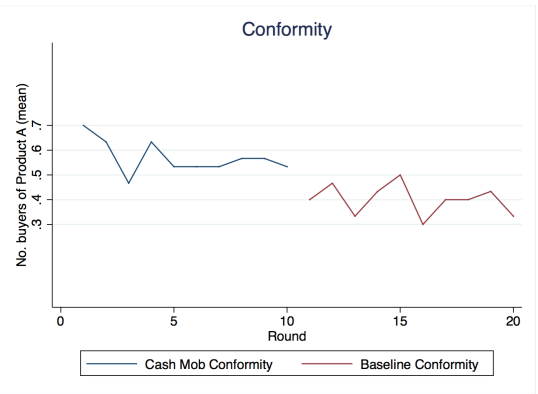
(c) Baseline Green – Cash Mob Green



(d) Cash Mob Green – Baseline Green



(e) Baseline Conformity – Cash Mob Conformity



(f) Cash Mob Conformity – Baseline Conformity

Figure 2: Share of cooperative buyers (by sequence-treatment).

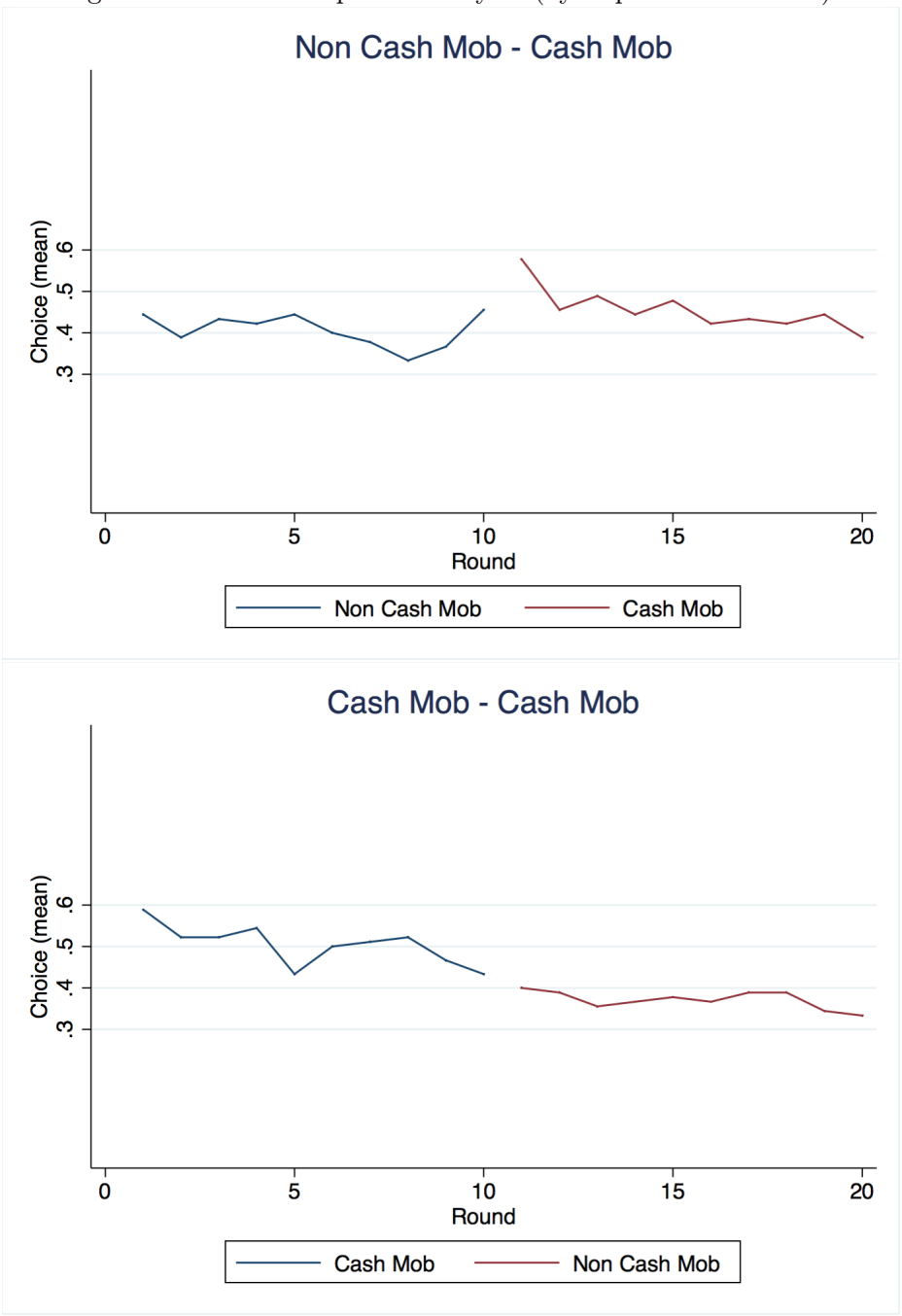


Figure 3: Descriptives of the cooperative choices.

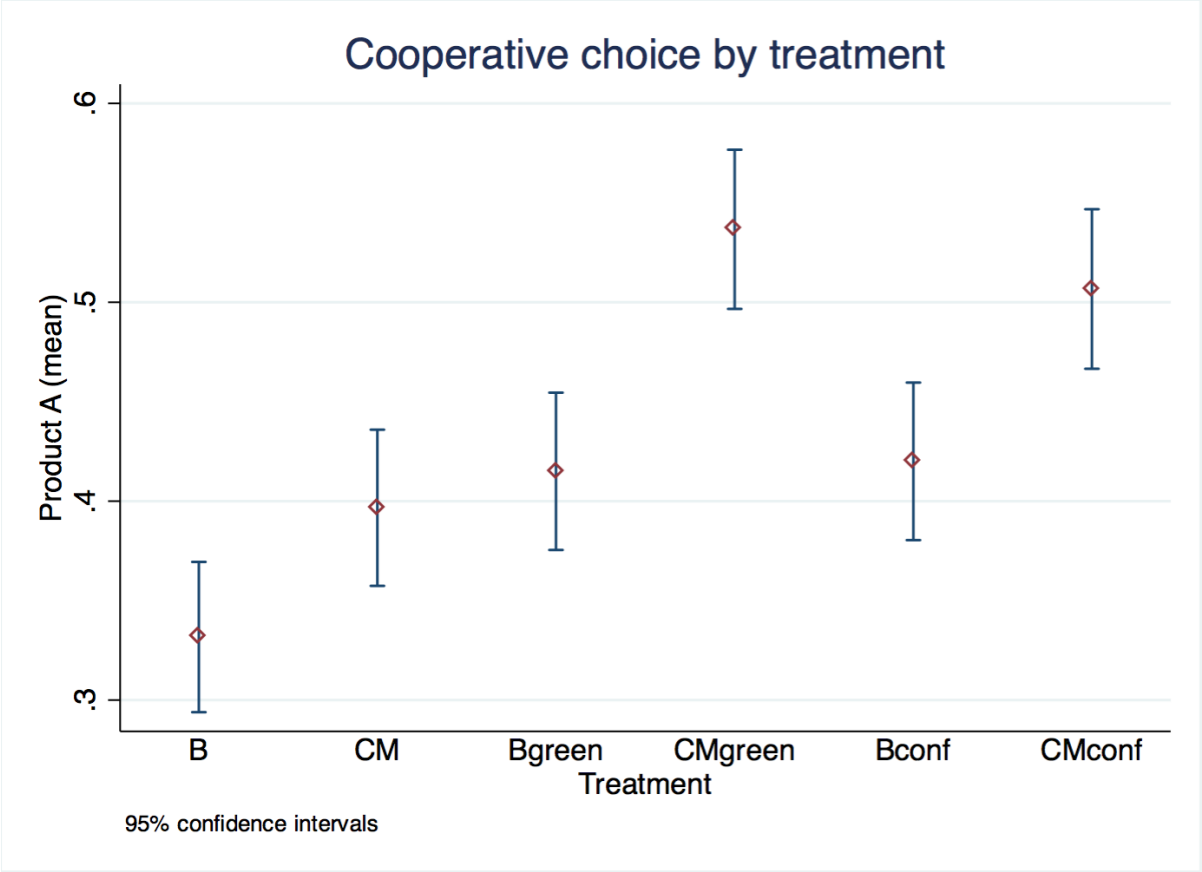
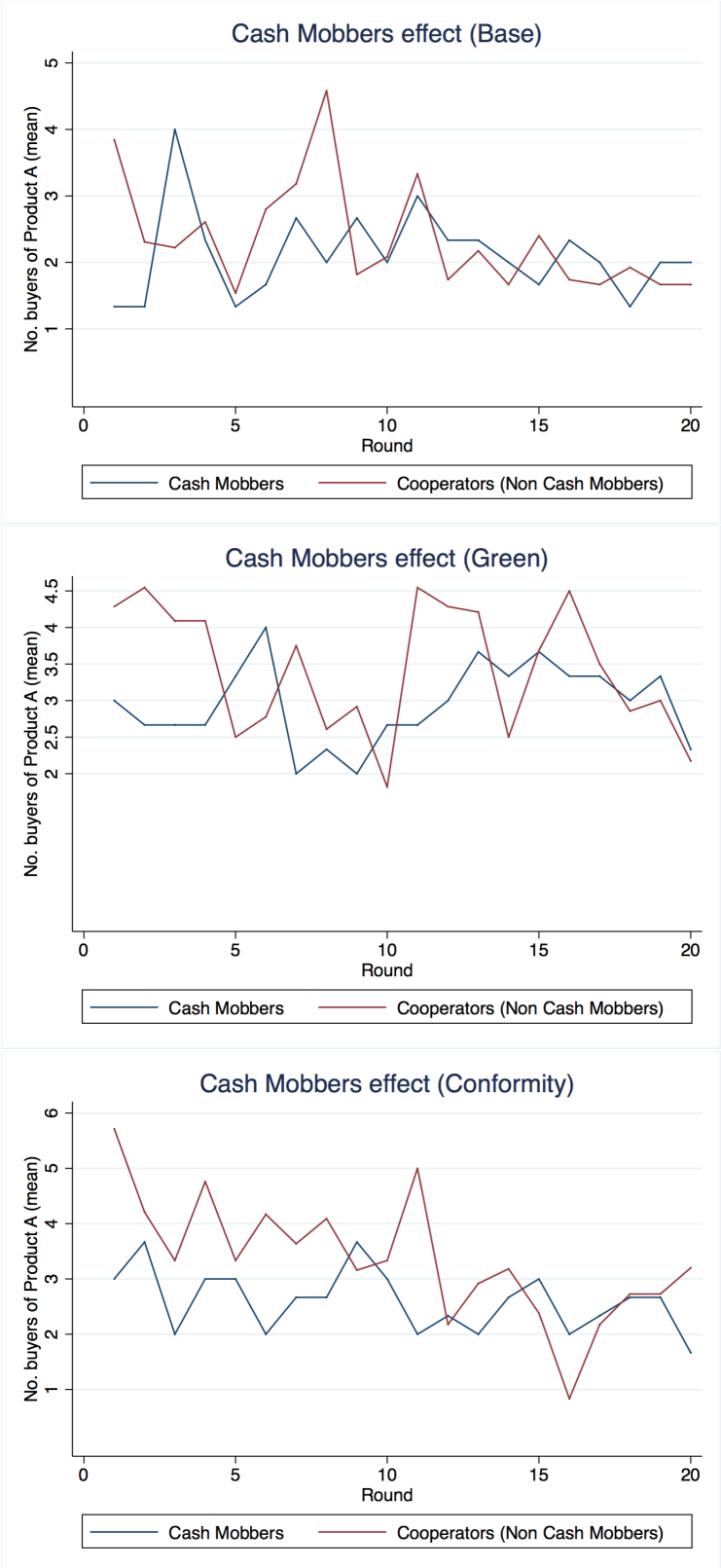


Figure 4: The effect of CMbers (by treatment).



A Experimental instructions

A.1 General instructions

Welcome and thanks for participating to this experiment.

The goal of this experiment is to verify the impact of some factors on our decision making process.

Together with other experiment participants you will have to make decisions in different situations. Your decision and the other participants' decision will jointly determine your economic gain in tokens. You will be paid according to the outcome of one randomly select round among all your decision rounds. In addiction to this payment, you will receive a show-up fee of 5 tokens. At the end of the experiment, the tokens gained will be converted in pounds sterling (with the exchange rate 2 tokens = £1) and paid out to you privately in cash.

Your private identity and those of the other participants to the experiment will never be revealed even after the end of the experiment and our research. Also, unless otherwise specified, your choices and answers will be dealt with anonymously (without reference to your identity).

Overall the experiment session will last approximately one hour.

We ask you to work alone and in silence.

Thank you for your participation!

A.2 Specific instructions

A.2.1 Baseline Session

In this session you are asked to choose between two products, namely Product A and Product B.

Product A costs 10 tokens. If you choose Product A, you directly gain 3 Tokens. In addiction, you gain 3 Tokens for each of the other participants choosing Product A.

Product B costs 5 tokens. If you choose Product B, you do not have any direct gain. Yet, you gain 3 Tokens for each of the other participants choosing Product A.

For every round you are given an endowment of 15 tokens that you are able to spend to choose one of the two products. Each round consist of the following steps

1. You formulate your expectations on how many participants (out of 10) choose Product A and how many participants choose Product B in this round;
2. You make your choice between Product A and Product B;
3. After your choice and the choices of all other participants, we tell you and them how many participants have chosen Product A and Product B without revealing their identity;
4. We ask you to what extent you are satisfied about the outcome of the round, about the other participants' behaviour in this round, and about your behaviour in this round.

At end of the game we will make a lottery with a monetary prize of 5 Tokens for the participant(s) who made the best guess on step 1.

The effect on your payoff of the two choices (Product A or Product B) are summarised in the following table
Each of the 10 participants is in your same situation and faces the same table describing payoffs.

Table 9: Summary of costs and gains.

	Costs and benefits (tokens)	
	If you choose Product A	**If you chose Product B**
SHOW-UP FEE	5	10
INITIAL ENDOWMENT	15	15
COST	−10	−5
DIRECT GAIN	3	0
GAIN (arising from the other participant's choice)	+3 for each participant choosing Product A	+3 for each participant choosing Product A

Your final total gain will be

$$\begin{aligned} \textit{Final Total gain} = \textit{Show-up fee} \; + \; \textit{Initial endowment} \\ - \; \textit{Cost of selected Product} \\ + 3 \times (\textit{Number of people who chose Product A, you included}) \end{aligned}$$

The following table summarises your final total gain (conditional to your choice and those of the other players).

Table 10: Payoff table.

If you choose Product A		**If you choose Product B**	
Number of people (you excluded) who choose Product A + You	*Total gain (tokens)*	*Number of people (you excluded) who choose Product A*	*Total gain (tokens)*
$9+1$	**40**	9	**42**
$8+1$	**37**	8	**39**
$7+1$	**34**	7	**36**
$6+1$	**31**	6	**33**
$5+1$	**28**	5	**30**
$4+1$	**25**	4	**27**
$3+1$	**22**	3	**24**
$2+1$	**19**	2	**21**
$1+1$	**16**	1	**18**
$0+1$	**13**	0	**15**

NOW YOU CAN CHOOSE!

A.2.2 Cash Mob Session

As in the Baseline session, in this session you are asked to choose between two products, namely Product A and Product B. For every round you are given an endowment of 15 tokens that you are able to spend to choose one of the two products. Now, before playing next round, half of you (5 players) are randomly selected as participants who have the opportunity to reveal to everyone else that they choose Product A, if they do so. This is an opportunity. Therefore these selected participants can still choose Product A and remain anonymous. Then, all other players choose.

The new sequence of steps is the following

1. You formulate your expectations on how many participants (out of 10) choose Product A and how many participants choose Product B in this round;
2. We randomly select some participants who have the opportunity to reveal that they choose Product A (if they choose to do so). The randomly selected participants are not publicly revealed. If you are one of the selected participants, you can decide to choose Product A publicly or remain anonymous – and still choose Product A or Product B);
3. All other participants choose between Product A and Product B;
4. After your choice and the choices of all other participants, we tell to you and them how many participants have chosen Product A and Product B without revealing their identity (except for those at step 2 who revealed publicly their choice);
5. We ask you to what extent you are satisfied about the round, about the other participants' behaviour in this round, and about your behaviour in this round.

At end of the game we will make a lottery with a monetary prize of 5 tokens for the participant(s) who made the best guess on step 1.

A.3 Frames

A.3.1 Green Product Session

In this session you are asked to choose between two products, namely Product A and Product B.

Product A is a generic "Green" product, which is it has less of an environmental impact or is less detrimental to human health than Product B. **Product A** costs 10 tokens. If you choose Product A, you directly gain 3 tokens. In addiction, you gain 3 tokens for each of the other participants choosing Product A.

Product B costs 5 tokens. If you choose Product B, you do not have any direct gain. Yet, you gain 3 tokens for each of the other participants choosing Product A.

For every round you are given an endowment of 15 tokens that you are able to spend to choose one of the two products. Each round consist of the following steps

1. You formulate your expectations on how many participants (out of 10) choose Product A and how many participants choose Product B in this round;
2. You make your choice between Product A and Product B;
3. After your choice and the choices of all other participants, we tell you and them how many participants have chosen Product A and Product B without revealing their identity;
4. We ask you to what extent you are satisfied about the outcome of the round, about the other participants' behaviour in this round, and about your behaviour in this round;

At end of the game we will make a lottery with a monetary prize of 5 tokens for the participant who made the best guess on step 1.

A.3.2 Conformity session

In this session you are asked to choose between two products, namely Product A and Product B.

Product A costs 10 tokens. If you choose Product A, you directly gain 3 tokens. In addiction, you gain 3 tokens for each of the other participants choosing Product A.

Product B costs 5 tokens. If you choose Product B, you do not have any direct gain. Yet, you gain 3 tokens for each of the other participants choosing Product A.

For every round you are given an endowment of 15 tokens that you are able to spend to choose one of the two products. Each round consist of the following steps

1. You formulate your expectations on how many participants (out of 10) choose Product A and how many participants choose Product B in this round;
2. We tell all participants how many participants have chosen Product A and Product B in the same round of a previous game session with exactly the same characteristics;
3. You make your choice between Product A and Product B;
4. After your choice and the choices of all other participants, we tell you and them how many participants have chosen Product A and Product B without revealing their identity;
5. We ask you to what extent you are satisfied about the outcome of the round, about the other participants' behaviour in this round, and about your behaviour in this round;

At end of the game we will make a lottery with a monetary prize of 5 tokens for the participant who made the best guess on step 1.

A.4 Control questions

Please answer the following control questions. They will help you to gain an understanding of the calculation of your final total gain, which varies with your decision about which product you choose between Product A and Product B. Please answer all the questions and write down your calculations.

1. Each group member has 15 tokens. Assume that none of the members (including you) choose Product A.

   a) What will your total gain be?

   b) What will the total gain of the other group members be?

2. Each group member has 15 points. You choose Product A. Each of the other members of the group also choose Product A.

   a) What will your total gain be?

   b) What will the total gain of the other group members be?

3. Each group member has 15 points. Three participants choose Product A.

   a) What will your total income be, if you also choose Product A?

   b) What will your total income be, if you choose Product B?

B Post-Experimental Questionnaire

1. Gender
    a. Male
    b. Female
2. Age
3. Place of residence
4. Housing condition
    a. Living alone
    b. Living with family
    c. Living with other people (not family)
5. Marital status
    a. Single
    b. Married
    c. Unmarried partnership
    d. Separated
    e. Divorced
    f. Divorced
    g. Widow
    h. Other
6. Father education
    a. Primary School
    b. Middle School
    c. Upper Intermediate/High School
    d. University degree
    e. Other
7. Mother education

a. Primary School

b. Middle School

c. Upper Intermediate/High School

d. University degree

e. Other

8. Father professional status

a. Self employed

b. Clerk

c. Manual worker

d. Executive

e. Retired

f. House activity

g. Student

h. Entrepreneur

i. Unemployed

j. Other

9. Mother professional status

a. Self employed

b. Clerk

c. Manual worker

d. Executive

e. Retired

f. House activity

g. Student

h. Entrepreneur

i. Unemployed

j. Other

10. Number of people in the household (including yourself)
11. Are you or members of your family actively involved in volunteering organisations?
12. Are you or members of your family actively involved in environmental organisations?
13. On a 0-10 scale, to what extent do you consider the environmental footprint in your weekly shopping basket (Tick your preferred box – 0 means you do not consider it at all, 10 means you completely consider it)
14. Which bracket represents your annual net household income in 2014? (Net income is after any tax or National Insurance is deducted).
    a. Less than £11,070
    b. £11,070 – £18,450
    c. £18,451 – £25,831
    d. £25,832 – £36,901
    e. £36,902 – £66,422
    f. More than £66,422
15. On a 0-10 scale, to what extent do you feel generally satisfied with the experience worked out in the experiment? (Tick your preferred box – 0 means you are not satisfied at all, 10 means you are fully satisfied)
16. On a 0-10 scale, to what extent do you feel generally satisfied with the behaviour of the other participants in the experiment? (Tick your preferred box – 0 means you are not satisfied at all, 10 means you are fully satisfied)
17. On a 0-10 scale, to what extent do you feel satisfied with your behaviour in the experiment? (Tick your preferred box – 0 means you are not satisfied at all, 10 means you are fully satisfied)
18. Generally speaking, on a 0-10 scale to what extent do you think we can trust other people? (Tick your preferred box – 0 means we cannot trust other people at all, 10 means we can completely trust other people)
19. On a 0-10 scale, how satisfactory do you consider your life as a whole? (Tick your preferred box – 0 means you not satisfactory at all, 10 means fully satisfactory)

20. On a 0-10 scale, how satisfactory do you consider your financial situation? (Tick your preferred box – 0 means not satisfactory at all, 10 means fully satisfactory)
21. Based on your political preferences, rank you on a Left-Right scale (Tick your preferred box, where -5 means you are extreme left-wing oriented and $+5$ means you are extreme right-wing oriented)
22. Do you have a Facebook profile?
23. If you answered "Yes" to Question 22, how many friends you have on Facebook?
24. Do you have a Twitter profile?
25. If you answered "Yes" to Question 24, how many tweets you have done so far on Twitter?
26. If you answered "Yes" to Question 23, how many profiles are you following on Twitter?
27. If you answered "Yes" to Question 23, how many followers do you have on Twitter?